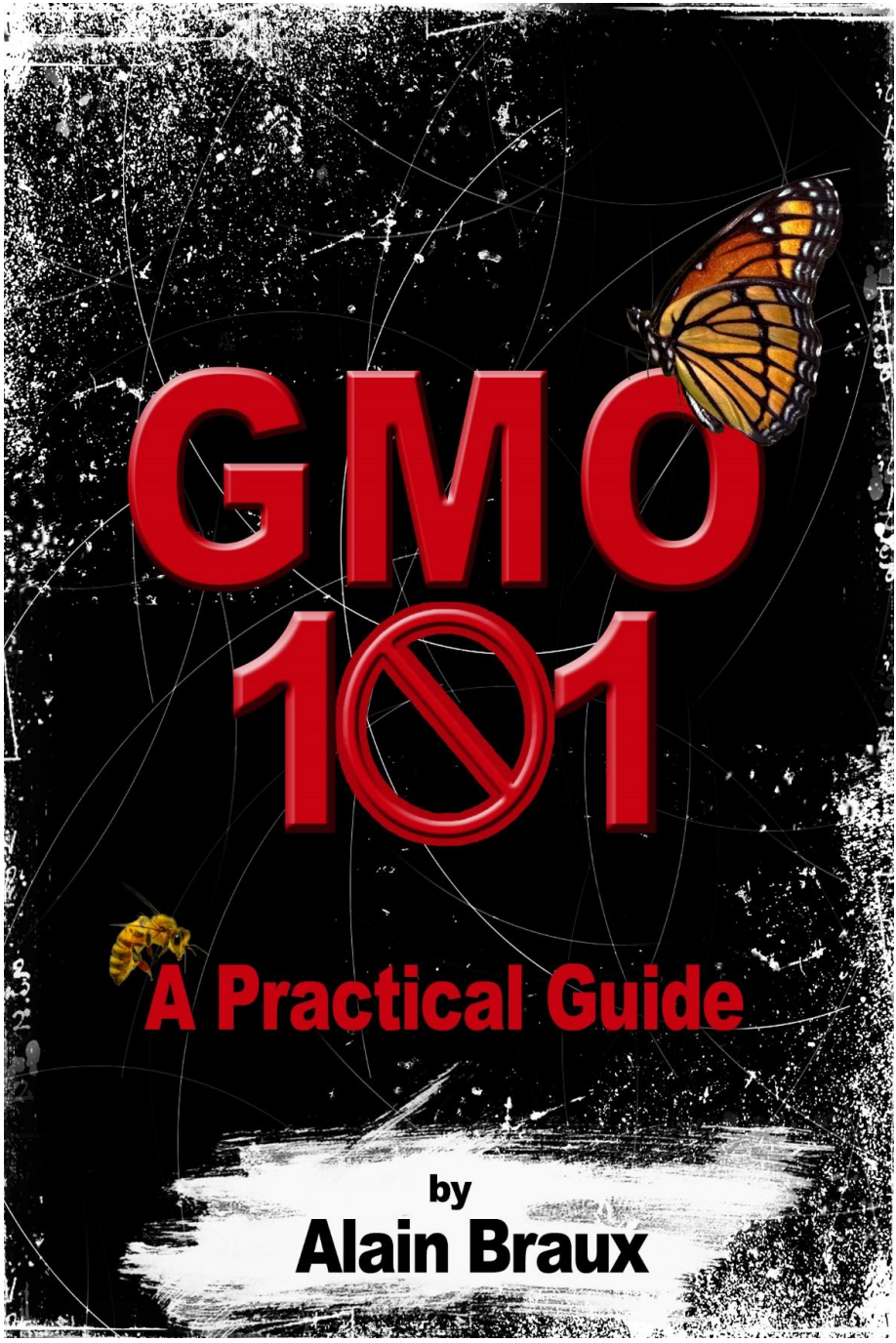
GMO
101
A Practical Guide
by
Alain Braux

GMO
101

A Practical Guide
to Genetically Engineered Food

By Chef Alain Braux, C.E.P.C., C.M.B.

B.S. Holistic Nutrition

Executive Chef and Culinary Nutritionist

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Disclaimer: This book has been written as an educational tool only. It is not a substitute for the informed medical recommendations of your personal physician or other qualified healthcare provider. The information within these pages is designed to help you learn about and understand your current health condition. My hope is that this book will allow you to have a better dialogue with your healthcare providers and make your life easier.

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Before starting a lifestyle change, please check with your personal physician to make sure that the changes you plan to make are right for you. Sincerely, **Alain Braux**.

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Foreword

Have you ever read one of those really scary books? The kind that keeps you up at night but you just… can't… stop… reading it?

This could be one of those books.

Dependent on your mindset, the information provided in this book could scare you half to death. Of course, in my mind, I think people need to be scared out of their comfy and complacent foxholes that they have dug for themselves and look around at what is really going on. Anytime some uncomfortable truth is brought into the light, it seems much easier for people to simply stay in denial. It's too hard to think that maybe not everyone has your best interests at heart. It's easier to condemn the whistleblowers as "conspiracy theorists". It's so much easier to rely on the headlines in the paper or the evening news with the oh-so-comforting information that a "new study" has just been done and you have nothing to worry about. A study that was commissioned and funded *by the very people* who have the financial interest in creating and selling these heinous products, but we won't mention that part. Shh…. Go back to sleep… Everything is okay…

We don't have that option anymore. Not if we want to live and be healthy. In my mind, genetically modified foods are a plague in this world that needs to be first recognized and then eradicated. Having said my opinion, let's look at it from another angle. I do believe that GM foods were probably created with… let's not say *good*, but perhaps not bad intentions. With our growing populations worldwide I know that there is very serious concern regarding world hunger. Where I part ways with this is that I feel that the answer to world hunger is more actual food; not this Frankenfood that is being churned up out of a laboratory. Instead of spending the time and research money into how to make "food" in a test tube, why did we not invest in growing more actual food? Did you know that the certification for GM foods is "GRAS"? Stands for "generally recognized as safe". Would you order something off a menu whose strongest recommendation for it is that it is *probably* safe?

Some of my ideas as to why this happened will probably cause you to think of me as a "conspiracy theorist". That's okay. Wouldn't be the first time. As

to the more open minded, you can grab your tinfoil beret and follow me down the rabbit hole with a few facts.

FACT: Sixty two countries label GMO's. The United States isn't one of them. If they honestly feel that GMO's are not a problem, then why do they spend millions of dollars defeating legislation that are not even asking for them to be removed; just labeled. If there is no problem, then why cover it up?

FACT: It's not just the wing nuts that are against GMO's. There is also a large and growing group of doctors, researchers, scientists and nutritionists that are seeing damage first hand. Although the "studies" that have been funded by the corporations creating these things (like Monsanto) say that they're fine, the independent research is telling a far different story.

FACT: The most common implication of GM foods is digestive problems. According to data tracker IMS Health the combined sales of the two most common digestive medicines (Nexium and Prilosec) has gone from $6.2 billion in 2001 to $13.6 billion in 2009. Coincidence?

FACT: You can't patent a food. Anyone can grow whatever they like in their yard, keep some seeds from this year's crop, and do it all over again next year without buying more seeds, which cuts down on profits. However you CAN patent a GMO and the seeds will not regerminate so that you constantly have to buy more. Good thing to keep in mind: If a "food" or "food product" is patented, there is a good chance that it has been genetically modified. You can't patent stevia, but you can patent "Truvia"…

FACT: On March 25, 2014, President Obama signed into law H.R. 933, otherwise known as "The Monsanto Protection Act". This bill, crafted by Monsanto backed Sen. Roy Blunt, states that even if future research shows that GMOs or GE seeds cause significant health problems (i.e. digestive problems, allergies, tumors, cancer, anything), that the federal courts no longer have any power to stop their spread, use, or sales. Wow. Sen. Blunt even admits that he "worked with Monsanto to craft the language in the bill". Plain old common sense dictates that if you're not worried about your Frankenfoods causing any future damage, why protect yourself so heavily? And why did this get signed over the protests of over 250,000 petition signing concerned Americans?

A link that is not (yet) established is to the rapidly rising numbers of incidences of Autism and Autism Spectrum disorders, like ADD, ADHD, Aspergers, and the like. When I started working with autism extensively in 2005, the rates were already going up in a meteoric fashion. Going from about 1 in 10,000 when I was in school and staying around that neighborhood for a long time, it seemed to start skyrocketing around the year 2000 or so. The rate of 1 in 166 children being diagnosed seemed catastrophic enough to me, but now, only nine years later it is 1 in every 68 children. 1 in every 54 boys. And although I know that there are other culprits at play in this tsunami, I can't help but believe that these GMO's - who leave inflammation and leaky gut behind in their wake - are a contributing factor.

After reading this book you will have no questions as to what a GMO is, where they can be found, and why you shouldn't eat them or put them on your skin. This is a practical, easy to read and to access book, with lots of websites and reference sites. Educating yourself is the first important step. I congratulate Alain Braux on his exhaustive (and I mean exhaustive) and excellent research. You have no excuses now…

The time is gone where we can sit around hoping that "somebody" will step up and do something about our failing food supply and the poisoning of our population. The time is now to get involved! Go to a search engine and enter "Anti GMO groups USA" and see if there is anyone local to you, or someone national that you like for that matter. Donate. Sign petitions. Get involved. Stop waiting for "someone". YOU are someone…

As I said before, this could be construed as a "scary" book, but the choice is yours. Do you want to freak out or do you want to educate yourself? If education is your choice, then read on…

– Shauna Young, PhD, CTN. Health freedom activist.
Medical director: The NoHarm Foundation (noharmfoundation.org)
Author: "If Naturopaths Are Quacks, Then I Guess I'm A Duck"

Heard on the Grapevine

Dear Chef Alain. Thank you for caring and having the initiative of creating a book that will help bring much needed information about GMOs. This amazing book, will help us all live healthier lives, while also caring for the environment. Thank you for thinking ahead and caring not only for our health , but also for the future of the Earth. Wishing you the best in health. One Planet for all, all for one Planet.

– Rachel Parent. Founder, **Kids Right To Know**. Twitter: @RachelsNews

What a wonderful resource, Chef Alain Braux has created for us! In his 5th book on food and health, Alain Braux explores the dark sides of genetically modified organisms (GMOs) in our environment. He reviews how GMOs came to be and then became a major force in our current agricultural and industrial environment and, most importantly, how GMOs are beginning to adversely affect our health.

Chef Alain explores the negative effects of GMOs on our immune systems, increasing the risk of developing food allergies, leading to the development of autoimmune diseases. The book also includes a comprehensive list of genetically engineered ingredients hidden in our food supply. What most of us do not realize is that GMOs are also used in the manufacturing of many vitamins and nutritional supplements! Chef Alain has given us the ultimate reference guide to keeping GMOs out of your life!

As a practicing physician, a clinical researcher and a champion of using "Food As Medicine", I highly recommend this book. If you care about your health, your family's health, and the future of humanity this book is for you.

– Dr. Terry Wahls. Clinical professor of Medicine, University of Iowa, Iowa City, Iowa, U. S. A. Author, ***The Wahls Protocol***. *How I Beat Progressive MS Using Paleo Principles* and *Functional Medicine* at **TerryWahls.com**

Chef Alain has provided a wonderful introduction for some, and resource for others wanting to expand their knowledge of GM foods.

He's written an accurate account of the beginning of the GMO takeover of our food system, while disproving the seed oligarchies propaganda and

myths, and covering the many health concerns that are constantly present in our grocery stores.

It covers the many important facts that are part of this issue, I wish for anyone trying to gain more knowledge of their food to read this book.

– **Birke Baehr**. Internationally-known Youth Food Advocate, Author, Public Speaker, and Future Farmer in organic and sustainable farming practices at **Birke on the Farm**

As a chef, Alain Braux has a deep appreciation for good-tasting, nutritious, and sustainably produced food. At the same time, he has a deep concern for foods that pose risks to our health and the environment, such as genetically engineered foods.

He clearly expresses his concerns in *GMO 101. A Practical Guide to Genetically Engineered Food.* In this comprehensive book, Chef Alain describes the history of genetically engineered foods, how they are made, and, most importantly, how they threaten our health. He also lists, in incredible detail, the foods and ingredients that are derived from GMOs.

In order to stop this uncontrolled experiment on our food, more and more people must become aware of this threat. *GMO 101. A Practical Guide to Genetically Engineered Food* is an excellent tool to learn about GMOs and to avoid them.

– **Ken Roseboro**. Editor and Publisher, ***The Organic & Non-GMO Report***

This book is one of the most amazing GMO Truth guides in existence today, not only clearly detailing the harms, but providing a practical guideline to avoid the known dangers of these genetically engineered and agrochemical contaminated foods. I highly suggest anyone who is aware of the issue to read it and spread it far and wide!

– **Sayer Ji**. Author, researcher, and lecturer on GMO issues; Steering Committee Member of the **Global GMO Free Coalition** (GGFC); Advisory board member of the National Health Federation. Founder GreenMedInfo.com, the world's most widely referenced evidence-based natural health resource.

GMO 101 is a must read for anyone who is even a little bit interested in Genetically Modified Organisms. No matter what side you support.

You can sense the depth of research and time taken to bring what is a very complex subject within easy grasp of all who are seeking answers. In fact Alain Braux has tackled those difficult questions about GMOs and through his deep understanding of this subject – been able to provide straight forward answers.

The first part of the book provides the intelligent overview of where the real problems are and goes on to bring out well thought out and practical solutions to those problems – giving just the right amount science needed to provide quite a deep insight for the reader, yet not so much as to be impenetrable. This is not a dry or boring book – thankfully. It is a real source of sound information presenting the problems with current GMO research and with the products that have been unleashed onto the world of food production.

Once you have read this book, you will be informed but you won't be able to sit on the fence. You'll also look more closely at what you eat. And even there Alain has taken on the huge task of listing the larger part of food and ingredients that contain GMOs. So you'll not only know why you should be careful about the food you eat, you'll also know what foods to avoid.

Bottom Line… If you want to be reliably informed about what GMOs are and – if you value your health – what you should be doing about them… Then GMO 101 is exactly the book you need to read.

– Mark Moxom Beng MEng. Editor: **Low Carb Magazine**. Author Expert Speaker Low carb Advocate

Everyone needs to read this eye-opening book on the dark side of GMO food. Chef Alain Braux does a masterful job of outlining all the arguments "they" use for why we should have genetically modified foods, along with the reasons "we" are not benefiting from these foods.

On the contrary, GMO foods are slowly weakening our immune systems, creating allergies, and leading us towards autoimmune diseases. If, by now, you're worried about what to eat, never fear. Chef Alain takes you by the hand and walks you through the food aisles, guiding you to the healthy,

organic choices. From apples to zucchini, he steers you away from the genetically modified "Franken-foods" and the ingredients to watch out for.

More than a practical guide, GMO 101 is very comprehensive, and can be used as a thorough reference guide for almost any food or food ingredient you can think of.

I highly recommend this book to anyone who cares about their health, their family's health, and our environment.

- **Lynda Goldman**, Publisher of **Healthy Organic Woman**.

Trained as a professional French pastry chef, Alain Braux seems like an unlikely advocate for healthy eating. But as a culinary nutritionist and his passionate connection with food, he began to ask hard questions about where his food came from, how it was made, and how it impacts the health of people and the planet. Inevitably, this led him to confront the world of genetically modified organisms (GMOs) and what he found there troubled him so much that he felt compelled to share his findings.

In "GMO 101", Chef Alain dives into the history of genetically modified foods, its origins at the turn of this century and its modern day applications. He takes on the purported benefits of GMOs, a supposedly safe way to increase crop yields chief among them, and systematically exposes them for the lies that they are.

Tony Federico, B.S. APK, ACSM HFS, CFL1. Author of ***"Paleo Grilling – A Modern Caveman's Guide to Cooking with Fire"***

I have had the distinct pleasure to get to know Chef Alain Braux over the past couple of years. His knowledge of nutrition and avoidance of particular foods like gluten and dairy combined with French cooking is truly a shared gift. I love the recipes in his cook books and am very excited that his 'GMO 101' book is being published. It is a must read for many reasons.

In addition to poignantly describing our food industry he has written the most comprehensive list of ingredients (especially those that are difficult to pronounce) that I have ever read. I will refer to it for years to come. My thanks to Alain for helping me continue to be aware and mindful of the foods I choose to eat and serve.

– Julie Trone. CEO **Allergy Free Table**; Nutrition Education Development Specialist

All aboard for Chef Alain Braux's new work, GMO 101 which will elevate the understanding of everyone in the land who wants to understand the most serious issue of the day with regards to the food you are eating.

Chef Braux's easy going style melds with a mountain of research. If your life revolves around healthy living and the great, fresh food needed to drive it this is your book to understand how to protect yourself and your family from the poisonous food stuffs in everyday packages.

– Chef Christopher Daly. Founder **Hip4Kids**. New York

In the early 1900's, hydrogenated margarines (trans fats) were released into the food system, deemed by governments to be safe. Later, polyunsaturated margarines containing these trans fats were even recommended by health authorities to be beneficial for prevention and treatment of coronary disease, when substituted for butter and natural saturated fats. Now, we have discovered that there is no 'safe' level of artificially produces Trans fats and labeling is mandatory. Are we to trust our "authorities" blindly again?

We could be going down the same path with GMO. We don't know if they are safe. That's the problem. No-one knows, and worse, no one seems willing or able to do the research to prove one way or the other. My belief, as is Alain Braux's , is that when you don't know if something can harm you, avoid it, and the key to avoiding them is knowing where they lurk.

Chef Braux masterfully takes us on the GMO voyage. In an easy to read, entertaining and very understandable style, he gives us the history, politics, potential health dangers, and, most importantly the likely sources.

This book is a must for anyone who is interested in the GMO debate, and for anyone who cares for the future health of, not only themselves, their family and friends, but the global environment. It is only by empowering ourselves with knowledge that we will be able to help win the battle. And it is only through consumer demand that retailers and manufacturers, farmers, fishers and ranchers will take heed and stop the spread of these organisms, or demand valid research.

This book will give you all and more than you need. I highly recommended you read it.

– **Sally James**. Award-winning author, educator, chef, television presenter and radio producer/host of **Slow Living Radio** whose books and recipes have won international acclaim for food & wine pairing.

GMO 101 is a health guide … No, a real life drama of classified toxic, vicious, insidious, specious GMOs invading our basic food supply and bodies. Did you know GMOs were "officially" introduced to the food market in 1996?

Here it is in a nutshell:

Food Safety 101: Toxins, considered a chemical hazard, cannot be killed but can be eliminated or removed whereas harmful biological bacteria or pathogens are destroyed by cooking which is considered a "kill step" (example: chicken-cook to 165degrees internal temp)

GMO 101: GM Bt toxins are not destroyed by cooking nor by our bodily digestive process. So as these toxins end up in our intestines, they can kill friendly bacteria living there that helps us stay healthy.

In GMO 101, Rarebird French Chef & Nutritionist Chef Alain passionately spells the pros & cons for you without too much scientific chemistry jargon. He blatantly reads between the lines for you!

– **Jocelyn C. Lee**. Gourmet In Motion, CEO - Culinary Product Development & Processing, Food Safety Compliance, Nutrition Value Analyst.

Introduction

Bonjour! Are you well today? I hope you are. I have a question for you…

Have you by any chance eaten a genetically engineered food product today? The resounding answer is "most certainly."

Hello again to you all, my old Friends, Family, Fans, Supporters and Readers of my previous forays into the fascinating relation between food and health. To all my new readers, welcome to my fifth effort in this ancient concept in the world at large, yet a burgeoning field in the U.S.A., the connection between food and health.

This new effort will endeavor to educate you in the mysterious world of food engineering. I would like to explore with you how our food is manipulated by large corporations for world food domination and profits. I do not mean to scare you, just to educate you into the alternative world of genetically engineered food you and I eat every day without being aware. I sincerely hope it will open your eyes to its ultimate effects on our health and that of our children.

To make sure you are clear from the beginning, as a Chef and Food Nutritionist, I am absolutely against it. I am anti-GMOs and proud of it. No one messes with my food and my health. I will not pretend to agree or even argue with the pro-GMO side of the food business which in reality is the world of toxic food degeneration and chemicals. Feel free to read their side of this story somewhere else. I feel that my responsibility to you, dear reader and longtime follower, is to help you understand this issue so you can make an educated decision. After that, what you decide to do with this information is entirely up to you.

Even though I will give you a lot of information, as in my previous books, I will try to make it easy for you to understand without drowning you in scientific mumbo jumbo or fancy and complicated words. As some of you already know, I approach the subject of health and nutrition form the point of view of a food geek and a French chef, otherwise known as a food lover. I am romantic food fool. Before I became passionate about the nutritional aspect of food, I had worked in many capacities in the food business for about 30 years. As a chef handling food daily, I expressed my love of food in

my craft as a chef and skills in presenting my food in an artistic and appetizing form. In those days, my love for tasty food and pastries were my only guides.

About 15 years ago, I started to make the connection between the quality of the food we eat and the quality of our life and health. It became my new passion and gave a whole new direction to my approach to food.

It is in the name of this love of good quality food that I wrote this book. It came mostly from the outrage I felt when I discovered how industrial food was treated in this country and its negative influence on our quality of life and ultimate costs in dollars and suffering. In my ongoing exploration of the connection between food quality and health, I am willing to explore the dark side of our food world for you. Are you ready to follow me?

Unlike my previous books, this practical manual will not contain recipes. Unless you specifically request them in a follow-up book, I do not see the point of offering recipes based on non-GMO foods. Quality food is food any way you slice it. It should be easy once you know what to do with it. How you put them together should be easy once you know how to select your source ingredients. Feel free to refer to any of my previous books for the healthiest ways to shop and cook tasty French recipes.

Instead I will endeavor to explain the dark side of genetically engineered foods and give you advices on how to avoid them and eat only good quality, nourishing foods.

I will also give you some examples of how GMOs can affect your health. Again, I will not drown you with tons of negative results of eating GMOs, just enough so you will get the picture. There are plenty of great scientific studies, reports and books already available on this subject. I will give you a list of books or reports to read if you are interested in digging deeper. Remember, the title is “GMO 101”, not “101 scientific reasons to avoid GMOs”. Find all the scientific answers you are looking for in the Resources section at the end of this book.

Finally, to help you make sense of this complicated issue, I will give you a long list of GM ingredients hiding in your daily food, groceries, supplements and even skin care and cosmetics to help you avoid them. To complete this

effort, I will send you to explore the long list (and growing daily) of wonderful non-GMO products verified by the Non-GMO Project.

You are about to enter another dimension, the dimension of food manipulations in secret labs. A dimension not only of toxins and gene manipulation, but of the creative mind of mad scientists. A journey into a wondrous dark land of Frankenfood. Next stop, the GMO Zone! (Inspired from my favorite show of all times, "The Twilight Zone")

I hope this practical manual will open your eyes to what seems to be a strange parallel world but unfortunately is all too real in our daily lives, I wish you "A Votre Santé" (To Your Health).

Ready? Follow me into the GMO Zone.

– Chef Alain Braux.

Once Upon a Time in GMO Land – The Short History of GMOs

Once upon a time, in a parallel universe called the GMO universe, there were well-meaning scientists who wanted to feed the ever growing earth population. It was a worthy goal. Unfortunately, the greedy corporations stepped in with their poisoned GM apple. This is how we start our voyage into the dark side of food… the GMO Zone.

Around 1900, a European scientist called Gregor Mendel's discovered the genetic theory to manipulate and improve plant species. He called it "classic selection." A plant of one variety is crossed with a plant of the same family to produce the characteristics desired by farmers. It is sometimes called cross-breeding. Keep that fact in mind as there is an important distinction between this natural form of manipulating nature and the genetically engineered version.

Right after World War II, scientists discovered that they could transfer DNA between organisms. In 1953, James Watson and Francis Crick discovered the three-dimensional DNA. This, in turn, led to the ability of other scientists to identify and "splice" genes from one family of organism into the DNA of another. Remember though that these organisms are not from the same family, an important difference with cross-breeding.

Then, in 1973, Herbert Boyer and Stanley Cohen combined their research to create the first successful recombinant DNA organism. That was the official beginning of the mad scientist's version of Frankenfood.

To make things worse, in 1980, the U.S. Supreme Court ruled that genetically altered life forms can be patented in the in *Diamond v. Chakrabarty* case. This ruling allowed the Exxon Oil Company to patent an oil-eating microorganism and other companies to patent genetically engineered seeds. That is when some corporations decided that they could patent life in the form of GMOs.

A couple of years after that, in 1982, the U.S. Food and Drug Administration gets into this nasty game and approves the first genetically engineered drug, Genentech's Humulin, a biosynthetic form of insulin produced by genetically engineered bacteria. This is the first official consumer product developed

through modern bioengineering. It is still sold today by Eli Lilly. One could say, "So what? It's a good thing, right?" Not so fast my friend!

In 1986, Belgium is the first country in the world to field tests genetically engineered tobacco and the United States conduct their first field tests of tobacco and tomato crops right after that, in 1987.

In the early 1990s, a bioengineered version of rennet, chymosin or rennin, was approved for use in several countries, replacing natural rennet in cheese-making.

Then in 1992, the company Calgene created the first tomato engineered to stay firm and "fresh" for a longer shelf life. It was called Flavr Savr. It was approved for commercial production by the FDA in 1994. After Monsanto bought out Calgene, it was taken out of the market in 1998 due to high production costs and consumers' resistance to this first GE food product.

That same year, the FDA made what some concerned people consider to be a controversial statement. It claimed that "foods developed through genetic modification are not inherently dangerous and, except in rare cases, should not require extraordinary premarket testing and regulation." It considered GM foods as GRAS (generally regarded as safe) like other questionable food additives, colorings and chemicals added to our food.

Better yet – not for us customers but for the seed corporations – the FDA left it up to the biotech companies to test the safety of their own genetically engineered (GE) products. It's like giving the wolf the key to the hen house. So while all of Europe and most of developed countries require safety testing by their own government scientists for GE plants, the U.S. government agency in charge of protecting American citizens allows these companies, who stand to make billions in profits from GE foods, to conduct their own "voluntary safety consultations." How nice! - For the corporations, of course, not for us.

Back in the U.S., around 1996, the following crops were officially introduced to the food market: Canola oil from Calgene, Bt (Bacillus thuringiensis) corn or maize from Ciba Geisy, Bomoxynil-resistant cotton by Calgene, Bt cotton by Monsanto, Roundup (glyphosate)-resistant soybeans by Monsanto, Bt potatoes by Monsanto (later taken off the market), virus-resistant squash by Monsanto-Asgrow, and more delayed ripening tomatoes by DNAP,

Zeneca/Peto and Monsanto received marketing approval from the FDA. That was the official beginning of modern genetically engineered crops.

In 2000, Aventis Cropscience (now Bayer Cropscience) introduced a type of Bt corn called StarLink. They inserted a protein (Cry9C) isolated from a common soil bacteria, *Bacillus thuringiensis* (Bt) into this corn. This protein was known to be effective against caterpillars because it binds to different sites of the insect gut and destroys its stomach cells. This protein has no effect on other living creatures. StarLink corn was approved by the U.S. The EPA approved it for animal feed but not for human food until additional testing was completed. Unfortunately, traces of DNA from StarLink corn were found in taco shells and over 300 corn products for human consumption. Since StarLink was not approved for human consumption for potential food allergies risks, Aventis withdrew the product entirely from the market after multiple lawsuits were filed.

Currently, bioscientists are testing the controversial golden rice, a variety of *Oryza sativa* rice, with increased vitamin A (beta carotene) content was created in 2000 to combat deficiencies in third world countries. At this time, scientists have not proven that humans can actually assimilate and convert these GE vitamins to benefit humans as claimed. In 2005, a new strain of Golden Rice is released by Syngenta, replacing the daffodil gene with maize (corn). This 2nd version of Golden Rice claims to produce more than 20 times more beta-carotene. In 2012, a Tuft University Chinese study published in the *American Journal of Nutrition*, tested Golden Rice on Chinese children without their parents' approval, claiming that as little as one cup of Golden Rice could provide half the recommended daily allowance of Vitamin A. In response, 20 scientists wrote an open letter, stating the clinical trials were flawed and unethical. The lead scientist was barred from further studies and the study was withdrawn.

Other possible GM crops: cassava that can resist viruses routinely damaging harvest; bananas containing higher levels of iron; corn that uses nitrogen more efficiently; pest-resistant black-eyed pea and a Golden Banana that would also deliver vitamin A.

And much more to come… unfortunately.

They Say, We Say Argument

In this chapter, They Say will be the Pro-GMO group and We Say is the Anti-GMO group. Regarding GM (genetically modified) crops…

They Say… GMOs offer higher crop yield

We Say… At this time, it is pretty clear that not only GM crops do not have higher yields, in some cases, it actually shows a lower yield after a year of two. Unlike what we are told, GM crops are not better at tolerating poor soils or difficult climate conditions. These traits are very difficult to genetically engineer in these crops in such short time. GM crops have not be proven to be more nutritious either.

Currently, virtually all GM crops are designed to resist certain herbicides (Roundup-ready alfalfa, corn, cotton and soy) or are created to generate their own insecticides (Bt corn as soon Bt soy). These monoculture crops are used mostly for animal feed (alfalfa, canola, corn, cottonseed and soy cakes) and processed foods (canola, corn, cottonseed and soy oils), even biofuel (corn). There is a much longer list later on in this book. Some of the smaller crops are created to resist certain pests or molds only. Some others are developed to offer a better vitamin profile (rice or bananas). Since corporations are created as a for-profit entity, the last thing on their mind is to help humanity. Market domination and their bottom line is their most important concerns, not our health. I know, it may sound paranoid but when have you seen corporations to care more about us than their bottom line?

Sustainable and Organic Agriculture is the Answer

On the other side of that food coin, a recent UN/World Bank report on the future of agriculture offered by about 400 scientists and endorsed by 58 countries does not endorse GM agriculture as a viable way to feed the world. Instead, sustainable and organic methods of growing food as shown increases in yield of 20% and up to more than 100%. These crops also require less water to grow, much less pesticide and insecticide use, show much better health and resistance to environments challenges. Oh, and as an added benefits for the farmers, these crops can be replanted from one year to another unlike sterile GM crops that need to be bought again and again every year, no matter what the results are.

They Say… GMOs benefit the environment.

We Say… GM crops typically require more water, more chemical fertilizers, deplete the soil from its nutrients, use a lot more pesticides and insecticides which then run off in our water tables. How are any of these factors beneficial to the environment?

They Say… GMOs reduce the use of herbicides and pesticides.

We Say… I say bull poop! GM herbicide-tolerant crops are engineered to survive being sprayed with herbicides, most often glyphosate-based herbicides such as Roundup. All plants, besides herbicide-resistant crops, are supposed to die. But guess what? Nature always finds a way and evolves. Those pests and weeds these herbicides were supposed to kill become resistant to the toxins. Now farmers have to battle super bugs and super weeds. What do they do then? Apply even more of the same in order to try to eliminate those pests. A recent report by the USDA shows that between 1996 (the official beginning of GM crops) and 2011, spraying over these GM crops show an overall increased use of pesticides by 404 million pounds (about 7% more) compared to the amount of pesticides that would have been used on regular, non-GM crops.

So then, chemical companies come up with a "new and improved" more toxic pesticides to deal with those pesky bugs. It's a race between man-made poisons and nature's ability to overcome them. In my opinion, it's a losing battle and we, the customers are paying the price with our health. Is that really what we want for our children?

They Say… Bt toxins do not harm non-targeted species

We Say… Although natural Bt toxin, which is derived from a common soil bacterium, has a history of safe use when used as an insecticidal spray in traditional and organic farming, it is applied to the outside of the plant and eventually degrade when exposed to the elements.

In contrast, the Bt toxin engineered into the Bt crops are switched on all the time and act differently than the natural. GM Bt crops have been shown to harm monarch butterflies as well as beneficial pest predator insects helpful to the farmers (ladybugs, and lacewings for example). In animal testing, GM Bt corn has been found to be toxic to labs and farm mammals.

It appears that Bt toxins are not destroyed by cooking nor by the digestive process. So, since these toxins end up in our small and large intestines, they can kill the friendly bacteria living there that helps us to stay healthy. So you know, since testing Bt corn on humans is illegal, it is hard to prove. But if we look at the results shown on mice and farm animals, it would not take a big jump of faith to extrapolate that it could be harmful to humans as well. Meanwhile, since we are eating these Bt toxin-laced foods daily, I am concerned that we may be the lab rats in this vast scale experiment.

They Say… GMOs increase crop yields and in the process, helping food farmers be more profitable.

We Say… Unlike what they promise, GM crop do not increase crop yield. The only growth that has been observed was in conventional breeding. Yield increase, despite their promises, cannot be genetically engineered in plants. The old fashion way of cross breeding to create favorable traits is the way farmers have been able to increase yield adapted to their region.

You may not be aware of this fact but all GM seeds are patented. That means, they can only be sold by and bought from that seed company. It is said that just ten seed companies control 2/3 of global seed sales. Since GM seeds are created to be proprietary and secret, once a farmer starts using these seeds, under severe licensing terms, they are not allowed save their seeds for reuse. Besides, most of these seeds are sterile which means they will not reproduce from one year to another.

That forces farmers to keep on buying from the same seed company year after year which, of course is good business for these companies, not the farmers. To keep on buying these seeds, farmers borrow more money, go deeper into debt and as they are forced to continue to buy. If their crop do not deliver as promise (higher yield or better quality) these farmers lose money year after year and have to borrow more to buy next year's crop seeds. Eventually, the farmers will go so deep in debt that they will go bankrupt. Some of them, not able to face the disgrace of bankruptcy, will kill themselves as a way to wipe out debts. For more details on this subject, please watch **Seeds of Death** here:
https://www.youtube.com/watch?v=eUd9rRSLY4A

On the other hand, traditional seed cross-breeding gives farmers unlimited access to improved seeds as well as replant saved seeds as they have done for centuries.

They Say… GMOs are just another form of plant breeding and have no more risks than naturally bred crops.

We Say… GM proponents claim that, there is no difference between mutation breeding, or mutagenesis and genetically engineered crops. For one, mutagenesis has a history of being safe over generations. They are done through natural cross breeding of two species of the same crop.

GM crops, on the other hand, are engineered in a lab by "shooting" a toxin-resistant bacteria with a gene gun at random into the plant gene, hoping it will get the expected results. Do you know how they found that bacteria? One day, a curious Monsanto scientist discovered that a certain bacteria was alive and well in a pool of Roundup sludge residues. That bacteria was recovered, tested, replicated and inserted into corn gene and Voila! Roundup-resistant corn.

Unfortunately, science is not that precise, at least not yet. As in using letters of the alphabets to form words and sentences in a specific order to make sense, it is important to insert a new gene into a host plant gene in precise order or you will not get the expected results. As you can change the meaning of a word by changing the letter sequence, it's the same with food science. Try throwing a bunch of letters up in the air and make sense of them when they land randomly. Although this a simplistic explanation, it is similar to gene sequencing. You can't just shoot a foreign gene at random into a plant gene and expect exact results. All it takes is to damage one little section of that plant DNA to create a whole different plant with possible toxic results. It can be worse when you introduce a known toxin (like Bt toxin) into a plant. These scientists are playing apprentice sorcerers with nature and, as you know from that old story, it did not end well. I don't expect this Frankenfood experiment to end well for us human beings if we do not put our foot down and refuse to buy their weird science products.

They say… GMOs are safe to eat and more nutritious

We Say… Pro-GM food claim that genetically engineered crops deliver healthier and more nutritious "biofortified" crops. At this time, no such nutritionally advanced commercial GM crops are available. There are trials

being done on golden rice and bananas but, at this time, they have not proven to be more nutritious than traditional crops. Actually, some of them have proven less nutritious due to unintended consequences of genetic manipulation.

The most talked about is the "golden rice" enriched with GM biosynthesized beta-carotene which our body will then turn into vitamin A. This crop was originally designed to bring added vitamin A benefits to poor countries' population – a seemingly good idea. Vitamin A deficiency in malnourished people can cause blindness, illness and death. So, in effect, golden rice proponents are claiming that their "miracle rice" will prevent blindness and death. Since those are medical claims, they should be investigated by the FDA like any drug, yet they are not. No studies have proven yet that golden rice can prevent blindness and death. Why are they allowed to make these outrageous claims when supplements or herbal medicine are not allowed to make similar healing claims? I wonder.

Unfortunately, in order for beta-carotene to be transformed into vitamin A, dietary fat is needed. Typically, poor countries habitants do not have access to quality fats. It's too expensive for them to use daily. Secondly, a study by the Iowa State University discovered that in order to get the recommended amount of vitamin A, a child would have to eat 12 pounds of golden rice and a woman up to 16 pounds (1 kilogram) a day. Really? That's a lot of rice to buy for poor people.

Furthermore, in order to absorb beta carotene properly, our body requires adequate amounts of zinc, protein and fats, elements often lacking in the diets of poor people.

The common sense way of doing this would be to teach these poor countries' farmers to eat animal liver or grow and eat carrots and leafy green vegetables, inexpensive crops easily available.

Oh, by the way, call me a cynic but the fact that the leader of the International Rice Research Institute (IRRI) research, Gerald Barry, was the previous director of research at Monsanto doesn't inspire trust. I don't know about you but that makes me wonder about the real reasons behind this "good will" effort. Might it have something to do with Monsanto trying to control rice production all over Asia? Mmm! Just sayin'

They Say… GMOs are good for farmers

We Say… As mentioned above, due to the inefficacity of Roundup-ready crops regarding super bugs and super weeds, farmers have to use more pesticides, which of course, add to their cost of production. Or they have to use other, more powerful and toxic herbicides and pesticides like 2,4-D (an ingredient of the Vietnam War toxic defoliant Agent Orange) and dicamba. Do we really need Agent Orange in our food?

Another problem is that GM genes cannot be controlled, contained, or recalled. Once released into the environment, they can persist and proliferate through cross-pollination and self-seeding. In addition, GM crops can be mixed with non-GM crops during harvesting, in storage, or in transport. There have been many incidents of GM pollen cross breeding with organic crops and ruining these farmers since their clients refuse to eat GM food. They have tried to sue GM companies but have failed so far. Worst yet, Monsanto is known to sue organic farmers whose crop has been contaminated by their GM pollen for "using" their GM genes… and won. Wow! Where is this world going to?

The last dark side of this cost coin is that more and more countries are refusing to buy American GM crops. Europe, Japan and China are the largest but they are not the only ones. They are banning the growth, purchase and use of GM food crops or even of GM-fed animals (beef, pork, and chicken). That drastically reduces American farmers' ability to sell their crops to the world at large.

They Say… GMOs are solving the world's food crisis.

We Say… The world's food crisis is a political issue, not an agriculture issue. Claiming otherwise is disingenuous. Greedy corporations and controlling governments are the main reasons why millions of people in the world do not have enough food to eat.

Scientific studies to back the above information

Find much more in-depth information about GMOs 25 Myths and Truths at the **Earth Open Source** site,
http://www.gmwatch.org/news/archive/2010/11906-10-reasons-why-we-dont-need-gm-foods

But Why Are You Saying GMOs are Dangerous for Us?

Well… this is a tough one to prove mainly because it is unethical to test potentially dangerous foods on human beings. Never mind that multiple unproven drugs are tested on humans daily in this country and even after been approved by the FDA, have proven to be toxic and dangerous to people. Why is it that what is good enough for pharmaceutical companies is not required of chemical companies developing seeds with medical claims?

Secondly, anyone that want to test the GM seeds has to obtain the same exact types that are sold by commercial seed companies and used daily by farmers all over the country. GM seed companies make that impossible by banning anyone to sell or share their seeds for research purposes. If they are found to do so despite strict confidentiality agreements, they are sued by these same corporations. So, the few labs that managed to test these seeds had to be sneaky about it and get them in the middle of the night from shady and mysterious characters. All of that without approval from these friendly seed companies that care so much about our health.

But we can use tests done of animals to extrapolate what it could do to humans. Feeding studies on laboratory animals and farm livestock have found that some GM crops, including those already commercialized, have toxic or allergenic effects.

Some of the health consequences on these test animals' health, which could come from the GM feed itself or from pesticides residues (glyphosate) used on them, include:

Digestive system

- Altered gut bacteria

- Disturbances in the functioning of the digestive system

- Excessive growth in the lining of the gut, similar to a pre-cancerous condition

- Intestinal abnormalities and inflammation

- Less efficient feed utilization and digestive disturbance

- Severe stomach inflammation and heavier uterus

- Stomach lesions and unexplained animal deaths

Liver

- Accelerated liver ageing

- Cellular changes in liver and pancreas

- Disturbed liver, pancreas and testes function

- Enlarged liver

- Liver and kidney toxicity

Organ damages

- Altered blood biochemistry, multiple organ damage, and potential effects on male fertility

- Cellular changes in liver and pancreas

- Differences in organ weights, which can be a sign of toxicity or disease

- Enzyme function disturbances in kidney and heart

- Higher density of uterine lining

- Immune disturbances, immune responses, and allergic reactions

Here are a couple of recent studies to help you understand

In a recent long term and very detailed French study by Dr. Seralini, rats fed a commercialized GM corn diet grew large cancerous tumors, severe damage to the liver and pituitary gland after a few months of observation. They showed a higher mortality rate and lower fertility rate compared to the control group. If they survived long enough and actually had babies, they were much smaller than normal. This study was deemed controversial by the pro-GMO camp but eventually proven true. See more details here: http://www.gmoseralini.org/en/

In a separate study developed by Dr. Judy Carman, pigs were fed a diet of GM soy and corn compared to a control group fed regular corn. After they reached maturity, these animals were slaughtered and cut open to analyze their entrails (to divine our future). They showed a 267% increase in severe stomach inflammation compared to those fed non-GMO diets. The difference was even more pronounced in males, a 400% increase. Wow! In case you did not know, most autistic children are males, and almost all of them have severe intestinal inflammation. It could be the GM feed or it could be the result of added pesticides sprayed on these crops. See more here: http://gmojudycarman.org/

The lead author of the study, Dr. Judy Carman stated, "We found these adverse effects when we fed the animals a mixture of crops containing three GM genes and the GM proteins that these genes produce. Yet no food regulator anywhere in the world requires a safety assessment for the possible toxic effects of mixtures. Our results provide clear evidence that regulators need to safety assess GM crops containing mixtures of GM genes, regardless of whether those genes occur in the one GM plant or in a mixture of GM plants eaten in the same meal, even if regulators have already assessed GM plants containing single GM genes in the mixture."

But, but… pro-GMOs say, "Millions and millions of people have eaten GM and no one is sick"

This is a specious argument. To date, no large epidemiological studies have been carried out on the potentially negative effects of a GM crop diet since they were introduced in 1996/1997. Besides, since in the U.S. and Canada, GMO food labeling is not legal (yet), how are we supposed to know? The main reason is because the types of illnesses that would affect humans are progressive, they are very difficult to trace back to the source. But if you asked gastroenterologists around the country, they would probably tell you that they have seen an increase in gastrointestinal diseases for the past 15 years or so. In my own nutrition clientele, I see more and more children with food allergies and digestive problems like leaky gut syndrome. What about the amazing and scary increase of autism, ADD/ADHD and cancer in our children? I can't help but wonder at the potential correlation. Don't you?

All the details regarding these studies can be found in **GMO Myths and Truths** here: http://earthopensource.org/index.php/reports/gmo-myths-and-truths

GMOs in your daily life

Did you know that you and your family are unknowingly eating genetically engineered food that affects your health? How is that possible, you might ask? Most likely because very few people are aware of GMOs (genetically modified organisms), also called GM (genetically modified) or GE (genetically engineered) in our food supply.

How are GMOs created?

In labs, scientists use genetic engineering to insert genes from a type of bacteria, viruses, and animals genes into plants as well as animals (salmon for example) from another species to create hybrids that would never occur in nature. Despite warnings of potential health dangers from its own scientists, the U.S. Food and Drug Administration decided to allow genetically modified (GM) foods on the market without letting the public know. The commercial introduction of GMOs into our food supply started in 1996.

Why were GMOs created?

For many reasons, some of them made sense at the time and later were proven wrong, but here is a general list: to increase crops yield (later proven to be false); to resist hard weather conditions like drought (it turns out it does not work as well as advertised); to increase the amount of vitamin in food – like golden rice and vitamin A (a child in an undeveloped country would have to eat 27 to 54 bowls of rice a day to get the recommended daily allowance of vitamin A); to resist bugs (pesticides); or to survive their own toxic pesticides.

Every new GM seed is patented by large corporations – in the US the big players are Monsanto, Syngenta, DuPont, and Bayer. Since GM seeds are not fertile and farmers are not allowed to save them to replant next year's crop, they have to continue to buy from these GM seeds merchants and generate more and more business. The more GE seeds are created, the more control these companies have on our food supply. All of this also means that farmers have less selection of non-GM seed to choose from. That creates higher prices for traditional seed that has not been genetically modified. Voila! For more details about this aspect of the GM business, please watch **Seeds of Destruction** here: https://www.youtube.com/watch?v=eUd9rRSLY4A

GM food crops are created in a lab for two main purposes

1. To survive the spraying of glyphosate-laden pesticides like RoundUp by Monsanto and other chemical companies (Dow, Syngenta, Bayer, etc.). RoundUp is used by farmers to eliminate unwanted weeds during growth season. Unfortunately, nature found a way around it and created super weeds that resist pesticides. The result is that farmers are forced to use more and more glyphosate to keep up with nature and they are not winning the war. Bad for the farmers and bad for our health.

2. To contain its own pesticides Bt (*Bacillus thuringiensis)*, a bacteria used to kill insects. When we consume GM food containing this pesticide, it remains fully functional when we digest it. So now we have these toxic bacteria invading our gut and killing our friendly bacteria, the frontline for our immune system. It is thought that seventy percent of our immune system originates in our gut, and an unhealthy gut creates an unhealthy human.

Why should it matter to us and our children?

Because when we ingest GM foods, they can slowly weaken our immune system and make it less susceptible to fight off allergens bugging us as well as other health issues and immune disorders. Moms Across America: https://www.facebook.com/MomsAcrossAmerica is even linking the growth of use of glyphosate with the accelerated growth of autism in this country for the past decade.

Some scientists even suggest the GM bacteria are so happy residing in our guts that they reproduce and continue to grow, therefore creating our own self-generated Bt toxin factory. They gang up with other unfriendly bacteria and yeasts (candida yeast for example) to thrive and poke tiny holes through our intestinal walls, creating what is called leaky gut syndrome. This, in turn, allows allergenic proteins from some foods to get right through into our blood stream. Your immune system recognizes these proteins as foreign and attacks them, creating an allergic reaction or even auto immune disease.

Why the controversy?

Of course, proponents of GMOs claim that GM crop toxicity has never been proven. Their studies are often sponsored by the very same corporations that own the GMO patents and are conducted during very short time periods to

observe any adverse reactions in test animals. Longer studies are required to determine the true effect these bacteria and pesticides have on our body's long term – over the course of years or life times, perhaps even multi-generational. Proponents also claim that no one has been able to prove a link between GM foods and assorted health issues. The reason is that there have been no controlled long-term studies to date, so we are in the dark at this time. But a study by the US Center for Disease Control shows that food-related diseases increased from 2 to 10 times from 1994 (2 years before GMOs were officially released in our food system) and 1999. Do you think there is a link? I do.

The fact is that because these large food and chemical corporations have managed to block multiple attempts to require products containing GMOs to be labeled as such in U.S. States, we are, as consumers, still in the dark. Vermont was the first state to break through and succeed… but it is being sued by Monsanto to stop this labeling effort. Meanwhile, we and our children are still unknowingly consuming GMOs on a daily basis.

Doctors Say No to GMOs

Recently, the American Academy of Environmental Medicine (AAEM) urged physicians to advise all their patients to avoid genetically modified food. They say, "Because GM foods pose a serious health risk in the areas of toxicology, allergy and immune function, reproductive health, and metabolic, physiologic and genetic health and are without benefit, the AAEM believes that it is imperative to adopt the precautionary principle, which is one of the main regulatory tools of the European Union environmental and health policy and serves as a foundation for several international agreements. The most commonly used definition is from the 1992 Rio Declaration that states: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." I would listen to them. The complete warning is here:
http://www.aaemonline.org/gmopost.html

In which crop are GMOs present?

The most prevalent sources of direct genetically engineered (GE) or genetically modified (GM) food are those most used in every day processed

and fast foods. Over the past 10 year, evidence has been collected to suggest that they are contributing to higher allergy rates.

- Alfalfa used as feed for meat and dairy cattle

- Canola (rapeseed oil)

- Corn (food, starch, oil, sweeteners, animal feed and many more)

- Cotton (cottonseed oil and cattle feed)

- Soy (food, oil, animal feed). Because of their national health system, England is one of the few countries conducting a yearly evaluation of food allergies. GM soy was introduced to the food world in 1996. In March 1999, scientists at the York Laboratory were shocked to discover that allergic reactions to soy had increased by 50% from the previous year. The soy used in the study was largely GM. The spokesman for the lab, John Graham, declared, "We believe this raises serious new questions about the safety of GM foods."

- Sugar beets (sugar, assorted sweeteners and animal feed)

- Minor crops such as small amounts of papaya, plums, and crookneck squashes

GMOs Hidden in Our Food

- Meat from beef, pork (fed GM alfalfa, corn, cottonseed, soybean pellets, etc. plus GE growth hormones and antibiotics).

- Fish (fed corn and soybean pellets and colored with artificial colorings from petroleum).

- Poultry and eggs (fed GM grains).

- Dairy products from cattle (fed GM grains, GE growth hormones and GE antibiotics).

- In vitamins, supplements and even some medications. A lot of their ingredients are derived from GM foods like corn (ascorbic acid) and soy (lecithin), etc.

- In skin products and cosmetics.

- Potential environmental cross-pollination

- Possible contamination through the use of the same storage and production facilities for similar crops GM and regular.

More potential GM Hidden Ingredients to Look Out For

GMO sweetener aspartame and other synthetic sweeteners. Aspartame is created in part by GM microorganisms. It is also called NutraSweet and Equal and is found in more than 6000 products, including any "diet" products, candies, cake mixes, desserts, gums, soft drinks, some yogurts, single-serving sweeteners packets, and even in some, supplements, pharmaceuticals and sugar-free cough drops.

Animal products: Meat, dairy products, farmed fish and eggs usually come from animals fed GM feed – alfalfa, corn, soy. To avoid them, buy certified organic, wild caught, or from 100 percent grass-fed animals. Avoid dairy products from cows that have been injected with GM bovine growth hormone (called rbGH, or rbST). See more details below.

Honey and bee pollen may have been gathered from GM plants and flowers, especially from canola and corn flowers. Use only local honey gathered from local flowers.

Many additives, enzymes, flavorings, processing agents and even vitamins that are used in processed food can be created by GM bacteria, yeast or fungi. To avoid them, either buy organic or eat only fresh foods from clean sources. See my much more detailed information below.

OMG?!? What should I eat? What do I do to avoid GMOs?

Here are my suggestions to avoid genetically engineered products:

One: Buy certified organic

Buy USDA Certified Organic. These standards do not allow the use of GM ingredients.

There are three levels of organic labels:

1. "100% organic" means all the ingredients are organic

2. "Organic" means that at least 95% of the ingredients are organic. The other 5%, however, still have to be non-GMO

3. "Made with organic (including the ingredient's name, such as corn)" This label means that at least 70 percent of the ingredients are organic, but the remaining 30 percent still have to be non-GMO.

If you can find a few organic ingredients on the ingredients list but cannot find them anywhere else on the package, the company does not have to include a percentage of organic ingredients in this product, which means the balance of the ingredients may come from GM sources. Be cautious.

Two: Buy your food from a farmer

Buy your food from a trusted farmer at your local farmers' market. Get to know your farmers. Ask them a lot of question (Don't worry, they're used to it). If you get a chance, visit their farm – make to ask for permission and acceptable times to visit first.

Three: Grow your own food

If at all possible, grow your own food. Create a kitchen garden in your front yard or your backyard. Make sure to check local zoning regulations before your start this work-intensive project. Some cities are known to frown on this anti-establishment practice. You can even plant potted herbs and some plants inside an apartment. Look into permaculture.

Four: Read labels carefully

Some packaging may make a "Non-GMO" claim. For example, if it says "non-GMO soy" because they know some people will be suspicious about that ingredient, they may make this claim at this time. Since there is no federal or national labeling law at the time of this writing, this claim is purely voluntary but, if it is not verified by a third-party trusted certification program, I would approach that claim with caution. Don't believe everything you read unless it is substantiated. Use the old "precautionary principle": Trust but Verify.

Five: Avoid the most at risk crops

Avoid any of the largest GM crops. At this time, they are canola, corn, cotton, soybean and sugar beets. Smaller amounts of Chinese and Hawaiian papaya as well as squashes such as zucchini and yellow crookneck summer squashes. If you cannot tell from the label posted (grocery stores typically do not brag about selling GM food), I'd rather you buy certified organic products.

Since the vast majority of the fast food and processed foods you purchase contain hidden GM ingredients, unless clearly labeled, contain any form of soy, corn, canola, cottonseed or sugar from beets – our main culprits, this is where you need to be more discerning. Up to 80 percent of our processed/fast foods contain these ingredients. In this book, I will try to give you as much information about these hidden sources of GM ingredients. In case I cannot answer your inquiring mind, shoot me an email (see that info on the front page of this book or go to: http://www.responsibletechnology.org for a constantly updated long list of these secret derivatives.

Six: Pick your proteins carefully

When it comes to proteins, buy only grass-fed and grass-finished (if possible) or certified organic beef, bison, pork and lamb; buy pastured-raised or certified organic poultry and eggs; buy only wild caught and not farm-raised fish. They also a good source of vitamin K2 good for your bones and Coenzyme Q10 good for your heart. Try to buy small fish lower in the food chain like sardines. Buy natural, not-farm-raised shellfish. Unfortunately, there are no set quality standards in fish and shellfish. Ask your favorite

fishmonger. He'll be glad to help you if you show concerns about the quality of the food you feed your family.

Seven: Shopping Guides

Use any of the Non-GMO Shopping Guides offered by:

- **The non-GMO Project Shopping Guide:**
http://www.nongmoproject.org/wp-content/uploads/2010/01/Non-GMO-Project-Shopping-Guide-September-1-20101.pdf

- **Dr. Mercola True Food Shopping Guide**:
http://articles.mercola.com/sites/articles/archive/2007/09/18/the-gmo-food-guide.aspx)

- **The Center for Food Safety True Food Shoppers Guide**:
http://www.centerforfoodsafety.org/fact-sheets/1974/true-food-shoppers-guide-to-avoiding-gmos#).

As time goes by, there will be more and more non-GMO information available on either of these very informative sites.

How to Avoid GMOs when eating out

I would suggest you patronize restaurants that use locally-grown food, produce, grass-fed meat and pasture-raised poultry. I personally prefer eating at establishments that cook meals from scratch. Get to know the chef and his food policy. Some local magazines and newspaper now offer lists of restaurants that cook locally-grown food only. Do not eat fast food and junk food; they are the worst source of GE ingredients. The most easily hidden and lost in the shuffle ingredient is vegetable oil, which is most likely corn, soy, cottonseed or canola. Find out if your restaurant uses any one of these and ask your waiter if the kitchen is able to use another fat like olive oil, butter, or lard to cook your meal. If they wonder why, feel free to educate them and let them know about the negative side of GMO – only if your waiter is wondering. They already have enough trouble keeping up with all sorts of food allergies demands as it is.

GMOs at Home

Avoid packaged and processed foods that likely contain GM ingredients unless they are clearly labeled USDA Certified Organic or display the Non-

GMO Verified label with the butterfly on it. For those of you home cooks or chefs that cook from scratch (congratulations, by the way), look for my list of hidden GM ingredients below. As for fresh products, look for the usual culprits: question any corn and soy products; canola and cottonseed oils and any sugar that is not labeled cane sugar.

What to do when you are invited at family of friends events

Well, that's a tough one. If your family or friends are aware of the GMO issue, you may make some suggestion. Otherwise, I would not push my luck… unless you are willing to be seen as a pain in the tush (or "toosh" if you are English; In French, "derriere") or as some hard core food agtivist (agricultural activist). Leave the issue alone. Eating a little bit of GMOs will not kill you as long as you avoid it 95% of the time. There are enough issues to argue about as it is. Live a little and enjoy your family and friends… or you might not be invited again. Then you will live a GMO-free life but most likely a family-free or friend-free life. It's not worth the trouble.

What can you and I do about this important food issue?

At this point, after reading this information, you might be discouraged and ask yourself, "What can I, little ol' me, do about these large corporations and their enormous financial and political influence?" Actually, there's a lot we can do as customers. You and I have something they don't have: strength in numbers (there are billions of us all over the world) and purchasing power, otherwise called pocketbook power. That is, every time you and I go shopping for food, our purchasing choices have power. If you refuse to buy foods coming from GM crops, you are sending a clear message to the food and agricultural industry, "We will not buy your crap!" They, in turn, and in order to survive, will stop growing these crops and stop buying these GM seeds which will send the following message to the seeds companies, "Uh ho! Farmers all over the world are refusing to buy our seeds because their customers don't want to eat their food crops. We better change our ways if we want to survive."

Sure, we could all send petitions after petitions to our local, state or even federal governments to label our food but it's complicated, takes a lot of time and energy and it's hard to fight their powerful lobbies with millions in their pockets to buy all the negative ads and politicians they can afford.

So, why don't we try another and much simpler way? Absolutely refuse to buy their products. My mentor, Jeffrey Smith, calls it the "tipping point". We, as customers, when we stop buying these GMO products, we are telling our grocery stores, "Stop stocking these products! We don't want them." Since they are in business to sell you food and all about earning a profit, when they see that their customers (you and I) would rather buy locally grown, organic or non-GMO foods, they will listen to you in order to survive. It's all about their bottom line. If they don't pay attention to their customers, the market (us and the stock market) will punish them and they will lose market shares to their competitors. Trust me, there are plenty of other grocery stores willing to sell you their clean food products. So, in order to survive, they will stop buying GM products and buy the kind of products YOU want. I don't care what they want you to believe. We are not sheep willing to just buy anything just because of their lying marketing campaigns. We can think for ourselves. Thanks to people like Jeffrey Smith, the Cornucopia Institute, the non-GMO Project and many more anti-GMO institutions (see list at the end of the book), and thanks to the internet, we are now educated customers. We know what we want. We are mad and won't take it anymore.

Keeping that I mind, now you know you DO have the power to influence food policies. You sure do and that's how you do it. Reclaim your power of choice by refusing to buy these health-damaging foods. You have the right to live a healthy and full life. So do your children. Grab it with both hands. It's your to use. Hell no! No GMOs!

Mother Earth Knows Best

If you or anyone in your family (parents or grand-parents) have lived on a farm or close to nature, you already know that nature knows best. In other words, animals, unless forced to eat nasty food in concentration camps – Oops! Commercial farms, they will know instinctively what's good for them and avoid what's bad for them. Don't ask me how. I am a chef, not an animal behavior scientist. All we have to do is stop and observe animals in the wild.

Buffalo

In India, animals are allowed by farmers to graze on cotton plants after harvest. In an Andhra Pradesh village, buffalo grazed on regular cotton plants for eight years without incident. In January 2008, 13 buffalo were allowed to graze on Bt cotton plants for the first time. All died within three days. Other buffalo in Haryana refuse to eat cottonseed cakes made from GM cotton.

Pigs

Pigs won't touch genetically modified corn. A Midwest farmer grinned as he told his visitor, "Watch this!" He called out his pigs, which ran quickly towards him to be fed. But when he scooped out corn feed and threw it on the ground, his pigs sniffed it and refused to touch it. The farmer then scooped corn feed from another bin and flung it next to the previous corn. His pigs ran over and quickly devoured it. He said, "The first corn was genetically engineered. They won't eat it." Similar trials with other hogs gave the same results for two years in a row.

Chicken

In South Africa, Strilli Oppenheimer's chickens won't eat genetically modified corn.

Cows

In 1998, Howard Vlieger harvested both natural corn and a GM Bt corn variety on his farm in Maurice, Iowa. He decided to conduct an experiment. He led a few of his cows at a time into a feeding area with two separate troughs. The first one contained shelled Bt corn. The other one had natural shelled corn. The cows sniffed at the GM corn, turned around and walked

over to the other one. They then proceeded to finish it off. After they were led out, he tried the same experiment on a new group of cows. They all behaved in the same exact manner. The same experiment was conducted the same way on about six or seven farms in Northwest Iowa, in 1998 and again in 1999 with similar results.

In a 1999 Acres USA article, we are told that cattle broke through a fence, ambled through a field of Roundup-ready corn, and finally got to what they really wanted, the non-GM corn they ate happily. They sniffed at the GM corn and left it untouched.

Gale Lush from Nebraska mentions, "If a field contained GM and non-GM maize, cattle would always eat the non-GM first."

Gary Smith from Montana tells us, "A neighbor had been growing Pioneer Bt corn. When the cattle were turned out onto the stalks they just wouldn't eat them."

Tim Eisenbeis from South Dakota observes, "While my cows show a preference for open-pollinated corn over the hybrid varieties, they both beat Bt-corn hands down."

Another farmer said this, “Well, if you want your cattle to go off their feed, just switch them out to a GMO silage.”

Deer

Writer Steve Sprinkel described a herd of about forty deer that ate from the field of organic soybeans, but not the Roundup Ready variety across the road.

Elk

Susan and Mark Fitzgerald in Minnesota report that a captive elk ran away and set shop in one of their fields of organic corn and soy. Right next door, it had free access to a buffet of GM crops, but somehow, it knew better than to nibble on it.

When put out for them to feed on, elk, deer, raccoons, and rats all avoided GM grains.

Field mice

A farmer, wondering about what he read on social media, decided to do his own experiment with his own neighborhood's squirrels. In preparation for the upcoming winter, he stored two bags of corn ears in his garage, one of GM corn, one of regular. When he went back to fetch the corn for his experiment on squirrels, he found that his friendly and hungry neighborhood mice did all the work for him. They chewed through the non-GM corn bag and pretty much ate them all of it while they left the GM corn bag untouched. I guess even mice are smarter than humans when it comes to GM food.

Another farmer in Holland wanted to verify if his barn mice would make the same choice. He left one pile of GM corn and one pile of natural corn for them to feast on. The GM pile was left untouched while the non-GM pile had disappeared.

Even field mice will move natural over GM crops when given a choice. What is it that they know instinctively that most of us ignore?

Geese

Geese with bad habits for a farmer, not for themselves. A farmer in Illinois had been planting regular soybeans on his fields for years. Unfortunately, he also had a flock of migrating soybean-eating geese that took up residence in a pond nearby. Being creatures of habits, these noisy creatures returned to the same spot. Much to this farmer's surprise, once he decided to plant new genetically engineered soybeans on part of his land, his winged visitors got picky. They chose to eat only the regular soybeans and ignored the GM soybeans. He could even see exactly where the geese chose to eat as there was a clear line down the middle of his field with the natural beans on one side, and the untouched genetically engineered soybeans on the other.

Raccoons

Another farmer noticed that a family of raccoons were having a banquet on his organic corn, his Br corn field was left untouched. You know these guys tend to eat anything that falls into their grubby paws. Not the GM corn.

Sheep

When shepherds let sheep graze on Bt cotton plants, thousands died. Investigators said preliminary evidence "strongly suggests that the sheep mortality was due to a toxin... most likely Bt-toxin." In a separate small study, all sheep fed Bt cotton plants died; those fed natural plants remained healthy.

Squirrels

Even squirrels which usually devour natural corn during the coldest days of Iowa winter, refused to touch the GM variety. For years, a retired Iowa farmer had fed squirrels on his farm through the winter months by placing corncobs on feeders. Being curious, he decided to see if the squirrels preferred natural corn over Bt corn. He placed a natural corncob on one side and Bt corncob about twenty feet away. His squirrels ate all the corn off the natural cobs but didn't touch the Bt. Wanting to make sure, he repeated his experiment once more and the Bt corn was left untouched again. Then he wondered, "What if only left one choice to my furry friends?" He put out only Bt corn. Guess what, even though they were hungry, his squirrels still did not nibble at the Bt corn. They went somewhere else for food. Feeling sorry for his friends, he gave them natural corn again and they ate it all.

Lab animals

In lab studies, twice the number of chickens fed Liberty Link corn died.

The Washington Post reported that laboratory mice, usually happy to feast on regular tomatoes, turned their noses up at the genetically modified FlavrSavr tomato. Researcher Roger Salquist said about his GM tomato, "I gotta tell you, you can be Chef Boyardee and mice are still not going to like them."

These mice were eventually force-fed the tomato through gastric tubes and stomach washes. Several developed stomach lesions and seven of forty died within two weeks. Result: the GM tomato was approved for human consumption without further tests.

No one knows why animals – wild, domesticated or the lab version – refuse to eat GM food. They seem to instinctively know. Nature has a way to show

us the right way, if we pay attention. Maybe we should take a lesson from these animals and beware of what we eat.

Speaking of animals… Are your pets sick of GMOs?

Are Your Furry Friends Sick of GMOs?

Have you ever wondered, like me, why all the sudden, our pets are getting human sicknesses like heart, rashes, food allergies, kidney or liver diseases – to mention a very few? It's been bothering me for a while now and it finally came to focus during the non-GMO training I took a few weeks ago with Jeffrey Smith. In most cases, it's all about food quality and GMOs (IMMO).

In the 1990s, veterinarians started diagnosing their clients' pets with allergies, asthma, atopic dermatitis and other skin problems; irritable bowel syndrome, leaky gut syndrome and inflammatory bowel disease; colitis, recurrent diarrhea, vomiting and indigestion; abnormalities in liver, pancreatic and immune system functions. Doesn't that sound very similar to what us humans started to suffer from?

In their 2009 detailed review of animal safety studies of GM foods, Dona & Arvanitoyannis conclude that "The results of most of the rather few studies conducted with GM foods indicate that they may cause hepatic, pancreatic, renal, and reproductive effects and may alter hematological, biochemical, and immunologic parameters the significance of which remains unknown." Altered DNA from GM foods can be incorporated by gut bacteria and may alter their behavior and ecology in the digestive tract.

Food quality is most important

Why should the quality of the food we give our pets be worse than the one we eat ourselves? Then again, plenty of American people eat fast food and processed food. You could say, "But one has nothing to do with the other, right?" Well, when you think about it and start to read food ingredients listed on our food as well as on pet food, you will find strange similarities. They all contain mystery as well as genetically engineered ingredients.

As you would do with human food, you should check the food label in the back of the package. Considering our pets are probably our best friends and sometimes sole companions, and the fact that they rely on our judgment for their sustenance, should we not make a special effort to make sure their food is safe for them to eat? I certainly think so. Here are a few ingredients you should be aware of and avoid at all costs.

Most Pet Food Additives and Preservatives are Genetically Engineered

GMOs (genetically modified organisms) or GM (genetically modified) or GE (genetically engineered) foods or food products are hidden in a majority of pet food in the market. They are GM soy additives, GM corn derived vitamin C, vitamin B12 and many, many others. Even foods labeled "healthy" or "natural" are rife with GMOs, like GM corn-derived xylitol. In fact, any pet food that is not USDA Certified Organic or do not bear the non-GMO Verified label is highly suspect.

Unfortunately, the list is very long. Here's what I have found so far.

- **Animal Fat** (Beef tallow, lard, poultry fat). Keep in mind that commercially-raised animals are feed the cheapest and most fattening crops, would it surprise you to know that they are fed GM corn, soy, cottonseed, sugar beet and canola cakes made of the residues left after they are processed for oil. Not to mention that these poor animals are pumped with growth hormones and antibiotics. Please remember that toxins are stored in these animals' fat. Now, do you see why your pets might get sick from eating these kind of products? I would not dare call it food.

- **Brewers Rice** (may come from GM rice). Please keep in mind that animals do not eat carbohydrates of any for in the wild. Here's the reason why some pets are obese and can have another common human disease: diabetes.

- **Cellulose**. Although cellulose can come from trees (unless your pets are termites, not a healthy source of fiber), the cheapest source is still GM corn, cotton and soybean fibers left over after processing.

- **Corn Gluten** (from GM Corn). Most corn grown in this country is used for human and pets consumption. In pet food, the corn crop is used as corn flour, meal, oil, starch, modified food starch, corn gluten, and corn syrup. Also sweeteners such as fructose, dextrose, glucose come from corn. Genetically modified corn has been linked to health problems, including weight gain and organ disruption. Then again, pets should not eat grains.

- **Glyceryl Monostearate** (from GM corn). Glyceryl Monostearate is an esterification product of glycerin and stearic acid. They can be made from palm kernel oil or soy and corn oil, 2 GM crops.

- **Maltodextrins**. Maltodextrin is an oligosaccharide used as a food additive. Maltodextrin can be enzymatically derived from any starch. In the US, this starch is usually GM corn.

- **Propylene glycol** (from GM corn). Do you maintain your own car? If you do, you should know what this ingredient is used for, anti-freeze! Wow! Polypropylene glycol or PPG is typically a byproduct of gasoline, but recently, in an effort to reduce reliance on fossil fuels, alternative production has been found. A new method converts glucose from corn to lactic acid, which can then be used with a copper catalyst to synthesize PPG. It is there to help control moisture and prevent bacteria growth. As for us humans, your pet needs his intestinal friendly bacteria to help break down and digest their food. Since this ingredient kills bacteria, it will also kill your pet's helpful bacteria as well. Also, since it reduces moisture needed to aid in digestion, your pet might have blocked digestion and develop cancerous intestinal lesions.

- **Soy Flour**. Soy is the most prevalent GM crop in the US. Soy beans are the most important crop worldwide for producing oil and vegetable protein. Soybean and it processed derivatives are used in a multitude of food, groceries, supplements, pet food and cosmetics. Additionally, the remaining soy mass is used as protein-rich animal feed for fish, poultry, pigs and beef. Soy is estrogenic and can wreak havoc on your pet's endocrine system. As a pulse, soy is not recommended food for pets.

- **Vegetable oils**. Here we come again. The largest source of cheap vegetable oils are GM crops: corn, soybean, cottonseed and canola oil.

- **Wheat gluten** (may come from GM wheat). No grains for pets.

- **Yeast**, like Brewer's yeast is made from a one-celled fungus called *Saccharomyces cerevisiae.* When bred as a food supplement, brewer's yeast is often grown on glucose or fructose, or on disaccharides such as sucrose and maltose from sugar beets or corn – 2 suspected GM crop.

I only addressed the GM ingredients I could find. There are many more scary and downright disgusting ingredients used in pet food like artificial coloring and petrol-based preservatives. Do you really want your cherished pets to eat those? For more detailed information please check this thorough list at

the Dog Food Project:
http://www.dogfoodproject.com/?page=badingredients

Other Suspect Ingredients

- **Artificial colors, flavors, sugars, and sweeteners.**

- **BHT/BHA**. Butylated-hydroxyanisole (BHA) or butylated hydroxytoluene (BHT) both can also be found in human food as preservatives. BHA is known to be often responsible for kidney damage. BHT is even more potent than BHA. It is used to help reduce food spoiling and has been directly linked with cancer in both pets and humans. If the food in those cans were of good quality, there would not be a need for these preservatives.

- **"By Product"** Is a code name for any leftover remains (carcasses and entrails) after commercial animals (themselves fed on GM corn, beet, soybean, cottonseed or canola cake feed) have been "harvested". The animal "by products" are the internal remains of any animal like beef, chicken, fish, lamb turkey and more, after the good muscle meat is taken out for human food. In the industry, it is referred to as "4-D" meat sources - defined as food animals that have been rejected for human consumption because they were presented to the meat packing plant as "Dead, Dying, Diseased or Disabled." Because of lack of sanitary supervision, often times, these leftovers will include diseased tissues, organs and tumors. If they're lucky, they might have been doused with bleach – another toxic poison – to get rid of bacteria.

- **Corn Syrup**. Corn syrup is as damaging for pets as it is to humans. It is a genetically engineered sweetener that comes from GM corn. Since then have you seen a cat or a dog eat candies or sweetened food in nature. As for humans, too much sugar over time will lead to dental diseases (carries), weight gain, diabetes, hyperactivity, and even a change in mental behavior.

- **Corn**. It is used as a cheap filler in pet food. Not only does it comes from a genetically engineered crop, over time it may develop mold or fungus which will affect your pet's healthy in a very negative way. Both corn as a filler and corn syrup are unhealthy for pets. Pets should not eat grains in any form, GM or not. End of the story.

- **Ethoxyquin**. This preservative can be found in pet food. Do you what is was originally created to be? As an herbicide! Really? An herbicide in my

pet's food? It can be the cause of kidney and liver damage, cancer (liver, spleen, stomach, and skin), immune deficiency syndrome, blindness, and leukemia. How's that for human diseases?

- **Propyl gallate (**E310) is an artificial food additive that can also be found in cosmetics and pharmaceuticals. You'll find it in assorted frozen meals, breakfast cereals, candies and chewing gum, chicken soup base, frozen dairy products, mayonnaise, meat products, microwaveable popcorn, pet food, shortening, soup mixes, and vegetable oils. Studies on rats have shown that propyl gallate may be carcinogenic. Other possible side effects are stomach and skin irritability, as well as allergic reactions that impact breathing, kidney and liver problems. Although the FDA considers propyl gallate safe, in other countries it is either banned or very limited in use.

Am I Upset About All of this Information?

You bet I am. I am upset at the fact that pet food manufacturers are dumping this pet food crap onto our favorite companions while marketing loudly the "benefits" of this brand over that brand. Even the vet-recommended brands are suspect. Question everything, even when it comes from your vet. For example, here is the ingredients listing for one of the most recommended pet food sold by your vet, **Science Diets** and **Hills**. For complete details, click here: http://www.hillspet.com/products.html

Adult Optimal Care® Original. Chicken, Whole Grain Wheat (grain), Corn Gluten Meal, Pork Fat (see above), Brewers Rice (see above) , Wheat Gluten (see above), Chicken Liver Flavor (?), Dried Beet Pulp, Dried Egg Product (?), Calcium Sulfate, Lactic Acid (from GM corn), Potassium Chloride, DL-Methionine, Choline Chloride, Fish Oil, Soybean Oil, Calcium Carbonate, Iodized Salt, Taurine, vitamins (Vitamin E Supplement (from GM soy), L-Ascorbyl-2-Polyphosphate (source of vitamin C form GM corn), Niacin Supplement, Thiamine Mononitrate, Vitamin A Supplement, Calcium Pantothenate, Riboflavin Supplement, Biotin, Vitamin B12 Supplement (from GM soy), Pyridoxine Hydrochloride, Folic Acid, Vitamin D3 Supplement), L-Lysine, minerals (Ferrous Sulfate, Zinc Oxide, Copper Sulfate, Manganous Oxide, Calcium Iodate, Sodium Selenite), Oat Fiber (grain), Mixed Tocopherols for freshness, Phosphoric Acid, Beta-Carotene, Natural Flavors, Dried Apples, Dried Broccoli, Dried Carrots, Dried Cranberries, Dried Peas.

I don't know about you but this reads like a science experiment, not pet food. If it has more than a few ingredients I can understand, I will not feed it to my kitty.

Compare that to a good quality pet food ingredient list:

Free-Range Meat = 69%. Chicken meat including bone, chicken gizzards, chicken hearts and chicken livers.

Organic Vegetables = 29.3%. Carrots, squash, yams, zucchini, celery, romaine, parsley, apple cider vinegar

Special Nutrient Mix = 1.7%. Kelp, sea salt, inulin, zinc, copper and iron amino acid chelates, vitamin E

That's more like it.

Good Quality Pet Food Sources

By the way, all of this information concerns not only the wet canned food but also the dry food and treats. Please read those labels carefully. For a long time, I used the **Wellness** line of pet food because they did not contain grains and their ingredients list was clean. But lately I switched my kitty girl to certified organic pet food.

If you're lost and don't know where to start, check out **Dog Food Advisor**: http://www.dogfoodadvisor.com/ and

Natural Cat Care: http://www.naturalcatcareblog.com/2010/12/the-7-best-natural-commercial-cat-foods-so-far/ for excellent information on pet food.

Here's also a great video by **Dr. Karen Becker**, The 3 Best Pet Foods You Can Buy:
http://healthypets.mercola.com/sites/healthypets/archive/2011/05/10/my-top-3-pet-food-picks-from-an-upscale-boutique-shop.aspx.

Commercial pet food can be expensive, especially for big dogs. Keep in mind that the higher the quality, the less is needed to feed. Most of the time, animals are overfed anyway. I know, they will beg for more but you're the adult. Be firm. Ask your vet for proper ration size and stick to it.

How about preparing food for your pets? Buy meat raw from a wholesaler or butcher and serve it to them fresh. Once again, have you ever seen wild animals cook their food? I don't think so or I have been watching the wrong nature shows. As long as it is good quality, serve it raw, and freeze the rest. Give them fresh bones. They will love them. Some even like raw veggies. Play around and see what works for them.

The Dollar and Emotional Cost

Pet food is the same as human food. You get what you pay for. Yes, you will pay a little more for grain-free or organic pet food now. But isn't it better than paying huge vet bills and facing the pain you can see in their eyes when they suffer? Losing a loved pet is second only to lose a loved human. I know, I just lost my feline companion a month ago.

Lose them as late as possible

Some people might think, "It's easy for him to talk, he's a food nutritionist and a chef". True! But a lot of that information is available for free online. That is also why I wrote this article to open your eyes and teach you what to look for.

I know, they will eventually leave us, as we all will. But isn't it worth the minimal effort needed to keep them healthy and happy as long as possible? Through my curiosity and care for her, I managed to keep my kitty girl/old lady for 23 years. I can only wish the same for you.

Now it's time to get into the nitty gritty of GM ingredients hidden in our food, groceries, supplements, medications and cosmetics. Are you ready? Here we go…

GMO 101 Master GM Ingredients List

Genetically Engineered Food Crops

It may surprise you to find that there are GMOs hidden in a majority of our food, supplements, cosmetics and even pet food out there. They are GMO soy additives, GMO corn derived vitamin C, vitamin B12 and many others (see below for full list). Even foods labeled "healthy" or "natural" are rife with GMOs, like GMO corn derived xylitol. Almost all gluten free products contain one form or another of genetically engineered ingredients unless proven otherwise. In fact, any foods, groceries, supplements or skin care products that do not bear the non-GMO Verified label are highly suspect.

According to the report, entitled "Seed Giants vs. U.S. Farmers," 93 percent of soybeans and 86 percent of corn crops in the U.S. come from patented, genetically engineered seeds.

According to the USDA Report, **Genetically Engineered Crops in the United States** released in February 2014,

Quote: "As of September 2013, about 7,800 releases were approved for GE corn, more than 2,200 for GE soybeans, more than 1,100 for GE cotton, and about 900 for GE potatoes. Releases were approved for GE varieties with herbicide tolerance (6,772 releases), insect resistance (4,809), product quality such as flavor or nutrition (4,896), agronomic properties like drought resistance (5,190), and virus/fungal resistance (2,616).

The institutions with the most authorized field releases include Monsanto with 6,782, Pioneer/DuPont with 1,405, Syngenta with 565, and USDA's Agricultural Research Service with 370.

As of September 2013, APHIS had received 145 petitions for deregulation (allowing GE seeds to be sold) and had approved 96 petitions: 30 for corn; 15 for cotton; 11 for tomatoes; 12 for soybeans; 8 for rapeseed/canola; 5 for potatoes; 3 for sugar beets; 2 each for papaya, rice, and squash; and 1 each for alfalfa, plum, rose, tobacco, flax, and chicory.

A few examples... I cannot list all of them. That would take another 70 pages. Unless certified organic or non-GMO, the following crops are suspect.

Current high-risk crops (in commercial production; ingredients derived from these must be tested every time prior to use in Non-GMO Project Verified products.

The top GM crops are, in alphabetical order:

1. Alfalfa – 1 petition approved. (First planting 2011) – Trait: Resistant to glyphosate or glufosinate herbicides (RoundUp). Alfalfa is grown mostly to make hay fed to dairy cows and horses. More than 20 million acres are grown in the United States; it is the nation's fourth-largest crop by acreage, behind corn, soybeans and wheat. It is used as feed for CAFO animals and dairy cows. It could show up in milk, dairy products and meat coming from these animals. Although GM alfalfa planting was stopped by a court order in 2007, it was approved again by the USDA on Jan, 27, 2011. Ask for non-GMO certification.

2. Apple – Pending**.** Okanagan Non-Browning Apple. Okanagan's "Arctic" apple would be the first genetically engineered version of a food that people directly bite into. According to the latest study by the Environmental Working Group, conventionally grown apples are the most pesticide contaminated fruit or vegetable on the market.

3. Bananas – Pending. An Australian food scientist, James Dale, has been working on creating a pro-vitamin A-enriched banana since 2005. A human testing trial is in process. Not approved yet.

4. Beef – Pending**.** Genetically-grown beef.

5. Canola or Rapeseed – 8 petitions approved (approx. 90% of U.S. crop, 95% of Canada's crop) **–** Trait**:** The name Canola is a brand name combining Can (from Canada, its country of origin) and Ola (oil in Latin). Canola oil was originally bred from rapeseed in Canada**.** It is now genetically engineered for resistance to herbicides (glyphosate or glufosinate), for high laurate canola and oleic acid canola. It is considered one of the most chemically altered oils sold in the US and Canada. For example, **Monsanto Glyphosate Tolerant Canola**; **Pioneer Glyphosate Tolerant Canola**; **Genective Glyphosate Tolerant Corn** and more.

6. Chicory – 1 petition approved.

7. Corn/Maize – 30 petitions approved. (Approx. 88% of U.S. crop in 2012) – Trait: Resistance to glyphosate or glufosinate herbicides. Insect resistance via producing its own Bt (Bacillus thuringiensis) proteins. Most of this corn is going to be used for human consumption. Besides that, added enzyme and alpha amylase converts starch into sugar to facilitate ethanol production used as a gasoline additive in our cars. In our food, the corn crop is used as corn flour, meal, oil, starch, modified food starch, corn gluten, and corn syrup. Also sweeteners such as fructose, dextrose, glucose and modified come from corn. See complete list of ingredients coming from corn under **corn** below. Genetically modified corn has been linked to health problems, including weight gain and organ disruption. Look for non-GMO certification for any corn-based ingredients. Such as…

- A **Dow AgroScience's** variety of corn is up for USDA approval. Its appellation is **DAS-40278-9** and it is designed to be resistant to ACCase inhibitor herbicides (including quizalofop, which is not registered for use on corn) as well as 2,4-D (2,4-Dichlorophenoxyacetic acid), the other half of Agent Orange), a known toxin. And many more.

- **Monsanto Hybrid Corn**. Four of the nine are genetically engineered with a soil bacteria that keeps them alive even when they're sprayed with massive doses of the herbicide glyphosate (Monsanto's RoundUp). More of these so-called "RoundUp Ready" crops mean more RoundUp sprayed on our food.

- **Syngenta Corn Rootworm Resistant Corn**. Syngenta's genetically engineered Bt crops have been banned in many countries because of the documented harm they cause to people, animals and insects. Bt corn produces its own insecticide that kills bad bugs and good bugs alike, Bt corn pollen has reportedly killed peasants in the Philippines, Bt livestock feed harms animals, and the Bt toxin is now found in the blood of over 80% of women and their unborn children.

8. Cotton – 15 petitions approved. (Approx. 94% of U.S. crop in 2012) – Trait: Kills susceptible insect pests. Cottonseed oil, fibers, cellulose, methylcellulose, etc. Cotton containing the Bt (*Bacillus thuringiensis*) toxin originating from India and China, in particular, is considered higher risk for personal health. Monsanto has developed dicamba-resistant cotton variety, pending USDA approval. Like 2,4-D, dicamba easily drifts off-target and is highly toxic to many plants and many more.

- **Oil**: the highly processed cotton seed oil is utilized for cooking and deep frying, as well as in hydrogenated margarine.

- **Whole grain**: the albuminous pellet is used primarily for feed. It is also the base for protein compounds and isolates, as well as for cotton seed milk.

- '**Linters'**: These very short, non-textile fibers cling to the cotton seeds. They consist almost exclusively of cellulose. Various food additives such as thickening agents, stabilizers, emulsifiers or supplement fillers are made from these.

9. Flax – 1 petition approved.

10. Milk and dairy products: There are two different issues at play regarding these products. Use only certified organic or non-GMO certified products.

GE feed coming from genetically engineered crops such as soybean, corn, cotton, beet and even canola seeds. These GE traits – Roundup resistance and Bt toxins – are not destroyed when the animals are killed and are ingested and absorbed in our bodies.

- GE bovine growth hormones. One fifth of the dairy cows in the United States are given growth hormones to help them grow faster and increase their yield. These hormones can be found in some of the milk produced by these cows. These growth hormones have been shown to transfer to the human body and influence children's growth.

11. Papaya (Hawaiian) – 2 petitions approved**.** 80% in 2010 – Trait: Resistance to the papaya ringspot virus. In 2009, the USDA rescinded regulations prohibiting GM papaya on the US mainland; they have since been introduced to Florida plantations.

12. **Pineapple** – 1 petition approved. Not sold in the U. S. yet. Del Monte Fresh Produce Co., based in the Cayman Islands has won approval from the USDA to ship genetically engineered pineapple into the U. S. Its transgenic pineapple that has flesh of a "novel rose color." I can't help but wonder… Do we really need a pineapple with a novel rose color?

13. Plum – 1 petition approved. (Amount unknown) – Trait: Plum Pox Virus Resistant/C5 by ARS. The US Agricultural Research Service developed a GM plum that is altered to resist the plum pox virus. ARS has submitted a

petition to the USDA for "de-regulated status," which would allow commercial production.

14. Potatoes – 5 petitions approved. (Amount unknown) – Trait: 1. NewLeaf: Bt resistance against Colorado beetle and resistance against 2 viruses (removed from market in 2001). 2. Amflora: resistance gene against an antibiotic, used for selection, in combination with modifications for better starch production. Currently, potatoes are not used for French fries but are still used for potato starch.

15. Radicchio. Amount unknown.

16. Rice – 2 petitions approved, one of which is Golden Rice – Trait: genetically modified to contain beta-carotene (a source of vitamin A). The current version of Golden Rice under development contains genes from maize and a common soil microorganism. Forecast to be on the market in 2015.

17. Rose – 1 petition approved. Amount unknown. Florigene scientists are developing a GM blue rose. In 1996, Florigene introduced a GM mauve-colored carnation that is sold commercially.

18. Salmon – This new genetically engineered fish called AquAdvantage from AquaBounty Technologies is created by inserting a combination of a growth hormone regulator gene from Chinook salmon and a promoting gene from an ocean pout (a fish of the eel family that lives in near freezing waters) to end up with a Frankenfish that grows twice as fast as wild salmon and is much more aggressive. By the way, it has been approved to be sold in our supermarkets by the FDA. Multiple groups are currently putting pressure on major grocery store chains to refuse to sell this unnatural experiment.

19. Soybean – 12 petitions approved. (Approx. 94% of U.S. crop in 2012) – Traits: Resistance to glyphosate (see Roundup Ready soybean) or glufosinate herbicides; designed to contain less saturated fats. Kills susceptible insect pests.

Soy beans are the most important crop worldwide for producing oil and vegetable protein. Soybean and it processed derivatives are used in a multitude of food, groceries, supplements, pet food and cosmetics.

Additionally, the remaining soy mass is used as protein-rich animal feed for fish, poultry, pigs and beef. See below for more details.

Tolerance to herbicides is by far the most important commercial characteristic of GM-soybeans. So, not only it is a genetically engineered food crop but, because of adaptive super bugs and super weeds, farmers are forced to use more and more pesticides to combat them. It is a never ending war between chemical labs and nature and we, the customers, are losing our health in the process. Avoid or look for non-GMO certification.

Miso, natto, soy drink or milk, soy flour, soy sauce, soy lecithin, soy protein, soy yogurt, soybean oil, isolate, and isoflavone, tamari, tocopherol (vitamin E), texturized soy protein, tofu, tempeh, vegetable oil* and vegetable protein* and many other applications. See complete ingredients and additives list below.

- **Bayer Glyphosate and Isoxaflutole Tolerant soybean.** Bayer's petition to force its new controversial herbicide (isoxaflutole) tolerant soy on the market conceals crucial information on potential allergenicity and toxicity that came to light when EU experts examined the GMO soybean.

- **Dow** has applied for a **2,4-D** (2,4-Dichlorophenoxyacetic acid) **and Glufosinate tolerant soybean**. As a cousin of the known toxin Agent Orange, 2,4-D is already the third-most-used U. S. herbicide, after glyphosate and atrazine, and as a leading source of dioxin pollution, it's one of the most dangerous. As of 2006, 2,4-D was used on about 3 percent of the total U. S. soybean acres. Not only will this percentage skyrocket once Agent Orange soy hits the market, according to the USDA, the amount used per acre may triple.

- **Dow** is inserting the insect-resistant trait event **DAS-81419-2** into soybeans to provide a novel insect resistance by soybean plants has received approval or “nonregulated status” from the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture.

- **Monsanto Dicamba Tolerant Soybean**. According to the Institute for Science in Society (ISIS), "dicamba is actually an old herbicide that served alongside "agent orange" in Vietnam, and has been resurrected as an environmentally friendly chemical through the magic of public relations."

- **Monsanto High Yield Soybean**; **BASF Imidazolinone Tolerant Soybean**; Bayer Glyphosate and Isoxaflutole Tolerant Soybean. Bayer's petition to force its new controversial herbicide (isoxaflutole) tolerant soy on the market conceals crucial information on potential allergenicity and toxicity that came to light when EU experts examined the GMO soybean.

20. Squash, Zucchini and Yellow Crookneck Summer Squash – 2 petitions approved. 13% in 2005. Traits: Resistance to watermelon, cucumber and zucchini/courgette yellow mosaic viruses. **Squash –** 2 petitions approved.

21. Sugar Beets – 3 petitions approved. (About 95% of U.S. crop in 2012) **-** Although GE sugar beets were temporarily taken out of production by a court ruling, they came back in 2009 and now have captured 95 percent of the market. They are engineered to be RoundUp ready, like corn. They are used in refined sugar production and the fiber left is used to feed CAFO animals. Traits: Resistance to glyphosate, glufosinate herbicides. Anything not listed as 100% cane sugar is suspect. Look for organic and non-GMO sweeteners, candy and chocolate products made with 100% cane sugar, evaporated cane juice or organic sugar, to avoid GM beet sugar.

22. Sugarcane – Traits: Resistance to certain pesticides, high sucrose content. Amount unknown.

23. Sweet Peppers (small amount grown in China – Traits: Resistance to cucumber mosaic virus.

24. Tobacco – 1 petition approved. Amount unknown.

25. Tomatoes – 11 petitions approved. (Small quantities grow in China) – Traits: Suppression of the enzyme polygalacturonase (PG), retarding fruit softening after harvesting. Amount unknown.

26. Wheat (no amount known) – Traits: Resistance to glyphosate herbicide.

27. Zucchini and crook neck squash (approximately 25,000 hectares) – In the USA two GM-squash (zucchini) species are approved for cultivation and as foodstuff. Virus and fungus resistance. These have two or three envelop protein genes as protection against virus attack. Genetically modified zucchini contains a toxic protein called glyphosate, that helps make it more resistant to insects. This introduced insecticide, has recently been found in human blood, including that of pregnant women and fetuses. This indicates

that some of this insecticide is making its way into our bodies rather than being broken down and excreted.

Of the above GM crops, only corn, soybeans, cotton, canola, squash, and papaya grown in Hawaii, are commercially produced.

And if that was not enough, more GE foods in the pipeline

According the Seed World, a variety of GM fruits and vegetables are being field-tested, including: apple, banana, blueberry, carrot, cranberry, eggplant, grape, grapefruit, lettuce, onion, pea, pepper, persimmon, pineapple, plum, potato, squash, strawberry, sweet potato, tomato, and watermelon.

Corn. A high-lysine version by Monsanto received US regulatory approval for high-lysine GM corn that would be used as animal feed.

Grass: Monsanto and Scotts Company have applied for de-regulated status of Roundup Ready GM bentgrass, which would be grown on golf courses.

Rice: After Bt corn and Bt cotton, we now have Bt rice. Chinese scientists have developed several varieties of GM rice, which have been altered to resist insects or disease. The rice has been field-tested and several thousand tons have already been sold illegally. The Chinese government is reviewing the rice, but no date has been set for its introduction. As long as they keep it in their country, I'm all for that.

Soybean: Monsanto (again?) is genetically engineering soybeans with higher levels of heart-healthy Omega-3 fatty acids, hoping to produce healthier cooking oils.

Wheat: Fungus-resistant wheat. Syngenta aspires to introduce the first fungus-resistant GE wheat, which is genetically altered to resist fusarium, a bothersome fungal disease affecting wheat. The company hopes to introduce the wheat early next decade.

Pigs: How about pigs with increased Omega-3 fatty acids. Scientists at the University of Pittsburgh recently announced that they've genetically altered pigs to produce higher amounts of Omega-3 fatty acids. There seems to be resistance to this idea. I wonder why?

More pigs: How about Enviro pigs? Scientists at the University of Guelph in Ontario, Canada, have genetically altered pigs to produce manure that

contains up to 75 percent less phosphorus, which is a leading cause of water pollution. That sounds like a good idea… until we see the actuals real life results.

Increased Use of Pesticides

Since the introduction of GM crops, the U. S. has seen herbicide use increase by more than 300 million pounds. The big biotech companies like Monsanto (RoundUp) originally claimed that weeds would not develop resistance to glyphosate in RoundUp, but they have and these new "superweeds" have become the impetus behind new crops engineered for stacked, or multiple, herbicide tolerances. Adoption of these new crops will lead to dramatic increases in the use of higher risk herbicides such as 2,4-D and dicamba, potentially increasing the herbicide use farmers already face.

More details here:
http://www.aphis.usda.gov/biotechnology/petitions_table_pending.shtml

By the Way, What is That "Glyphosate" Mentioned Earlier?

Glyphosate is the active ingredient in Monsanto Roundup and other companies' pesticides. It is designed to kill bugs by destroying their stomach. Glyphosate is also an antibiotic that kills healthy gut bacteria which weakens our immune system; a chelator that binds important minerals and prevent their absorption into our body; and an endocrine disruptor that can lead to damaged kidneys, birth defects, miscarriage and infertility).

Despite chemical companies' claims, glyphosate is not destroyed in cooking and stomach acids or just pass through our body in our urine. It accumulates and build up over time. Even at very low levels, it can be harming our bodies… it has been found in Canadian mother's breast milk thus passed along to their nursing child. As such, it could negatively influence the health of that baby's immune system and expose it to a cocktail of serious health issues early on.

More potential GM Hidden Ingredients to Look Out For

- GMO sweetener aspartame and other synthetic sweeteners. Aspartame is created in part by GM microorganisms. It is also called NutraSweet and Equal and is found in more than 6000 products, including any "diet" products, candies, cake mixes, desserts, gums, soft drinks, some yogurts,

single-serving sweeteners packets, and even in some, supplements, pharmaceuticals and sugar-free cough drops.

- Animal products: Meat, dairy products, farmed fish and eggs usually come from animals fed GM feed – alfalfa, corn, soy. To avoid them, buy certified organic, wild caught, or from 100 percent grass-fed animals. Avoid dairy products from cows that have been injected with GM bovine growth hormone (called rbGH, or rbST). See more details below.

- Honey and bee pollen may have been gathered from GM plants and flowers, especially from canola and corn flowers. Use only local honey gathered from local flowers.

- Many additives, enzymes, flavorings, processing agents and even vitamins that are used in processed food can be created by GM bacteria, yeast or fungi. To avoid them, either buy organic or eat only fresh foods from clean sources. See my much more detailed information below.

In the next few pages, I will details all the genetically engineered foods, ingredients and additives derived from the major GM crops: canola, corn, cottonseed, dairy, soy, sugar beets and tobacco. I hope my long and deep research will help you find that mysterious ingredient you have been looking for.

Potential Sources of Genetically Engineered Ingredients in Food

CANOLA

Canola or Rapeseed – (Approx. 90% of U.S. crop, 95% of Canada's crop) **–** Trait**:** The name Canola is a brand name combining Can (from Canada, its country of origin) and Ola (oil in Latin). Canola oil was originally bred from rapeseed in Canada**.** It is now genetically engineered for resistance to herbicides (glyphosate or glufosinate), for high laurate canola and oleic acid canola. It is considered one of the most chemically altered oils sold in the US and Canada. For example, Monsanto Glyphosate Tolerant Canola; Pioneer Glyphosate Tolerant Canola; Genective Glyphosate Tolerant Corn and more.

Ingredients or Food Products Coming from Canola (Rapeseed)

For all following ingredients or products, ask for source, USDA Organics or non-GMO certification.

Please note: To clarify in which industry each of the following products are used, I used (F) for food and drinks, (S) for supplements, (P) for pharmaceuticals, (C) for cosmetics, (A) for animals feed and pet food, and (I) for industrial uses.

- **Alcohol Ethoxylate** (AE) and **Alcohol Ethoxysulfates** (AES) are non-ionic surfactants found in products such as laundry detergents, surface cleaners, cosmetics and for use in agriculture, textiles and paint. They can also be used as emulsifiers, emollients and thickeners in cosmetics and food industry. Ethoxylation is an industrial process in which ethylene oxide from corn (see ethylene) is added to alcohols (see alcohol) and phenols to give surfactants. Ethoxylated fatty alcohols (such as lauryl, stearyl, and oleyl alcohols can come from coconut, **rapeseed [canola]** or corn – both GM crops) are often converted to organosulfate. (F) (S) (P) (C) (I)

- **Alpha tocopherol (TCP), E 307 or d-alpha tocopherol** is one of eight forms (4 tocopherols – alpha, beta, gamma and delta - and 4 tocotrienols) is a fat-soluble antioxidant and one of the forms or vitamin E. Alpha or d-alpha tocopherol is the natural form of vitamin E. Other natural forms are d-alpha tocopherol acid succinate and d-alpha tocopherol acetate.

  In the European diet, most alpha tocopherols come from olive and sunflower oils. In the American diet, gamma tocopherols mainly come from soybean, **canola** and corn oils – all suspected GM crops. Tocopherols and tocotrienols are fat-soluble antioxidants but have many other functions in our body. Although originally extracted from wheat germ oil, most natural vitamin E supplements are now derived from vegetable oils, usually soybean oil.

  Note: the dl-alpha tocopherol is the synthetic form of tocopherol made through the synthesis of petrochemicals with the help of a mixture of eight stereoisomers to end with a condensate of a-tocopherol. It is only half as active as the natural version. It also can show on nutritional labels as mixed tocopherols. It can be used in supplements and in personal care products like skin creams, lip balm, hair styling products, moisturizers, shaving creams, soaps and sunscreens. (F) (S) (C) (P)

- **Behentrimonium Methosulfate** (or BMSulfate) or Behenyl Trimethyl Ammonium Methosulfate or Docosyltrimethylammonium Methyl Sulphate is a quaternary ammonium compound used as an emulsifier to combine oil and water in the formulation of a cream or lotion. It is derived from rapeseed (**canola**) oil. (F) (C)

- **Brassica Campestris** is the Latin or scientific name for rapeseed – **canola** plant, a GM crop. (F) (C)

- **Brassica campestris / aleurites fordi oil copolymer** is a copolymer of Brassica Campestris (rapeseed or Canola) Oil and Aleurites fordi oil (Chinese Tung oil - a drying agent in inks, paints, and varnishes) monomers. (C)

- **Canadian Gold Honey.** Canadian bees could feed on GM canola flowers.

- **Canola-amidoethyl hydroxyethylammonium methyl sulfate**. Wow! What a long name you have Grandma. In this long name, you have canola – a suspected GM crop – and its cousins, ethyl and methyl, all coming from corn – another GM crop. (C)

- **Canola oil** (rapeseed oil). GE **canola** oil comes from rapeseed seeds (toxic to humans) changed by scientist through mutagenesis. In other words, these plants were exposed to radiations to promote mutation of their DNA to create a low toxicity oil and voila! Canola oil was invented. Once extracted, this oil is then refined using hexane (a chemical derived from gasoline), another reason to avoid it. The rapeseed meal left over from oil processing is then used as animal feed. This fact alone should caution you about eating COFA beef, pigs and poultry grown on that feed. For clarification, even when canola oil claims it is organic or non-GMO, all it means is there are no additional foreign gene inserted in these plants but keep in mind that they still have been mutated from the original toxic seed.

  Warning: Canola oil has been shown to cause lung cancer (Wall Street Journal: 6/7/95). Recorded and potential side effects are: loss of vision, disruption of the central nervous system, respiratory illness, anemia, constipation, increased incidence of heart disease and cancer, low birth weights in infants and irritability. It takes about 10 years of cumulative consumption before symptoms appear. Another possible effect of long term ingestion is the destruction of the myelin sheath protecting our nerves. When this protective sheath is gone, our nerves signals short-circuit causing erratic, uncontrollable movements and could lead to MS.

- **Coco methyl ester** + sulfonate/ethoxylate. Common sources for methyl ester manufacture are coconut, palm, **canola** (rapeseed) oils, and beef tallow. Methyl esters are made through a chemical process called transesterification. The conversion of these oils to methyl esters involves the use of methanol (see methanol) as a raw material and a basic catalyst (potassium or sodium). Glycerin (see glycerin) is a by-product of the conversion process. (F) (C)

- **Coenzyme Q10** or **CoQ10** (ubiquinone, ubidecarenone, ubiquinol): There are three redox states of coenzyme Q10: fully oxidized (ubiquinone),

semiquinone (ubisemiquinone), and fully reduced (ubiquinol). Some of the foods that are good sources of ubidecarenone include beef, salmon, mackerel, sardines, soybeans, peanuts, walnuts, broccoli, and spinach. Other sources include whole grains, wheat germ, and oils such as **rapeseed** (**canola** oil), soybean, and sesame. It can also be manufactured by fermenting beets (a GM crop) and sugar cane with special strains of yeast. Most other CoQ10 manufacturers ferment their products from bacteria or chemical synthetic from tobacco. (F) (S) (P) (C)

- **Glucosinolate(s)**. In nature, glucosinolates are natural components found in many pungent plants such as broccoli, Brussels sprouts, cabbage, cauliflower, collard greens, kale, kohlrabi, mustard, rutabaga, turnips, bok choy, and Chinese cabbage. Arugula, horse radish, radish, wasabi, and watercress are also cruciferous vegetables. But it is rarely known that rapeseed meal (**canola**) is used as a protein feed for livestock in Northern America, Canada and Europe. Rapeseed meal contains several glucosinolates and produces not only oxazolidine-2-thiones but also isothiocyanates, nitriles and thiocyanates that can be toxic to the animals and passed through in their meat and dairy products. Commercially, glucosinolates can be extracted from rapeseed with MeOH and the extracts are cleaned up with Florisil cartridges. As such, it can be used in supplements. Caution. (F) (S) (C)

- **Glycerides,** also known as **acylglycerols**, they are esters (a combination of a fatty acid with an alcohol – from corn) formed from glycerol (see glycerol) and fatty acids, possibly coming from corn, **canola** or soybean oils – all GM crops. Don't eat ice-cream, sauces or salad dressings that use mono-glyceride or di-glyceride. (F) (S) (P) (C)

- **Glycol stearate or distearate**. This chemical compound is used as an emollient in cosmetic products, and is a combination of ethylene glycol (colorless chemical possibly from corn) and stearic acid (a common fatty acid from soy or **canola**). This chemical may be derived either from animal sources (cow or hog-derived) or vegetable sources, such as soybean oil and canola oil. It can also be produced synthetically through processing stearic acid. Similar ingredients: Glycol Stearate SE, and Glycol Distearate. See Glycol. (F) (S) (C)

- **Lauryl + oleoyl alcohol ethoxylates** is a surfactant (cleaning agent) made from coconut and also contains oleic acid from **canola**, cotton or corn oil (oleoyl alcohol). (C)

- **Oleic acid** is a fatty acid that occurs naturally in various vegetable fats and oils. Triglycerides of oleic acid compose 61% of **canola** oil – a potential GM crop. Oleic acid can also come from genetically modified (GM) soybean (*Glycine max)* containing higher levels of oleic acid. Commodity soybean oil is composed of five fatty acids: palmitic acid (16:0), stearic acid (18:0), oleic acid (18:1), linoleic acid (18:2), and linolenic acid (18:3). Soybean is a also potential GM crop.

  The biosynthesis of oleic acid involves the action of the enzyme stearoyl-CoA 9-desaturase acting on stearoyl-CoA. In effect, stearic acid is dehydrogenated to give the monounsaturated derivative oleic acid. Small amounts of oleic acid are used as an excipient in pharmaceuticals and supplementation. Oleic acid is used as an emulsifying or solubilizing agent in aerosol products. (F) (S) (P) (C)

- **Omega 3, 6 and 9**. If the source is not specified, be cautious. In commercial supplements, they could be extracted from refined **canola**, corn, cottonseed, or soybean oils – all suspected GM crops. Adding to that fact is that English researchers hope to produce the world's first sustainable plant source of omega-3 fatty acids this year. This gene, normally found in oily fish, will be added by "cutting and pasting" taken from marine algae into camelina, a member of the mustard family and a relative of canola plants. (F) (S) (C)

- **PEG 400 dioleate** is a polishing and shining agent. It comes from oleic acid that could come from **canola**, coconut, corn, cotton, olive palm or soybean oils. Ask for source. (C)

- **Pepsin** is a proteolytic enzyme generated by the gastric juice of mammals, humans, birds, reptiles, and fish. It helps break down proteins. It is formed from a precursor, pepsinogen, which is found in the stomach mucosa. Pepsin is prepared commercially from the

glandular layer of fresh hog stomachs (see **ovine**) fed GM crops (**canola**, corn, cottonseed or soybean). Pepsin is used for a variety of food manufacturing production; to modify soy protein and gelatin, thereby providing whipping qualities; to modify vegetable proteins for use in nondairy snack items; to make precooked cereals into instant hot cereals; and to prepare animal and vegetable protein hydrolysates for use in flavoring foods and beverages. (F)

- **Phenylalanine.** There are three forms: the L, D and DL forms. **L-Phenylalanine** is an essential amino acid typically found in proteins such as **beef**, **dairy** products, **eggs**, **fish**, **poultry**, **pork**, nuts and seeds, and GM **soy** products (like soy protein isolate, soybean flour, tofu and many more). Since the majority of commercial animals are fed GM alfalfa, **canola**, corn, cotton, and soybean feed, make sure the source is GMO-clean. (F) (S) (P)

- **Plant sterols/stanols (or phytosterols)**: Plant sterols and stanols are extracted from the deodorizer distillates of vegetable oil refining and from tall oil, a by-product of paper pulping industry. Major refined vegetable oil sources of plant sterols include GM soybean oil, GM corn oil, sunflower oil, rapeseed oil (**canola**, a GM crop) and wheat germ oils. (F) (S) (C)

- **Rapeseed feed** (the seed source for **canola** oil) used as animal feed. Rapeseeds are first crushed to remove the oil, yielding rapeseed cake as the first by-product. In most cases, this cake is further processed through solvent extraction, resulting in rapeseed meal used to feed cattle and CAFO animals.

- **Tocopherols** are the lower quality forms of vitamin E. As a food additive, they are **tocopherol** (E306), **alpha-tocopherol** (E307), **gamma-tocopherol** (E308) and **delta-tocopherols** (E309). They can be found naturally in sunflower, peanut, sesame, olive and walnut oils. Commercially, they are extracted from cheaper oils such as **canola**, corn**,** cotton and soybean – all GM crops. Although they are all approved in

the USA, EU and Australia and New Zealand for use as antioxidants in food and vitamins, since they are typically coming from GM crops, caution. Ask for food source. (S) (C)

- **Triglyceride** or **triacylglycerol**, or **triacylglyceride** is an ester derived from glycerol and three fatty acids. Triglycerides are the main constituents of vegetable oil (typically more unsaturated), most likely **canola** (rapeseed or linseed) oil, corn oil, soybean oil or cottonseed oil – all potential GM crops. (F) (S) (C)

- **Tocopheryl Acetate** is a fat-soluble vitamin that can be isolated from vegetable oils (**canola**, corn, cotton and soy – all GM crops). It is also found in dairy products, meat, eggs, cereals, nuts, and leafy green and yellow vegetables. (S) (C)

- **Vegetable anything** that's not specific* can come from **canola**, cottonseed, corn or soy origins. (F) (S) (P) (C)

- **Vegetable -based fatty acids** (not specified) can come from **canola**, cottonseed, corn or soy. (F) (S) (P) (C)

- **Vegetable-based fatty acids**, when not specified, could come from **canola**, corn**,** cottonseed or soybean – al GM crops. (F) (S) (C)

- **Vegetable fats** and **oils**. The vast majority of commercial oils used in restaurants, fast food establishments and sold at your local grocery store are from **canola**, corn, cottonseed and soybean. Soybean oil by itself comprises about 80% of commercial oils. A large percentage of these crops come genetically engineered (see details above) and are usually blended into "regular" oils. Unless they are specifically labeled "USDA Certified Organic" or "non-GMO Verified, be cautious and ask for source. For cooking, you can look for untainted oils or fats such as butter (make sure is does not contain bovine growth hormones), olive, coconut, safflower, sunflower, and peanut oils; for cold applications, use flaxseed, walnut, hazelnut, and macadamia oils. (F) (S) (P) (C)

- **Vegetable lubricants**: They can be any of the following: Stearic acid or stearates, magnesium stearate, calcium stearate, ascorbyl palmitate, fractionated vegetable oil, hydrogenated vegetable oil, castor oil, etc. These are primarily triglyceride esters that can be derived from plants as well as animals. Other common vegetable-based lubricants are high oleic **canola** oil (GM crop), castor oil, palm oil, soybean oil (GM), sunflower seed oil and Tall oil from tree processing sources. Other deceptive names such as Pharmaceutical Glaze, Confectioners Glaze or Natural Glaze are names for shellac. Natural Vegetable Coating, Natural Protein Coating, Vegetable Coating, and Maize Protein are names for Zein which is **corn** protein – a GM crop. (F) (S) (P) (C)

- **Vitamin E** exists in eight different forms, four **tocotrienols** (alpha, beta, gamma and delta) and four **tocopherols** (alpha, beta, gamma and delta). Vitamin E is widely utilized in the supplements and cosmetic industry as an ingredient in the manufacture of soaps, creams, make-up and hair care products. (F) (S) (C)

  Tocopherols are the lower quality forms of vitamin E. As a food additive, they are **tocopherol** (E306), **alpha-tocopherol** (E307), **gamma-tocopherol** (E308) and **delta-tocopherols** (E309). They can be found naturally in sunflower, peanut, sesame, olive and walnut oils. Commercially, they are extracted from cheaper oils such as **canola**, corn, and soybean – all GM crops. Although they are all approved in the USA, EU and Australia and New Zealand for use as antioxidants in food and vitamins, since they are typically coming from GM crops, caution. Ask for food source. (F) (S) (C)

  Mixed Tocopherols are a concentrated form of both forms of tocopherols derived from the same GM crops. Mixed tocopherols in the US are less fractionated "natural mixed tocopherols" and high d-gamma-tocopherol fraction supplements. These can still come from GM crops. (F) (S) (C)

  Tocotrienols are the natural form of vitamin E. Their three main commercial sources are rice bran, palm and annatto. In its natural form, it can be also be found in grains like barley, corn (a GM crop), oat, rye, wheat bran and wheat germ; they can also be found in vegetables like

broccoli, cauliflowers, carrots, and olives; in fruits like apricots, avocado, black currants, blueberries, grapes and its seeds; nuts like almonds, cashews, coconut, macadamia, and pistachio; and even certain **meats** (lard) and eggs. (F) (S) (C)

Both members of the vitamin E family act as antioxidants. However, the natural vitamin E is a more powerful antioxidant due to its unique molecular structure. Unfortunately, since the synthetic version is cheaper to produce, it is most likely that, if you do not pay attention, you will use the tocopherols extracted from GM crops. If you are looking for the real thing and the non-GMO version, look for the tocotrienol form of vitamin E. (F) (S) (C)

Finally, you have the **synthetic vitamin E**, commonly referred to as **dl-alpha-tocopherol**, the cheapest form of vitamin E, most commonly sold supplement form usually as the acetate ester. Synthetic forms of the nutrient have "dl" or "all-rac" in front of the name, like "dl-alpha-tocopherol". This synthetic form of vitamin E is derived from **petroleum** products. Synthetic vitamin E is most commonly used in tablets and multiple vitamins. Only about 25% of synthetic vitamin E is used by our body. The present largest manufacturers of this type are DSM and BASF. Since it is synthetic and not coming from a natural source, one could say it is GMO-free, but I would still avoid it. (F) (S) (C)

- **Vitamin E acetate or Tocopheryl acetate**, is the acetic acid ester form of tocopherol isolated from vegetable oils (usually **canola**, corn and soybean – all GM crops). Because it contains antioxidants and do not oxidize as fast as tocopherol, it is a common vitamin supplement used in dermatological products such as skin cream, lipstick, eye shadow, blushers, face powders and foundations, moisturizers, skin care products, bath soaps and detergents, hair conditioners, and many other products. (C)

BOVINE, OVINE, CAPRINE

- **Adrenal Cortex Extract or** ACE, is a chemical coming from the adrenal glands of slaughtered cows, pigs, and sheep. People use adrenal extract taken from animals in the hope that the extract will function like the body's adrenal gland. But it's not known whether the human body can absorb adrenal extract or how it might work. These animals are mostly fed corn, **soybean** or cottonseed feed, all potential GM crops. (S)

  Related products or ingredients: Adrenal, Adrenal Complex, Adrenal Concentrate, Adrenal Cortex, Adrenal Cortex Extract, Adrenal Factors, Adrenal Medulla, Adrenal Polypeptide Fractions, Adrenal Powder, Adrenal Substance, Cortex Surrénalien, Extracto Suprarrenal, Extrait de Cortex Surrénalien, Extrait de Glandes Surrénales, Extrait de Glandes Surrénales Entières, Facteurs Surrénaliens, Glandulaire, Glandular, Lyophilized Adrenal Tissue, Médullaire des Glandes Surrénales, Médullaire Surrénale, Médullosurrénale, Substance Surrénalienne, Tissu Lyophilisé de Glande Surrénale, Whole Adrenal Extract)

- **Beef or bovine gland or organ extracts**: Soybean, corn or **cottonseed** meal is used to feed bovines in the U.S. It is cheap and plentiful in the United States. The 1.5 million tons of cottonseed meal produced in the U.S. every year that is not suitable for humans or any other simple-stomach animal is even cheaper than soybean meal. Also, some bovines are injected genetically engineered growth hormones. (S) (P)

- **Bovine (**beef**) gland** or **organ extracts**: Alfalfa, soybean, **corn** or cottonseed meal is used to feed bovines in the U.S. It is cheap and plentiful in the United States. The 1.5 million tons of cottonseed meal produced in the U.S. every year that is not suitable for humans or any other simple-stomach animal is even cheaper than soybean meal. Also, some bovines are injected genetically engineered growth hormones. Bovine products**:** Tallow or beef fat (Zest soap is made of tallow). See bovine. (S) (C)

- **Bovine immunoglobulin** comes from bovine colostrum (see bovine). People with eating disorders can have low levels of IGF-1 due to malnutrition, as do obese individuals. Although IGF-1 is not absorbed intact by the body, it does stimulate the production of IGF-1 when taken as a supplement. Bovine colostrum also has antioxidant components, such as Lactoferrin and hemopexin, which binds free iron heme in the body. If this product comes from grass-fed cows, it can be acceptable. If it comes from commercially-raised cows fed with GM corn, soybean, **cotton** or sugar beets, ask. (S) (P)

- **Calcium** ***microcrystalline hydroxyapatite*** (MCHC) is a technical name for powdered **calf** or **cow bone**. It is prepared using a special process of re-suspending bone matrix into an easily absorbable crystalline structure. See MCHC below. MCHC also goes by other names, including MCHA, HA or ossein hydroxyapatite. Since it can come from bovine fed with GM crops (alfalfa, **corn**, soybean, cotton) feed (see bovine), ask for source. (S)

- **Calcium carbonate** can come from limestone or from **cow's bone meal** or dolomite. It is used in the food industry as an alkaline agent, nutrition supplement, a dough regulation agent, solidification agent, yeast foodstuff, anti-lumping agent, loosening agent, fermenting agent and a modifier. Since the majority of cows are fed GM feed (corn, **soybean**, sugar beet or cottonseed), be cautious. (F) (S)

- **Calcium hydroxyapatite.** Many foods can supply various calcium salts but human and **animal bones** are the only natural source of calcium hydroxyapatite. The most efficacious calcium hydroxyapatite is microcrystalline hydroxyapatite concentrate (MCHC) extracted from the raw bones or bone marrow of **cattle**. Since cattle can come from feedlot animals fed GM alfalfa, corn, **soybean**, or cottonseed feed (see bovine), be careful. (F) (S)

- **Calcium Oxide or quicklime or lime (**CaO) is produced industrially by roasting calcium carbonate (could come from **bovine bones** fed GM crops) to drive off carbon dioxide. At room temperature, CaO will spontaneously absorb carbon dioxide from the atmosphere, and absorb humidity in the air. Used as a desiccant. (F) (I)

- **Calcium phosphate, Monosodium, Dicalcium and Tricalcium phosphates** are forms of precipitated **bone** phosphate. In the food processing industry, it is used as leavening agent, dough modifier, buffer, nutritional supplement, emulsifier, and stabilizer. In is also used as a frictional agent for top quality tooth paste. It is used in the pharmaceutical industry to make calcium tablets. Since calves and cows used for bone-sourced calcium are typically fed GM alfalfa, **corn**, soybean, cottonseed or sugar beet feed, ask for source. (F) (S) (C)

- **Calcium hydroxyapatite.** Many foods can supply various calcium salts but human and **animal bones** are the only natural source of calcium hydroxyapatite. The most efficacious calcium hydroxyapatite is microcrystalline hydroxyapatite concentrate (MCHC) extracted from the raw bones or bone marrow of **cattle**. Since cattle can come from feedlot animals fed GM alfalfa, **corn**, soybean, or cottonseed feed (see bovine), be careful. (F) (S)

- **Casein** is a white, tasteless, odorless protein precipitated from dairy milk by rennin. It is the basis of cheese and is used to make plastics, adhesives, paints, and foods. As all dairy products from bovines, since the vast majority of these animals are fed corn, soy or **cotton** feed (all suspected GM crops), ask. This is valid for all casein-derived products.

- **Cetyl myristoleate (CMO) or miristoleate** as oil, is the hexadecyl ester of the unsaturated fatty acid cis-9-tetradecenoic acid. It is created by the esterification of myristoleic acid found commonly in fish oils, whale oils, dairy butter, kombo butter, sperm whale oil, and can be found in a small gland in the male beaver. It is used as a cure for rheumatoid and

osteoarthritis. It can also be extracted from **bovine** sources (see bovine and GMOs above) and processed with cetyl alcohol (see cetyl alcohol). If coming from a vegetable source, it can come from palm or coconut oil but it could also contain stearic acid (see stearic acid) from soybean oil and cetyl esters. (C)

- **Collagen**: Manufacturers of collagen-based dietary supplements claim that their products can improve skin and fingernail quality as well as skin and joint health. However, mainstream scientific research has not shown strong evidence to support these claims. Collagen is sometimes made from **chicken** (see poultry) sternal cartilage extract. Most medical collagen is derived from young **beef** cattle (**bovine**) from certified BSE-free animals. **Porcine** (pig) tissue is also widely used for producing collagen sheet for a variety of surgical purposes. It can also be made from **equine** (horse) source (mostly in Europe). The issue here is not so much from what animal is collagen coming from as much as what food is used as animal feed. In the vast majority of cases, chicken, bovine and pigs are fed alfalfa, corn, **soy** or cottonseed feed – all GM crops. (S) (C)

  The most common form of collagen used in the supplement industry is **hydrolyzed collagen**. It is produced from collagen found in the bones, skin, and connective tissue of animals such as cattle, fish, horses, pigs, and rabbits. The process of hydrolysis involves breaking down the molecular bonds between individual collagen strands using heat and either acid or alkali solutions. Typically, with skin-sourced collagen, hides are put in a lime slurry pit for up to 3 months, loosening collagen bonds; the hides are then washed to remove lime, and the collagen is extracted in boiling water. The extracted collagen is evaporator concentrated, desiccated with drum driers, and pulverized.

  Collagen can also be derived from marine sources, such as shark cartilage and shellfish (caution if you allergic to shellfish). Most likely they are sourced from **farmed fish** like **salmon** and **tilapia** and which are fed corn and **soy** pellets – 2 GM crops.

- **Dicalcium phosphate** is a dibasic calcium phosphate. It usually comes from defatted bones from **bovine**, **ovine** or **caprine** (goats or sheep)

animals. It is mainly used as a dietary supplement in prepared breakfast cereals, supplements, dog treats, enriched flour, and dry pasta products. It is can also be used as a tableting agent in some pharmaceutical preparations and some toothpastes as a tartar control agent. It is used in poultry feed. (F) (S) (P) (C)

- **Elastin** is a protein found in the skin and tissue of the body. It helps to keep skin flexible but tight, providing a bounce-back reaction if skin is pulled. These proteins are not from human sources; they typically are harvested from either cows or birds (poultry) and in theory should promote better skin elasticity. Since it comes primarily from cows and birds, it can be argued that the protein potentially might expose users to mad cow disease and avian flu. My concern here is the quality of the feed given to these animals. Typically, they are fed alfalfa, corn, soy or cottonseed feed – all GM crops. (C)

- **Fish gelatin** can come from commercially-farmed **tilapia** or swai (iridescent shark) fed with corn or soybean pellets – 2 GM crops In the supplement and pharmaceutical industry gelatin is generally used in capsules, tablets, suppositories and vitamin encapsulation. (F) (S) (P)

- **Gelatin**: Gelatin is mostly produced from **pig** skin, and cattle (**bovine**) hides and bones. Both pigs and bovines can be fed GM crops. Also, bovines and sometimes pigs are injected genetically engineered growth hormones. (F) (S) (P) (C)

  Bison meat and **bison gelatin**: Although bison is typically grass fed it can be grain-finished, in which case it could be fed GM grains. Look for "grass-fed" labels on bison to best avoid any GM-**corn**-fed bison. (F) (S) (P) (C)

  Fish gelatin: Can come from commercially-farmed **tilapia** or swai (iridescent shark) fed with **corn** or soybean pellets – 2 GM crops In the supplement and pharmaceutical industry gelatin is generally used in capsules, tablets, suppositories and vitamin encapsulation. (F) (S) (P)

- **Hydrolyzed gelatin** (see gelatin). Sometimes used as a substitute for collagen in supplements. (S) (C)

- **Isopropyl Myristate** is a skin product used as an emollient, thickening agent, or lubricant in beauty products. It is a combination of synthetic isopropyl alcohol (a propane derivative) with myristic acid, and a fatty acid found in nutmeg, GM corn oil or soybean oil, palm oil, coconut oil, butter fat, and spermacetin, the oil from the sperm whale. Isopropyl Myristate is a popular cosmetic and pharmaceutical ingredient. It is most often used as an additive in aftershaves, shampoos, bath oils, antiperspirants, deodorants, oral hygiene products, and various creams and lotions. Since it could come from animal source (see **dairy** or **bovine**) fed with GM feed, be cautious. (C)

- **Keratin**, a strong animal protein, is a major component in skin, hair, wool, nails, hooves, horns, and teeth. Commercial keratin comes from the controlled acid or alkali hydrolysis process (using lime) of abundant by-product of **poultry** (feather meal from chicken), slaughterhouse (**bovine**, **ovine** hair), sheep wool and the refuse from tanning and fur processing industry. Sometimes, a complex enzymatic process is used. Keratin applications can be found in the food, pharmaceutical, supplementation (to strengthen air and nails), cosmetics (treatment of human hair and skin) and fertilizers. Considering the potential animal source of keratin most likely fed GM feed, please ask. (F) (S) (P) (C)

- **Lactoferrin** is a protein purified from cow's milk or produced recombinantly. Human colostrum (*"first milk"*) has the highest concentration, followed by human milk, then **cow milk** (150 mg/L). Cow's, unless certified organic are fed corn, soy and **cottonseed** feed, all potential GM crops.

- **Lipase** - Used to enhance buttery flavors in oils by degrading some of the lipids. Lipases are generally animal sourced, but can also be sourced microbially. If it comes from animals, they might be fed GM corn, soy

and **cotton** feed. It could also be extracted from the scutella of corn, a GM crop.

- **MCHC** (Microcrystalline Hydroxyapatite Concentrate). MCHC is a complete bone food from **bovines**; it contains proteins and Vitamin C. Microcrystalline hydroxylapatite (MH) is marketed as a "bone-building" supplement with superior absorption in comparison to calcium. It is a second-generation calcium supplement derived from bovine bone. In the 1980s, bone meal calcium supplements were found to be contaminated with heavy metals, and although the manufacturers claim their MH is free from contaminants, people are advised to avoid it because it has not been well-tested. May contain high lead, arsenic, cadmium, etc. Also, since it comes from bovine, there is a potential risk for these bovines to have been fed alfalfa, **corn**, soy and cottonseed – all potential GM crops. (S)

- **Medium chain triglycerides** (MCTs) are medium-chain fatty acid esters (caprylic acid, capric acid, caproic and lauric acids) of glycerol. They can come from horse milk, **cow's** butter (typically, commercial cows are fed alfalfa, **corn**, soy or cottonseed feed – all GM crops), coconut oil, or palm kernel oil. If not clearly specified, ask for source. (F) (S)

- **Melatonin** is a hormone secreted at night by the pineal gland in the center of our brain to help regulate our circadian rhythm. It can be found in animals, plants, and microbes. Vegetable sources of melatonin can be found in cherries, bell peppers, bananas and grapes, rice and cereals, herbs, olive oil, walnuts, wine and beer. Commercially, there are two forms: synthetic and natural. When synthetic, it is created in a lab as N-acetyl-5-methoxytryptamin. If natural, it can come coming from animal source, most likely from tryptophan extracted from sheep or **bovine** (cows) pineal gland extract. There are concerns over possible animal viral contamination – mad cow disease. Also, since cows are typically fed GM crops, ask for source. (S) (P)

- **Myristyl alcohol** or **1-Tetradecanol,** can be produced by the reduction of myristic acid or fatty acid esters from assorted sources (animal and vegetal) with reagents such as lithium aluminum hydride or sodium. Animal source can be sperm oil from whales or **beef** tallow. Vegetable sources can be jojoba, rapeseed (**canola**), mustard seed, coconut or palm kernel oil, as well as soy and **corn** oils. Fatty alcohols are also be prepared from petrochemical sources. Ask for source. (F) (D) (C) (I)

  Fatty alcohols are mainly used in the production of detergents and surfactants. They are also components of foods, cosmetics cold creams for its emulsifying and emollient properties, and as industrial solvents. Due to their amphipathic nature, fatty alcohols behave as nonionic surfactants for detergents.

- **Oleyl alcohol**, **octadecenol**, or **cis-9-octadecen-1-ol**, is a non-ionic, unsaturated fatty alcohol coming from beef fat. It used as a nonionic surfactant, emulsifier, emollient and thickener in skin creams, lotions and many other cosmetic products. It is also a surfactant and hair coating in shampoo and hair conditioner. It can also be found in fish oil. See **beef** or **bovine**. (C)

- **Organic acid salts or acid salts** can be **lactic acid** (from GM **corn**); **acetic acid** (E260) (also called ethanoic acid) used for distilled vinegar made from corn; **formic acid** or methanoic acid from ant venom; **citric acid** (from corn); **oxalic acid** made from corn; or **uric acid** from the metabolic breakdown of purine nucleotides from **bovines**.

- **Ovine or sheep gland, spleen or organ extracts**: Soybean or cottonseed meal is used to feed sheep in the U.S. It is cheap and plentiful in the United States. The 1.5 million tons of cottonseed meal produced in the U.S. every year that is not suitable for humans or any other simple-stomach animal is even cheaper than soybean meal. (S)

- **Pancreatic enzymes**: Coming from animal source (cows and pigs) most likely fed with GM corn, soy or cottonseed feed. (S) (P)

- **Pepsin** is a proteolytic enzyme generated by the gastric juice of mammals, humans, birds, reptiles, and fish. It helps break down proteins. It is formed from a precursor, pepsinogen, which is found in the stomach mucosa. Pepsin is prepared commercially from the glandular layer of fresh hog stomachs (see **ovine**) fed GM crops (canola, corn, **cottonseed** or soybean). Pepsin is used for a variety of food manufacturing production; to modify soy protein and gelatin, thereby providing whipping qualities; to modify vegetable proteins for use in nondairy snack items; to make precooked cereals into instant hot cereals; and to prepare animal and vegetable protein hydrolysates for use in flavoring foods and beverages. (F)

- **Phenylalanine.** There are three forms: the L, D and DL forms. **L-Phenylalanine** is an essential amino acid typically found in proteins such as **beef**, **dairy** products, **eggs**, **fish**, **poultry**, **pork**, nuts and seeds, and GM soy products (like soy protein isolate, soybean flour, tofu and many more). Since the majority of commercial animals are fed GM alfalfa, canola, corn, cotton, and soybean feed, make sure the source is GMO-clean. (F) (S) (P)

  D-phenylalanine, the non-food, synthetic version of phenylalanine is the artificial sweetener aspartame. As you already know, aspartame is the result of genetically engineering *E. coli* fed glucose from sugar beets or **corn** fructose, both GM crops. This compound, sold under the trade names Equal and NutraSweet, is metabolized by the body into several chemical byproducts including phenylalanine. It is used in the manufacture of food and drink products and sold as a nutritional supplement for its reputed analgesic and antidepressant effects. The DL version is a combination of 50% D and 50% L forms. (F) (S)

- **Pork or porcine gland or organ extracts:** Swine have a digestive system similar to humans and different from ruminants such as cattle and sheep, which can eat forages or grasses. Pigs are fed a diet that is primarily ground **corn** to supply heat and energy and soybean meal to provide

protein. Vitamins and minerals are also added in their feed. Both crops are GM crops. (F) (S)

- **Probiotics**: Probiotics come in various types and names. The most common are: *Lactobacillus acidophilus, Bifidobacterium bifidum, Lactobacillus casei, Lactobacillus plantarum, Lactobacillus paracasei, Lactobacillus rhamnosus, Lactobacillus reuteri, Saccharomyces boulardii, Lactobacillus reuteri , Lactobacillus plantarum , Lactobacillus bulgaricus, Streptococcus thermophilus, Lactobacillus bifidus,* etc. Typically, lactic acid is added to a nutrient-rich **dairy** culture, allowed to grow then extracted from the growth medium and usually freeze-dried before being packaged. Dairy could come from cows fed alfalfa, canola, corn, soy or cottonseed feed, all suspected GM crops. In many cases, probiotics are packed with maltodextrin (from GM corn) as a filler or flow agent. Most capsules are made of vegetable cellulose (see cellulose for details) from GM sources. (F) (S) (P)

- **Stearic acid** (E570) or **vegetable stearic acid** is a saturated fatty acid. It is an emulsifier, thickener, and stabilizer. It occurs in many animal and vegetable fats and oils. Stearic acid is prepared by treating these fats and oils with water at a high pressure and temperature (above 200 °C), leading to the hydrolysis of triglycerides. The resulting mixture is then distilled. Stearic acid is used to produce dietary supplements. Commodity soybean oil is composed of five fatty acids: palmitic acid (16:0), stearic acid (18:0), oleic acid (18:1), linoleic acid (18:2), and linolenic acid (18:3). It can be found in butter flavoring, vanilla flavoring, chewing gum and candy, and fruit waxes. It is also used as coating for medicine and supplements tablets to ease unmolding. It can be made from soybean, **corn**, cottonseed, coconut oil, the fat of cows (see bovine), pigs (see porcine) and sheep. Since alfalfa, **corn**, cottonseed, soybean oil and **bovine**/**porcine** fats are questionable, ask for certification. (F) (S) (P) (C)

- **Stearate** is the anion form of stearic acid (see stearic acid). It is a saturated fat that can come from animal or plant sources. If from plant sources, it can come from **corn**, cottonseed, and soybean sources. If it comes from animal source (beef tallow), it might come from cows fed with GE corn, alfalfa or soybean as well as GE growth hormones and thus be suspect. See bovine paragraph for GMO questions.

- **Tilapia** (used in fish gelatin capsules) is farm-raised and fed pellets made largely of corn and soy (2 GM crops) and to gain weight rapidly. Feed is typically 90 to 92 percent grains such as soybean meal, rice, wheat and corn. (F) (S)

- **Trypsin** - A primary mammalian protease. Used in some infant formulas to predigest casein. Most likely coming from animals GM fed corn, soy and **cottonseed** feed.

CHICKEN and EGGS

Eggs: In typical industrial chicken farms, chicken are fed corn or soybean feed – 2 GM crops. Unless the egg provider can prove his chickens are NOT fed corn or soy, it is safe to assume they are. In that case, ask for non-GMO feed certification. Here's a list of egg ingredients, components or additive added to food or even supplements:

- Albumin or albumen
- Avian immune
- Binder
- Coagulant
- Egg (dried, powdered, solids, white and yolk)
- Globulin
- Lecithin
- Livetin
- Lysozyme
- Ovalbumin
- Ovamucin
- Ovamucoid
- Ovovitellin
- Powdered egg
- Vitellin
- Whole egg

Of course, you already know that eggs are found in untold numbers of foods and food products. Too long to list here. This is one of the few times I will not overwhelm you with TMI (too much information). Instead, try to buy farm-raised or organic eggs.

CORN

For all following ingredients or products, ask for source, USDA Organics or non-GMO certification.

Please note: To clarify in which industry each of the following products are used, I used (F) for food and drinks, (S) for supplements, (P) for pharmaceuticals, (C) for cosmetics, (A) for animals feed and pet food, and (I) for industrial uses.

Corn: There is a long list of products made from, extracted from or grown on corn. It includes: ingredients that contain corn; products that contain corn derivatives; products that use corn as part of the preparation or packaging process; and products that are made from corn. For ALL of these products or ingredients, ask for non-GMO certification.

- **Acetic acid (**E260), also called **Ethanoic acid, Acetasol**, **Methanecarboxylic acid**, **Ethylic acid**, **Vinegar acid**, **Acetic acid**, **Glacial acetic acid**, **Acetate**, **Essigsaeure** is a colorless liquid. When undiluted, is called *glacial acetic acid*. Acetic acid is the main component (6 to 9%) of white vinegar. Some of it is manufactured from petrochemical or wood distillation. The remainder is produced by fermentation and subsequent oxidation of ethanol - produced from a variety of feedstocks such as sugar beet, **corn**, cotton- all suspected GM crops (see ethanol below). By the way, that makes white vinegar a suspect ingredient as well. (F) (S) (C) (P)

- **Adrenal Cortex Extract or** ACE, is a chemical that is made from the adrenal glands of slaughtered cows, pigs, and sheep. People use adrenal extract taken from animals in the hope that the extract will function like the body's adrenal gland. But it's not known whether the human body can absorb adrenal extract or how it might work. These animals are mostly fed **corn**, soybean or cottonseed feed, all potential GM crops. (S)

  Related products or ingredients**:** Adrenal, Adrenal Complex, Adrenal Concentrate, Adrenal Cortex, Adrenal Cortex Extract, Adrenal Factors, Adrenal Medulla, Adrenal Polypeptide Fractions, Adrenal Powder, Adrenal Substance, Cortex Surrénalien, Extracto Suprarrenal, Extrait de Cortex Surrénalien, Extrait de Glandes Surrénales, Extrait de Glandes

Surrénales Entières, Facteurs Surrénaliens, Glandulaire,Glandular, Lyophilized Adrenal Tissue, Médullaire des Glandes Surrénales, Médullaire Surrénale, Médullosurrénale, Substance Surrénalienne, Tissu Lyophilisé de Glande Surrénale, Whole Adrenal Extract)

- **Alanine** is a nonessential amino acid, meaning it can be manufactured by the human body. Alanine is found in a wide variety of foods, but is particularly concentrated in meats. Good sources of alanine include meat, seafood, caseinate, dairy products, eggs, gelatin, lactalbumin or also from soybeans, whey, **corn**. If not coming from a USDA certified organic source, ask for source. (S) (C)

  Related products or ingredients: 2-aminopropionic Acid, Acide Alpha-aminopropionique, Acide Aminé Alanine, Acide Aminé Non Essentiel, Ala, Alanine Amino Acid, Alfa-alanina, Alpha-aminopropionic Acid, D-alanine, D-alpha-alanine, DL-alanine, L-alanine, L-alpha-alanine, L-alpha-aminopropionic Acid, Non-essential Amino Acid.

- **Allantoin** is present in botanical extracts of the comfrey plant and urine from cows and most mammals. This product is mostly used as a moisturizer to treat or prevent dry, rough, scaly, itchy skin and soothe minor skin irritations (e.g., diaper rash, skin burns from radiation therapy). Emollients are substances that soften and moisturize the skin and decrease itching and flaking. Chemically synthesized bulk allantoin is nature-identical, safe, non-toxic, and compatible with cosmetic raw materials and meets CTFA and JSCI requirements. If coming from animal source, ask. (C)
- **Alcohol** (ethanol, ethyl alcohol, methyl alcohol, denatured alcohol or grain alcohol) Besides alcohol by the natural fermentation of assorted fruits (like grapes in wine and many others) or grains (like rye in vodka and many others), the industrial version is a colorless volatile flammable liquid (C_2H_5OH) synthesized by hydration of ethylene or obtained by fermentation of sugars and starches from beet or corn (both suspected GM crops) used, either pure or denatured, in beverages, medicines or pharmaceutical drugs like cough medicine, lotions, tonics, colognes, supplements, cleaning solutions, explosives, and intoxicating beverages;

can also be used as a solvent, rubbing compounds, automobile radiator antifreeze, and rocket fuel.

Short chain alcohol like methanol, ethanol, ethyl alcohol and propanol can be made from **corn** or sugar beet – both GM crops. Higher alcohols such as C16 Cetyl alcohol, C18 Stearyl alcohol, Cetostearyl alcohol (a combination of cetyl and stearyl alcohols), C18 stearic acid, C18 oleic acid, or C22 behenyl alcohol can be extracted from corn and sugar beets as well as coconut and palm. Ask for source. (F) (S) (C) (P)

- **Alcohol Ethoxylate** (AE) and **Alcohol Ethoxysulfates** (AES) are non-ionic surfactants found in products such as laundry detergents, surface cleaners, cosmetics and for use in agriculture, textiles and paint. They can also be used as emulsifiers, emollients and thickeners in cosmetics and food industry. Ethoxylation is an industrial process in which ethylene oxide from corn (see ethylene) is added to alcohols (see alcohol) and phenols to give surfactants. Ethoxylated fatty alcohols (such as lauryl, stearyl, and oleyl alcohols can come from coconut, rapeseed [canola] or corn – both GM crops) are often converted to organosulfate. (F) (S) (P) (C) (I)

- **Alkyl glucoside or Alkyl polyglucoside** (APG), **Alkyl glucose ester** (AGE) or **Alkyl Polyglycoside** are non-ionic surfactants made from vegetable oils (**corn**, soy, palm or coconut) and corn starch – GM crops. These new products have been replacing traditional petroleum-based like sodium lauryl sulfate (SLS) or sodium lauryl ether sulfate (SLES) products for the past few years and even other natural oils-based surfactants. Initially, surfactants initially were developed for home care and body wash applications, but have been expanded to facial cleansing lotions, shampoos, oral care products, wipes, laundry detergents, hard surface cleaners and industrial and institutional cleaning applications. (F) (C) (I)

- **Alpha tocopherol (TCP), E 307 or d-alpha tocopherol** is one of eight forms (4 tocopherols – alpha, beta, gamma and delta - and 4 tocotrienols) is a fat-soluble antioxidant and one of the forms or vitamin E. Alpha or d-alpha tocopherol is the natural form of vitamin E. Other natural forms are d-alpha tocopherol acid succinate and d-alpha tocopherol acetate.

In the European diet, most alpha tocopherols come from olive and sunflower oils. In the American diet, gamma tocopherols mainly come from soybean, canola and **corn** oils – all suspected GM crops. Tocopherols and tocotrienols are fat-soluble antioxidants but have many other functions in our body. Although originally extracted from wheat germ oil, most natural vitamin E supplements are now derived from vegetable oils, usually soybean oil.

Note: the dl-alpha tocopherol is the synthetic form of tocopherol made through the synthesis of petrochemicals with the help of a mixture of eight stereoisomers to end with a condensate of a-tocopherol. It is only half as active as the natural version. It also can show on nutritional labels as mixed tocopherols. It can be used in supplements and in personal care products like skin creams, lip balm, hair styling products, moisturizers, shaving creams, soaps and sunscreens. (F) (S) (C) (P)

I suggest you get your natural vitamin E from food sources. The 10 highest food sources of natural vitamin E per 100 g serving are wheat germ oil (215.4 mg), sunflower oil (55.8 mg), almond oil (39.2 mg), sunflower seed (35.17 mg), almond (26.2 mg), hazelnut (26.0 mg), walnut oil (20.0 mg), peanut oil (17.2 mg), olive oil (12.0 mg), and poppy seed oil (11.4 mg).

- **Amino acids**: Commercial amino acids come from a bacterial fermentation on a substrate of syrups/sugars derived from sugar cane, **corn**, and cassava, and glutamate-producing microorganisms are fermented under the appropriate conditions. During this fermentation process, glutamate is excreted from the microorganisms into the fermented broth. This is how glutamate is obtained in large amounts. Finally, with the help of specific enzymes, only the target amino acid is obtained from this fermented broth in high purity. They are alanine, arginine, aspartic acid, asparagine, cysteine, cystine, glutamine, glycine, glutamic acid, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophane, tyrosine, and valine. Ask about non-GMO certification of growth medium. (F) (S) (C) (P)

- **Amylopectin.** A starch molecule made up of glucose units chemically arranged into branched chains. (F)

- **Amylose**. A starch molecule made up of glucose units chemically arranged in long straight chains. (F)

- **Anhydroglucose units**. They are the basic units – 3-Deoxyglucosone and Levoglucosan – that occur repeatedly in all starch molecules. (F)

- **Arginine** (or L-arginine) is a semi-essential amino acid naturally contained in red meat, fish, poultry, wheat germ, grains, nuts and seeds, and dairy products. It can be used to support heart health when arginine is changed into nitric oxide (NO) by our body. Nitric oxide is a powerful neurotransmitter that helps blood vessels relax and also improves circulation. It is also used as a skin and hair conditioner. As a commercial supplement, arginine results from the fermentation of glucose from tapioca, beet (GM crop) or **corn** (GM crop) with the help of a specific strain of E. coli. It is then filtered, cooled and dried to come to a white powder. (S)

- **Artificial flavorings.** Artificial flavors are simply chemical mixtures that mimic a natural flavor through laboratory manipulation. These are typically produced by fractional distillation and additional chemical manipulation of naturally sourced chemicals, crude oil or coal tar. For example, check out the following artificial flavorings: fruity flavor comes from ethyl propionate (see ethyl later); grape flavor from methyl anthranilate; pear flavor from ethyl decadienoate; sugar or cotton candy flavor from ethyl maltol; artificial vanilla from ethylvanillin; wintergreen from methyl salicylate (see methyl later) and many more. (F) (S) (P)

- **Artificial sweeteners or sugar substitutes**. It is defined as food additive duplicating sugar flavor, usually with fewer calories. They usually contain maltodextrins (see maltodextrin) from corn – a GM crop mixed in with a chemical sweetener. They are: aspartame (Equal, NutraSweet), sucralose (Splenda), neotame, acesulfame potassium (Sunett, Sweet One), and saccharin (Sugar Twin, Sweet'N Low) offered under different brand names.

Let's not forget another form of lab-created sugar substitutes known as polyols or "sugar alcohols" usually extracted from corn, berries, fruit, even some vegetables and mushrooms. They are erythritol, hydrogenated starch hydrolysate, isomalt, lactitol, maltitol, mannitol, sorbitol and xylitol. They are produced by catalytic hydrogenation (uh oh) of the appropriate reducing sugar. For example, xylose is converted to xylitol, lactose to lactitol, and glucose to sorbitol. Other new sweeteners like tagatose (Naturlose), trehalose, are known, but are yet to gain official approval for food use.

The only safe sugar substitute in my opinion is natural and organic **Stevia**, NOT the pretend stevia like **Truvia** and **Pure Via** which are mixed with the same artificial sweeteners mentioned above. Choose only certified organic source. Instead, I would suggest you use raw cane sugar, raw agave nectar, date sugar, coconut sugar, fruit juice concentrate, honey, maple syrup and molasses from organic source (if you can) and in moderation. (F) (S) (P)

- **Ascorbate** is the salt of ascorbic acid. (F) (S) (C)

- **Ascorbic acid**: Ascorbic acid is not vitamin C. Ascorbic acid is the synthetic form of vitamin C. It is an isolate, a fraction, a distillate of naturally occurring vitamin C. It's a chemical, a cornstarch derivative, a sulfuric acid by-product. Chemically, there exists a D-ascorbic acid which does not occur in nature. It is artificially synthesized. Ascorbic acid is prepared industrially from glucose in a method based on the historical Reichstein process. Industrial glucose usually comes from corn – a potential GM crop.

  Over 90% of ascorbic acid in this country is manufactured at a facility in Nutley, New Jersey, owned by Hoffman-LaRoche, one of the world's biggest drug manufacturers (1 800 526 0189). Here ascorbic acid is made from a process involving cornstarch and volatile acids. Most U.S. vitamin companies then buy the bulk ascorbic acid from this single facility. After that, marketing takes over. Each company makes its own labels, its own claims, and its own formulations, each one claiming to have the superior form of vitamin C, even though it all came from the same place, and it's really not vitamin C at all. Ask for source or for non-GMO certification. (F) (S) (C)

- **Aspartame** (also called AminoSweet ®, NutraSweet ®, Equal ®, Spoonful ® and Equal Measure ®. **Aspartame** is a non-calorie artificial sweetener comprised of methanol, phenylalanine and aspartic acid. It is used in diet sodas and thousands of other products worldwide. Aspartame has been linked in a multitude of studies to cancer, diabetes, affects your brain (migraines, seizures) and cause emotional and psychological disorders (it is excitotoxins that damage brain cells), cause birth defects, and create vision problems. It breaks down into three components: 50 percent phenylalanine, 40 percent aspartic acid, and 10 percent methanol from corn. It is produced by GM microorganisms typically grown on glucose/fructose from GM corn. (F) (S)

  Aspartame is the methyl ester derived from amino acids from L-aspartic acid and L-phenylalanine, in other words a close cousin of MSG, can be found in some medications, including children's medications. If you have any doubts about the ingredients (binders or fillers) in nutrients, supplements or pharmaceuticals, both prescription or over the counter, ask your wellness specialist or pharmacist and/or read the product labels or inserts for the hidden names of "other" or "inert" ingredients. They can also hide in some fluids administered intravenously in hospitals.

  News update: **Advantame**. The FDA is considering amending the food additive regulations to provide for the "safe" use of advantame, a new artificial sweetener created by Ajinomoto Co., Inc., a Japanese company which produces most of the world's MSG and is a major supplier of aspartame. It is a non-nutritive sweetener and flavor enhancer for beverages, foods, and tabletop use. It's a derivative of aspartame and according to *Science Direct*, it is an N-substituted (aspartic acid portion) derivative of aspartame that is similar in structure to neotame, another N-substituted aspartame. Advantame is 20,000 times sweeter, gram per gram, than table sugar, making it the sweetest, by far, of the artificial sweeteners currently on the market. Advantame does not yet have a brand name for general distribution. I will keep you updated on Chef Alain Braux on Facebook. Void. (F) (S) (P)

  List of products containing genetically engineered artificial sweeteners:

- All diet soft drinks
- Altern
- AminoSweet
- Anything labeled “diet”
- Anything labeled low calories
- Anything labeled sugar-free
- Aspartame
- Aspartic acid
- Canderel
- Cyclamate
- Equal
- Erythritol
- HFCS (high fructose corn syrup)
- Hydrogenated starch hydrolysate
- Isomalt
- Lactitol
- Lactose
- Low calories ice cream and frozen desserts
- Maltitol
- Mannitol
- Many sugar-free candies and gums
- Many sugar-free desserts and cakes
- Neotame
- NutraSweet
- Saccharin
- Splenda
- Some breakfast cereals
- Some chips and crisps
- Some ketchups and BBQ Sauces
- Some of the low/no-calories diet yogurts
- Some of the maple syrups
- Some powdered drinks
- Some sauces and gravies
- Sorbitol

- Sucralose
- Sugar-free chocolate and chocolate syrup
- Sugar-free cookies
- Sugar-free jams, jellies and preserves
- Sugar-free puddings and gelatin desserts
- SugarTwin
- Sunette
- Sweet and Safe
- Sweet'N Low
- Sweet One
- Tagatose
- Trehalose
- Xylitol

- **Aspartate** is not an essential amino acid, which means that it can be synthesized from central metabolic pathway intermediates in humans. Aspartic acid can be synthesized from molasses from **corn** sugar or sugar beets, both GM crops. (F) (S)

- **Aspartic acid** is an amino acid made synthetically using ammonium fumarate and aspartase from *E.coli*, *E.coli* usually breaks down the aspartic acid as a nitrogen source. Aspartic acid, which is available in all protein foods, forms *aspartame* when it's combined with phenylalanine (another amino acid). It can come from **corn**, sugar cane or sugar beet – a GM crop. (S)

- **Astaxanthin** is a carotenoid. Like many carotenoids, astaxanthin is a colorful, fat-soluble colorant. It is also known as a powerful antioxidant in its natural form. In nature, astaxanthin is found in microalgae, some yeasts, wild salmon and trout, krill and shrimp, as well as crayfish and crustaceans. Krill eats the microalgae and salmon eats the krill, giving it its pale orange meat. You can also see it in shellfish when cooked.

  Unfortunately, there is a synthetic form of astaxanthin used commercially in food supplements and used as artificial color in farmed

fisheries (to color farmed salmon meat bright orange) and in animal feed (bovines, pork and poultry – to make the egg yolk more yellow). The U.S FDA has also approved astaxanthin as a food coloring or color additive for specific uses in animal and fish foods and as such is considered as generally recognized as safe (GRAS). In Europe, it is considered a food dye and is given the food additive code E161j.

The synthetic version combines these chemicals together with an ethynylation and then a Wittig reaction. Two equivalents of the proper ylide combined with the proper dialdehyde in a solvent of methanol or ethanol from **corn**, a GM crop, or a mixture of the two, and yields astaxanthin at up to 88% yield.

A newer production method uses the metabolic engineering of beta-carotene to zeaxanthin to astaxanthin through the use of genetically engineered bacteria, *Escherichia coli*. It has a yield of up to 90% but is not widely used yet. Worldwide, it is a $200 million industry. (F) (S)

- **Baking powder**: The releasing agent, starch, can be derived from **corn**. In the USA, transgenic maize already is grown on a large scale. Citric acid as an acidifier. See citric acid below. (F)

- **Barley and barley malt**. Although there is no GM barley, as a source of starch, it can be processed by the same machines use to process **corn** starch. Be cautious. (F)

- **Behenyl alcohol**. See alcohols. (F) (S)

- **BeneVia** ®, (E 951). A "health" drink containing the following GE ingredients (in bold): Water, **Sugar**, **Whey Protein Isolate**, **Natural Flavors**, **Corn Dextrin**, Vitamin Blend (Monopotassium Phosphate, **Dl-Alpha Tocopheryl Acetate**, **Niacinamide**, **Vitamin B12**, Folic Acid, Vitamin D3, Pyridoxine Hydrochloride [Vitamin B6], Thiamin Mononitrate, **Riboflavin**, Vitamin A Palmitate), **FD&C Color Red 40 and Blue 1**, Phosphoric Acid, White Grape Juice Concentrate, **Whey Mineral Complex**, Encapsulated Fish Oil (Refined Fish Oil [Anchovy and Sardine], **Gelatin**, **Sodium Ascorbate**, **Canola Oil**, **Tocopherols**, Sunflower Oil, **Citric Acid**), **Choline Bitartrate**, Lutein, **Potassium Sorbate** and **Sodium Benzoate** (Preservatives), **Ascorbic Acid**, Indian

Gooseberry Extract. This is a small example of how easily GE ingredients can be hiding in products claimed to be "healthy" for you. Avoid! (F)

- **Beta carotene** is a precursor the body can convert to vitamin A. Unfortunately, as a supplement, synthetic beta carotene is usually "stabilized" in refined vegetable oils (**corn**, soy or cottonseed – all GM crops). In this transfatty acid form, oxidation occurs and the chemically "pure" beta carotene can no longer act as a nutrient, because it was changed. Almost all synthetic beta carotene is produced by the Swiss drug giant Hoffman-LaRoche. This form can no longer be converted to vitamin A. The best it can be is worthless, and the worst is toxic. Synthetic vitamins cannot prevent deficiencies. (S) (C)

- **Biosaccharide Gum-1** is a skin conditioning gum made from sorbitol fermentation, itself a genetically engineered sweetener from GM **corn** or beet. It is used in a wide variety of cosmetics and personal care products including bath products, makeup, skin and hair care products, and toothpaste. (C)

- **Blackstrap molasses** can be made from cane or beet sugar – a GM crop. (F)

- **Bleached flour. Cornstarch** is sometimes allowed as a diluent for some bleaching agents. Although there is no such thing as commercial GM wheat as of now, there have been cases of test GMO wheat contaminating regular wheat fields through pollen cross contamination. It should not be a concern unless you are extremely sensitive. (F)

- **Blended sugar** (sugaridextrose). It is a blended form of sugar, potentially from GM sugar beets and dextrose from GM **corn**. (F) (S)

- **Bororganic glycine** is the mineral boron chelated with gluconic acid (see gluconic acid). (S)

- **Brewer's yeast** is made from a one-celled fungus called *Saccharomyces cerevisiae.* When bred as a food supplement, brewer's yeast is often grown on glucose or fructose, or on disaccharides such as sucrose and maltose from sugar beets or **corn** – 2 suspected GM crop. Sometimes potato starch dextrose or malt extract is used (mostly in Europe). When it is produced specifically for use as a food supplement, is dried at a higher temperature than baker's yeast, killing the live enzymes and producing no-leavening yeast that will not ferment. Brewer's yeast is often used as a source of B-complex vitamins, chromium, and selenium. The B-complex vitamins in brewer's yeast include B1 (thiamine), B2 (riboflavin), B3 (niacin), B5 (pantothenic acid), B6 (pyridoxine), B9 (folic acid), and H or B7 (biotin).

  If it is not clearly described as non-GMO, assume it has been genetically engineered. You should know that genetically modified yeasts long have been in use in the production of medications, special chemical compounds, enzymes and food additives. With the use of recombinant-DNA techniques, labs have been creating specific breeding of yeast for brewing. Strains have been created with the ability to ferment a wider range of carbohydrates, with altered flocculation properties. They then can produce beers with modified flavors. In the US and Canada GM yeasts have been approved for primary use in the production of wine and beer. For example, the GM yeast labeled ML01 is used to improve the color stability and taste of wine and to avoid the production of undesirable compounds (histamines). (F) (S) (P)

- **Brominated vegetable oil** (BVO) is vegetable oil, derived from **corn** or soy – 2 suspected GM crops, bonded with the element bromine. Bromines are known endocrine disruptors. They are part of the halide family, a group including fluorine, chlorine and iodine. It is added as an emulsifier in some soft drinks to prevent the citrus flavoring from separating and floating to the surface. (F) (S)

- **Brown sugar** can be made from sugar beets (a GM crop) or contain caramel color from **corn** syrup – another GM crop. See caramel coloring below. (F)

- **Butylene glycol** is used as solvent and viscosity decreasing agent in cosmetics and personal care products. I can be made from the fermentation of **corn** and or other carbohydrate substrates as well as petroleum. See Glycol. Similar ingredients: Butylene Glycol Diisononanoate, Hexylene Glycol, Ethoxydiglycol and Dipropylene Glycol. (C)

- **C12-15 alkyl benzoate** (ethanol) can be found under the trade names *Crodamol* AB or *Tegosoft* TN. It is the ester (a compound of acids and alcohols) of benzoic acid and C12-15 alcohols. It ca be refined from **corn**, **beet** or **cotton** – all GM crops. (F) (S) (P) (C)

- **Calcium acetate**, also called calcium ethanoate (from ethanol), is the calcium salt of acetic acid (see above). It is a food additive used as growth inhibitor for certain bacteria; a texturizer, thickening and firming agent; an acid regulator in controlling the pH of food during processing; a processing aid; a stabilizer when salts migrate from food-packaging material (sequestrant); to extends shelf life and a calcium supplement. It can be found in candy and confections, cake batters and mixtures, pie fillings, puddings, some cheeses, gelatin, some snack foods, sweet sauces, bread and baked foods and pet products. (F)

- **Calcium ascorbate** is commercially synthesized by bacterial fermentation of glucose followed by chemical oxidation with calcium. Glucose usually comes from **corn** – a GM crop. (F) (S)

- **Calcium aspartate** anhydrous is an organic calcium chelated with L-aspartic acid. Aspartic acid combined with a mineral like calcium becomes an aspartate. It is one the calcium form used in supplementation. Since aspartic acid can come from **corn**, a suspected GM crop (see aspartic acid), this ingredient is suspect. (S) (C)

- **Calcium carbonate** can come from limestone or from cow's bone meal or dolomite. It is used in the food industry as an alkaline agent, nutrition supplement, a dough regulation agent, solidification agent, yeast foodstuff, anti-lumping agent, loosening agent, fermenting agent and a

modifier. Since the majority of cows are fed GM feed (**corn**, soybean, sugar beet or cottonseed). Be cautious. (F) (S)

- **Calcium citrate (E333)** is the calcium salt of citric acid (see below). It is commonly used as a food additive, usually as a preservative, but sometimes for flavor. It is used to alter the baking properties of flour. Calcium citrate is also found in some dietary calcium supplements. Since citric acid is made from **corn** – a suspected GM crop, ask. (F) (S)

- **Calcium fumarate** is the calcium salt of fumaric acid (see below). It is used as a food additive. (F)

- **Calcium gluconate** is calcium carbonate processed with gluconic acid from **corn** glucose (see gluconic acid below), which is used in cleaning compounds. It is used in sewage purification and to prevent coffee powders from caking. (F) (I)

- **Calcium glycerophosphate** is calcium carbonate processed with dl-alpha-glycerophosphates (see below). It is used in dentifrices, baking powder, and as a food stabilizer. (F) (S) (C)

- **Calcium glycinate is** calcium mineral chelated with gluconic acid from glucose from **corn,** a GM crop. (F) (S)

- **Calcium lactate** (E327) is a calcium salt of lactic acid. It is created by the reaction of lactic acid with calcium carbonate or calcium hydroxide. The reaction forms white crystals that are found in milk and other dairy products. It is used in foods (as an ingredient in baking powder) and given medicinally. It could come from **dairy** (see dairy). If not from dairy, it is produced synthetically by hydrolyzing **cornstarch** (a GM crop). This fermentation process is used by Archer Daniels Midland Company, a food and agricultural company. Purac of America, Inc., another food company, uses **beet sugar** (a GM crop) in its fermentation process. (F) (P) (S)

- **Calcium magnesium acetate** (CMA) is a chemical compound made by combining dolomitic lime with acetic acid in its pure form as glacial acetic acid (see acetic acid). (F)

- **Calcium malate**, sometimes called dicalcium malate or sometimes bis-glycinate chelate, is the calcium salt of malate or malic acid. It is typically chelated to glycine (from suspected GM soybean) and malic acid from **corn** (see malic acid), providing a combination of the two most health promoting and most absorbable forms of calcium available. (F) (S)

- **Calcium propionate** (E282) is the calcium salt of propionic acid. It is a preservative used in flour-based products like breads and pizzas as well as dairy products like cheese. (F)

- **Calcium sorbate** is a food additive from sorbic acid. See sorbic acid. (F)

- **Calcium stearate** is an octodecanoic calcium salt and can be extracted from animal fat or triglyceride esters that can be derived from plants such as cottonseed, **corn** or soybean – all suspected GM crops. (F)

- **Canderel** ®, brand name for aspartame: See aspartame. (F)

- **Caprylic/Capric Triglyceride** is a mixed triester of glycerin from **corn** and caprylic and capric acids. It is used as an emollient, dispersing agent and solvent. See glycerin. (C)

- **Caprylyl glucoside** and polyglucoside are new surfactants derived from reacting **corn** starch (a GM crop) with a fatty alcohol (see ethyl) to produce a highly biodegradable that is highly tolerant to electrolytes like salt. (C)

- **Caprylyl Glycol** is a skin-conditioning agent that may be plant-derived. It is also known as 1,2-octanediol. If synthetic, it is derived from petro-chemicals. But glycol can also be made from **corn** – a GM crop. Corn glycol is a non-toxic glycol with the same properties as synthetic glycol. Only through a special catalytic process are chemical engineers able to

turn corn into glycol. The corn is broken down into lactic acid, and by utilizing copper ions as a catalyst, with hydrogen gas present, transform the chemical make-up of the lactic acid into glycol. Not only is the corn glycol formed in this process considered a green glycol, the approach itself is more environmentally friendly, resulting in fewer pollutants and unwanted byproducts like alcohols. It has extremely low toxicity and is even recognized as being safe for food additive purposes. So, if from vegetable source, ask. (C)

- **Caramel** and **caramel color** is made by caramelizing **corn** syrup or sucrose from sugar beets. Corn and sugar beets are GM crops. It is used in soft drinks, baked goods, candy, ice cream, and meats to impart a brown color, and also as a flavoring. On a side note, Consumer Reports has revealed that the caramel coloring can contain a harmful carcinogenic chemical called 4-methylimidazole, or 4-MEI. Caution. (F) (S)

- **Carbopol**® is a registered trademark of Noveon, Inc. (formerly B.F. Goodrich Co.) for a family of polymers (Carbomer) that are used as thickeners, suspending agents and stabilizers. Carbopo are cross-linked with allyl penta erythritol (from **corn** glucose – see erythritol) and polymerized in ethyl acetate. Polycarbophil is cross-linked polymer in divinyl glycol (see glycol) and polymerized in solvent benzene. Both processes contain potential GM corn. (C)

- **Carboxymethyl starch** is a popular chemically modified starch. It is one of the modified starches playing a major role in the food and pharmaceutical industries over the past few decades, mostly used for purposes of thickening, stabilization, water preserving, etc. It is very practical as a thickener in such food varieties as jelly, juice, ice cream, canned food, yogurt, butter, bread, noodle, etc. It is prepared by a reaction of starch (St-OH) and sodium monochloroacetate (SMCA) ($ClCH_2COO^-Na^+$) in the presence of sodium hydroxide (NaOH). Unless specifically sourced from potato or sweet potato, it can be assumed to come from **corn** – a GM crop. (F) (S) (P)

- **Cellulose** (E 460), **Carboxymethyl Cellulose, Croscarmellose Sodium, Ethylcellulose, Hydroxypropyl Cellulose, Hydroxypropyl Methylcellulose, Hemicellulose, Hydroxymethyl Cellulose and Methylcellulose** (E 461), **Microcrystalline Cellulose, and Croscarmellose Sodium.** They sometimes show on labels as crospovidone(s), bentonite, and polysorbate(s). They are used as filler, binder, or coating. Leftover corn or cotton fibers that are too short to be spun into textiles consist almost completely of cellulose and can be used as food additives. Cellulose and methylcellulose can be used as thickeners, stabilizers, emulsifiers, or fillers in medication or supplements. Corn and cotton are both potential GM crops. (F) (S) (P)

- **Cellulose gum –** also called **Carboxymethyl Cellulose**, **Sodium Carboxymethyl Cellulose (CMC)**, **Modified Cellulose Gum**, **and Cellulose Gel** can be extracted from wood pulp or **corn** and **cotton** cellulose. This synthetic gum helps to improve shelf life and has a variety of uses. Since corn and cotton are GM crops, ask for source. (F) (S) (P)

- **Cetearyl Alcohol** is a fatty alcohol made of a blend of cetyl and **stearyl alcohol** that can come from synthetic or vegetable sources like coconut, palm oil or **corn** and soy vegetable oil –both GM crops. It is used in cosmetics as a stabilizer to thicken an emulsion and keep it from separating, and as a foaming agent in food. (C)

- **Ceteareth-20** is the polyethylene glycol ether of cetearyl alcohol from **corn**; it may also contain potentially toxic impurities such as 1,4-dioxane. See Cetearyl alcohol. Similar ingredients: Cetyl Isononanoate. (S) (P) (C)

- **Cetearyl Alcohol** is a fatty alcohol made of a blend of cetyl and stearyl alcohol. It may come from coconut, palm oil or **corn** and soybean vegetable oil (2 GM crops) as well as synthetic sources. It is used in cosmetics as a stabilizer to thicken an emulsion and keep it from separating, and as a foaming agent. Cetearyl Alcohol also contains emollient properties which leave skin soft and smooth. It can be found in facial creams and lotions, body creams and lotions, hair conditioners,

ointments, body butters, salt scrubs. It is also known as cetostearyl alcohol and cetylstearyl alcohol. (C)

- **Cetearyl glucoside** or **Cetearyl Polyglucose** is a surfactant and emulsifier produced from natural or synthetic ingredients. Since it can be synthesized from coconut or **corn** oil – a GM crop. In supplements and cosmetics, it can be found in: Acne Creams and Gels, Acne Treatment Kits, After Shave, After Sun Product, Anti Frizz, Anti-Itch/Rash Cream, Baby Lotion, Baby Sunscreen, Bar Soap, Bath & Shower (General), Body and Foot Scrub, Body Oil, Body Wash & Cleanser, Bronzer or sun tanning lotions, Concealer, Diaper Cream, Deodorants & Antiperspirants (General), Depilatory (Men's), Eczema/Damaged Skin Treatment, Facial Scrub, Facial Wipes, Foot Cleansing, Foot Moisturizer, Fragrance For Women, Hair Care (General), Hair Detangler, Hair Growth Inhibitor, Hand Sanitizer, Hormonal Cream, Leave-In Hair Conditioner, Lip Balm with SPF, Lip Gloss with SPF, Lip Plumper, Liquid Hand Soap, Makeup Remover, Mascara, Massage Oils and Lotions, Men's Grooming (General), Muscle/Joint Soreness, Nipple Cream (For Moms), Oil Controller, Redness/Rosacea Treatment, Shampoo, Shampoo Plus Conditioner, Shaving Cream, Skin Care Kits, Skin Cream, Skin Fading/Lightener, Skin Peels, Stretch Mark Treatment, Styling Gel/Lotion, and Sunless Tanning. (C)

- **Cetearyl Ethylhexanoate** is an ester of Cetearyl Alcohol and 2-ethylhexanoic acid. See Cetearyl alcohol. Similar ingredients: Cetearyl Isononanoate, Cetearyl Isononanoate, and Cetearyl Nonanoate. (C)

- **Cetostearyl alcohol**, **Cetearyl alcohol** or **Cetylstearyl alcohol** is a mixture of fatty alcohols, predominantly cetyl and stearyl alcohol and is classified as a fatty alcohol from **corn** or soy – both GM crops. It is used as an emulsion stabilizer, opacifying agent, and foam boosting surfactant, as well as an aqueous and nonaqueous viscosity-increasing agent. It adds an emollient feel to your skin and can be used in water-in-

oil emulsions or oil-in-water emulsions. It can be found in the same products as stearyl alcohol. (C)

- **Cetyl Dimethicone** is a silicone or siloxate polymer used as an antifoaming agent, a skin-conditioning agent and occlusive and an emollient in assorted cosmetics such as: sunscreen, foundation, concealer, lipstick, facial moisturizer, blush, eye cream and anti-aging treatment. Since it is processed with cetyl alcohol from **corn** (see cetyl alcohol) and stearic acid (see stearic acid) from soybean oil, beware. Also known as: Cetyl dimethicone copolyol. (F) (S) (C)

- **Cetrimonium chloride.** The actual chemical name of this ingredient is cetyl (hexadecyl, more properly) trimethyl-ammonium chloride (CTAC). See cetyl and methyl. It is a cationic quaternary compound and is used as a preservative, emulsifying or conditioning agent in hair conditioners, shampoos, and cleaning products. (C)

- **Chimyl Alcohol** or **Ethylhexylglycerin** or **Cetyl Glyceryl Ether** (same product, different names) is an alkyl glyceryl ether. This means that the ethylhexyl group is bound to glycerin (see glycerin) at one end by an ether linkage. These ingredients may be found in bath products, body and hand products, cleansing products, deodorants, eye makeup, foundations, hair care products and suntan products. (C)

- **Choline.** The most often available choline source, lecithin can be derived from soy or egg yolks, often used as a food additive. Soybean is a potential GM crop. Eggs can come from chicken fed **corn**, soy or cottonseed feed, all GM crops. (F) (S) (P)

  Note: **Choline chloride** and **Choline Bitartrate** are synthetic forms of choline. Choline dihydrogen citrate is the citrate salt of choline.

- **Chondroitin** or **chondroitin sulfate** is an important structural component of cartilage and provides much of its resistance to compression. Most commercial chondroitin are made from extracts of

cartilaginous cow and pig tissues (cow trachea and pig ear and nose from commercial farming fed with GM feed), but other sources such as shark, fish (farm-raised on GM feed), and bird cartilage are also used. (S)

- **Chromium nicotinate glycinate** is the mineral chromium chelated with gluconic acid from glucose from **corn** – a GM crop. (S)

- **Citric acid** (E 331, 332 and 333), (vitamin C): Citric acid was the first additive that was produced on a large scale biotechnically. The classic method used the metabolic power of certain fungi (*Aspergillus Niger*). Citric acid-producing microorganisms grow on culture media that usually contain molasses (sugar beet) and/or glucose. It can be found in chips, tomato paste, and many other processed foods. Fructose and glucose can also be produced form **corn** starch which can be derived from GM corn. (F) (S) (P) (C)

- **Citrus cloud emulsion** (CCS). A clouding agent is used by soft drink manufacturers to give a more natural appearance to products with low juice content. They also help mask sedimentation and "ringing" where coloring or flavoring oils rise to the surface of the container during storage. It is a stabilizer made citrus oils, sometimes from brominated vegetable oil (coconut, or other vegetable oils), sucrose acetate isobutyrate or SAIB (see sucrose), modified food starch (from **corn**), and ester gum (pine tree resin) or damar gum esterified with food-grade glycerol (see glycerol), then purified. As you can see there are many potential GM sources in this additive. (F)

- **Cobalamin** (Vitamin B12): It is used in nutritional supplements or in sport and fitness drinks. (F) (S)

  It can be produced industrially only through bacterial fermentation-synthesis. A common semi-synthetic form of the vitamin, **cyanocobalamin**, does not occur in nature, but is produced from bacterial hydroxocobalamin and then used in many pharmaceuticals and supplements, and as a food additive, because of its stability and lower production cost.

The term B_{12} may be properly used to refer to cyanocobalamin, the principal B_{12} form used for foods and in nutritional supplements. Cyanocobalamin is commercially prepared by bacterial fermentation. The bacterial species *Pseudomonas denitrificans* and *Propionibacterium shermanii* are more commonly used today. These are frequently grown under special conditions to enhance yield, and at least one company, Rhône-Poulenc of France, which has merged into Sanofi-Aventis, used genetically engineered versions of one or both of these species. (F) (S)

- **Coco glyceride** or **cocoglyceride** is an emulsifier made from glucose (see glucose) and coconut oil. It can be used in body lotion, face cream, children's tooth gel, plan gel toothpaste and skin care for burns. (F) (S) (C)

- **Coco methyl ester** + sulfonate/ethoxylate. Common sources for manufactured methyl ester are coconut, palm, canola (rapeseed) oils, and beef tallow. Methyl esters are made through a chemical process called transesterification. The conversion of these oils to methyl esters involves the use of methanol from **corn** as a raw material and a basic catalyst (potassium or sodium). Glycerin (see glycerin) is a by-product of the conversion process. (F) (C)

- **Coco glucoside** is an emulsifier, surfactant and foaming agent made from coconut and **corn** – a suspected GM crop. Ask for source. (C)

- **Copper (cupric) glycinate** is a copper salt processed with glycine (see glycine). It is used in photometric analysis for copper. (S) (C)

- **Corn extract** is used in some supplement and cosmetics for its antiseptic, astringent and soothing properties. In cosmetics, it is used in creams, toners and tonics. It is extracted from corn kernels. (S) (C)

- **Cornsilk or corn silk** is the fiber from corn husks used as fiber fillers for supplements. (S) (P)

- **Confectioner's sugar**. It can come from sugar beet, a GM crop as well as contain a small percentage of **corn** starch as an anticaking agent from corn, a GM crop. (F)

- **Corn alcohol** is another name for ethanol, ethyl alcohol or grain alcohol used as carrier for fruit extract (lemon, orange) or vanilla extract. It is also used in pharmaceutical products such as cough syrup. See ethanol. Corn liquor or whiskey is an American-made liquor made from a mash of at least 80 percent corn mixed with sugar (from sugar beets – a GM crop). (F) (S) (P)

- **Corn flour**. This term is used in England and Australia for cornstarch. In America, it can be used as synonym for fine **corn** meal. (F) (S)

- **Corn fritters** are a traditional savory Southern USA fried snack. Traditional **corn** fritters are a mixture of corn kernels, egg, wheat flour, milk, and melted butter. They usually deep fried or pan fried; they can also be baked. (F)

- **Corn gluten or** CGM is a byproduct of **corn** (maize) processing that is used as an adjuvant to animal feed. It's just a term used by the food industry to describe corn proteins extracted from the kernels. Although corn contains prolamins, as wheat does, it does not contain gliadin and glutenin. So corn starch is not corn gluten. For people on a gluten-free diet, unless you are allergic to corn protein (to which some people are), corn should be safe for you. See corn. (F) (A)

- **Corn oil** is extracted from **corn** kernels. (F)

- **Corn oil margarine**. Same comment as corn oil. Beware that **corn** margarine is most likely hydrogenated in order to make it solid at room temperature. Avoid either way. (F)

- **Corn puffs** are breakfast cereals made from **corn**, a GM crop. (F)

- **Corn meal** or **cornmeal** describes the coarse flour ground from dried corn or maize. It can be found as fine, medium, and coarse consistencies. In the U.S. very finely ground cornmeal is also referred to as corn flour. However, in England and Australia, the word corn flour denotes corn

starch and cornmeal is known as polenta. Ii is used to dust the bottom of pizzas, English muffins and other breads as well as in polenta and corn bread. (F)

- **Corn starch** or **cornstarch** can consist partly of genetically modified corn, especially if the raw material was imported from the USA or Argentina. In the United Kingdom and Australia, corn starch is called corn flour. (F)

- **Cornsilk** or **corn silk** used as a fiber, flowing agent or filler in some supplements. (F) (S)

- **Corn sugar**. Another way for the **corn** industry to mislead and confuse customers and make it sound more natural. Don't get fooled. It should say corn glucose or high fructose corn syrup (HFCS). Corn sugar can also be found under the names dextrose, Dyno, Cerelose, Puretose, or Sweetose. (F) (S) (P)

- **Corn sweetener** can be **corn** fructose or high fructose corn syrup (HFCS). (F) (S) (P)

- **Corn syrup**, **corn syrup solids**. (F) (S) (P)

- **Croscarmellose** is made by first soaking crude cellulose from cotton or **corn** in sodium hydroxide, and then reacting the cellulose with sodium monochloroacetate to form sodium carboxymethylcellulose. Excess sodium monochloroacetate slowly hydrolyzes to glycolic acid and the glycolic acid catalyzes the cross-linkage to form croscarmellose sodium. Chemically, croscarmellose sodium is the sodium salt of a cross-linked, partly O-(carboxymethylated) cellulose. It is mostly used as a filler in medications and supplements. (S) (P)

- **Crosscarmellose sodium** or **Sodium CMC** (E468) is a white powder made from the matrix of sodium carboxymethyl cellulose from **corn** or cotton. Croscarmellose is made by first soaking crude cellulose in sodium hydroxide, and then reacting the cellulose with sodium monochloroacetate. It is an inert ingredient used in pharmaceutical

formulations and supplements as a disintegrant to help facilitate the breakup of a tablet in the intestinal tract after. (S) (P)

- **Crystalline dextrose.** See dextrose. (F) (S)

- **Crystalline fructose.** See fructose. (F) (S)

- **Cyclodextrins** or **Alpha, Beta** and **Gamma Cyclodextrins** are a family of compounds (polysaccharides) made up of sugar molecules bound together in a ring. Cyclodextrins are produced from any starch but typically **corn** starch by means of enzymatic conversion. In the pharmaceutical field and dietary supplements it is used as a delivery agent in the cholesterol-lowering and weight loss industry; they add a nice "sweetness" scent to nebulizers; they are used as a scent carrier and dried onto dryer sheet; you can also find them used by the chemical industry, as well as agriculture and environmental engineering. (S) (P)

- **Cysteine** (E921): Is an amino acid. Is used as a flour treatment to make dough production easier. It can be produced with the help of genetic engineering. Cysteine is also found in most high-protein foods like dairy from cows fed GM crops like alfalfa, **corn,** cotton and soy. (F) (S)

- **D-Ribose** can come from the organic synthesis of arabinose from glucose from **corn**. It is called the Wohl degradation. (F) (S)

- **D-gluconic acid.** Another name for gluconic acid. (F)

- **DATUM** is the brand name for a bread dough conditioner made from **corn**. (F)

- **Decyl Glucoside** and **Decyl Polyglucose** are produced by the reaction of glucose from **corn** starch – a GM crop, with the fatty alcohol decanol which is derived from coconut. It is a natural nonionic surfactant used in shampoos, body washes, shower gels, facial cleansers, natural cleaners, and laundry soaps. (C)

- **Dextrans.** Partially hydrolyzed **corn** or potato starch. Ask for source. (F)

- **Dextrates**. Mix of sugars resulting from the controlled enzymatic hydrolysis of glucose from starch. It can come from potato or **corn**. Ask for source. (F)

- **Dextrins (E1400)** are a group of low-molecular-weight carbohydrates produced by the hydrolysis of common starches, usually **corn** or glycogen by using enzymes like amylases. **Pyrodextrins** can be found on the surface of bread by the oven's heat during the baking process, contributing to flavor, color, and crispness.

  They can be found in food processing as a crispness enhancer, in food batters, coatings, and glazes. In dietary supplements, indigestible dextrins are developed as soluble fiber. You can also find them as water-soluble glues on envelope adhesives and paper tubes. It also is a textile finishing and coating agent used to increase textile's weight and stiffness, a thickening and binding agent in pharmaceuticals and paper coatings. They are added to fireworks and sparklers as a binder and fuel to allow them to solidify as pellets or "stars." (F) (P) (I)

- **Dextrose** is a simple monosaccharide found in plants. It is the dextrorotatory form of glucose from wheat, rice and **corn** starch. It is also called glucose, d-glucose, D-Glucopyranose, Glucodin, Meritose, Clintose L, CPC hydrate, Roferose ST, grape sugar and under many more names.

  Commercially, you can find it in the following: candies, sweets, soft drinks and sports beverage (Gatorade); baking and cake mixes and icings; crackers, pretzels; cookies, brownies, assorted pies and custards; frozen desserts like ice creams, sherbets, sorbets and sorbetto, and fruit jellies and preserves. In the medical field, it can be found in IV solutions. (F) (S) (P)

- **Dextrose anything** monohydrate or anhydrous. See dextrose. (F) (S) (P)

- **Di-glyceride(s).** See glycerides. (F)

- **Dihydroxyacetone** or DHA (a glycerone) is used as an ingredient in sunless tanning products. It is often derived from plant sources such as sugar beets**, corn** (GM crops) or sugar cane, and by the fermentation of glycerin. (S) (P)

- **Diglyceryl monooleate** is an emulsifier (like lecithin) or stabilizer in food and supplement production. These fatty acids can be made from a mixture from vegetal oils (**corn**, cottonseed oil, and soybean oil – both GM crops). (F) (S) (P)

- **Dipropylene glycol monomethyl ether** is a solvent containing glycol and methyl, both processed from **corn** – a GM crop. (C)

- **Disaccharides** are a bond of two monosaccharides. You can find them as sucrose, maltose or galactose. See saccharides. (F) (S) (P)

- **Distilled vinegar**: Vinegar is a liquid consisting mainly of acetic acid and water. The acetic acid is produced by the fermentation of ethanol (alcohol fermented from corn a GM crop) by acetic acid bacteria (**Acetobacter).** Corn is distilled into corn alcohol (ethanol). To make vinegar, corn alcohol is combined with water and bacteria. That combination is then fermented into white distilled vinegar. Most vinegars in the USA are *not* made from wheat, but are instead made from corn, potatoes or wood, which are all GF safe (Heinz white vinegar is distilled from corn). Flavored vinegars are made with white, distilled vinegar, and flavorings are then added.

  Note from Heinz: Heinz® Distilled White Vinegar and Apple Cider Flavored Vinegar are sourced from **corn**, not from wheat, rye, barley, or oats. Corn is a GM crop. (F)

- **DMAE** or **Dimethylaminoethanol or Dimethyl Amino Ethanol** (also known as *deaner, deanol, dimethylaminoethanol, Deanol Aceglumate, Deanol Acetamidobenzoate, Deanol Benzilate, Deanol Bisorcate, Deanol Cyclohexylpropionate, Deanol Hemisuccinate, Deanol Pidolate, Deanol Tartrate, Dimethylaminoethanol, Dimethylaminoethanol Bitartrate,*

Dimethylethanolamine, and DMAE BitartrateI). It is an anti-wrinkle and anti-aging ingredient that helps firm, tone and improve skin's elasticity. It can be derived from choline from **corn** or soy lecithin. (C)

- **Drying agent** in cosmetics can be alcohol, ethyl alcohol, propylene glycol, polyethylene alcohol coming from **corn** distillation. Sometimes, corn starch can also be used as a drying agent in diaper powder as a less toxic alternative to talcum. Make sure your baby is not allergic to corn. (F) (C)

- **Emulsifier E481:** Emulsifier and stabilizer. Also known as Sodium stearoyl-2-lactylate. Vegetarians beware – it can be of animal origin. Also functions as a plasticizer, surfactant and is just as likely to be found in face cream and body lotions as in bread and other bakery products. Since animals can be fed GM **corn**, soy or cottonseed feed, ask for source. (F) (C)

- **Enriched flour** can contain dough enhancers made from **corn**. (F)

- **Enzymes:** Commercial enzymes are grown on a glucose slurry from **corn** or sugar beet, or protein or fat substrates. The microorganisms feed on nutrients derived from e.g. maize (corn), soybeans, potatoes or sugars. But the right nutrients for the microorganisms depend on the enzyme which is to be produced. Today more than 90% of enzymes are made from GMOs. Enzymes are very powerful, and they must typically be diluted and standardized to a uniform usable strength. A common *diluent is* ***lactose****, so* one must be careful that ***papain*** *and* ***bromelain****,* for example, may be considered a dairy product for this reason. See dairy. (F) (S) (P) (C) (I)

  There are three major plant-derived protease enzymes used commercially today. *Papain* is derived from the papaya plant. ***Bromelain*** from the pineapple plant, and ficin from the fig. ***Papain*** *and* ***bromelain*** are commonly used as meat tenderizers, *ficin* being more limited in use due to its more dangerous proteolytic activity. Barley ***amylase*** is also used to make maltose syrup.

The following is a list of some commonly used enzymes and their applications in food manufacture:

- **Amylase** - Degrades starch into dextrin. Used in the manufacture of **corn** (glucose) syrup, alcohol fermentation, and in bakery products.

- **Catalase** - Used to degrade hydrogen peroxide (H_2O_2). H_2O_2 is added to eggs and dairy products to aid in pasteurization, and is subsequently removed by adding catalase.

- **Cellulase** or *endo-1,4-beta-D-glucanase*, *beta-1,4-glucanase*, *beta-1,4-endoglucan hydrolase*, *cellulase A*, *cellulosin AP*, *endoglucanase D*, *alkali cellulase*, *cellulase A 3*, *celludextrinase*, *9.5 cellulase*, *avicelase*, *pancellase SS*, *1,4-(1,3, 1,4)-beta-D-glucan 4-glucanohydrolase*) is a term used to describe a family of enzymes produced chiefly by fungi, bacteria, and protozoans that catalyze cellulolysis (the hydrolysis of cellulose). There are five general types of cellulases based on the type of reaction catalyzed: Endocellulase (EC 3.2.1.4), Exocellulase (EC 3.2.1.91), Cellobiase (EC 3.2.1.21), Oxidative cellulase and Cellulose phosphorylases.

  To keep things simple, the cellulase enzyme complex breaks down cellulose to beta-glucose. Since humans cannot generate their own cellulase, it can be helpful for people with digestive problems to break down cellulose (fiber) in our food.

  Commercially, cellulase is used during the processing of coffee. It is also used in the fruit juice industry as a pressing aid to break down the cellulose in the fruit. It helps hydrolyze cellulose during the drying process of beans. Additionally, cellulases are widely used in textile industry and in laundry detergents. They are also used in the pulp and paper industry to break down tree fiber, and they are even used for pharmaceutical applications. Cellulase is to treat phytobezoars, a form of cellulose bezoar found in the human stomach. Cellulase is currently used in experimental tests in the fermentation of biomass into biofuels.

- **Galactosidase** (alpha and beta) is an enzyme that hydrolyzes a galactoside (a glycoside) in glycolipids and glycoproteins. Alpha-galactosidase is an active ingredient in Beano, Bean-zyme, and Gas-zyme 3x, products marketed to help reduce stomach gas production after eating foods known to cause gas like beans.

- **Glucoamylase** is an enzyme that degrades dextrin into glucose.

- **Glucose Isomerase** - Changes glucose into fructose. Used to make High Fructose **Corn** syrup (HFCS).

- **Glucose Oxidase** - Used to degrade sugars, such as in dried egg whites. If the sugar would remain in the dried egg whites, it would caramelize during the heat treatment to which the powdered eggs are subjected and give a brown color to the product.

- **Hemicellulase -** *Hemicellulase* is a collective term for enzymes that hydrolyze hemicellulose. These types of enzymes help hydrolyze hemicellulose and are usually classified under cellulase in general.

- **Invertase** - Splits the sucrose molecule into its component fructose and glucose. Used in the confectionery industry.

- **Lactase** - Allows the body to digest *lactose* (milk sugar) by degrading it into its component sugars (glucose and galactose). Commercially produced lactase can be extracted both from yeasts such as *Kluyveromyces fragilis* and *Kluyveromyces lactis* or from fungi, such as *Aspergillus Niger* and *Aspergillus oryzae*. Its primary use in commercial supplements such as **Lacteeze** and **Lactaid**, is to break down lactose in milk to make it suitable for people with lactose intolerance to drink milk.

- **Lipase** - Used to enhance buttery flavors in oils by degrading some of the lipids. Lipases are generally animal sourced, but can also be sourced microbially. If it comes from animals, they might be fed GM

alfalfa, **corn**, soy and cottonseed feed. It could also be extracted from the scutella of **corn**, a GM crop.

- **Pectinase** - Used in the fruit juice industry to break down pectin.

- **Peptidase** is an enzyme that hydrolyzes simple peptides (parts of proteins) or their amino acids. See protease.

- **Peptizyme SP**® is the registered trademark for the enzyme Serratia Peptidase owned by Specialty Enzymes and Biochemicals Company of Chino, California. Specialty Enzymes states that "Peptizyme SP is Serratia Peptidase that is standardized to 200,000 units per gram, using maltodextrin." See maltodextrin.

- **Protease** - Degrades proteins. Used to chill proof beer (remove the protein haze in cooled beer), tenderize meats, and to age cheese (Enzyme Modified Cheese - EMC). It is also used in the baking industry to act as a dough conditioner.

- **Pancreatin** is a mixture of several digestive enzymes produced by the exocrine cells of the pancreas. It is composed of amylase, lipase and protease. Pancreatin is sometimes called "pancreatic acid", although it is neither a single chemical substance nor an acid. It is usually extracted from **porcine** fed GM feed. See porcine.

- **Rennin** - The primary enzyme in rennet. Used to make cheese by breaking down and destabilizing the casein molecules to make cheese.

- **Trypsin** - A primary mammalian protease. Used in some infant formulas to predigest casein. Most likely coming from animals GM fed alfalfa, **corn**, soy and cottonseed feed.

- **Equal and Equal Spoonful** ®: Genetically engineered sweetener. Are produced by GM microorganisms typically grown on glucose/fructose from GM **corn**. (F) (S) (P)

- **Erythorbic acid** (E315) is an epimer (monosaccharide) or stereoisomer (isomeric molecules) of L-ascorbic acid (see ascorbic acid). It is a vegetable-derived food additive produced from sucrose or glucose. It is used in the United States as a food additive as an antioxidant in processed food. (F)

- **Erythritol:** At the industrial level, erythritol is a produced from glucose from **corn** or wheat starch. To do this, the starch is first treated with enzymes (see above) that break the starch down into glucose. This glucose is then mixed with yeast, such as *Moniliella pollinis* or *Trichosporonoides megachliensis*, and the yeast ferments the glucose to form erythritol. (F) (S) (P)

- **Ethanol,** also called **ethyl alcohol**, **pure alcohol**, **grain alcohol**, or **drinking alcohol**, **(**or C12-15 alkyl benzoate) is a long chain alcohol. During ethanol fermentation, glucose and other sugars that are converted into ethanol and carbon dioxide. Ethanol can be produced from a variety of feedstocks such as sugar beet, and **corn –** all these crops are potential GMO crops. Currently, the first generation process for the production of ethanol from corn uses only the corn kernels taken from the corn plant and only the starch, which represents about 50% of the dry kernel mass, is transformed into ethanol. Two types of second generation processes are under current development. The first type uses enzymes and yeast fermentation to convert the plant cellulose into ethanol while the second type uses pyrolysis to convert the whole plant to either a liquid bio-oil or a syngas. Ethanol can also be distilled from petroleum. Ask for source. (F) (S) (P) (C)

  In the food industry, industrial ethanol is used as a raw material for the production of white vinegar and yeast, food extracts, flavorings, and glazes contain large amounts of alcohol. Some ethanol is even used in

some animal feed products as liquid energy source (can you imagine a tipping drunken cow?)

In the beverage industry, it is sold in bulk to bottlers or other distillers, who blend it, flavor it and package it as a final product. Familiar products like hard lemonades and iced teas and liquors like vodka generally use grain neutral spirits as the volume of the alcohol content.

In the personal care or cosmetic products, it can be found in nail polish, hairspray, mouthwash, aftershave, cologne, and perfume, all of which contain a high percentage of alcohol (ethanol) by volume. Ethanol is also used in many deodorants, lotions, hand sanitizers, soaps, and shampoos.

Another use for ethanol is for pharmaceutical products. The characteristics of ethyl alcohol make it a prime carrier for a whole spectrum of medicines including cough syrups, chest decongestants, iodine solution, and many others. As a solvent for the pharmaceutical industry, ethanol is useful as a carrier for antibiotics, vaccines, tablets, pills, and vitamins.

Many of your regular household cleaning products also contain high volumes of ethanol. A bottle of your everyday disinfectant spray can contain up to 80 percent ethanol. Ethanol is used as a solvent in the manufacture of many other substances including paints, lacquer, as well as explosives. I bet you were not even aware of all the uses of ethanol or ethyl alcohol in your daily life. Now you do. (F) (S) (P) (C) (A) (I)

- **Ethocel 20 or 200** is a brand name of Dow Chemicals for an ethylcellulose polymer. See ethylcellulose. (F) (S)

- **Ethoxydiglycol**. Derived from glycol. See glycol. (C)

- **Ethyl acetate** is an ester (fat/oil) that is synthesized from acetic acid and ethanol with the help of strong acids like concentrated sulfuric acid in an esterification reaction. See ethanol. (F) (S) (P) (C)

- **Ethyl alcohol** is another name for ethanol. See ethanol. (F) (S) (P) (C) (A) (I)

- **Ethyl acrylate** is another ester (fat/oil) from ethanol. See ethanol. (F) (S) (P) (C) (A) (I)

- **Ethyl cellulose or Ethylcellulose** (E462) is a polymer derivative of cellulose (see cellulose) in which some of the glucose units are converted into ethyl ether groups. It can come from wood, cotton or **corn** – both GM crops. Ethyl cellulose is used is a food additive as an emulsifier, a binder, and flavor fixative to make flavors last longer on our palate. In pharmaceuticals or dietary supplements, it helps mask bitter taste, strengthen and improve the appearance of tablets and capsules. It also enable the controlled release of formulations. (F) (S) (P) (C) (I)

- **Ethyl ester (EE) or Fatty Acid Ethyl Ester (FAEE)** is an alternate lipid class different than natural fish oil triglycerides. Natural triglycerides are a combination of three fatty acids (i.e. EPA and DHA) esterified (bonded) to a glycerol backbone. On the other hand ethyl esters are a class of fats that are derived by reacting free fatty acids with ethanol (see ethanol). This process, called trans-esterification, describes the process involving a reaction removing the glycerol backbone of a TG and substituting it with ethanol. The resulting EE allow for the fractional distillation (concentration) of the long chain fatty acids at lower temperatures. The result is concentrated EPA and DHA and is typically marketed and sold as "Fish Oil concentrate". Ethanol can come from **corn** or sugar beet distillation (see ethanol), a suspected GM crop. (C)

- **Ethyl hexyl glycerin or Ethyhexylglycerin is a** preservative used as an alternative to parabens. It is derived from glycerin and can also be used as a deodorizer and skin conditioner. See glycerin. (C)

- **Ethylene glycol** (EG) or **ethylene glycol monostearate**. See **Glycol distearate or Glycol stearate.** (C)

- **Ethylhexyl glycerin**(e) is a deodorant agent, skin conditioning agent, preservative booster made from vegetable glycerin(e) typically extracted from GM **corn**. Similar ingredients: Ethylhexyl Isononanoate, Ethylhexyl Pelagonate, Ethyl Pelargonate, and Ethyl Thioglycolate. (C)

- **Ethyl lactate,** also known as **Lactic acid ethyl ester**, is a form of ester (fatty acid) formed from lactic acid and ethanol (see ethanol). Also known as Actylol, Acytol, Lactic acid, ethyl ester, Solactol, 97-64-3, Ethyl 2-hydroxypropanoate, and Propanoic acid. It is used as a food additive, perfumery, and flavor chemicals. It is also used as a solvent for nitrocellulose, cellulose acetate, many cellulose ethers, resins; lacquers, paints, enamels, varnishes, stencil sheets, safety glass and flavoring. (F) (S) (P) (C) (I)

- **Ethyl levulinate glycerol ketal** and **ethyl levulinate propylene glycol ketal** are solvents. Contains glycol and glycerol (see glycerin, glycerol) from GM **corn**. (C)

- **Ethyl maltol** is a liquid sweetener similar to maltol, another flavor, by replacing the methyl group by an ethyl group. It presents itself as a white solid that smells like caramelized sugar and cooked fruit. It is commonly used as a replacement flavor in the food, beverage, fragrance, tobacco and confectionery industry. A good example would be commercial cotton candy. (F)

- **Ethylene or ethene** is a hydrocarbon coming from the petrochemical industry. It can also be extracted via dehydration of ethanol (from **corn**) with sulfuric acid. Either way, it is not a healthy ingredient. It is a colorless flammable gas with a faint sweet and musky odor used in the chemical industry. It is an important plant hormone used in agriculture to force the ripening of fruits. Other ethylene intermediates are ethylene dichloride, ethyl chloride and ethylene dibromide. (F) (I)

- **Ethylene glycol** is the result of hydrolyzed **e**thylene oxide, widely used as car antifreeze as well as higher molecular weight glycols, glycol ethers and polyethylene terephthalate. See glycol. (F) (S) (P) (C) (I)

- **Ethylenediaminetetraacetic acid** (**EDTA**), E385, also called **Calcium Disodium EDTA**, is an amino acid made from formaldehyde, sodium cyanide, and ethylenediamine. EDTA is used in foods to bind with iron to "fortify" grain-based products such as breakfast cereals and cereal

bars. It is also added to some food as a preservative or stabilizer to prevent catalytic oxidative discoloration and to promote the color, texture, and flavor of food, pharmaceutical products, detergents, shampoos, soaps, agricultural chemical sprays, contact lens cleaners and cosmetics. Although Calcium Disodium EDTA is approved by the U.S. Food and Drug Administration (FDA) for use in chelation therapy, a process which removes heavy metals from the body, it should be used with caution in larger amounts. (C)

- **Ethylene oxide** is the product of oxidized ethylene. It is the raw material in the production of surfactants and detergents by ethoxylation. (C) (I)

- **Fatty acid complex** can be a blend or contain phosphatidyl choline (PC) (from soybean lecithin), stearic acid (SA) (from **corn** or soybean), palmitic acid (PA) (from palm), decanoic acid (DA) (from coconut or palm) and decylamine (DE). Since corn and soybean are suspected GM crop, ask for source. (C)

- **Ferrous bis-glycinate** is an iron chelate of the amino acid glycine. Ferrous bis-glycinate is formulated containing iron with bis-glycinate (see glycinate) and food-grade citric acid (see citric acid), maltodextrin (see maltodextrin), silicon dioxide, and water. It is used for food fortification and dietary supplementation. (F) (S) (P)

- **Ferulic acid** is an organic compound, a phenolic phytochemical found in plants' cell wall. Although ferulic acid can be found naturally in the seeds of apple, artichoke, coffee, orange and peanut, as well as in both seeds and cell walls of commelinid plants such as **corn**, oats, pineapple, rice, wheat, and water chestnut (*Eleocharis dulcis*), commercially, corn is the most abundant source of ferulic acid. It is synthesized to create artificial vanilla extract, vanillin. (F)

- **Fibersol-2** ®, **-2AG, -LQ, -HS** is a registered mark for maltodextrin by **ADM** (Archer Daniels Midland food conglomerate). It is a spray-dried powder produced by controlled enzymatic hydrolysis of **corn** starch. It is used as a digestion-resistant maltodextrin and a low-calorie bulking agent containing 90 percent dietary fiber. It is commonly used in all of

the following processed products: assorted diet products; a fiber replacement in baking products of all sorts; beverages like smoothies; dairy products like ice cream; all sorts of confectionary products; dips, sauces, dressings; hot and cold breakfast cereal product; and snacks of all shapes and forms. See maltodextrin. (F) (S) (P)

- **Flavorings*** or **natural flavorings**. The exact definition of natural flavorings & flavors from Title 21, Section 101, part 22 of the Code of Federal Regulations is as follows: "*The term natural flavor or natural flavoring means the essential oil, oleoresin, essence or extractive, protein hydrolysate, distillate, or any product of roasting, heating or enzymolysis, which contains the flavoring constituents derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, seafood, poultry, eggs, dairy products, or fermentation products thereof, whose significant function in food is flavoring rather than nutritional.*" So, flavorings could come from anywhere and anything.

  As with any commercially-created product, it hides a very complex issue. First off, companies are not required to list the source of the flavorings, whether from animal or plant. Then we have to deal with the "natural" versus "artificial" flavor. Natural flavor starts from a plant or animal source but by the end of the process, it most likely does not resemble the original material because it has been extracted, modified, distilled, concentrated, etc. On the other hand, artificial flavor is clearly created in a lab from an assemblage of assorted molecules, most of them coming from petrochemicals.

  As a good example, have you heard that castoreum is a "natural" flavor? What is castoreum you ask? Well, it may be a little gross to read but here it is. Castoreum is a chemical is derived from a gland taken out of beaver and is located very close the beaver's butt. Hard to believe, eh? But several processing chemical steps, it is considered a legal (GRAS – Generally Recognized As Safe by the FDA) "natural flavoring" and will be listed as such in an ingredient list. Who would have guessed? Want to know where beaver butt natural flavor is hiding? In your favorite ice cream, soda, yogurt as raspberry, strawberry and vanilla flavor. Come to think of it, it makes perfect sense. It comes from an animal. An animal is natural. So the flavor is deemed natural. Elementary dear reader.

Without getting too detailed, you will find that "natural" or "artificial" flavors will not be actually spelled as such. It's their secret recipe. I can dig that as a chef but as a food-eating customers, not so much. Here are a few mystery flavorings spelled out: carmine or natural red #4 comes from the cochina beetle; your favorite chewing gum may contain "gum base" which is made of a combination of petroleum ingredients, lanolin, glycerin, polyethylene, polyvinyl acetate, petroleum wax, and stearic acid; E120: cochineal (red food coloring made from crushed beetles); E542: edible bone phosphate; E631: sodium 5'-inosinate; E901: beeswax; E904: shellac; E920: L-cysteine hydrochloride; and many more suspects. If you are concerned about the composition of the mystery "natural" or "artificial" flavor on your packaged food, please check with the company. (F) (S) (P)

- **Food starch**: Can come from potato (Europe) or GM **corn**. (F)

- **Fructose***. Although fructose can be found in a wide choice of fruits and vegetables, commercial fructose mostly come from **corn**. GM microorganisms are used for the saccharification of glucose/sucrose/fructose from GM corn. (F) (S) (P)

- **Fruit juice concentrate*** can be further sweetened with **corn** syrup or high fructose corn syrup. (F)

- "**Fruit**" **sugar** is another name for fructose. See fructose. (F)

- **Fumaric acid** (E297) is an organic acid widely found in nature mostly in mushrooms, lichen, Irish moss and even produced on human skin when exposed to the sun. In its synthetic form – the most commonly used form – this food additive comes from succinic acid, itself produced through the fermentation of glucose (from **corn**) from unused feedstock or through carbonylation of ethylene glycol (from corn).

  As a food additive, it is used as an acidity regulator and food acidulent since 1946. It used in beverages and baking powders. It can also be used as a substitute for tartaric acid and citric acid. It is also used in medicine, in the manufacture of polyester resins and polyhydric alcohols and as a mordant to set dyes in fabric. (F) (S) (C) (I)

- **Germ**: Although germ could easily mean wheat or rice germ, if not specified, it could easily be from **corn**, a GM crop. Corn or maize germ is the seed part of the corn, its reproductive part. It contains the oil that is extracted to make corn oil. (F) (S) (A)

- **Germ meal**: **Corn** germ meal comes from steam drying the residue left after the oil extraction process. It has good palatability and higher digestibility. It is mainly used for livestock (cows and pigs) and poultry feed. It is also used as a grain-based protein source for wet and dry pet food. (F) (A)

- **Glucan** or **beta-glucan** is the name used for any polysaccharide consisting of a polymer of glucose (see glucose), such as cellulose (see cellulose) or starch (see starch). (F) (S) (P)

- **Gluconate**: Gluconate is a salt or ester of gluconic acid that could come from **corn** dextrose. (F)

- **Gluconic acid** (E574), is also known as Calcium Gluconate, d-Gluconic acid**,** Gluconate salts, Gluconate esters**,** Dextronic acid, Maltonic acid, Glycogenic acid, Gluconate, Glosanto, D-gluconate, and Potassium Gluconate Pentahydroxycaproic acid, Sodium Gluconate and more**.** Although gluconic acid occurs naturally in fruit, honey, and wine, its commercial form comes from glucose from **corn**. It is a mild organic acid derived from glucose (from **corn** or sugar beet) by a simple oxidation reaction. The reaction is facilitated by the enzyme glucose oxidase (a fungi) and glucose dehydrogenase (a bacteria such as *gluconobacter*). Microbial production of gluconic acid is the preferred method and it dates back to several decades. The most studied and widely used fermentation process involves the fungus *Aspergillus Niger*.

  Gluconic acid and its derivatives, have wide applications in food and pharmaceutical industry. As a food additive it is used as an acidity regulator and sometimes as a cleaning products to help dissolve mineral deposits. (F) (S) (P) (C) (I)

- **Glucono delta-lactone** or **GDL** (E 575), **gluconolactone** or d-gluconic acid is an ester of gluconic acid from dextrose. It is used as a food additive used as a sequestrant, an acidifier, for curing, pickling, or

leavening agent (baking powder) in baking products. It is produced by microbial (bacteria or yeast) fermentation of a carbohydrate source, **corn** in the U.S. - a GMO crop.

It can be found in commercial honey, cheese, tofu, fruit juices, canned fish, cured meats and personal lubricants, and wine. In cosmetics, it can be used as an active ingredient for its skin conditioning abilities as a moisturizer. As an additive, it is used as an antioxidant, a chelating agent, a stabilizer, a deodorant and a preservative. Although it is deemed as a generally recognized as a safe ingredient (GRAS) by the FDA, since it comes from a GM crop, be cautious. (F) (C)

- **Gluconolactone** (E575) or **Glucono delta-lactone** (GDL) is a gluten-free, fermented food starch derived from **corn**. It is used as a chemical leavening agent in baking, as an anti-milk stones in dairy products and a coagulant in making tofu. In dermatology, gluconolactone is used as a skin moistener, as a PHA (Poly Hydroxyacid). (F) (C)

- **Glucosamine:** Glucosamine is an amino sugar in the form of monosaccharide. It is a natural compound that is found in healthy cartilage. Glucosamine sulfate is a normal constituent of glycoaminoglycans in cartilage matrix and synovial fluid. Traditionally, it has been extracted from the polysaccharides chitosan and chitin, of which the exoskeletons of crustaceans (crabs, lobsters, crayfish, shrimp, and krill) are made from. It can also be found in the cell walls of assorted mushrooms and mold. It is produced traditionally by the hydrolysis (using hydrochloric acid) of crustacean exoskeletons to break down its components.

  But currently, it is mostly created in a lab by fermenting grains such as **corn** or wheat into glucose then glucosamine. In the US it is one of the most common non-vitamin, non-mineral dietary supplements used by adults for joints and articulations troubles. It is commonly found under glucosamine sulfate, glucosamine hydrochloride, and *N*-acetylglucosamine. If not clearly labeled, please ask for source. Commonly sold forms of glucosamine in supplements are glucosamine sulfate, glucosamine hydrochloride, and *N*-acetylglucosamine. (S) (P)

- **Glucose,** also known as **D-glucose**, **dextrose**, or **grape sugar** is a simple monosaccharide found in plants. Glucose is produced commercially via the enzymatic hydrolysis of starch. Many crops can be used as the source of starch. **Corn**, corn husk or maize – a GM crop, rice, wheat, cassava, and sago are all used in various parts of the world. In the United States, corn starch (from corn or maize) is used almost exclusively. Most commercial glucose occurs as a component of invert sugar, an approximately 1:1 mixture of glucose and fructose. It is even found in IV solutions. (F) (S) (P)

- **Glucuronate**: It is the salt form of glucuronic acid from **corn**. As trimetrexate glucuronate, it can be used as an antimetabolic lipophilic dihydrofolate reductase inhibitor or antifolate approved for treating pneumonia. (P)

- **Glucuronic acid** is a sugar acid formed by the oxidation of the C-6 carbon of glucose. Its structure is similar to that of gluconic acid and both come from **corn**. It is thought to be a powerful liver detoxifier. Some people claim it can be found in kombucha, a naturally fermented tea. (S) (P)

- **Glutamate and Glutamic acid** are produced by GM microorganisms typically grown in a lab on glucose/fructose from GM **corn**. (F)

- **Glutamine or L-Glutamine**: The best glutamine products on the market are derived from the bacterial (*Clostridium sporogenes*) fermentation on a substrate of glucose from vegetable source (most likely **corn** or beet – both GM crops), purified then dehydrated. This can be an expensive process but it ensures the highest quality. Similar process is used for the production of amino acids. Many glutamine products on the market are chemically synthesized from wheat and shellfish and may contain unwanted toxins such as lead, arsenic or mercury. (F)

- **Gluten feed/meal**. Unless its source is specified, it could come from wheat and other gluten-containing grains or **corn**. Ask for source. (F)

- **Glycerides, Monoglycerides and Diacetyl Diglycerides:** Glycerides, or acylglycerols are esters (a combination of a fatty acid with an alcohol – from **corn**) formed from glycerol and fatty acids, possibly coming from **corn**, canola or soybean oils – all GM crops. Glycerides are formed as monoglycerides, diglycerides or triglycerides. Monoglycerides and diglycerides are used as food additives to help certain ingredients blend better. Various fatty acid compounds including mono- and diglycerides (E471) can also come from soy – a potential GM crop or almonds. Don't eat ice-cream, sauces or salad dressings that use mono-glyceride or di-glyceride. (F) (S) (P) (C) (F) (S) (P) (C)

- **Glycerin** (E422) or **Glycerine** or **vegetable glycerin(e)** is a simple polyol compound used as a humectant (it attracts water) in cosmetic products. It is a colorless, odorless, viscous liquid that is widely used in pharmaceutical formulations. As a food additive, glycerol is labeled as E number E422. It can be derived from the refining of biofuels from **corn** or **sugar beet**, both potential GM crops. In foods and beverages, glycerol serves as a humectant, solvent, and sweetener, and may help preserve foods. It is also used as filler in commercially prepared low-fat foods (e.g., cookies), and as a thickening agent in liqueurs. (F) (S) (P)

- **Glycerin acetate** or **glycerin monoacetate** also called **glycerol acetate** or **glycerol monoacetate** is the ester produced from the esterification of glycerol (see glycerol) with acetic acid. (F) (S) (P) (C)

- **Glycerine carbonate** is an emulsifier made from glycerine. See glycerin(e). (F) (S) (P) (C)

- **Glycerol** (E 422) and **Glycerol monooleate** is a simple polyol compound. It's a colorless, odorless, viscous liquid that is widely used in pharmaceutical formulations. Glycerol is sweet-tasting and of low toxicity. Glycerol is a carbohydrate that can be made in the body from glucose and obtained through the diet as a food additive. It also exists naturally in triglycerides (TGs) and phospholipids (PLs). Glycerol has applications in food manufacturing as a sweetener, thickener, solvent

and preservative. If non-synthetic, glycerol could come from **corn** or soy triglycerides. For human consumption, glycerol is classified by the U.S. FDA among the sugar alcohols as a caloric macronutrient. (F) (S) (P) (C)

Synonym(s): 1,2,3-Propanetriol, Monoacetate; Acetyl Monoglyceride; Glycerin Monoacetate; 1-Monoacetin; Acetin; Glycerol, 1-Acetate; alpha-Monoacetin; Glycerol Monoacetate; glycerol alpha-monoacetate; glycerol monoacetate; Glyceryl Acetate; Glyceryl Monoacetate; Monoacetyl Glycerine.

- **Glycerol ester of wood rosin** is a combination of highly refined wood rosin gum (an oleo-resin usually from pine tree) with **glycerin** (see glycerin) to produce glycerol ester. (F) (S) (P) (C)

- **Glycerol phosphate** is produced from glycerol (see glycerol), the triose sugar backbone of triglycerides and glycerophospholipids, by the enzyme glycerol kinase. (F) (S) (P) (C)

- **Glyceryl, Glyceryl Stearate, Glyceryl Monostearate, Glyceryl Isostearate or Glyceryl Caprylate**. Glyceryl Stearate and Glyceryl Stearate SE are esterification products of glycerin (see glycerin) and stearic acid (see stearate - a vegetable fatty acid). They can be made from palm kernel oil or soy and **corn** oil, 2 GM crops. (F) (S) (P) (C)

- **Glyceryl Behenate and Dibehenate** is a fat used in cosmetics, foods, and oral pharmaceutical formulations. It is an emollient and lubricant for beauty products. It is a mixture of glyceryl esters made from glycerin and behenic acid (a saturated C22 fatty acid). See glycerin. (F) (S) (P) (C)

  Similar ingredients: Bis-Diglyceryl Polyacyladipate-2, Glyceryl Adipate, Glyceryl Alginate, Glyceryl Arachidate, Glyceryl Arachidonate, Glyceryl Dilaurate, Glyceryl Diarachidate, Glyceryl Dibehenate, Glyceryl Dierucate, Glyceryl Dihydroxystearate, Glyceryl Diisopalmitate, Glyceryl Diisosearate, Glyceryl Dilinloeate, Glyceryl Dimyristate, Glyceryl Dioleate, Glyceryl Diricinoleate, Glyceryl Dipalmitate, Glyceryl Dipalmitoleate, Glyceryl Distearate, Glyceryl Monolaurate, Glyceryl

Palmitate Lactate, Glyceryl Stearate Citrate, Glyceryl Stearate Lactate, Glyceryl Stearate Succinate, Glyceryl Thioglycolate and Polyglyceryl-20 Octaisononanoate are referred to as Glyceryl Diesters. They are made of glycerin and fatty acids. All of the ingredients are used in skin care products, moisturizers, and lipstick and other makeup products.

- **Glycosaminoglycans** (GAGs) or **mucopolysaccharides** are long unbranched polysaccharides consisting of a repeating disaccharide unit. See polysaccharides and disaccharides. (F) (S) (P) (C)

- **Glycidol** is a liquid alcohol obtained from glycerol by indirect dehydration. See glycerol. (C)

- **Glycine** (or glycine) is a non-essential amino acid. For humans, glycine is sold as a sweetener/taste enhancer. Food supplements and protein drinks contain glycine. Certain drug formulations include glycine to improve gastric absorption of the drug. Most glycine is manufactured as USP grade material for use in consumable or cosmetic applications as a sweetener/taste enhancer and buffering agent. Glycine is manufactured by chemical synthesis from formaldehyde or monochloroacetic acid and ammonia. It can be extracted from either sugar cane or GM **corn**. (F) (S) (P) (C)

- **Glycol** can be synthetic derived from petro-chemicals or from plant source. If plant-base, most likely it is made from **corn** – a GM crop. Corn glycol is a non-toxic, safe glycol with the same properties as synthetic glycol. Through a special catalytic process, chemical engineers able to turn corn into glycol. The corn is broken down into lactic acid, and by utilizing copper ions as a catalyst, with hydrogen gas present, transform the chemical make-up of the lactic acid into glycol. Not only is the corn glycol formed in this process considered a green glycol, the approach itself is more environmentally friendly, resulting in fewer pollutants and unwanted byproducts like alcohols. It has extremely low toxicity and is even recognized as being safe for food additive purposes. So, if from vegetable source, ask for non-GMO certification. (F) (S) (P) (C)

Similar ingredients: Ammonium Thioglycolate, Butylene Glycol, Butyl Thioglycolate, Calcium Thioglycolate, Diethylene Glycol, Diethylene Glycol Diethylhexanoate/Diisononanoate, Dipropylene Glycol, Ethoxydiglycol, Ethanolamine Thioglycolate, Hexylene Glycol, Isooctyl Thioglycolate, Isopropyl Thioglycolate, Magnesium Thioglycolate, Methyl Thioglycolate, Neopentyl Glycol Diisononanoate , Pentylene Glycol, Potassium Thioglycolate and Sodium Thioglycolate, Propylene Glycol Diisononanoate, Sodium Glycolate, Thioglycolic Acid, Triethylene Glycol, and Triethyleneglycol Dimethacrylate.

- **Glycol Ricinoleate**. See Glycol. (F) (S) (C)

  Similar ingredients: Cetyl Rinoleate, Ethyl Ricinoleate, Glyceryl Ricinoleate, Glyceryl Ricinoleate SE (SE stands for self-emulsifying).

- **Glycol stearate or distearate**. This chemical compound is used as an emollient in cosmetic products, and is a combination of ethylene glycol (colorless chemical possibly coming from **corn**) and stearic acid (a common fatty acid from soy or canola). This chemical may be derived either from animal sources (**cow** or **hog**-derived) or vegetable sources, such as **corn**, soybean oil and canola oil. It can also be produced synthetically through processing stearic acid. Similar ingredients: Glycol Stearate SE, and Glycol Distearate. (F) (S) (C)

- **Glycosaminoglycan.** Glycosaminoglycans or GAGs are long sugar carbohydrate chains found in numerous cells in the human body. There are members of the glycol family: glucuronic acid, iduronic acid, galactose, galactosamine, and glucosamine). See glycol. (F) (S) (P) (C)

- **Golden syrup** is used in England, Scotland and Ireland in the same way as maple syrup is used in America and Canada, to drizzle over pancakes or desserts. It is a thick, clear honey-colored form of inverted sugar syrup transformed by the addition of an acid. It comes from the left material of refining sugar cane or sugar beet juice into table sugar. It can also be made by combining high fructose **corn** syrup colored with caramel. (F)

- **Granule**. It's the small, grain-like storage particle produced in plants, consisting of starch molecules arranged in characteristic patterns. (F)

- **Grits** is a **corn**-based food of Native American origin. It is commonly served in the Southern United States at breakfast. Modern grits are commonly made of alkali-treated corn known as hominy, then ground coarsely. It is similar to polenta from Italy but comes from different types of corn. Grits come from a white corn named *dent corn* while polenta is made from a yellow corn named *flint corn* which is harder. Both could also be described as corn meal but that would not please the purists from both sides. (F)

- **Hexylene glycol**: Hexylene glycol is a small molecular weight surfactant. Hexylene glycol is also used as a selective solvent in petroleum refining, as a component of hydraulic fluids, as a solvent for inks, in cosmetics, and as a cement additive. See Glycol. (C) (I)

- **High amylose starch**. A starch containing over 50% amylose (usually 55-70%). See amylose. (F)

- **High fructose corn syrup** or **HFCS** or high fructose maize syrup (in England) is a sweeter and cheaper form of glucose than from **sugar beet** or potato. (F)

- **Hominy** is made by drying **corn** or maize grain. It is then treated by soaking and cooking the dried grain in a solution of water and lime (calcium hydroxide) or wood ash. Once rinsed, they can be eaten as is as a side dish. Otherwise, the soaked result is then washed, dried again and ground into masa flour for tortillas. (F)

- **Honey***. Typically, most commercial honey, besides being highly processed, contains a percentage of glucose or high fructose **corn** syrup. Eat only raw, locally harvested honey that has not been overheated and filtered then mixed with HFCS and you will be fine. Please read the label for more details. (F) (S) (P)

- **Hyaluronic acid or Hyaluronan (HA),** also called **sodium hyaluronate.** This glycosaminoglycan has traditionally been extracted from animal

tissues such as synovial fluid, rooster combs, cartilage, vitreous humor and umbilical cords; however, microbial fermentation by the bacteria *Streptococcus or Bacillus subtilis* generate yields with higher concentrations of HA at lower costs and with more efficient downstream processes. The sugar backbone of HA is derived from glucose-6-phosphate and fructose-6-phosphate. You basically have reactors with bacteria that are fed with plant sugars (peptone and glucose from GM **corn** and sugar beets, or wheat). (C)

- **Hydrogenated starch**: Can be made from GM **corn**.

- **Hydroxymethylcellulose**, **Hydroxymethyl cellulose** or **Hydroxyethyl cellulose**. See cellulose. (F) (S) (P) (C)

- **Hydroxypropyl methylcellulose phthalate** (HPMCP) or hypromellose phthalate is a phthalic acid ester of hydroxypropyl methylcellulose. In the pharmaceutical and supplements industry, hypromellose phthalate is used as an enteric coating agent for tablets and capsules to prevent them from dissolving in our stomach. Mmm! Have you heard of phthalate? It is a chemical found in vinyl products and vinyl flooring, PVC shower curtains, plastic furniture and even in the plastic coating of the insides of dishwashing machines. Are you sure you want that chemical to go inside your body? (S) (P) (I)

- **Hydrolyzed corn, hydrolyzed corn protein** or **hydrolyzed corn gluten** describes corn gluten that has undergone hydrolysis. The hydrolysis process breaks down the corn proteins into their component amino acids. Because of its strong fermented flavor, hydrolyzed corn is rarely used directly in foods or only in small amounts. Hydrolyzed corn protein is very similar to glutamic acid, which is a type of MSG (see MSG).

  It is found in many processed and fast foods to give you that yummy "umami" flavor your taste buds are craving. It is sometimes used as an environmentally friendly herbicide for lawns, vegetable gardens, and flower beds. It is present in some animal food as a protein supplement. If

it is used as an herbicide in gardening, I wonder what it does to our health. (F) (I)

- **Hydrolyzed vegetable protein**. Another name for hydrolyzed **corn**, soy or wheat protein. (F)

- **Hypromellose** (hydroxypropyl methylcellulose) or **HPMC** (Hidroxy, Propyl, Methyl, Cellulose): a widely used excipient in food, supplements, pharmaceuticals, and cosmetics. Well suited for various cultural, religious and vegetarian dietary requirements. They can be made from pure cellulose of either pine, poplar, **corn** or cotton fiber – a potential GM crop. (F) (S) (P) (C)

- **Imino disuccinate** is a chelator found in laundry detergents, hand soaps and dishwashing detergents. It is derived from **corn** glucose – a GM crop. (C)

- **Inositol** is a carbohydrate found naturally in many fiber-rich foods (such as beans, brown rice, **corn**, sesame seeds, and wheat bran). Inositol hexaphosphate is one of the most widely used forms of inositol. Inositol as it occurs in certain plant-derived substances such as lecithin, however, is well-absorbed and relatively bioavailable. Inositol can be extracted from the phytic acid naturally present in waste **corn**, a potential GM crop. Beans like soybean (potential GM crop) and grains, as seeds contain large amounts of inositol as phytate. (F) (S) (P) (C)

- **Invert syrup and Invert sugar** is a mixture of glucose and fructose; it is obtained by splitting sucrose into these two components. It is created by adding an acid (citric acid, cream of tartar or lemon juice as 1 part to 1,000) and heated to allow part of the sugar (sucrose) to invert. It can be made from **corn** or sugar beet - GM crops. If sourced from cane, it is safe. (F) (S) (P) (C)

- **Iodized salt.** Really?!? Better read this allergy warning: "*People following a **corn**-free diet should avoid iodized salt since it contains dextrose, which should be avoided by those allergic to corn.*" See dextrose. (F)

- **Isomalt:** Isomalt is the popular name for Isomaltitol, a cousin of maltitol, a sugar substitute made from **corn** or beet sugar – both GM crops. Isomalt is manufactured in a two-stage process in which sucrose is first transformed into isomaltulose, a reducing disaccharide (6-O-α-D-glucopyranosido-D-fructose). The isomaltulose is then hydrogenated, using a Raney nickel catalytic converter. The final product, isomalt, is an equimolar composition of 6-O-α-D-glucopyranosido-D-sorbitol (1,6-GPS) and 1-O-α-D-glucopyranosido-D-mannitol-dihydrate (1,1-GPM-dihydrate). (F) (S) (P) (C)

  It can be found especially in the production of commercial sweets or diet products like sugarless candies, sugar-free chewing gum, chocolate candies, baked goods, and ice cream. In the supplements and pharmaceutical industry, isomalt can be used as an excipient, where it is used as a low-calorie filler and sweetening agent. It can also be present as a plasticizer in gelatin capsules, as an emollient, and as a humectant in cosmetics. (F) (S) (P) (C)

- **Isomalto-oligosaccharides** or **IMO** is created for the food industry from a starch processed from different cereal crops like, wheat, barley, **corn**, pulses (peas, soybeans, lentils) oats, tapioca, rice, potato and other starch sources. See isomalt. (F)

- **Isostearyl alcohol**. As soon as you seen the word alcohol, you have to suspect it comes from **corn**. See alcohol. It is a mixture of branched chain 18 carbon aliphatic alcohols. In cosmetics, it is used as a skin-conditioning agent and emollient, a viscosity increasing agent – non-aqueous; a skin conditioner; and a viscosity controller. It is found in many skin products as well as in lipsticks. You still want to kiss that pretty girl? (F) (S) (P) (C)

Also known as: Isooctadecanol, 16-Methylheptadecan-1-ol, Isooctadecan-1-ol, 1-Heptadecanol, 16-methyl-, 16-Methyl-1-Heptadecanol, Einecs 248-470-8.

- **Itaconic acid polymer** is a dispersant created through the fermentation of plant sugars (**corn** or sugar beet), both suspected GM crops. (C)

- **Lactate** is the conjugate base of lactic acid. See lactic acid**.** (F) (S)

- **Lactic acid*** (E270). Although our body generates lactic acid as a natural function of all our muscles, lactic acid is also employed in the pharmaceutical industry to produce water-soluble lactates from otherwise insoluble active ingredients. Also used in topical preparations and cosmetics to adjust acidity as for its disinfectant and keratolytic properties. Commercially, lactic acid fermentation is performed by lactic acid bacteria, to convert glucose, sucrose or lactose into to lactic acid. Carbohydrate sources include **corn**, sugar beets, and cane sugar.

  As a food additive, lactic acid is approved in the USA, the EU, Australia and New Zealand. Lactic acid is used as a curing agent, a food preservative, and a flavoring agent. It is an ingredient in processed foods and is used as a decontaminant in processing meat. (F) (S) (P) (C)

  Lactic acid can be tasted in naturally fermented products such as sauerkraut, kimchi, koumiss, laban (Greek yogurt), cow and goat yogurt, kefir, some cottage cheeses, and even kombucha. Lactic acid gives its sour flavor to real sourdough breads. It is used in beer brewing to lower the pH and reduce to increase the body of beer.

  In wine making, a bacterial process, natural or induced, is often used to convert the malic acid in wine to lactic acid, to reduce its sharpness and to improve wine flavor profile. This fermentation is undertaken by the family of lactic acid bacteria.

- **Lactylates** are FDA approved organic compounds used as food additives and cosmetic ingredients (i.e. lactylates are food grade emulsifiers). Lactic acid is primarily produced by lactic acid fermentation of sugar with lactic acid bacteria (*lactobacilli*). The sugar can be sucrose, fructose,

or glucose obtained from **corn**, sugar beet or sugar cane. Corn and beet are potential GM crops. (F) (C)

- **Lauroyl macrogolglycerides** are mixtures of monoesters, diesters and triesters of glycerol (from GM corn) and monoesters and diesters of macrogols. They are obtained by partial alcoholysis of saturated oils mainly containing triglycerides of lauric acid using macrogol or by esterification of glycerol and macrogol with saturated fatty acids or by mixing of glycerol esters and condensates of ethylene oxide with the fatty acids of these hydrogenated oils. See glycerol. (C)

- **Lauryl glucoside** is a surfactant and cleansing agent used in cosmetics. It is a glycoside produced from glucose and lauryl alcohol. See glucose. Decyl glucoside and Octyl glucoside are similar products used in cosmetics. (C)

  Also known as: D-glucopyranoside, Dodecyl; Dodecyl D-Glucopyranoside; Dodecyl-Glucoside; Lauryl D-Glucopyranoside.

- **Lauryl + oleoyl alcohol ethoxylates** is a surfactant (cleaning agent) made from coconut and also contains oleic acid from canola, cotton or **corn** oil (oleoyl alcohol). (C)

- **Lauryl polyglucose** is a natural and mild non-ionic surfactant derived from glucose extracted from raw materials like **corn** (a GM crop), potatoes, coconut or palm oil. It is used in the cosmetic industry in body wash, shampoo, conditioner, kitchen detergents and other commercial uses. (C)

- **Lecithin** can be extracted from **corn**, soy, sunflower or egg yolks, often used as a food additive. Soy bean is a potential GM crop. Also, eggs can come from chicken fed corn, soy or cotton feed, all GM crops. (F) (S) (P) (C)

- **Levulinic Acid**: Levulinic acid is an organic acid prepared by heating sucrose (from **corn** or sugar beet – GM crops) with a concentrated acid.

The process proceeds through the intermediacy of glucose, which isomerizes to fructose and then undergoes dehydration into hydroxymethylfurfural (HMF). Other sugar-derivatives can be used in this process including levulose (D-fructose), inulin and starch. HMF hydrolyzes to formic acid and levulinic acid. It is used as a fragrance ingredient, skin-conditioning agent in the perfume and skin care business. (C)

Synonym(s): 3-acetylpropionic acid; 4-ketovaleric acid; 4-oxopentanoic acid; 4-oxovaleric acid; 4-oxo; pentanoic acid; acetoproprionic acid.

- **Lysine** is the natural form of an essential amino acid that must be obtained from the diet because it can't be produced by our body. Lysine is an essential amino acid. Good quality natural food sources of lysine are high-protein foods such as eggs, meat (specifically red meat such as beef, game meat as well as lamb, pork, chicken and turkey); fish (cod, sardines, bluefish, burbot, mahi-mahi, grouper, haddock, ling, mackerel, perch, pike, pollock, pout, roughy, salmon, sunfish, trout, tuna, turbot, yellowtail, etc.); beans (adzuki, soybean, kidney, navy, chickpea and lentils); grains (amaranth, quinoa); seeds (pumpkin); sprouts (soybean); peas, and cheese (Parmesan). But read L-lysine below. (F)

- **L-lysine** is the industrial version produced for supplementation. It can be created by extracting it from soybean or by using bacteria, *corynebacterium glutamicum*, cultivated on a growth medium made of glucose from **corn** starch hydrolysis or fructose from corn and sucrose from sugar beets as present in molasses. The same process is used for L-threonine, L-methionine, and L-isoleucine production. Soybean, corn and sugar beets are suspected GM crops. (F) (S) (P)

- **Magnesium ascorbate** is a synthetic form of vitamin C derived from ascorbic acid. It is usually extracted from **corn**. (S)

- **Magnesium citrate** (E345) is the magnesium salt of citric acid. Citric acid is usually made from GM **corn**. (F) (S)

- **Magnesium fumarate** is one of the magnesium forms. It may come from GM **corn**. (F) (S)

- **Magnesium glycinate** is a magnesium salt processed with glycine (see glycine). It is used in 'non-food' supplements. (S)

- **Magnesium stearate or vegetable magnesium stearate** (**s**ee stearate), also called *octodecanoic acid, or magnesium salt*, is a white powder which becomes solid at room temperature. It used to be made from bovine source but because of the recent increase in the threat of bovine diseases such as mad cow disease, foot and mouth disease and others, many magnesium stearate manufacturers are switching over from an animal-based ingredient to a vegetable derived version.

  In its current form, it shows as a combination of stearic acid from hydrogenated vegetable oils (GM **corn**, cottonseed or soybeans) and the mineral magnesium. It is commonly used as a flow agent to prevent sticking in the production of medical or supplement tablets, capsules and powders. (F) (S) (P) (C)

- **Maize**. Another name for **corn**. (F)

- **Malate or malic acid** (E296) is a food additive. It has two forms: l-malic, the natural and biologically active isomer contained in foods such as green apples, grapes and wine, and rhubarb. The d-malic type is the synthetic version, which is produced by the fermentation of glucose by metabolic engineered *S. cerevisiae.* As a food additive, it is used in sour candies and beverages or replaces citric acid in other applications. Unless proven otherwise, it could come from **corn**. So you know, racemic malic acid is synthesized petrochemically from maleic anhydride. (F)

- **Malonic acid** also called malonate or propanedioic acid, an industrial chemical, can be found in food, cookware, dental ware, dishes, utensils and bottled water. It can be extracted from GM **corn**. (F) (I)

- **Malt**, **Malt syrup**, **Malt extract**, **Maltose**, **Maltitol, and Maltite**: Sugar substitutes such as these can come from GM **corn**. (F)

- **Maltitol** (E965) is a sugar alcohol (a polyol) used as a sugar substitute. Maltitol is made by hydrogenation of maltose obtained from starch. It is used to replace table sugar because it has fewer calories, does not promote tooth decay, and has a somewhat lesser effect on blood glucose. It is known under trade names such as **Lesys**, **Maltisweet** and **SweetPearl®.** Maltitol is made by hydrogenation of maltose obtained from the starches of wheat, **corn**, or potatoes. (F) (S) (P)

- **Maltodextrin** is an oligosaccharide used as a food additive and filler. Maltodextrin can be enzymatically derived from any starch. In the US, this starch is usually **corn**; in Europe, it is commonly wheat. In the US, it is produced from corn starch by partial hydrolysis and is usually found as a white hygroscopic spray-dried powder. It is commonly used as a thickening agent is frequently used in ice-cream, salad dressings, as well as sodas and candy. It can also be found as an ingredient in a variety of other processed foods and supplements. Unless certified organic, corn maltodextrin should be avoided. (F) (S)

- **Maltol** is a liquid sweetener that can be extracted from **corn**. (F) (S)

- **Maltose** is a monosaccharide that can come from sugar beet or **corn**. (F) (S)

- **Manganese gluconate** is manganese carbonate or dioxide processed with gluconic acid (see gluconic acid). It is a manufactured item used in 'non-food' supplements. (S)

- **Mannitol** (E 421) is part of the sugar alcohol family of sweeteners. Fructose from **corn** or sugar beet is the basic material for the production of mannitol. It is produced from plant starch during the process of the saccharification of starch. It can be used as a coating for hard candies, dried fruits, and chewing gums, and as an ingredient in candies and

chewing gum. Its pleasant taste and mouth feel also makes it a popular excipient for chewable tablets. (F) (S) (P)

- **Methyl alcohol** or **methylene** is a simple alcohol from methanol that used to be extracted from wood. Nowadays, it is more cost efficient to produce it from **corn** – a suspected GM crop. (F) (S) (P) (C) (I)

- **Methyl gluceth**, methyl glucose and methyl glucoside are derivatives of methyl alcohol extracted from **corn**. (F) (S) (P)

- **Methylcellulose** (E 461) is a polysaccharide made from glucose. It is sold under a variety of trade names and is used as a thickener and emulsifier in various food products. It can also be used as a thickening agent and binders in cosmetics. For industrial use, methyl cellulose today is mainly obtained from wood pulp or GM cotton, **corn** and sugar beets. (S) (P) (C)

- **Methyl Gluceth**, **Methyl Gluceth-10 or -20**, **Methyl Gluceth Benzoate**: Methyl Gluceth and its derivations are a water-soluble skin conditioner, emollient (skin softener) and humectant (aids in moisture retention) produced from fructose from GM **corn** or glucose from sugar beets and methyl alcohol. (C)

- **Micelles**. The tight bundles into which linear starch molecules (possibly from **corn**) and the linear segments of the branched molecules are drawn together. They can act as emulsifiers in food production and detergents. (F) (I)

- **Microcrystalline cellulose** (see cellulose) (F) (S) (P)

- **Milo and milo starch** is coming from a grain from the sorghum family, also known as millet or Guinea **corn**. Although sorghum is not a GM crop, some people that are highly allergic to corn may suffer allergic reactions to milo. (F)

- **MIPA-lactate** (monoisopropanolamine-lactate) is a chelating agent used in cleaning products and made from GM **corn**. (C) (I)

- **Mixed Tocopherols are** a concentrated form of both forms of tocopherols derived from the same GM crops. Mixed tocopherols in the US are less fractionated "natural mixed tocopherols" and high d-gamma-tocopherol fraction supplements. These can still come from GM crops. (F) (S) (C)

- **Modified cellulose gum** and **cellulose gum** can be extracted from wood pulp as well as **corn** or cotton cellulose, both suspected GM crop. (F) (S) (P) (C)

- **Modified corn starch**. See corn starch. (F)

- **Modified food starch and Modified starch**: Modified starch and similar additives can come potato, sorghum or GM **corn**. Ask for source. (F) (S) (P) (C)

- **Molasses**. **Corn** syrup may be present. Read the label. (F)

- **Molybdenum ascorbate** is molybdenite processed with ascorbic acid (from **corn**) and acetone. It is a manufactured item used 'non-food' supplements. (S)

- **Monosaccharides** are the most basic units of carbohydrates. They are the simplest form of sugar and are found as colorless, crystalline and water-soluble solids. Most monosaccharides have a sweet taste but not all. Everyday examples of monosaccharides are glucose (dextrose), fructose (levulose) and galactose. Monosaccharides are the building blocks of disaccharides (such as sucrose or sugar), oligosaccharides and polysaccharides (such as cellulose and starch). Any of these could come from **corn** or sugar beets. (F) (S) (P) (C)

- **Monoglycerides** and **diglycerides**: See glycerides. (F) (S) (P) (C)

- **Monosodium glutamate** (MSG) or sodium glutamate is the sodium salt of the common amino acid glutamic acid. The industrial form of L-glutamate in MSG gives the same **umami** taste (savory) that comes naturally in some meats, sea vegetables, tomatoes, mushrooms and

cheeses. It is used as a flavor enhancer because it balances and rounds out the flavor profile of other food tastes. (F)

Ever since MSG was first created in Japan about 100 years ago, it has been produced by three main methods: 1. Hydrolysis of vegetable proteins with hydrochloric acid to disrupt peptide bonds (1909–1962), abandoned; direct chemical synthesis with acrylonitrile (1962–1973), a purely chemical process that uses a form of plastic (acrylonitrile), abandoned since; 3. And finally, through the current process of bacterial fermentation. In the old days, wheat gluten was used for hydrolysis because it offered more than 30 g of glutamate and glutamine per 100 g of protein, but as the demand increased, a new production processes of bacterial fermentation was developed. A selected bacteria, *coryneform*, is cultured with ammonia and carbohydrates like fructose from **corn** or glucose from sugar beets, as well as sugar cane, tapioca or molasses. The bacteria then excrete amino acids (I'll let you imagine how) into the culture broth from where L-glutamate is isolated. Sodium is added later through the neutralization process. If you're not sure, ask for source.

If taken in large enough doses, MSG is considered to be an excitotoxin, that is, it could excite your brain cells to death. MSG can also cause the following adverse reactions in some people: asthma, depression, itching, hives, vomiting, migraine headaches, nausea, heart irregularities, skin rashes and even seizures. Because it can be an addictive and nefarious food additive, food scientists will add MSG to processed foods to make you come back for more. Hidden MSG is also labeled as "autolyzed yeast extract" or "torula yeast" or even "hydrolyzed vegetable protein." Trade names of monosodium glutamate include *Ac'cent*, *Aji-No-Moto*, and *Ve-Tsin*.

Other ingredients that contain processed free glutamic acid – another term for MSG:

- Ajinomoto
- Acefultame potassium
- Amino acids
- Any "hydrolyzed protein"
- Anything containing "enzymes"
- Anything "enzyme modified"

- Anything "fermented"
- Anything "hydrolyzed"
- Anything "protein"
- Anything "protein fortified"
- Artificial flavors or flavorings
- Autolyzed yeast
- Calcium caseinate
- Calcium glutamate (E 623)
- Caramel coloring or caramel flavoring
- Free glutamic acid
- Hydrolyzed corn gluten
- Hydrolyzed gelatin
- Hydrolyzed oat flour
- Hydrolyzed pea protein
- Hydrolyzed plant protein
- Hydrolyzed protein
- Hydrolyzed soy protein
- Glutamate (E 620)
- Glutamic acid (E 620) (unless coming naturally from non-processed meat)
- Lecithin
- Monosodium glutamate (E 621)
- Monopotassium glutamate (E 622)
- Monoammonium glutamate (E 624)
- Magnesium glutamate (E 625)
- Natrium glutamate
- Natural beef flavoring
- Natural chicken flavoring
- Natural flavors or flavorings
- Natural pork flavoring
- Plant protein extract
- Protein powders containing glutamic acid (MSG)
- Sodium caseinate
- Soy protein

- Soy protein concentrate
- Soy protein isolate
- Soy sauce
- Soy sauce extract
- Tamari sauce
- Textured protein
- Textured vegetable protein
- Torula yeast
- Umami
- Vetsin
- Whey protein
- Whey protein concentrate
- Whey protein isolate
- Yeast extract
- Yeast food
- Yeast nutrient

Names of food additives or ingredients that often contain or produce free glutamic acid during processing:

- Annatto
- Any flavors or flavorings
- Anything "enzyme-modified"
- Anything "fermented"
- Anything "protein-fortified"
- Anything "ultra-pasteurized"
- Barley malt
- Bouillon and broth
- Brown rice syrup
- Carrageenan (E 407)
- Citrate (E 330)
- Citric acid
- Corn oil
- Cornstarch
- Corn syrup or corn syrup solids

- Dextrose is a simple sugar used as a sweetener in foods and drinks. Is it extracted from vegetable source, typically a modified food starch, such as corn
- Dough conditioners
- Dry milk solids
- Enzymes
- Flavors or flavorings (vegetable or animal-based)
- Guar gum
- High fructose corn syrup (HFCS)
- Locust bean gum
- Malt extract
- Malted barley
- Maltodextrin
- Milk powder
- Modified food starch
- Natural beef or chicken flavoring
- Pectin (E 440)
- Protease and protease enzymes
- Rice syrup
- Seasonings
- Sodium benzoate
- Spices
- Stock
- Sugar alcohol like erythritol, xylitol, etc. (see sugar alcohols)
- Ultra-pasteurized dairy products and anything
- Vegetable gum
- Xanthan gum
- Common processed food products that may contain any form of MSG:
- Accent ®
- Any products with breading on
- Assorted snacks (crackers, cookies, candies, chips, etc.)
- Baby formula and baby food
- Bouillon cubes

- Condiments (ketchup, BBQ sauce, pickles, etc.)
- Dry mixes for sauces and gravies
- Fast foods
- Flavored butter
- Frozen dinners
- Frozen entrees
- Gravies and sauces
- Most Asian food and food products
- Most canned and frozen soups
- Most chain restaurants use pre-made commercial foods containing MSG
- Most fast food products
- Most "flavored" chips
- Most snack foods
- Salad dressings
- Some canned, dried and frozen foods
- Seasoned fries
- Seasonings
- Vegetable dips

MSG in dairy products: Some processed low fat and no fat milk products often contain milk solids that contain MSG as part of thickeners. Many other dairy products contain gums such as carrageenan, guar, or locust bean gum. Other not-so-obvious dairy products can be low fat and fat-free ice cream, assorted processed cheeses, yogurt, milk, cream, cream cheese, cottage cheese, etc., but they do. As usual, read the labels for clues.

MSG in protein powders: Some dairy, soy or even rice protein powders may contain glutamic acid, which, during processing, will turn into free glutamic acid (MSG). Since individual amino acids are not always listed on labels of protein powders, beware if you are sensitive. If you can read the word "protein" on an ingredient label, that product most likely contains MSG.

MSG in cosmetics: Sorry, but we're not quite done yet: Free glutamic acid (MSG) have also been found in some assorted products such as:

soaps; shampoos; hair conditioners; toothpaste; teeth whitening agents; fluoride treatments; teeth-cleaning products at your dentist's office; supplement capsules (gelatin); cough syrup and cosmetics. In that case, MSG is hidden in ingredients with names that include the words "hydrolyzed," "amino acids," and/or "protein." Unfortunately, most sun block creams and insect repellents also contain MSG. Some drinks, soft drinks, candies, and chewing gum have been known to hide MSG and/or aspartame, or neotame in their midst;

Caution: If you are highly sensitive to MSG or any of its components, stay away from the following ingredients: Certain amino acid chelates (Citrate, aspartate, and glutamate are used as chelating agents with mineral supplements); Annatto; Anything "vitamin enriched"; Anything "pasteurized"; Balsamic vinegar; Corn starch; Corn syrup; Dextrose; Food starch; Lipolyzed butter fat; Modified food starch; Rice syrup; Vinegar (if not specified).

Please note: If you see the following ingredients listed on a label as flavorings, MSG is pretty sure to be present: Disodium 5'-guanylate (E 627); Disodium 5'-inosinate (E-631); Disodium 5'-ribonucleotides (E 635).

- **Mucopolysaccharide.** It is one of the many forms of saccharide, a carbohydrate present in common sugar. It could come from **corn** or sugar beet, 2 GM crops. (F) (S) (P)

- **Myristyl alcohol** or **1-Tetradecanol,** can be produced by the reduction of myristic acid or fatty acid esters from assorted sources (animal and vegetal) with reagents such as lithium aluminum hydride or sodium. Animal source can be sperm oil from whales or **beef** tallow. Vegetable sources can be jojoba, rapeseed (**canola**), mustard seed, coconut or palm kernel oil, as well as soy and **corn** oils. Fatty alcohols are also be prepared from petrochemical sources. Ask for source. (F) (D) (C) (I)

  Fatty alcohols are mainly used in the production of detergents and surfactants. They are also components of foods, cosmetics cold creams for its emulsifying and emollient properties, and as industrial solvents. Due to their amphipathic nature, fatty alcohols behave as nonionic surfactants for detergents.

Also known as 1-Hydroxytetradecane; Tetradecanol; 1-Tetradecanol; Tetradecyl Alcohol; Dytol R-52; Lanette Wax Ks; Loxanol V; Myristic Alcohol; Myristyl Alcohol (Mixed Isomers) ; N-Tetradecanol-1; N-Tetradecyl Alcohol.

- **Natural flavors** can come from processed proteins from GM **corn** (like maltodextrin, a sweetener) or soybeans, 2 GM crops. By the way, MSG is considered to be a natural flavoring agent by the FDA. See MSG above.

  The exact definition of natural flavorings & flavors from Title 21, Section 101, part 22 of the Code of Federal Regulations is as follows: "*The term natural flavor or natural flavoring means the essential oil, oleoresin, essence or extractive, protein hydrolysate, distillate, or any product of roasting, heating or enzymolysis, which contains the flavoring constituents derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, seafood, poultry, eggs, dairy products, or fermentation products thereof, whose significant function in food is flavoring rather than nutritional.*"

  For the record, **castoreum**, a common ingredient in "natural flavors" which is the castor glands' secretion they use to mark their territory. I'm not sure I would want that kind of "flavoring" in my food. It can be used in foods and beverages as part of a substitute vanilla flavor, or less commonly used as a part of a raspberry or strawberry flavoring. In other words, natural flavors can be pretty much anything approved for use in food.

- **Natural grain alcohol** is another designation for ethyl alcohol or ethanol from GM **corn**. (F) (S) (P) (C)

- **Niacin** (also known as **vitamin B_3**, **nicotinic acid** and **vitamin PP**). Lonza, the world's largest manufacturer of niacin, wrote that they start with liquefied petroleum gas (LPG) and other non-animal chemicals. Niacin is typically synthesized chemically through the fermentation of microorganisms using GM **corn** starch as the growth medium. Ask for clarification. (F) (S) (P)

- **Niacinamide ascorbate** is a synthetic form of vitamin C derived from ascorbic acid from **corn**. (F) (S) (P) (C)

- **Nicotinamide**, also known as **Niacinamide** and **Nicotinic acid amide**, is the amide of nicotinic acid (vitamin B_3 / niacin). Niacinamide is derived from **corn**-sourced niacin. Ask for source. (S) (P)

- **Octyl glucoside** is a detergent derived from glucose from GM **corn**, sometimes used in beauty products. (C) (D)

- **Olestra** or **Olean** (brand name) is a triglyceride (dietary fat) synthesized as a sucrose ester from **corn**. It consists of three fatty acids bonded to a glycerol "backbone" (see glycerol). It is a food additive used mostly in potato chips. Although it was originally developed as a way to reduce calories from fried foods, its side effects – stomach cramps and loose stools – it is almost non-existent nowadays. Nevertheless, it is still used under the brand name "Sefose" as an industrial lubricant and paint additive. Whether GM or not, avoid this food additive at all costs. (F) (I)

- **Oleic acid** is a fatty acid that occurs naturally in various vegetable fats and oils. It can also come from genetically modified **corn**, soybean (*Glycine max)* or canola oil, all suspected GM crops. (F) (S) (P) (C)

- **OLETH-2** is a polyethylene glycol ether of oleyl alcohol. It is used as a fragrance ingredient, a surfactant and emulsifying agent in cosmetic products. See Glycol. (C)

- **Oligofructose is a type of** oligosaccharides (short-chain sugars) consisting of fructose molecules from **corn** – a GM crop. (F) (S) **Olestra or Olean (trade name) is a** triglyceride, a dietary fat that consists of three fatty acids bonded to a glycerol backbone (a simple polyol – sugar alcohol) Because olestra is synthesized from sucrose – a disaccharide composed of the glucose and fructose from **corn** or sugar beets, both suspected GM crops, avoid. (F)

- **Oligosaccharides** and **polysaccharides** are short chains of sugars that can come from **corn** – a GM crop. (F) (S)

- **Olus Oil** is an emollient to soften and smooth the skin. Olus is a fancy Latin word for oil. It is an expressed oil of vegetable origin consisting primarily of triglycerides of fatty acids. If source is not clearly indicated, it could come from **corn**, soy or cottonseed oils – all GM crops. (C)

- **Omega 3, 6 and 9**. If the source is not specified, be cautious. In commercial supplements, they could be extracted from refined canola, **corn**, cottonseed, or soybean oils – all suspected GM crops. Adding to that fact is that English researchers hope to produce the world's first sustainable plant source of omega-3 fatty acids this year. This gene, normally found in oily fish, will be added by "cutting and pasting" taken from marine algae into camelina, a member of the mustard family and a relative of canola plants. (F) (S) (C)

- **Organic acid salts or acid salts** can be **lactic acid** (from GM **corn**); **acetic acid** (E260) (also called ethanoic acid) used for distilled vinegar made from corn; **formic acid** or methanoic acid from ant venom; **citric acid** (from corn); **oxalic acid** made from corn; or **uric acid** from the metabolic breakdown of purine nucleotides from **bovines**.

- **Ornithine or L-Ornithine** is a non-protein, non-essential amino acid. Is essential for making urea, which removes nitrogen and ammonia from the body and eliminates toxins and is easily found in common foods like fish, meat, nuts and beans. When produced industrially for supplementation, l-ornithine is extracted from soybean or using a bacteria, *Corynebacterium glutamicum*, cultivated on a growth medium made of glucose from **corn** starch hydrolysis or fructose from corn and sucrose from sugar beets as present in molasses. Other names: Chlorhydrate d'Ornithine, L-Ornithine, L-Ornithine HCl, L-Ornithine Hydrochloride, L-5-aminorvaline, L-2,5-diaminovaleric acid, Ornithine HCl, Ornitina. (F) (S)

- **Pasta**. Traditionally, pasta is made from wheat but since the resurgence of wheat and gluten allergies, **corn**-based pasta are available on the market. Please read the label. (F)

- **PEG 400 dioleate** is a polishing and shining agent. It comes from oleic acid that could come from canola, coconut, **corn**, cottonseed, olive palm or soybean oils. Ask for source. (C)

- **Pharmaceutical glaze** or **natural food glaze**, **pure food glaze**, **confectioner's glaze**, **resinous glaze**, is an alcohol (typically ethanol from **corn**) based solution of various types of food grade shellac. Pharmaceutical glaze may contain denatured alcoholic solution of 20-51% shellac, waxes and titanium dioxide as an opacifying agent. Ethanol is made from corn, a GM crop. (F) (S) (P)

- **Phenoxyethanol** is used as a stabilizing agent in skin products or perfumes. It contains ethylene glycol. Ethylene can be produced in the laboratory by subjecting ethanol to a chemical reaction. Ethanol typically comes from refined **corn** – a GM crop. (C)

- **Plant cellulose**: See cellulose.

- **Plant sterols/stanols (or phytosterols)**: Plant sterols and stanols are extracted from the deodorizer distillates of vegetable oil refining and from tall oil, a by-product of paper pulping industry. Major refined vegetable oil sources of plant sterols include GM soybean oil and **corn** oil, sunflower oil, rapeseed oil (canola, a GM crop) and wheat germ oils. (F) (S) (C)

- **Polenta** is a traditional Italian dish made from **corn** meal. (F)

- **Polydextrose** is a complex from of dextrose that can come from **corn**. (F) (S) (P)

- **Polyglyceryl-3 or -4 Caprate** is used as an emulsifier. It is an ester of Capric Acid (q.v.) and Polyglycerin-4 (q.v.). Glyceryl comes from glycerin that can come from **corn** – a GM crop. (F) (C)

- **Polyglycitol syrup (E964)**: Polyglycitol syrups are made from starch hydrolysates by catalytic hydrogenation. The hydrogenated starch hydrolysates are mixtures of polyglycitols such as sorbitol, maltitol, and higher order polyols (sugar alcohols), all coming from **corn** – a GM crop. Also referred to as polyhydric alcohols or sugar alcohols, they are used mainly as bulk sweeteners but also as humectants, texturizers, viscosity or bodying agents, stabilizers, crystallization modifiers, rehydration aids and carriers for food ingredients such as enzymes, colors, flavors and food premixes. Synonyms include hydrogenated starch hydrolysate, hydrogenated glucose syrup and polyglycitol. In humans, the main reported adverse effect specifically associated with polyglycitol syrup exposure was gastric disturbance. This food additive is approved in the USA but banned in Europe, Australia and New Zealand. Alternate names: Hydrogenated starch hydrolysate, Polyglycitol, Corn syrups hydrogenated, Polyglycitol syrup, Hydrogenated corn syrups. (F) (S) (P) (C)

- **Polylactic acid** (PLA) is a thermoplastic aliphatic polyester derived **corn** starch – a suspected GM crop – (in the U. S.), tapioca starch (mostly in Asia), or sugarcane (in the rest of the world). It is used as recyclable packaging and containers, corn plastic ware and plates. As tea bag material, it has attracted major tea companies due to its nice look and its claims of biodegradability. (F) (I)

- **Polyol** is another name for sugar alcohols, usually coming from **corn** (see sugar alcohols). (F) (S) (P) (C)

- **Polysorbates*** (e.g. Polysorbate 80) are a class of emulsifiers used in some food products. They are oily liquids derived from PEG-ylated sorbitan (a derivative of sorbitol) esterified with fatty acids. See sorbitol. (F) (S) (P)

- **Polyvinyl acetate.** Originally, this glue-like rubbery synthetic material was made from petroleum sources. So why is it addressed here? Since the price of oil has increased, cheaper source of adhesives had to be found. Here come nanotechnology. Creative scientists have created nanoparticle biopolymer latexes from **corn** starch. They are produced by a patented extrusion process that combines crosslinking and reduction of corn starch particles down to 50 nano-microns particle size. This new corn-based ingredient can be found in pressure sensitive applications (stick on labels), paperboard, paints and even white glue. (I)

- **Polyvinyl alcohol** is a water soluble synthetic alcohol synthesized by hydrolysis of polyvinyl acetate (see above). (I)

- **Popcorn**. Yep, you guessed it, it's made with **corn**. You win! (F)

- **Potassium citrate** (E332) is a potassium salt of citric acid. As a food additive, potassium citrate is used to regulate acidity. When lab-created, it can come from **corn**-based citric acid – a GM crop. (F) (S) (P)

- **Potassium fumarate** is the potassium salt of fumaric acid. See fumaric acid above. (F) (S) (C) (I)

- **Potassium gluconate** is the potassium salt of the conjugate base of gluconic acid from glucose from **corn**. (F) (S) (C) (I)

- **Potassium propionate (**E283) is the potassium salt of propionic acid. It is a preservative and antimicrobial agent used in bakery and flour based products like breads and pizzas, as well as dairy products like cheese. (F)

- **Potassium sorbate** is the potassium salt of sorbic acid, an organic acid that is used extensively as a fungistatic agent for foods. Today, most potassium sorbate is made synthetically from **corn** and sometimes soybean – 2 GM crops. See sorbic acid. (F)

- **Powdered sugar** is the same as confectioner sugar. It contains **corn** starch as a flowing agent. (F)

- **Polyethylene glycol** (E1521) or Polyethylene glycerol 8000 is an organic compound that is produced by propylene oxide hydration (see glycol).

This additive is used as an anticaking agent, antifoaming agent, a flavor enhancer, glazing agent and a sweetener. It can be found in chewing gum, fresh fruit protective coating, food supplements, added sweeteners, flavored water, as well as sport, energy, and electrolyte drinks. (F) (S) (C)

- **Polydextrose** made from glucose can come from raw material: GM **corn**. (F) (S)

- **Polylactic acid** (PLA) is a is a thermoplastic aliphatic polyester or resin derived from natural sources such as **corn** starch, a suspected GM crop (in the United States), tapioca starch (mostly in Asia), or sugarcane (in the rest of the world). First, dextrose is extracted from corn starch. Then the dextrose into lactic acid. Lactic acid is converted to lactide, and lactide molecules are linked into long chains polymers and Voila! Polylactic acid, PLA is presented as translucent white balls. It is used as recyclable packaging and containers, corn plastic ware and plates. As tea bag material, it has attracted major tea companies due to its nice look and its claims of biodegradability. (F) (I)

- **Polyquart-95** is a brand name for a BASF surface modifier (surfactant) made from **corn**. (C)

- **Polysaccharides (complex)** are a long chain of monosaccharides bound together. It is the main storage form of glucose in our body. Good examples are starch and glycogen, and cellulose and chitin. They can come from starches (**corn** for example) which are glucose polymers, as well as glycogen (glycogen is the analogue of starch). It could come from non-starch polysaccharides such as cellulose and the hemicelluloses like pectins, gums, xylans, and mucilages. Ask for source. (F) (S) (P) (C)

- **Polysorbates** are a class of emulsifiers used in some pharmaceuticals and food preparation. Polysorbates are oily liquids derived from PEG-ylated sorbitan (a derivative of sorbitol) esterified with fatty acids. Production of Polysorbate 80 is a complex chemical process. It's made in an industrial laboratory. *Polysorbates* are *made* by reacting ethylene oxide (a

gas) with sorbitan esters (derivatives of sorbitol, a sugar alcohol). Also known as **Alkest**, **Canarcel** and **Tween.** See sorbitol. Ask for non-GMO proof. (F) (S)

- **Potassium ascorbate** is a synthetic form of vitamin C derived from ascorbic acid. See ascorbic acid. (F) (S)

- **Potassium citrate** (E332) is a potassium salt of citric acid. It is a white, slightly hygroscopic odorless and slightly salty crystalline powder. As a food additive, potassium citrate is used to regulate acidity. It could come from **corn**-based citric acid – a GM crop. (F) (S) (P)

- **Potassium gluconate** is the potassium salt of the conjugate base of gluconic acid from glucose. Also known as pentahydroxycaproic acid potassium salt, D-gluconic acid potassium salt, or potassium D-gluconate. Unless specified otherwise, since glucose usually comes from **corn** or sugar beets, both GM crops, be careful. (F) (S) (C)

- **Potassium lactate** is used as a hard water dissolver in cleaning products. It uses potassium hydroxide to neutralize lactic acid which is fermented from a sugar source, usually GM **corn**. It can also show as potassium alpha-hydroxypropionate, monopotassium 2-hydroxypropanoate acid and 2-Hydroxypropionic acid. (C) (I)

- **Potassium sorbate (**E202)**:** Potassium Sorbate is the potassium salt of sorbic acid, a naturally occurring organic acid that has been used extensively as a fungistatic agent for foods. Today most potassium sorbate is made synthetically from **corn** and sometimes soybean – 2 GM crops. See Sorbic acid. (F) (C)

- **Prebiotic —** a non-digestible food (fiber) item that stimulates the growth of beneficial bacteria existing naturally in the colon. See inulin. (F) (S)

- **Pregelatinized starch** is a starch that has been chemically or mechanically altered used in food processing. The starch can come from potato, tapioca wheat, or **corn**. (F)

- **Propionic acid** (E280) or Carboxyethane, Ethylformic Acid, and Methylacetic Acid is a preservative and anti-microbial agents against bacteria, fungi and molds. Commercially it is chemically produced from ethylene from **corn**, carbon monoxide, natural gas, fermented wood or from propionaldehyde. It is used in bakery and flour based products, like breads, pastries, pizzas and cheese. (F)

- **Propylene glycol** or **PPG** (E1520) or 1,2-propanediol; 1,2-dihydroxypropane; methylethylene glycol; propane-1,2-diol is a colorless, nearly odorless, clear, viscous liquid with a faintly sweet taste. It is typically a byproduct of gasoline, but recently, in an effort to reduce reliance on fossil fuels, alternative production has been found. A new method converts glucose from **corn** to lactic acid, which can then be used with a copper catalyst to synthesize PPG.

  It is used in foods as a preservatives, an humectant, emulsifier and antioxidant in a wide variety of food products such as alcoholic beverages and wine; baked goods and cake frosting; confectionary, chewing gums, candies and chocolates; flavorings; frozen dairy products; margarine; nut products; poultry processing; prepared food and vegetables; seasonings; sweetened coconut. Add to that already long list, artificial sweetener bases, carrier liquid for food colors and flavorings (essences). It can also be found in many cosmetic and personal care products to absorb and retain moisture and as a thickener in many toothpastes, topical creams and ointments, in cosmetics, hair products and deodorants.

  Also known as: PEG-4, PEG-10 Propylene Glycol, PEG-8 Propylene Glycol Cocoate, Propylene Glycol Dicaprate, Propylene Glycol Dicaprylate, Propylene Glycol Dicaprylate/Dicaprate, Propylene Glycol Dicocoate, Propylene Glycol Diisononanoate, Propylene Glycol Diisostearate, Propylene Glycol Dilaurate, Propylene Glycol Dioleate, Propylene Glycol Dipelargonate, Propylene Glycol Isostearate, Propylene Glycol Laurate, Propylene Glycol Myristate, PEG-55 Propylene Glycol Oleate and SE, PEG-25 Propylene Glycol Stearate and

SE, PEG-75 Propylene Glycol Stearate, PEG-120 Propylene Glycol Stearate, and PEG-2 Stearate. PPG-9, PPG-12, PPG-15, PPG-17, PPG-20, PPG-26, PPG-30, and PPG-34. It has been recalled in all medications in the U.S.A., but is still permitted in food (really?). (F) (S) (P) (C)

- **Propylene glycol alginate** (E405) or alginate is an ester of alginic acid in which some of the carboxyl groups are esterified with propylene glycol from **corn**. It is an emulsifier, stabilizer and thickener used in many products including custard mixes, yogurt, jelly, ice-creams, salad dressings, flavored milk, artificial sweetener base, canned icing, and cheese. It is also found in diet products, slimming aids, indigestion tablets as well as in germicides, paint remover and antifreeze. (F) (S) (P) (C) (I)

- **Propylene glycol monostearate***. See propylene glycol above. (F) (S) (P) (C) (I)

- **Propylene mono and di-esters** or propylene glycol esters of fatty acids (E477) is a combination of propanediol and fats that can come from animal fat or vegetable fats such as **corn** or soybean. This additive is used as an emulsifier and stabilizer in confectionary, soft drinks, sparkling drinks, cake icings, ice cream and frozen desserts as well as processed meat. (F)

- **Pullulan** is a naturally occurring cell wall component of the fungus *Aureobasidium pullulans* breaking down **corn** starch. Pullulan is a polysaccharide polymer consisting of maltotriose units. Commercially, Pullulan is resulting from a fermentation process. *Aureobasidium pullulans* grow on the carbohydrate substrate (sugar or starch) from **corn** or sugar beets. Then *Aureobasidium pullulans* is harvested. (F) (S)

- **Qsorb** ® ingredients: Purified Water, Ubiquinone (CoQ10), Medium Chain Triglycerides, Non-GMO Soy Lecithin, **Polysorbate** 80, **Citric Acid**, **Potassium Sorbate**, **Alpha Tocopherol** from GM **corn** or soybean. See each one separately. (F) (S)

- **Retinoic acid** (commonly called vitamin A) is not real vitamin A. Retinoic acid is the oxidized form of vitamin A, with only partial vitamin A function. Synthetic vitamin A may be synthesized from acetone. It can be made from the compounds retinal, retinol, and four known carotenoids. When prepared as a dietary supplement, retinol is stabilized as the ester derivatives retinyl acetate or retinyl palmitate. Synthetic vitamin A had no antioxidant effect whatsoever. It is usually extracted from cod liver oil which could contain mercury.

  By 1931, LaRoche – one of the largest pharmaceutical companies in the world, even today – had succeeded in "synthesizing" vitamin A. That means they had created a purely chemical copy of a fraction of naturally occurring vitamin A from **corn**. Most synthetic vitamin A consists only of retinal, retinol, or retinoic acid. The well-publicized potential for toxicity with mega doses of vitamin A involves one of these three. See beta carotene. (F) (S) (C)

- **Riboflavin**: see vitamin B2. (S) (P)

- **Saccharide**, is the biochemistry name used for carbohydrate. Carbohydrates, or saccharides can be then broken down into four chemical groups: monosaccharide (single saccharide, the most basic form of carbohydrate), disaccharides (a bond of two monosaccharides such as sucrose, maltose or galactose), oligosaccharides (a saccharide polymer containing a small number of simple sugars or monosaccharides), and polysaccharides (a long chains of monosaccharides bound together. Good examples are starch and glycogen, and cellulose and chitin). Since all of the above could come from **corn** or sugar beets, you know what to do. (F) (S) (P) (C) (I)

- **Salt** (iodized salt). May contain dextrose. See iodized salt or table salt. (F)

- **Semolina** (unless from wheat) is made from **corn**. (F)

- **Simethicone** is an anti-foaming agent used to reduce bloating and gas in digestive aids like Maalox or Mylanta. It is also used as an anti-foaming additive in commercial applications such as processed and fast food – vegetable oil anti-foaming agent,) and industrial cleaners. (F) (S) (P) (I)

- **Slurry**. A suspension of starch in water, with or without other components of **corn**. (F)

- **Sodium alkyl glycerol sulfanate** is a surfactant used in cleaning products and soaps. It is an ester synthesized from glycerol, a GM **corn** product. Used in Zest bar soap, Aqua Pure soap, Sabun Moisturizing Bar Soap and many others. (C)

- **Sodium ascorbate** (E301), derived from ascorbic acid (synthetic form if vitamin C), is a more bioavailable form of vitamin C. As the sodium salt of ascorbic acid, it is known as a mineral ascorbate. It is used commonly as vitamin C in supplements. As a food additive, it is used as an antioxidant and an acidity regulator. For people sensitive or allergic to **corn**, it can create allergic reactions such as rash; itching; difficult breathing; hives; tightness in the chest; swelling of the mouth, face, lips, or tongue; bone pain; muscle weakness; severe or persistent diarrhea; mental or mood changes. Since ascorbic acid is coming from corn – a GM crop, beware. (F) (S)

- **Sodium benzoate** (E211): Sodium benzoate is produced by a reaction of benzoic acid with sodium hydroxide, which makes it dissolve in water. It can be used as a preservative in processed foods such as soft drinks and other carbonated beverages, fruit juices and jams, salad dressings, condiments, and pickles. It is also used a life extender for deodorant, lotions, mouthwash, ointments and skin products, shampoo, toothpaste, and medicinal syrups or pills. Synonym(s): Benzoic acid; sodium salt; antimol; benzoate of soda; sodium benzoic acid. (F) (C)

  Note: Although generally recognized as safe (GRAS) by the FDA, if sodium benzoate is mixed with ascorbic acid, commonly known as citric acid or vitamin C, it will develop a carcinogen know as benzene. A 2007 study published in *The Lancet* also found that when sodium benzoate is mixed with food dyes, it can lead to hyperactive behavior in children, although it was hard to tell if the dyes or the preservative were to blame.

- **Sodium carboxymethylcellulose** is the sodium form of carboxymethylcellulose. See cellulose. (F) (S) (P) (C)

- **Sodium citrate** (E331) is a sodium salt of citric acid. It may refer to any of the sodium salts of citric acid as **Monosodium citrate**, **Disodium citrate** or **Trisodium citrate**. It is a food additive used as an acidity regulator in drinks, and also as an emulsifier for oils when making cheese and supplements. Since it is derived from citric acid made from **corn** – a suspected GM crop, be cautious. (F) (S)

- **Sodium erythorbate** (E316) is the sodium salt of erythorbic acid (see above). It is produced from sugars derived from different sources, such as sugar beets**,** sugar cane, and **corn.** It is a food additive used predominantly in meats, poultry, and soft drinks production. It also used to preserve freshness in fruit and vegetables. It does this by preventing discoloration and development of off-flavors. (F)

- **Sodium fumarate** or disodium fumarate, is the sodium salt of fumaric acid. It is commonly used as an acidity regulator in processed foods. See fumaric acid. (F)

- **Sodium gluconate** is a derivative of gluconic acid (see above) from **corn**, have wide applications in food and pharmaceutical industry. (F) (S) (P)

- **Sodium Isostearoyl Lactylate. Lactylates** are organic compounds that are FDA approved for use as food additives and cosmetic ingredients (i.e. lactylates are food grade emulsifiers). Current manufacturing practices were patented in January 1956 and combine fatty acids (e.g. naturally derived stearic acid) and lactic acid at elevated temperatures. For CSL and SSL, the stearic acid component is typically produced from vegetable oils such as **corn**, soybean oil or palm oil. Lactic acid is primarily produced by lactic acid fermentation of sugar with lactic acid bacteria (similar to the bacteria used to produce yogurt). The sugar can be sucrose, fructose, or glucose obtained from **corn**, sugar beet or sugar cane. Since soy, corn and beet are potential GM crops, ask for non-GMO certification. (F) (C)

- **Sodium lactate** is the sodium salt of lactic acid. It is produced by the fermentation of a sugar source, such as **corn** and sugar beets - both GM crop, and by neutralizing the resulting lactic acid. (F) (S) (C)

- **Sodium levulinate** is a sodium salt of levulinic acid derived from **corn** – a GM crop. It is used as a skin conditioning agent, and preservative in cosmetics and personal care products. Sodium Levulinate can also be used as a food preservative, especially fresh meats. **Synonym(s):** 4-oxo-sodium salt pentanoic acid; pentanoic acid; 4-oxo, sodium salt; pentanoic acid, 4oxo, sodium salt; sodium 4-oxovalerate; sodium salt pentanoic acid. (F) (C)

- **Sodium PCA** (Pyrollidone Carboxylic Acid) or **NaPCA** (Na PCA, Na-PCA) is a vegetable-derived humectant (to keep your skin moist) and emollient found in cosmetic products. It can be made from the fermentation of sugar (**corn** or sugar beet) or starches (corn). It can also come from coconut, cherries and seaweed.

  Caution: It can form carcinogenic nitrosamine compounds on the skin or in the body after absorption, if mixed with amines. If source is not specified, ask for source. (C)

- **Sodium propionate (**E281) or Propionic Acid, and Sodium Salt is the sodium salt of propionic acid. It is a preservative and antimicrobial agent used in bakery and flour based products like breads and pizzas, as well as dairy products like cheese. (F)

- **Sodium polyaspartate** is a sodium salt coming from aspartic acid (see above) from sugar beet or **corn**. It is biodegradable polymer based on the amino acid aspartic acid. (C)

- **Sodium sorbate**. See sorbic acid. (F) (S)

- **Sodium starch glycolate** (or SSG) is the sodium salt of carboxymethyl ether. Sodium starch glycolate is used as a pharmaceutical grade dissolution excipient for tablets and capsules. Starch glycolate can come from rice, potato, wheat or GM **corn**. If source is not specified, ask. (S) (P) (C)

- **Sodium stearoyl fumarate** is a food additive derived from fumaric acid**.** (F)

- **Sodium stearoyl lactilate** is a food additive derived from lactic acid. (F) (S)

- **Sorbate.** See potassium sorbate. (F)

- **Sorbic acid** (E200): Sorbic acid, or potassium sorbate (synthetic) or 2,4-hexadienoic acid, is a natural organic compound used as a food preservative. It is unsaturated fatty acid. It is an antimicrobial agent used as preservative in food and drinks to prevent the growth of mold, yeast, and fungi. It can be manufactured from **corn** and soy – 2 GM crops. (F) (C)

- **Sorbitan oleate, Sorbitan monooleate** or **sorbitan stearate** are emulsifiers used in beauty products, binding water and oil. They are derived from the sugar alcohol sorbitol. See sorbitol. (F) (S) (C)

- **Sorbite**: Sugar substitutes such as sorbite can come from GM **corn** or sugar beet. (F)

- **Sorbitol** (E420): Sorbitol, a sugar substitute also known as **glucitol**, is a sugar alcohol which our body metabolizes slowly. Most sorbitol is made from **corn** syrup but can also be found in apples, pears, peaches, and prunes. Since it contains almost one half (55%) less calories than refined sugar, it is often used in diet foods (diet drinks, ice cream and even in mayonnaise), mints, mouthwashes, toothpaste, cough syrups, and sugar-free chewing gum. It can be a as a carrier or stabilizer for supplements, vitamins and flavorings. Be careful not to take in too much sorbitol at

once as it is a known laxative. If the source is not specified, it is safe to assume that it comes from GM **corn** or sugar beet**.** (F) (S) (C)

- **Sorghum*** Sorghum, in itself, is not a GM crop but the grain, starch or syrup can be cross contaminated with **corn**. Please be careful if you are allergic to corn. (F)

- **Splenda**. See artificial sweetener. (F) (S) (P)

- **Starch**: Almost all of the enzymes used to break down starch are produced with the help of genetically modified microorganisms. The most important sources of starch are GM **corn**, potatoes, and wheat. When corn is used as a source of starch, a certain portion of the raw material may be genetically modified, as GM corn is common in the US and in other countries. (F) (S) (P) (C) (I)

- **Starch paste**. The thick, viscous, smooth suspension formed by cooking starch from **corn** in a water suspension to a point above its gelatinization temperature. (F)

- **Stearic acid** (E570) or **vegetable stearic acid** is a saturated fatty acid. It is an emulsifier, thickener, and stabilizer. It occurs in many animal and vegetable fats and oils. Stearic acid is prepared by treating these fats and oils with water at a high pressure and temperature (above 200 °C), leading to the hydrolysis of triglycerides. The resulting mixture is then distilled. Stearic acid is used to produce dietary supplements. Commodity soybean oil is composed of five fatty acids: palmitic acid (16:0), stearic acid (18:0), oleic acid (18:1), linoleic acid (18:2), and linolenic acid (18:3). It can be found in butter flavoring, vanilla flavoring, chewing gum and candy, and fruit waxes. It is also used as coating for medicine and supplements tablets to ease unmolding. It can be made from soybean, **corn**, cottonseed, coconut oil, the fat of cows (see bovine), pigs (see porcine) and sheep. Since alfalfa, **corn**, cottonseed, soybean oil and **bovine**/**porcine** fats are questionable, ask for certification. (F) (S) (P) (C)

- **Stearate** is the anion form of stearic acid (see stearic acid). It is a saturated fat that can come from animal or plant sources. If from plant sources, it can come from **corn**, cottonseed, and soybean sources. If it comes from animal source (beef tallow), it might come from cows fed with GE corn, alfalfa or soybean as well as GE growth hormones and thus be suspect. See bovine paragraph for GMO questions.

- **Stearoyl** is an enzyme extracted from stearic acid, a fatty acid that can come from cottonseed, **corn** or soy. (F) (S)

- **Stearyl Alcohol** is a fatty alcohol made from stearic acid and cetyl alcohol. It is an emulsifier, emollient, foam booster, stabilizer, and thickener in beauty products. It can be produced from sperm whale oil (rare and expensive) or from vegetable sources, typically coconut or sometimes **corn** or soybean oil – both GMO crops. (C)

  Similar ingredients: Isostearyl Isononanoate, Stearamine Oxide, Stearyl Acetate, Stearyl Caprylate, Stearyl Citrate, Stearyldimethyl Amine, Stearyl Glycyrrhetinate, Stearyl Heptanoate, Stearyl Octanoate, Stearyl Stearate.

- **Steepwater**. Water containing dissolved protein, minerals and other substances in which **corn** has been soaked or "steeped" during the initial stages of the corn refining process. (F)

- **Sucralose**. See artificial sweetener. (F) (S) (P)

- **Sucrose**. If source is not specified, most likely sucrose has been extracted from **corn** or sugar beet, both suspected GM **crops**. (F)

- **Sugar***, if not identified as cane, can come from **corn** or **sugar beet** – both GM crops. (F)

- **Sugar Alcohols**: The common sugar alcohols – sorbitol, mannitol, maltitol, erythritol, and hydrogenated starch hydrolysates – are manufactured from GM **corn** starch. Xylitol, another common sugar

alcohol, is manufactured from such sources as corn cobs (a GM crop), sugar cane bagasse (stalk residue remaining after sugar extraction), or birch wood waste. Isomalt and lactitol are becoming more common and are manufactured from sucrose (sugar beet – a GMO crop) and whey (see dairy), respectively. Isomalt and lactitol are commonly called bulk sweeteners because their sizes are nearly the same as sugar. (F) (S) (P) (C)

They are:

- **Erythritol**: Erythritol is the newest sugar alcohol to be manufactured from **corn** starch. Unlike sorbitol, maltitol or hydrogenated starch hydrolysates, erythritol is produced by a fermentation process. (F) (S)

- **FOS or Fructooligosaccharide**: Two different classes of fructooligosaccharide (FOS) mixtures are produced commercially, based on inulin degradation or transfructosylation processes. Although FOS can be produced by degradation of inulin, or polyfructose, it is also produced by the transfructosylation action of a β-fructosidase of *Aspergillus Niger* on sucrose (could come from **corn** or sugar beet, 2 GM crops). (F) (S)

- **Hydrogenated starch hydrolysate**: The singular term "hydrogenated starch hydrolysate" is applied to a family of polyol products. Hydrogenated starch hydrolysates (HSH) are produced by the partial hydrolysis of starch – **corn** being the most prominent – and the subsequent hydrogenation the various starch fragments (dextrins). In practice, "hydrogenated starch hydrolysate" is used to describe products that contain more hydrogenated dextrins than sorbitol or maltitol. (F) (S)

- **Isomalt**: Isomalt is manufactured from sugar (from **corn** or sugar beet – GM crops). The original glucose – fructose bond remains intact. The fructose portion of sugar is converted to equal amounts of sorbitol and mannitol. The glucose portion is unchanged. Thus,

isomalt is a mixture of two disaccharides, glucose-sorbitol and glucose-mannitol. (F) (S)

- **Lactitol**: Lactitol is manufactured from **whey**, the lactose (milk sugar) rich by-product of cheese making and processed **dairy** foods. Lactitol is slightly less than half as sweet as sugar and is considered to have 2 calories per gram, which has been accepted by the Food and Drug Administration. In laboratory studies, lactitol has been shown to promote the growth of the two bacteria recognized to improve the health of the large intestine. As a result, the prebiotic potential of lactitol is sometimes highlighted for the foods using this sugar replacer. (F) (S)

- **Maltitol**: Maltitol is manufactured by hydrogenating maltose, the glucose-glucose disaccharide (two sugars) derived from **corn** starch. The use of maltitol in food is approved in most countries including Canada, Europe, Australia, New Zealand and Japan. (F) (S)

- **Mannitol**: Commercially, mannitol is manufactured from fructose. Today, the source of fructose is **corn** starch. Prior to the commercialization of starch hydrolysis, mannitol was produced from the fructose component of invert sugar. During hydrogenation (hydrogen addition), the fructose molecule rearranges to the sugar mannose. That is why this sugar alcohol is called mannitol. (F) (S)

- **Sorbitol**: Although small amounts of sorbitol are present is some fruits, the commercial source of sorbitol is the dextrose (glucose) produced from **corn** starch. Sorbitol is manufactured by hydrogenating (adding hydrogen) the recovered dextrose. While another name for sorbitol is glucitol (resembling glucose), sorbitol is the term used by the food industry. (F) (S)

- **Tagatose** is a functional sweetener. Tagatose is a natural sweetener present in only small amounts in fruits, cacao, and **dairy** products

(potential GMO ingredient). Tagatose can be commercially produced from galactose through an enzymatic process, starting with lactose which is hydrolyzed to glucose and galactose. The galactose is isomerized under alkaline conditions to D-tagatose by calcium hydroxide. The resulting mixture can then be purified and solid tagatose produced by crystallization. It is 92% as sweet, but with only 38% of the calories. (F), (S)

- **Xylitol**: Xylitol has approximately the same sweetness as sugar. Xylitol provides the greatest cooling effect of any of the sugar alcohols. Xylitol has a pronounced mint flavor. These characteristics make xylitol the polyol of choice for sugar-free chewing gums, candies and chewable vitamins. See sugar alcohol. (F) (S)

- **Syrups** – golden, invert, invert sugar, malt and malt extract syrups often come from processed **corn** starch. (F)

- **Table salt**. Ordinary iodized table salt contains dextrose. According to Morton salt, dextrose is added to stabilize the iodine compound in the salt. See dextrose. (F)

- **Tamales** is a Mexican dishes made with **corn** meal and additional fillings, wrapped in a banana leaf and steamed. (F)

- **TEA-Stearate** is the triethanolamine (TEA) salt of stearic acid. See stearic acid. (C)

- **Threonine** is an amino acid obtained from the hydrolysis of **corn** or soy protein – GM crops. The production of threonine with help of genetically modified microorganisms is spread worldwide. It is produced by fermentation technology using genetically modified strains of Escherichia coli. (F) (S)

- **Tocopherols** are the lower quality forms of vitamin E. As a food additive, they are **tocopherol** (E306), **alpha-tocopherol** (E307), **gamma-**

tocopherol (E308) and **delta-tocopherols** (E309). They can be found naturally in sunflower, peanut, sesame, olive and walnut oils. Commercially, they are extracted from cheaper oils such as canola, **corn,** cottonseed and soybean – all GM crops. Although they are all approved in the USA, EU and Australia and New Zealand for use as antioxidants in food and vitamins, since they are typically coming from GM crops, caution. Ask for food source. (F) (S) (C)

- **Tocopheryl Acetate** is a fat-soluble vitamin that can be isolated from vegetable oils (canola, **corn**, cottonseed and soy – all GM crops). It is also found in dairy products, meat, eggs, cereals, nuts, and leafy green and yellow vegetables. (F) (S) (C)

- **Tocotrienols** are the natural form of vitamin E. Their three main commercial sources are rice bran, palm and annatto. In its natural form, it can be also be found in grains like barley, **corn** (a GM crop), oat, rye, wheat bran and wheat germ; they can also be found in vegetables like broccoli, cauliflowers, carrots, and olives; in fruits like apricots, avocado, black currants, blueberries, grapes and its seeds; nuts like almonds, cashews, coconut, macadamia, and pistachio; and even certain meats (lard) and eggs. (F) (S) (C)

- **Treacle** (aka golden syrup) is usually a blend of molasses, sugar, and **corn** syrup. (F)

- **Trehalose,** also known as **tremalose** or **mycose**, is a natural alpha-linked disaccharide (non-reducing sugar) formed by an α,α-1,1-glucoside bond between two α-glucose units. Extracting trehalose was once a difficult and costly process, but circa the year 2000, a Japanese company developed a cheap process for mass production using an enzyme-based process to convert wheat and **corn** syrups to trehalose. Corn starch is a potential GM crop. (F) (S) (C)

- **Tetrahydrofurfuryl alcohol** is a resin developed from processing **corn cobs**. These resins are useful in the paint and varnish industry as solvents for dyes, lacquers. (I)

- **Triacetin** is a derivative of glycerin (acetylation of glycerol). (F) (S) (P)

- **Triethyl citrate** (E1505) is a triester of ethyl alcohol and citric acid. It is a colorless, odorless liquid used as a food additive to stabilize foams, especially as whipping aid for egg white. It is also used in pharmaceutical coatings and plastics. In cosmetics, it is used as a fragrance ingredient, plasticizer, antioxidant, deodorant, plasticizer, and solvent. See ethyl alcohol and citric acid. (F) (S) (P) (I) (C)

- **Triglyceride** or **triacylglycerol**, or **triacylglyceride** is an ester derived from glycerol and three fatty acids. Triglycerides are the main constituents of vegetable oil (typically more unsaturated), most likely canola (rapeseed or linseed) oil, **corn** oil, soybean oil or cottonseed oil – all potential GM crops. (F) (S) (C)

- **Truvia** (from our friends at Coca Cola and Cargill) is a genetically engineered sweetener made of **Erythritol, a** sugar alcohol which comes from the processing of genetically modified **corn** (unpleasant side effects: gastric distress, diarrhea, cramping, gas and bloating); **Rebiana** ½ of 1% of Truvia. True, rebiana is extracted from the Stevia plant (*Stevia rebaudiana)* but it is only one of the molecules of the stevia plant. It is 400% sweeter than sucrose. And finally, it contains **Natural Flavors**, whatever that means since the word "natural" is not regulated by the FDA. So, in fact we a have a "natural" sweetener made of 99.99% erythritol, a sugar alcohol derived from a potential GM crop, corn. By the way, you can place **PureVia** (by Pepsi Cola) and **Nectresse** (offered by the same people that created Splenda) in the same artificial sweetener trash bag. Stay away from this slickly marketed products to sound like Stevia. Please use the real thing, organic and pure Stevia. (F) (S) (P)

- **Unmodified starch** commonly come from **corn**. Can also come from other starch sources. If not clear, please ask for source. (F)

- **Vanilla extract** or **Natural Vanilla**: Vanilla extract is made by macerating and percolating vanilla beans in a solution of ethyl alcohol (from GM **corn**) and water. Vanilla extract may contain one or more of the following optional ingredients: Glycerin (see glycerin); Propylene glycol (see propylene glycol). Sugar –possibly from sugar beet, a GM crop (including invert sugar); Dextrose (see dextrose); and Corn syrup (from GM corn). If you are vegetarian or vegan, please be aware that some manufacturers use a "natural" vanilla product prepared by hot-alcohol extraction of castoreum, the dried and macerated castor sac scent glands (and their secretions) from beavers. Castoreum as a food additive is classified by the Food and Drug Administration as "generally recognized as safe" (GRAS). If you are allergic, make your own with real vanilla bean steeped in corn-free vodka. (F) (S) (P) (C)

- **Vanillin** (ethyl vanillin - artificial vanilla flavoring, vanilla flavor) is produced from the petrochemical raw material guaiacol (coal tar). Several routes exist for synthesizing vanillin from guaiacol. Vanillin can trigger migraine headaches in a small fraction of the people who experience migraines. Not GMO but from petrochemical. Avoid.

- **Vegetable anything** that's not specific* can come from canola, cottonseed, **corn** or soy origins. (F) (S) (P) (C)

- **Vegetable-based fatty acids**, when not specified, could come from canola, **corn,** cottonseed or **soybean** – al GM crops. (F) (S) (C)

- **Vegetable fats** and **oils**. The vast majority of commercial oils used in restaurants, fast food establishments and sold at your local grocery store are from canola, **corn**, cottonseed and soy. Soybean oil by itself comprises about 80% of commercial oils. A large percentage of these crops come genetically engineered (see details above) and are usually blended into "regular" oils. Unless they are specifically labeled "USDA Certified Organic" or "non-GMO Verified, be cautious and ask for source. For cooking, you can look for untainted oils or fats such as butter (make sure is does not contain bovine growth hormones), olive, coconut,

safflower, sunflower, and peanut oils; for cold applications, use flaxseed, walnut, hazelnut, and macadamia oils. (F) (S) (P) (C)

- **Vegetable fiber**: Could come from either **corn** or cottonseed – GM crops. See cellulose. (S) (P)

- **Vegetable lubricants**: They can be any of the following: Stearic acid or stearates, magnesium stearate, calcium stearate, ascorbyl palmitate, fractionated vegetable oil, hydrogenated vegetable oil, castor oil, etc. These are primarily triglyceride esters that can be derived from plants as well as animals. Other common vegetable-based lubricants are high oleic canola oil (GM crop), castor oil, palm oil, soybean oil (GM), sunflower seed oil and Tall oil from tree processing sources. Other deceptive names such as Pharmaceutical Glaze, Confectioners Glaze or Natural Glaze are names for shellac. Natural Vegetable Coating, Natural Protein Coating, Vegetable Coating, and Maize Protein are names for Zein which is **corn** protein – a GM crop. (F) (S) (P) (C)

- **Vegetable pepsin** is a misnomer. It really comes from the enzyme papain from the papaya fruit. Since all papaya from Hawaii and most from Florida is genetically engineered, beware. Ask for source. (S)

- **Vegetable stearate** can come from coconut oil, cocoa butter, palm oil, **corn**, cottonseed or soybean oils. They are high in stearic acid. These can also be used to make vegetable magnesium stearate. Ask for source. (F) (S) (P) (C)

- **Vinegar, white** is distilled from **corn** fermentation. (F)

- **Vinyl acetate** is the precursor to polyvinyl acetate. The industrial version involves the reaction of ethylene and acetic acid with oxygen in the presence of a palladium catalyst. See ethylene and acetic acid. (I)

- **Vitamin A acetate, Retinol acetate or Retinyl acetate** is an ester (dry) form of vitamin A which makes it more shelf stable than the oils version.

It can be presented in a dispersion of a gelatin matrix with sucrose from sugar beet, a GM crop, food starch from **corn, a** GM crop, methylparabin, propylparabin, and potassium sorbate preservative. (S)

- **Vitamin B**: Some synthetic vitamin B comes from coal tar. Not GMO but not from plant source. Avoid.

- **Vitamin B2** (riboflavin) can be produced synthetically or by genetically modified microorganisms (*Bacillus subtilis)* typically grown on glucose/fructose from GM **corn**. Synthetic vitamin B2, can also come from activated sewage sludge. (S)

- **Vitamin B3 (niacin or nicotinic acid** and **vitamin PP**): See niacin. (F) (S)

- **Vitamin B12** (cobalamin). There are three forms of cobalamins: **Hydroxocobalamin, Methylcobalamin** and **Cyanocobalamin**. While hydroxocobalamin is preferred over cyanocobalamin, another formulation called methylcobalamin is actually the best choice. Technically a `coenzyme` of vitamin B12, it is almost never used despite being effective, readily available, inexpensive and available in both sublingual preparations and injectable form. While Japan uses methylcobalamin nearly exclusively and it is the form present in prescription vitamin B12 there, the United States has virtually ignored the hundreds of studies that show the benefits this simple vitamin can bring.

  B12 can sometimes be found on the surface of plants, but commercial B12 production is partly based on growing B12 on the surface of glucose (GM **corn**) or molasses (GM beet sugar). Commercially, vitamin B12 is synthesized by microbial fermentation. The species *Pseudomonas denitrificans* and *Propionibacterium shermanii* are more commonly used today. These are frequently grown under special conditions to enhance yield, and at least one company, Rhône-Poulenc of France, which has recently merged into Sanofi-Aventis, used genetically engineered versions of one or both of these species. Genetic approaches like genome

shuffling have also been applied in Propionibacterium shermanii to improve yields of vitamin B12. (F) (S) (P)

Lastly, **cyanocobalamin** is the synthetic form of B12 and is the most commonly available form of vitamin B-12 on the market is the cheapest form that is actually bound to a cyanide molecule (yes, cyanide, the poison). It's called cyanocobalamin, and you'll find it in all the cheap vitamins made by pharmaceutical companies and sold at grocery stores and big box stores. Avoid.

- **Vitamin C** (citric acid or ascorbic acid). Nearly all of the "vitamin C" sold across the U.S., when not extracted directly from food, is most likely synthesized ascorbic acid derived from **corn**. It is produced by genetically engineered microorganisms typically grown on glucose/fructose from GM corn. You can purchase synthetic vitamin C, also called ascorbic acid. (F) (S) (P)

- **Vitamin E*** can be derived from vegetable oils such as canola, **corn**, soybean – all GM crops, as well as sunflower oil. (F) (S)

- **Vitamin D2 or ergocalciferol**, is not a natural form of vitamin D. Also called **calciferol** or vitamin D2, it is made from radiating fungus. It is half as potent as D3. It is a patented drug that behaves like vitamin D, but it is not natural. It has been responsible for the vast majority of toxicity reports on vitamin D and should be avoided. Vegans like to take this form because it is not derived from animals. However, ergocalciferol is foreign to the human body.

  When **vitamin D3** is labeled as **cholecalciferol** then it comes from lanolin in wool oil. This is considered a vegetarian source (the animal is not harmed, just sheared), but not vegan. If fish liver oil is shown in parentheses, it will be the source. Vitamin D3 is the better product to use next to 20 minutes to exposure daily. (F) (S)

- **Vitamin E** exists in eight different forms, four **tocotrienols** (alpha, beta, gamma and delta) and four **tocopherols** (alpha, beta, gamma and delta). Vitamin E is widely utilized in the supplements and cosmetic industry as

an ingredient in the manufacture of soaps, creams, make-up and hair care products. (F) (S) (C)

Tocopherols are the lower quality forms of vitamin E. As a food additive, they are **tocopherol** (E306), **alpha-tocopherol** (E307), **gamma-tocopherol** (E308) and **delta-tocopherols** (E309). They can be found naturally in sunflower, peanut, sesame, olive and walnut oils. Commercially, they are extracted from cheaper oils such as **canola**, corn, and soybean – all GM crops. Although they are all approved in the USA, EU and Australia and New Zealand for use as antioxidants in food and vitamins, since they are typically coming from GM crops, caution. Ask for food source. (F) (S) (C)

Mixed Tocopherols are a concentrated form of both forms of tocopherols derived from the same GM crops. Mixed tocopherols in the US are less fractionated "natural mixed tocopherols" and high d-gamma-tocopherol fraction supplements. These can still come from GM crops. (F) (S) (C)

Tocotrienols are the natural form of vitamin E. Their three main commercial sources are rice bran, palm and annatto. In its natural form, it can be also be found in grains like barley, **corn** (a GM crop), oat, rye, wheat bran and wheat germ; they can also be found in vegetables like broccoli, cauliflowers, carrots, and olives; in fruits like apricots, avocado, black currants, blueberries, grapes and its seeds; nuts like almonds, cashews, coconut, macadamia, and pistachio; and even certain meats (lard) and eggs. (F) (S) (C)

Both members of the vitamin E family act as antioxidants. However, the natural vitamin E is a more powerful antioxidant due to its unique molecular structure. Unfortunately, since the synthetic version is cheaper to produce, it is most likely that, if you do not pay attention, you will use the tocopherols extracted from GM crops. If you are looking for the real thing and the non-GMO version, look for the tocotrienol form of vitamin E. (F) (S) (C)

Finally, you have the **synthetic vitamin E**, commonly referred to as **dl-alpha-tocopherol**, the cheapest form of vitamin E, most commonly sold supplement form usually as the acetate ester. Synthetic forms of the nutrient have "dl" or "all-rac" in front of the name, like "dl-alpha-tocopherol". This synthetic form of vitamin E is derived from **petroleum**

products. Synthetic vitamin E is most commonly used in tablets and multiple vitamins. Only about 25% of synthetic vitamin E is used by our body. The present largest manufacturers of this type are DSM and BASF. Since it is synthetic and not coming from a natural source, one could say it is GMO-free, but I would still avoid it. (F) (S) (C)

- **Vitamin E acetate or Tocopheryl acetate**, is the acetic acid ester form of tocopherol isolated from vegetable oils (usually canola, **corn** and soybean – all GM crops). Because it contains antioxidants and do not oxidize as fast as tocopherol, it is a common vitamin supplement used in dermatological products such as skin cream, lipstick, eye shadow, blushers, face powders and foundations, moisturizers, skin care products, bath soaps and detergents, hair conditioners, and many other products. (C)

- **Vitamin K** (Phylloquinone: K1; Menaquinone: K2; Menadione: K3). As usual with vitamins, there are natural vitamin K from food and vitamin K coming out of a lab. Natural vitamin K1 (Phylloquinone) comes from eating green leafy vegetables, such as kale, spinach, turnip greens, collards, Swiss chard, mustard greens, parsley, romaine, and green leaf lettuce; vegetables such as Brussels sprouts, broccoli, cauliflower, and cabbage; fish, liver, meat, eggs, and in some cereals in smaller amounts. Vitamin K2 (Menaquinone) is produced by our own gut friendly bacteria, grass-fed meats, pasture-raised poultry and eggs and fermented organic soybean natto and miso.

  On the other hand, **vitamin K3** (Menadione) is chemically synthesized from the fermentation of soybean protein isolate and **corn** starch – both GM crops, in the presence of Gram-positive bacterium Bacillus subtilis natto. So make sure to ask for the source. Better yet, get it from fresh food. (S)

- **Vitamins**. Most commercial vitamins, when not specified, are synthesized in a lab from **corn**, soy of sugar beet. (F) (S)

- **Waxy maize**. A variety of **corn**, the starch content of which consists solely of branched molecules. (F)

- **Xanthan gum or Dehydroxanthan** is a polysaccharide secreted by the bacterium *Xanthomonas campestris* from the digestion and fermentation of **corn** syrup or fructose from GM sugar beet under controlled conditions. It is commonly used as a food thickening agent (in salad dressings or gluten-free flours for example) and a stabilizer (in cosmetic products). (F) (C)

- **Xylitol (E 967):** Traditionally, xylitol is produced chemically from wood sugar (xylose), which is available from wood chips produced in the paper industry. Xylose occurs in the tissue of many plants, such as birchwood, straw, **corn** cobs – a GM crop, and coconuts. Additionally, glucose can be the base material for the production of xylitol. This develops in the process of starch saccharification of plant starch. If glucose is grown on corn starch it may consist partly of genetically modified maize, especially when the raw materials are imported from the USA or Argentina. Ask for source. (F) (S)

- **Yeast**: The most commonly used strain of yeast is ***Saccharomyces cerevisiae.*** All strains of *S. cerevisiae* can grow aerobically on **glucose**, **maltose**, and **trehalose** (a form of glucose) and fail to grow on lactose and cellobiose. However, growth on other sugars is variable. **Galactose** and **fructose** are shown to be two of the best fermenting sugars. The ability of yeasts to use different sugars can differ depending on whether they are grown aerobically or anaerobically. Some strains cannot grow anaerobically on sucrose and trehalose. All of the following sugars are used as growing medium for yeast: glucose, maltose, trehalose, galactose and fructose. They can come from **corn** or sugar beets – 2 GM crops. (F) (S)

- **Zea** mays is another name for milled **corn** cobs. (F)

- **Zea mays meal** or **corn cob meal** is derived from milled corn cob. Is exfoliates, draws impurities from skin. (F)

- **Zea mays oil** = **corn** oil, a GM crop. (F)

- **Zeaxanthin** can be found in vegetables such as kale, as well as various fruits and **corn –** a GM crop. Only one zeaxanthin form (3R, 3'R) is naturally found in fruits and vegetables and it is the one the body prefers. It is also the only one that has been approved as a dietary supplement. Meso-zeaxanthin (the synthetic form) is available in dietary supplements, but more often than not, it isn't clearly labeled. (F) (S)

- **Zein** is a class of prolamine protein found in **corn**. It can be found as a powder from corn gluten meal. It is used to coat fruits and nuts, pills, candies and to coat plastics and buttons. (F) (I)

- **Zinc ascorbate** is zinc processed with ascorbic acid (see ascorbic acid) and acetone. It is a manufactured item used 'non-food' supplements. (F) (S)

- **Zinc citrate** is smithsonite processed with citric acid (see citric acid). It is used in the manufacture of some toothpaste. (C)

- **Zinc gluconate** is a zinc rock processed with gluconic acid (see gluconic acid). Gluconic acid is used in many cleaning compounds. (I)

- **Zinc lactate** is smithsonite processed with lactic acid (see lactic acid). Lactic acid lactate is used as a solvent. (I)

COTTON

Cotton – (Approx. 94% of U.S. crop in 2012). Cottonseed oil, fibers, cellulose, methylcellulose, etc. Cotton containing the Bt (*Bacillus thuringiensis*) toxin originating from India and China, in particular, is considered higher risk for personal health. Monsanto has developed dicamba-resistant cotton variety, pending USDA approval. Like 2,4-D, dicamba easily drifts off-target and is highly toxic to many plants and many more.

- **Oil**: the highly processed cotton seed oil is utilized for cooking and deep frying, as well as in hydrogenated margarine.

- **Whole grain**: the albuminous pellet is used primarily for feed. It is also the base for protein compounds and isolates, as well as for cotton seed milk.

- '**Linters'**: These very short, non-textile fibers cling to the cotton seeds. They consist almost exclusively of cellulose. Various food additives such as thickening agents, stabilizers, emulsifiers or supplement fillers are made from these.

Ingredients and Products Made With or From Cotton

For all following ingredients or products, ask for source, USDA Organics or non-GMO certification.

Please note: To clarify in which industry each of the following products are used, I used (F) for food and drinks, (S) for supplements, (P) for pharmaceuticals, (C) for cosmetics, (A) for animals feed and pet food, and (I) for industrial uses.

- **Acetic acid (**E260), also called **Ethanoic acid, Acetasol**, **Methanecarboxylic acid**, **Ethylic acid**, **Vinegar acid**, **Acetic acid**, **Glacial acetic acid**, **Acetate**, **Essigsaeure** is a colorless liquid. When undiluted, is called *glacial acetic acid*. Acetic acid is the main component (6 to 9%) of white vinegar. Some of it is manufactured from petrochemical or wood distillation. The remainder is produced by fermentation and subsequent oxidation of ethanol - produced from a variety of feedstocks such as sugar beet, corn, **cotton**- all suspected GM crops (see ethanol below). By the way, that makes white vinegar a suspect ingredient as well. (F) (S) (C) (P)

- **Beta carotene** is a precursor the body can convert to vitamin A. Unfortunately, as a supplement, synthetic beta carotene is usually "stabilized" in refined vegetable oils (corn, soy or cotton – all GM crops). In this transfatty acid form, oxidation occurs and the chemically "pure" beta carotene can no longer act as a nutrient, because it was changed. Almost all synthetic beta carotene is produced by the Swiss drug giant Hoffman-LaRoche. This form can no longer be converted to vitamin A. The best it can be is worthless, and the worst is toxic. Synthetic vitamins cannot prevent deficiencies. (F) (S) (P)

- **C12-15 alkyl benzoate** (ethanol) can be found under the trade names *Crodamol* AB or *Tegosoft* TN. It is the ester (a compound of acids and alcohols) of benzoic acid and C12-15 alcohols. It is refined from corn, beet or **cotton** – all GM crops. (S) ({P)

- **Calcium carbonate** can come from limestone or from cow's bone meal or dolomite. It is used in the food industry as an alkaline agent, nutrition supplement, a dough regulation agent, solidification agent, yeast foodstuff, resist of lumping agent, loosening agent, fermenting agent and a modifier. Since the majority of cows are fed GM feed (corn, soybean, beet or **cotton**), be cautious.

- **Calcium hydroxyapatite.** Many foods can supply various calcium salts but human and animal bones are the only natural source of calcium hydroxyapatite. The most efficacious calcium hydroxyapatite is microcrystalline hydroxyapatite concentrate (MCHC) extracted from the raw bones or bone marrow of cattle. Since cattle can come from feedlot animals fed GM alfalfa, corn, soybean, or **cottonseed** feed (see bovine), be careful.

- Calcium ***microcrystalline hydroxyapatite*** (MCHC) is a technical name for powdered calf or cow bone. It is prepared using a special process of re-suspending bone matrix into an easily absorbable crystalline structure. See MCHC below. MCHC also goes by other names, including

MCHA, HA or ossein hydroxyapatite. Since it can come from bovine fed with GM crops (corn, soybean, **cotton**) feed (see bovine), ask for source.

- **Calcium phosphate, Monosodium, Dicalcium and Tricalcium phosphates** are forms of precipitated bone phosphate. In the food processing industry, it is used as leavening agent, dough modifier, buffer, nutritional supplement, emulsifier, and stabilizer. In is also used as a frictional agent for top quality tooth paste. It is used in the pharmaceutical industry to make calcium tablets. Since calves and cows used for bone-sourced calcium are typically fed corn, soybean, **cotton** or beet feed – all suspected GM crops, ask.

- **Calcium stearate** is an octodecanoic calcium salt and can be extracted from animal fat or triglyceride esters that can be derived from plants such as **cottonseed**, corn or soybean – all suspected GM crops. (F)

- **Casein** is a white, tasteless, odorless protein precipitated from dairy milk by rennin. It is the basis of cheese and is used to make plastics, adhesives, paints, and foods. As all dairy products from bovines, since the vast majority of these animals are fed corn, soy or **cotton** feed (all suspected GM crops), ask. This is valid for all casein-derived products.

- **Cellulose** (E 460), Carboxymethyl Cellulose, Croscarmellose Sodium, Ethylcellulose, Hydroxypropyl Cellulose, Hydroxypropyl Methylcellulose, Hydroxymethyl Cellulose and Methylcellulose (E 461), Microcrystalline Cellulose, and Croscarmellose Sodium. They sometimes show on labels as crospovidone(s), bentonite, and polysorbate(s). They are used as filler, binder, or coating. Leftover cotton fibers that are too short to be spun into textiles consist almost completely of cellulose and can be used as food additives. Cellulose and methylcellulose can be used as thickeners, stabilizers, emulsifiers, or fillers in medication or supplements. **Cotton** is a potential GM crop. It can also come from corn or sugar beets, both suspected GM crops. (F) (S) (P)

- **Cheese spreads**, besides the dairy issue, can contain corn, **cottonseed** or soy oil – all GM crops

- **Choline.** The most often available choline source, lecithin is derived from soy or egg yolks, often used as a food additive. Soy bean is a

potential GM crop. Eggs can come from chicken fed corn, soy or **cottonseed** feed, all GM crops.

- **Collagen**: Manufacturers of collagen-based dietary supplements claim that their products can improve skin and fingernail quality as well as skin and joint health. However, mainstream scientific research has not shown strong evidence to support these claims. Collagen is sometimes made from chicken sternal cartilage extract. Most medical collagen is derived from young beef cattle (bovine) from certified BSE-free animals. Porcine (pig) tissue is also widely used for producing collagen sheet for a variety of surgical purposes. It can also be made from equine (horse) source (mostly in Europe). The issue here is not so much from what animal is collagen coming from as much as what food is used as animal feed. In the vast majority of cases, chicken, bovine and pigs are fed corn, soy or **cottonseed** feed – all GM crops.

- **Cooking oils** can be corn, **cottonseed** or soybean oil.

- **Cottonseed oil** is a high-value cooking or frying oil and is sometimes used to make margarine. The oil is also a source of Vitamin E (tocopherol).

- **Diglyceryl monooleate** is an emulsifier (like lecithin) or stabilizer in food and supplement production. These fatty acids can be made from a mixture from vegetal oils (**cottonseed** oil or soybean oil).

- **Elastin** is a protein found in the skin and tissue of the body. It helps to keep skin flexible but tight, providing a bounce-back reaction if skin is pulled. These proteins are not from human sources; they typically are harvested from either cows or birds and in theory should promote better skin elasticity. Since it comes primarily from cows and birds, it can be argued that the protein potentially might expose users to mad cow disease and avian flu. My concern here is the quality of the feed given to these animals. Typically, they are fed corn, soy or **cottonseed** feed – all GM crops.

- **Emulsifier E481:** Emulsifier and stabilizer. Also known as Sodium stearoyl-2-lactylate. Vegetarians beware – it can be of animal origin. Also functions as a plasticizer, surfactant and is just as likely to be found in

face cream and body lotions as in bread and other bakery products. Since animals can be fed GM corn, soy or **cottonseed** feed, ask.

- **Ethyl cellulose or Ethylcellulose** (E462) is a polymer derivative of cellulose (see cellulose) in which some of the glucose units are converted into ethyl ether groups. It can come from wood, **cotton** or corn – both GM crops. Ethyl cellulose is used is a food additive as an emulsifier, a binder, and flavor fixative to make flavors last longer on our palate. In pharmaceuticals or dietary supplements, it helps mask bitter taste, strengthen and improve the appearance of tablets and capsules. It also enable the controlled release of formulations.

- **Fried food** in any form. It can be fried in corn, soybean or **cottonseed** oil – all GM crops.

- **Glyceryl lipids** is an antistatic agent made from corn and plant (soybean, corn or **cotton**) oils – all potential GM crops.

- **Hypromellose (**hydroxypropyl methylcellulose) or **HPMC** (Hidroxy, Propyl, Methyl, Cellulose): a widely used excipient in pharmaceuticals, food and cosmetics. Well suited for various cultural, religious and vegetarian dietary requirements. They can be made from pure cellulose of either pine, poplar or **cotton** fiber – a potential GM crop.

- **Lauryl + oleoyl alcohol ethoxylates** is a surfactant (cleaning agent) made from coconut and also contains oleic acid from canola, **cotton** or corn oil (oleoyl alcohol).

- **Lecithin** can be extracted from corn, soy, sunflower or egg yolks, often used as a food additive. Soy bean is a potential GM crop. Eggs can come from chicken fed corn, soy or **cottonseed** feed, all GM crops.

- **Magnesium stearate**. All forms of stearates are derived from stearic acid, a form of fat that exists as a glyceride in tallow and other animal fats and oils, as well as some vegetables oils manipulated synthetically by hydrogenation of corn, **cottonseed** and soybean oils – all suspected GM crops.

- **Medium chain triglycerides** (MCTs) are medium-chain fatty acid esters (caprylic acid, capric acid, caproic and lauric acids) of glycerol. They can come from horse milk, cow' butter (caution: typically, cows are fed corn, soy or **cottonseed** feed – all GM crops), coconut oil, or palm kernel oil. If not clearly specified, be cautious.

- **Methylcellulose** is a polysaccharide made from glucose. It is used as a thickener and emulsifier in various food products. It can also be used as a thickening agent and binders in cosmetics (see below). For commercial use, methyl cellulose today is mainly obtained from wood pulp or GM **cotton** or glucose from corn or sugar beets – both GM crops.

- **Modified cellulose gum** and **cellulose gum** can be extracted from wood pulp as well as corn or **cotton** cellulose, both suspected GM crop. (F) (S) (P) (C)

- **Olus Oil** is an emollient to soften and smooth the skin. Olus is a fancy Latin word for oil. It is an expressed oil of vegetable origin consisting primarily of triglycerides of fatty acids. If source is not clearly indicated, it could come from corn, soy or **cottonseed** oils – all GM crops. (C)

- **Omega 3, 6 and 9**. If the source is not specified, be cautious. In commercial supplements, they could be extracted from refined canola, corn, **cottonseed**, or soybean oils – all suspected GM crops. Adding to that fact is that English researchers hope to produce the world's first sustainable plant source of omega-3 fatty acids this year. This gene, normally found in oily fish, will be added by "cutting and pasting" taken from marine algae into camelina, a member of the mustard family and a relative of canola plants. (F) (S) (C)

- **PEG 400 dioleate** is a polishing and shining agent. It comes from oleic acid that could come from canola, coconut, corn, **cottonseed**, olive palm or soybean oils. Ask for source. (C)

- **Plant cellulose**: See cellulose.

- **Stearic acid** (E570) or **vegetable stearic acid** is a saturated fatty acid. It is an emulsifier, thickener, and stabilizer. It occurs in many animal and vegetable fats and oils. It can be made from soybean, corn, **cottonseed**, coconut oil, the fat of cows (see bovine), pigs (see porcine) and sheep. Stearic acid is prepared by treating these fats and oils with water at a high pressure and temperature (above 200 °C), leading to the hydrolysis of triglycerides. The resulting mixture is then distilled. Stearic acid is used to produce dietary supplements. Commodity soybean oil is composed of five fatty acids: palmitic acid (16:0), stearic acid (18:0), oleic acid (18:1), linoleic acid (18:2), and linolenic acid (18:3). It can be found in butter flavoring, vanilla flavoring, chewing gum and candy, and fruit waxes. It is also used as coating for medicine and supplements tablets to ease unmolding. Since corn, **cotton**, soybean oil and **bovine**/**porcine** fats are questionable, ask for certification. (F) (S) (P) (C)

- **Stearate** is the anion form of stearic acid (see stearic acid). It is a saturated fat that can come from animal or plant sources. If from plant sources, it can come from corn, **cottonseed**, and soybean sources. If it comes from animal source (beef tallow), it might come from cows fed with GE **corn**, alfalfa or soybean as well as GE growth hormones and thus be suspect. See bovine paragraph for GMO questions.

- **Stearoyl** is an enzyme extracted from stearic acid, a fatty acid that can come from **cotton**, corn or soy. (F) (S)

- **Textured vegetable protein**: Textured or texturized vegetable protein (TVP), also known as textured soy protein (TSP), soy meat, or soya chunks is a defatted soy flour product, a by-product of extracting soybean oil. TVP is usually made from high (50%) soy protein soy flour or concentrate, but can also be made from **cotton** seeds (a potential GM crop), wheat, and oats. Soy bean is a potential GM crop.

- **Tocopherols** are the lower quality forms of vitamin E. As a food additive, they are **tocopherol** (E306), **alpha-tocopherol** (E307), **gamma-tocopherol** (E308) and **delta-tocopherols** (E309). They can be found

naturally in sunflower, peanut, sesame, olive and walnut oils. Commercially, they are extracted from cheaper oils such as canola, corn**,** **cotton** and soybean – all GM crops. Although they are all approved in the USA, EU and Australia and New Zealand for use as antioxidants in food and vitamins, since they are typically coming from GM crops, caution. Ask for food source. (S) (C)

- **Tocopheryl Acetate** is a fat-soluble vitamin that can be isolated from vegetable oils (canola, corn, **cotton** and soy – all GM crops). It is also found in dairy products, meat, eggs, cereals, nuts, and leafy green and yellow vegetables. (S) (C)

- **Tocotrienols** are members of the vitamin E family. An essential nutrient for the body, vitamin E is made up of four tocopherols (alpha, beta, gamma, and delta) and four tocotrienols (alpha, beta, gamma, and delta). Tocotrienols extracted from natural sources are **d-tocotrienols** (delta). Commercial tocotrienols can be extracted from select vegetable oils like corn, **cottonseed**, soybean, wheat germ, barley, saw palmetto, and certain types of nuts and grains. Other sources are rice bran, palm, annatto as well as coconut oil, cocoa butter, barley, and wheat germ. Ask for source.

- **Triglyceride** or **triacylglycerol**, or **triacylglyceride** is an ester derived from glycerol and three fatty acids. Triglycerides are the main constituents of vegetable oil (typically more unsaturated), most likely **canola** (rapeseed or linseed) oil, corn oil, soybean oil or **cottonseed** oil – all potential GM crops. (F) (S) (C)

- **Vegetable fiber**: Could come from either corn, soy or **cotton** – all suspected GM crops. See cellulose.

- **Vegetable anything** that's not specific* can come from canola, **cottonseed**, corn or soy origins. (F) (S) (P) (C)

- **Vegetable-based fatty acids**, when not specified, could come from canola, corn**, cottonseed** or soybean – al GM crops. (F) (S) (C)

- **Vegetable fats** and **oils**. The vast majority of commercial oils used in restaurants, fast food establishments and sold at your local grocery store are from canola, corn, **cottonseed** or soy. Soybean oil by itself comprises about 80% of commercial oils. A large percentage of these crops come genetically engineered (see details above) and are usually blended into "regular" oils. Unless they are specifically labeled "USDA Certified Organic" or "non-GMO Verified, be cautious and ask for source. For cooking, you can look for untainted oils or fats such as butter (make sure is does not contain bovine growth hormones), olive, coconut, safflower, sunflower, and peanut oils; for cold applications, use flaxseed, walnut, hazelnut, and macadamia oils. (F) (S) (P) (C)

- **Vegetable fiber**: Could come from either corn or **cottonseed** – GM crops. See cellulose. (S) (P)

- **Vegetable stearate** can come from coconut oil, cocoa butter, palm oil, corn, **cottonseed** or soybean oils. They are high in stearic acid. These can also be used to make vegetable magnesium stearate. Ask for source. (F) (S) (P) (C)

DAIRY PRODUCTS

Dairy products: Unless it is USDA Certified Organic or coming from a nearby local farm you trust, ALL dairy products can be assumed to come from commercial/industrial dairy sources (CAFO - concentrated animal feeding operations) whose cows are typically fed GM corn, cottonseed, alfalfa or soybean feed. Unless they can prove that their cattle were fed non-GMO feed, ask for clear certification.

The United States currently devotes nearly 75 million acres of land to the production of soybeans, most of which are fed to animals. Similarly, much of the nation's 80 to 90 million acres of corn is fed to livestock. Since 85 to 95% of these crops are GMO, it is safe to assume – unless provided proper certification – that "normal" dairy products contain GMO ingredients in one form or another. Sorry to break your bubble.

In the United States more than 99% of farmed animals come from factory farming. Conventional cattle grown in CAFOs is fed what is called **concentrated feed.** It can mean any number of things, but the base food is always a grain slurry, typically of corn and corn byproducts (husks, cobs) (GM crop), soy and soy hulls (GM crop), spent brewery grain (barley and such), spent distiller's grain, and other cereals. CAFO nutritionists can get pretty creative, though, sometimes including cotton byproducts (GM crop) and beets (GM crop) in their cows' diet.

Another concern with commercial dairy products is **Synthetic Growth Hormones** (rBGH – recombinant bovine growth hormones) or (rBST – recombinant bovine somatotropin) used by many dairy companies. One of the most commonly known examples of synthetic hormones is rBST. Developed by Monsanto (Posilac), rBST was created using genetically engineered E. coli bacteria. It was designed to mimic BST, a naturally occurring hormone that is produced in cattle's pituitary gland. Synthetic hormones, such as rBGH and rBST, are used to increase milk production in dairy cows. They can also be used to promote faster growth in cattle. Synthetic hormones can be found in non-organic dairy products as well as non-organic meat products.

Potential health concerns linked to the use of rBST or rBGH in dairy cows

- rBGH is proven to increase the level of circulating insulin growth factor-1 (IGF-1) in dairy cows animal followed by a 25 to 70% increase of IGF-1 excretion in their milk. Dairy cows' milk may also contain truncated IGF-1, which is even more potent than IGF-1 in the anabolic response when injected subcutaneously to rats. IGF-1 has shown a negative effect on endocrine, paracrine and autocrine mechanisms. There have been links between increased circulating IGF-1 levels and risk of breast and prostate cancer. The report noted a need to further evaluate the effects of IGF-1 and related proteins present in milk from rBGH treated cows to gut pathophysiology, particularly of infants, and to gut-associated cancers.

- Other secondary risks associated with the use of rBST or rBGH in dairy cows are: potential changes in milk protein composition (higher fat content) which can be linked to increased allergic reactions, as well as the increase use of antibiotics for the treatment of rBGH-related mastitis (infection), which could lead to increased risk of residue formation in milk and to antibiotic-resistant bacteria.

More details: http://www.organicitsworthit.org/learn/information-concerning-rbst-recombinant-bovine-somatotropin

Note: A2 milk is cow's milk that contains the A2 type of β-casein protein rather than the more prevalent A1 protein. This milk is branded by A2 Corporation and sold mostly in Australia, New Zealand and the United Kingdom. There is no consensus that A2 milk has benefits over "A1" milk. A review of the relevant scientific literature by the European Food Safety Authority (EFSA), published in February 2009, found that "a cause and effect relationship is not established between the dietary intake of BCM7, related peptides or their possible protein precursors and non-communicable diseases". In other words, A2 milk is milk and as long as it is not coming from an USDA Certified Organic dairy farm, ask for non-GMO certification.

Food Products with Possible Hidden Dairy Ingredients

- Artificial butter or flavor (see above).
- Au gratin dishes and white sauces contain dairy products.
- Baked goods -- bread, cookies, crackers, etc.

- Battered and fried foods can be dipped in milk or buttermilk before being dredged in flour and fried.
- Bavarian cream is made with milk.
- Broths and bouillons cab contain casein.
- Bread. Most commercial breads contain any form of dairy.
- Brown sugar flavoring can be colored with caramel from lactose.
- Café au lait is coffee with milk.
- Candies and candy bars can be made with milk chocolate or nougat.
- Cappuccino contains steamed milk.
- Custard is usually made with milk.
- Cakes and cake mixes can be made with butter, cream or milk.
- Canned tuna. Some brands of canned tuna fish contain casein.
- Caramel candies can be flavored with caramel from lactose (milk sugar).
- Caramel coloring and flavoring can be made from heat treatment of many food-grade carbohydrates, including milk sugar or lactose.
- Casseroles may contain dairy products.
- Cereals (protein cereals)
- Cheese and cheese flavors. Yup!
- Chewing gum. There might be a milk protein ingredients hiding in there, like Recaldent, made from casein and found in chewing gum brands such as Trident.
- Chicken fired anything can be dipped in a milk or buttermilk batter before being dredged in flour and fried.
- Chocolate and cream candies
- Chocolate milk is a drink mix made with cocoa powder, milk powder and sugar.
- Chocolate sauces and toppings may contain dairy ingredients.
- Chowders are usually made with milk or cream.
- Coffee creamers
- Cookies can be made with butter.
- Cosmetics
- Crackers can be made with butter.
- Creamed or scalloped foods
- Cold cuts, deli and processed meats may contain casein (milk protein) to act as a binder.
- Dips can be made with made with milk, yogurt or sour cream.
- Dipping sauces (most)
- Donuts

- Egg products. Commercial egg products like pre-made scrambled eggs or omelets may contain dairy.
- Fat products and sprays
- Fat replacers like Opta, K-Blazer®, ULTRA-BAKE™, ULTRA-FREEZE™, and Lita®
  are reduced-calorie fat substitutes based on egg white and milk proteins.
- French fries can be dipped in a milk or buttermilk batter before being dredged in flour and fried.
- Frozen prepared foods and meals
- Ghee (see above)
- Glazes
- Granola and granola bars
- Gravy
- Gratins or anything gratiné can be made with milk, cream and topped with cheese.
- Hot chocolate mixes
- Hot dogs can contain milk proteins as an extender or filler
- Ice cream (see above)
- Latte and other fancy coffee drinks
- Malted drinks and mixes
- Margarine
- Mashed potatoes, instant. As a dehydrated potato product, some manufacturers add butter, cream and/or milk before dehydrating, so that the end result is a tastier product.
- Meats, canned and processed, including cold cuts and deli meats contain casein.
- Medicine. Some medications may contain whey (a milk protein), or lactose as a filler. Read the labels or ask your pharmacist.
- Milk chocolate. The name says it all.
- Non-dairy creamers
- Nougat can be found in some candy like 3 Musketeers and Snickers bars in the United States. It is generally made with honey, sugar, nuts, egg whites and sometimes milk powder.
- Pastries made with butter: croissants, Danishes, muffins, scones, etc.
- Pastries filled with custard: éclairs, donuts, crullers, etc.
- Pâté (French meat loaf). Animal liver such as beef or chicken may be soaked in milk to remove blood which gives it an off taste prior to cooking, seasoning and pureeing into a pate.
- Pet food

- Pizza. Most of them are topped with grated cheese.
- Processed meats may contain casein (milk protein) to act as a binder.
- Protein, when not specified can come from milk or whey
- Puddings are typically made with milk or milk product.
- Recaldent (see above)
- Salad dressings like ranch and blue cheese can be made with milk, yogurt or sour cream.
- Sauces like béchamel or white sauce contain milk
- Sausages, all sorts. Milk protein may be used as a filler or extender in the processing of sausages like breakfast sausages, chorizo, merguez, hard salami, and other dried sausages from France, Italy and Spain.
- Seasoned chips can be flavored with sour cream or cheddar cheese
- Seasoned snacks. Same as seasoned chips.
- Seasonings. Some pre-made seasonings do contain dairy. Please read labels.
- Shellfish**.** Sometimes manufacturers, to control the stinky smell of fish, dip it in milk. Ask first before you buy.
- Simplesse® is the brand name for a fat replacer made from egg and milk protein (whey) used as a fat substitute in low-calorie food products like cheese spread, coffee creamer, ice cream, margarine, mayonnaise, salad dressing, soups, sauces and yogurt. Since Simplesse is a trademark name, you may not find it listed as an ingredient. Instead, you may read "egg and milk protein."
- Sherbets (see above)
- Soups, soup mixes and chowders contain milk or cream.
- Soy cheese may use rennet casein as a coagulant.
- Steak at a restaurant**.** Have you ever noticed how juicy and glistening a steak can be as it is walked to your restaurant table? I'll give you chef's secret. Your steak may have been brushed with butter or topped with butter blended with herbs before it's served to you. If you are allergic to dairy, don't risk it, ask for it "plain" with no added ingredients.
- Yogurt (see above)

Foods that do NOT contain dairy even though it may sound like it

- Calcium Propionate
- Calcium Carbonate
- Calcium Citrate
- Calcium lactate

- Calcium Phosphate
- Cocoa Butter
- Cocoa Powder
- Coconut butter
- Coconut Cream
- Coconut milk
- Cream of Coconut
- Cream of Tartar
- Creamed Honey
- Fruit Butter (Apple, Pumpkin, etc.)
- Glucono Delta-Lactone
- Lecithin Oleoresin
- Malted Barley or other Grain-Based Malts
- Malt Liquor
- Malt Vinegar
- Milk Thistle
- Nut Butters (Peanut, Almond, etc.)
- Oleoresin
- Sodium lactate
- Shea Butter

Note: If you feel that this is TMI (too much information), blame it on my food geekiness ☺

Assorted Dairy Ingredients and Products

For all following ingredients or products, ask for source, USDA Organics or non-GMO certification.

Please note: To clarify in which industry each of the following products are used, I used (F) for food and drinks, (S) for supplements, (P) for pharmaceuticals, (C) for cosmetics, (A) for animals feed and pet food, and (I) for industrial uses.

- **Acidophilus milk** contains added *Lactobacillus acidophilus*, to give it a tangy flavor and thickened texture. It is thicker than milk but thinner than yogurt. Like yogurt, this cultured milk is believed it can benefit digestion and prevent allergies due to the activity of the acidophilus

friendly bacteria in the digestive system. This product is more common in the English commonwealth than in America. (F)

- **Alpha-lactalbumin** is a protein present in the milk of almost all mammalian species, including in human's milk. This protein helps to synthesize the milk sugar lactose. Alpha-lactalbumin is added to some infant formula mixtures to make them more nutritious. It can be found in all milk-based products. (F)

- **Ammonium caseinate** is a water-soluble protein polymer used in formulations for industrial applications that require binding, adhesion, and emulsification. It is made of casein, the main milk protein. (F), (S)

- **Anhydrous milkfat** is made by removing practically all of the moisture and nonfat solids from pasteurized cream. The 40% milkfat cream is first concentrated to 70% to 80% milkfat, and then the high-fat cream is processed through a specialized phase inversion unit or separator. The milkfat is then concentrated in separators and vacuum-dried to remove residual moisture. Anhydrous milkfat contains no less than 99.8% milkfat and not more than 0.10% moisture. It is used by bakeries, confectioneries and producers of chocolate and ice cream all over the world. (F)

- **Artificial butter flavoring** may contain diacetyl or acetoin, two compounds that give butter its characteristic taste. Because of this, manufacturers of margarines or similar hydrogenated oil-based spreads, like I Can't Believe It's Not Butter (because it's not) typically add these butter-based flavors plus added beta carotene to get that butter yumminess. Otherwise, it would just taste like whipped oil. Yuk! (F)

- **Artificial cheese flavor**. Same as above. (F)

- **Beta-lactoglobulin** is the major whey protein of cow and sheep's milk. It is also present in many other mammalian species, except in human's milk. It is found in all milk-based products and whey protein. (F), (S)

- **Bovine Lacteal Compounds** is another name for colostrum (see below). (F), (S)

- **Buffalo curd**: A traditional and nutritious dairy product prepared from buffalo milk and it is popular throughout south Asian countries such as India, Pakistan, Sri Lanka and Nepal. (F)

- **Bulgarian yogurt**. A fermented milk product. In common with all dairy yogurt, Bulgarian yogurt is produced through the bacterial fermentation of milk, using a live culture of *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. (F)

- **Butter** consists of butterfat, milk proteins and water. It is made by churning fresh or fermented cream or milk. It is generally used in pan frying, cooking and baking, for making assorted sauces, as well as a spread and a condiment. I like to add a sliver of grass-fed butter in my morning hot chocolate. (F)

- **Butterfat** is the fatty portion of milk. Milk and cream are often sold according to the amount of butterfat they contain, fat-free, low-fat, 2% fat, and whole milk. (F)

- **Buttermilk** is the liquid left behind after churning butter out of cream. It can be served as a drink or as an ingredient in cooking or baking. (F)

- **Buttermilk solids or powder** can be used in the production of ice cream as a source of solids, in processed sliced cheese to increase viscosity, as an emulsifier in chocolate products and in dry mixes such as pancake mix, to add dairy flavor and enhance food browning. (F)

- **Butter oil** (ghee) is made by the removal of practically all of the moisture and nonfat solids from butter. It is produced by gently heating butter, disrupting the butter emulsion. The milkfat is then concentrated in separators and vacuum-dried to remove residual moisture. Sometimes butter oil is washed with water prior to the final drying stage to remove trace impurities. Butter oil contains about 99.5% milkfat and not more than 0.20% moisture. It is used in cooking, in bakeries, confectioneries and chocolate and ice cream producers. (F)

- **Butter solids** is another name for clarified butter or ghee. (F)

- **Calcium caseinate** is a protein produced from the casein in milk. The casein is separated from the other ingredients then spray dried. The food industry uses calcium caseinate in powders offering rapid dispersion in liquids, such as instant cream soups and coffee creamers. It is also used as a dietary supplement by bodybuilders and other athletes for muscle bulking up. (F), (S)

- **Calcium lactate** (E327) is a calcium salt of lactic acid. It is created by the reaction of lactic acid with calcium carbonate or calcium hydroxide. The reaction forms white crystals that are found in milk and other dairy products. It is used in foods (as an ingredient in baking powder) and given medicinally. It could come from dairy (see dairy). If not from dairy, it is produced synthetically by hydrolyzing cornstarch (a GM crop).

- **Calostro** is Spanish for bovine colostrum. (S)

- **Caramel color** and **caramel flavoring** can be made from lactose milk cooked a long time to reach the caramel color and flavor. It can also be made from sugar beet or corn syrup. Ask for source. (F), (S), (P)

- **Casein** is a white, tasteless, odorless protein precipitated from dairy milk by rennin. It is the basis of cheese and is used to make plastics, adhesives, paints, and foods. As all dairy products from bovines, since the vast majority of these animals are fed corn, soy or cotton feed (all suspected GM crops), ask. (F) (S) (C) (I)

  Related products or ingredients: Acid Casein, Bovine Casein Hydrosylate, C12, C12 Peptide, C12 Peption, Calcium Caseinate, Casein Decapeptide, Casein-derived Peptide, Casein Hydrosylate, Casein Peptide, Casein Phosphopeptide, Casein Protein Extract, Casein Protein Hydrosylate, Casein Tripeptide, Casein Tryptic Hydrolysate, Caséinate, Caséinate de Calcium, Caseinates, Caséine de Potassium, Caséine Hydrolysée, Caseins, Concentré de Caséine Hydrolysée, Cysteine Milk Peptide, Extrait de Protéine de Caséine, Extrait de Protéine de Lait, Hydrolysed Casein, Hydrolyzed Casein, Hydrolyzed Casein Concentrate, Hydrolyzed Lactalbumin, Hypotensive Peptides, Isoleucyl-Prolyl-Proline, Lactalbumin Hydrolysate, Lactalbumine Hydrolysée,

Lactotripeptide, Micellar Casein, Milk Protein Extract, Milk Protein Hydrosylate, Peptide C12, Peptide Dérivé de la Caséine, Peptides de Caseine, Peptides de Caséine, Peptides Hypotenseurs, Péptidos de la Caseína, Potassium Caseinate, Protéine de Lait Hydrolysée, Sodium Caseinate, Sour Milk Extract, Sour Milk Peptides, Tripeptide de Caséine, Valyl-Prolyl-Proline.

- **Casein** or **caseinates** (ammonium caseinate, calcium caseinate, magnesium caseinate, potassium caseinate, and sodium caseinate) are the names for a family of related phosphoproteins. These proteins are commonly found in mammalian milk, making up 80% of the proteins in cow milk and between 20% and 45% of the proteins in human milk. (F), (S)

- **Casein hydrolase** is an enzyme that speeds up the process of hydrolysis. (F), (S)

- **Casein hydrolysate**, also known as hydrolyzed casein, is a predigested protein treated with proteolytic enzymes. It is generally used in nutritional and pharmaceutical applications as easily digestible, fast-assimilating protein. Unlike other casein products, hydrolyzed casein has a fast assimilation rate similar to whey protein. It is found in an assortment of protein products. (F), (S)

- **Casein tryptic hydrolysate**: It is a casein peptide coming from **bovine milk** (see dairy). As a supplement, it is used as an antianxiety and sleep aid. Unfortunately, because it most likely come from bovine fed GM crops (alfalfa, corn, soy and cotton), it is a suspect ingredient. (F) (S)

- **Cheese**, all sorts, is a food product made from milk and is produced in a wide range of flavors, textures, and forms by coagulation of the milk protein casein. It is made from the proteins and fat from milk, usually the milk of cows, buffalo, goats, or sheep. In France only there are more different types of cheeses than there are days in a year. Add to that all others cheeses created all over the world and you have a boatload of cheeses to pick from. (F)

- **Chymosin,** recombinant chymosin or rennin an enzyme (protease) genetically engineered produced by microorganisms. It is used mostly in the production of hard cheeses. In the past, rennet, a natural enzyme collected from the stomach lining of calves, was the favorite milk coagulant. But limited access to natural rennet and vegetarian/vegan concerns led to the creation of the GE enzyme, recombinant chymosin. Since its introduction in 1990, more than 70% of American-made cheeses are produced using this new enzyme. It is not allowed in organic cheeses.

- **Clabber** is produced by allowing unpasteurized milk to turn sour at a specific humidity and temperature. Over time, the milk thickens or curdles into a yogurt-like substance with a strong, sour flavor. Clabber can be found in Anglo-Saxon countries. (F)

- **Clotted Cream** is a thick English cream made by indirectly heating full-cream cow's milk using steam or a water bath and then leaving it in shallow pans to cool slowly. During this time, the cream content rises to the surface and forms 'clots' or 'clouts'. In England, it is an essential part of a cream tea and served with scones and fruit preserves. (F)

- **Collagen**: Manufacturers of collagen-based dietary supplements claim that their products can improve skin and fingernail quality as well as skin and joint health. However, mainstream scientific research has not shown strong evidence to support these claims. Collagen is sometimes made from **chicken** (see poultry) sternal cartilage extract. Most medical collagen is derived from young **beef** cattle (**bovine**) from certified BSE-free animals. **Porcine** (pig) tissue is also widely used for producing collagen sheet for a variety of surgical purposes. It can also be made from **equine** (horse) source (mostly in Europe). The issue here is not so much from what animal is collagen coming from as much as what food is used as animal feed. In the vast majority of cases, chicken, bovine and pigs are fed alfalfa, **corn**, soy or cottonseed feed – all GM crops. (S) (C)

  The most common form of collagen used in the supplement industry is **hydrolyzed collagen**. It is produced from collagen found in the bones, skin, and connective tissue of animals such as cattle, fish, horses, pigs,

and rabbits. The process of hydrolysis involves breaking down the molecular bonds between individual collagen strands using heat and either acid or alkali solutions. Typically, with skin-sourced collagen, hides are put in a lime slurry pit for up to 3 months, loosening collagen bonds; the hides are then washed to remove lime, and the collagen is extracted in boiling water. The extracted collagen is evaporator concentrated, desiccated with drum driers, and pulverized.

Collagen can also be derived from marine sources, such as shark cartilage and shellfish (caution if you allergic to shellfish). Most likely they are sourced from **farmed fish** like **salmon** and **tilapia** and which are fed **corn** and soy pellets – 2 GM crops.

- **Colostrum** (bovine) or **first milk** is a form of very nourishing milk produced by the mammary glands of mammals (including humans) in late pregnancy. Proponents claim colostrum is useful in the treatment or prevention of a variety of illnesses. Some athletes use bovine colostrum to burn fat, build lean muscle, increase stamina and vitality, and improve athletic performance. In some cultures – India and Ukraine – solidified colostrum is eaten as cheese. (F), (S)

- **Condensed milk** is milk from which water has been removed. It is most often found in the form of sweetened condensed milk, with sugar added. (F)

- **Cottage cheese** consists of a cheese curd with a mild flavor. It is drained, but not pressed, so some liquid whey remains and the individual curds remain loose. (F)

- **Cream** is the higher-butterfat layer skimmed from the top of milk before processing. In non-homogenized milk, the fat, which is less dense, will eventually rise to the top. When I was a kid, we would skim the cream off the milk, add sugar or jam and eat it straight up. Yum! No one cared about fat content in those days. (F)

- **Cream cheese** is a soft, mild-tasting cheese with a high fat content (it also comes in low-fat content with added gums to thicken it). Traditionally, it is made from unskimmed milk enriched with additional cream. In its

modern version, stabilizers such as carob bean gum and carrageenan are added. (F)

- **Cream curds** are the result of milk coagulated by rennet in the creation of cheese. (F)

- **Creamer** is a cream or milk substitute that is added to coffee or tea. It can also come in powder form. (F)

- **Crème Anglaise** is a light pouring egg custard used as a dessert cream or sauce. It is also the base for French-style ice cream. It is a mix of hot milk, egg yolks and sugar, often flavored with vanilla. (F)

- **Crème Chantilly** is similar to whipped cream in that it is cream whipped by an electric mixer, or a hand whisk until it is light and fluffy. Crème Chantilly is often sweetened and can have a wide assortment of flavors. It is claimed (without proof) to have been invented by Francois Vatel the famous maître d'hôtel to the king of France Louis XIV at the Château de Chantilly. (F)

- **Crème Fraiche** is a soured cream containing 30–45% butterfat. It is fermented with bacterial culture, but is less sour than U.S.-style sour cream, and has a lower viscosity and a higher fat content. Its fat content is lower than heavy whipped cream and can be used for sauces and crème Chantilly (a lighter French version of whipped cream). (F)

- **Cultured** and **confectionery powders** used in candies and bars. (F)

- **Cultured dairy products** or **fermented milk products** are a world-wide assortment of dairy foods that have been fermented with lactic acid bacteria such as Lactobacillus, Lactococcus, and Leuconostoc. (F), (S)

- **Curd** is obtained by *curdling* (coagulating) milk with rennet (enzymes coming from a cow's stomach) or an edible acidic substance such as lemon juice or white vinegar, and then draining off the liquid whey portion. The increased acidity causes the milk proteins (casein) to tangle into solid masses, or *curds*. It is then formed and aged into a wide assortment of cheeses. (F)

- **Custard** is typically a mixture of milk or cream, sugar and egg yolk cooked with some thickener added, in the old days it was wheat flour, nowadays it usually is corn or potato starch. Depending on how much egg or thickener is used, custard can be a thin dessert sauce like crème Anglaise or a thicker pastry cream used to fill pies, éclairs and cream puffs of assorted flavors. The unsweetened version is called a white sauce or béchamel with added cheese. (F)

- **Delactosed whey** or **delactosed whey powder** is the whey product that results from condensed whey after lactose has been crystallized and harvested from it. It is targeted to customers with lactose intolerance. It can be found as a food supplement as dried whey protein. (F), (S)

- **Demineralized whey**, also called reduced-minerals whey, is obtained by removing a portion of the minerals from pasteurized whey. It is found in supplements and protein powders. (F), (S)

- **Diacetyl** is an organic compound resulting from the fermentation of dairy products. For example, cultured cream, cultured butter, and cultured buttermilk owe their tart flavor to lactic acid bacteria and their buttery aroma and taste to diacetyl. It can also be the result of beer fermentation. It is a volatile, yellow/green liquid with an intensely buttery flavor. Because of this, manufacturers of artificial butter flavoring, margarines or similar hydrogenated oil-based products typically add diacetyl, acetoin and beta carotene for the yellow color to create this wonderful butter-like flavor, otherwise they would be taste oily. (F)

- **Dried milk**, **dry milk solids** or **powdered milk** is a manufactured dairy product made by evaporating milk until fully dried. Milk powder can be useful in places with no access to refrigeration or for convenience. It has a much longer shelf life than liquid milk due to its low moisture content. It is used in making all sorts of baking products. (F)

- **Dulce de leche** is a product made by slowly heating sweetened milk and cook it a long time to create the caramelization of the sugar, changing its flavor and color. Literally translated, it means "milk candy" or "milk jam." A Mexican version called cajeta is made from goat's milk. In Puerto Rico *dulce de leche* is sometimes made with coconut milk. (F)

- **Egg beaters** and **egg products** sometimes contain dairy fat. (F)

- **Enzymes** (some) used in food supplements like protease, chymosin or rennin as well as pepsin and lipase can come from the rennet coming from cows' stomachs. (F), (S)

- **Evaporated milk** is also known as dehydrated milk. Evaporated milk is a shelf-stable canned milk product with about 60% of the water removed from fresh milk. It differs from sweetened condensed milk, which contains added sugar. (F)

- **Filled milk** is an English term used for any milk, cream, or skim milk that has been reconstituted with vegetable fats, coming from other sources than dairy cows. (F)

- **Fromage blanc** or **maquée** is French for "white cheese". It is similar to fromage frais but its fermentation is halted before it's sold to customers. It can be served either as a dessert similar to yogurt, with added fruits or preserves, or in savory dishes as a replacement to cream. It is lower in fat than cream. (F)

- **Fromage frais** means "fresh cheese" in French, is unripened cheese that underwent a lactic fermentation. It must contain live flora at the time of sale to the consumer. (F)

- **Fermented milk products**, also known as cultured dairy foods, cultured dairy products, or cultured milk products, fermented milk products are dairy products that have been fermented with a lactic acid bacteria such as *Lactobacillus*, *Lactococcus*, and *Leuconostoc*. (F)

- **Frozen custard** or frozen egg custard is the term used in England for a frozen dessert similar to ice cream, but made with eggs in addition to cream and sugar. It describes the French style of ice cream which contains more egg yolks than the Italian gelato. (F)

- **Frozen yogurt** is an American-based frozen dessert made with yogurt and sometimes other dairy products. Its taste varies from slightly tart to much more tart than ice cream, as well as being lower in fat (due to the

use of milk instead of cream). Don't get fooled by the marketing hoopla out there. Frozen yogurt is not necessarily healthier than ice cream. The modern version can contain an assortment of unsavory ingredients such as corn syrup, hydrogenated soy oil, sodium caseinate, dipotassium phosphate, mono and diglycerides, taro powder (a thickener), maltodextrin (from corn), polydextrose (from corn), erythritol (from corn), maltitol syrup (from corn), emulsifier and stabilizer like propylene glycol monoesters, and thickeners like guar gum, locust bean gum and/or carrageenan, alcohol (from corn), caramel color (from corn), calcium carbonate, whey protein concentrate, disodium phosphate, sucralose (artificial sugar), acesulfame potassium, added sugar for 20 g per serving or more and, for the final touch, a funky assortment of artificial colors. Really?!? It takes that many ingredients to make frozen yogurt? Keep them away for your kids. (F)

- **Fully cream milk** powder also known as whole milk powder. (F)

- **Galactooligosaccharides** (GOS), which occur naturally, consist of short chains of galactose molecules. GOS is naturally found in soybeans (GM crop) and can be synthesized from lactose (**milk** sugar from cows fed GM crops). (S) (P)

- **Galactose** is a monosaccharide sugar extracted from the milk disaccharide, lactose. It is less sweet than glucose and fructose. This monosaccharide can also be found in peas. (F), (S)

- **Gelato** is the Italian word for ice cream, derived from the Latin word "gelātus.", meaning frozen. Gelato is made with milk, eggs, sugar, and an assortment of flavoring such as fresh fruit and nut purees. It typically contains less eggs and more sugar than French frozen custard, thus contains less fat. (F)

- **Ghee** is a form of clarified butter that originated in India. As it does not contain whey, it can be used by people allergic to whey or strict Paleo diet followers. (F)

- **Goat milk** accounts for about 2% of the world's total annual milk supply. For most people, goat milk is easier to digest than cow's milk as it does

not contain lactose. Also goat are not intensively raised as cows and give us a cleaner product. (F)

- **Greek yogurt** is made by straining regular yogurt to remove the whey (the liquid remaining after the milk is curdled). The end result is a thicker yogurt with a lower amount of sugar (when plain), fewer carbohydrates, and more protein compared to regular yogurt. Be careful though as some Greek yogurt companies use thickeners like modified corn starch (a GM crop), guar gum or carrageenan as thickeners. (F)

- **Half and half** is a mixture of milk and cream containing at least 10.5% but not more than 18% milk fat. (F)

- **Heavy cream** contains not less than 36% butterfat. It can be pasteurized, ultra-pasteurized and homogenized. (F)

- **High milk-fat** and nutritional powders are used in infant formulas. (F)

- **High protein anything** (drinks, powders, bars, etc.) typically contain concentrated milk protein isolate, casein isolate and whey protein isolate. (F), (S)

- **Hydrolysates** sometimes from whey, are enzymatically predigested whey proteins created for maximal speed of absorption. It is used mostly by body builders. (S)

- **Hydrolyzed casein** or **casein hydrolysate** is a predigested protein treated with proteolytic enzymes. It is generally used in nutritional and pharmaceutical applications as easily digestible, fast-assimilating protein. Unlike other casein products, hydrolyzed casein has a fast assimilation rate similar to whey protein. It is found in an assortment of protein products. (S), (P)

- **Hydrolyzed milk protein** is milk protein that has been hydrolyzed or broken down into its component amino acids. Protein hydrolysis can be used to modify the allergenic properties of infant formula. It is also found in pet food, in supplements and protein products for body builders, and cosmetics in hair and skin conditioning. (C), (F) (S).

- **Hyperimmune bovine colostrum**. It is a boosted form of colostrum found in protein supplements. (S)

- **Ice cream** is a frozen dessert usually made from dairy products, such as milk and cream and often combined with fruits or other ingredients and flavors. As in with frozen yogurts, it pays to read the ingredients panel. The typical American ice cream contains can contain up to 50% of air (yes, you are paying for air) and a wild assortment of ingredients such as corn syrup or HFCS, bleached wheat flour (Really? Yep, in Skinny Cow), isomalt, caramel color (from corn), sorbitol (from corn), palm or soy oil, corn flour (?), modified corn starch, soy lecithin, maltodextrin, sorbitol, cellulose gel, cellulose gum, carrageenan, sucralose (artificial sweetener), acesulfame potassium, artificial colorings and natural and artificial flavors – and that is reading only ONE brand of ice cream ingredients. Wow! You need to be a food scientist to eat that kind of ice cream. I personally go for real ice cream with a few ingredients: milk, cream, cane sugar, eggs and real flavor like chocolate, coffee, vanilla and others. (F)

- **Ice milk** is a frozen dessert made with less than 10 percent butterfat and the same sweetener content as ice cream. (F)

- **Infant** or **baby formula** is usually dried milk powder complemented with additives to feed human babies that cannot breastfeed. (F)

- **Iron caseinate** is a form of iron derived from casein. (F), (S)

- **Kefir** is a fermented milk drink prepared by inoculating cow, goat, or sheep milk with kefir grains. (F)

- **Lactaid milk** is designed for individuals with lactose intolerance, not milk allergy. Lactaid milk contains milk protein (casein and whey) but has had the milk sugar (lactose) removed. (F), (S)

- **Lactalbumin** is the albumin contained in mammals' milk and obtained from whey. There are alpha and beta lactalbumins; both are contained in milk. (F), (S)

- **Lactalbumin phosphate** is the phosphate form of lactalbumin. (S)

- **Lactic acid** is created via the fermentation of sugars, and can be found in many dairy-free and/or vegan foods. Most commercially used lactic acid is fermented from carbohydrates, such as cornstarch, potatoes or molasses, and thus dairy-free. Though lactic acid can be fermented from lactose, its use is generally restricted to dairy products, such as ice cream and cream cheese. (F), (S)

- **Lactic acid starter culture** may be prepared by using milk as an initial growth medium. (F)

- **Lactitol**: Lactitol is manufactured from **whey**, the lactose (milk sugar) rich by-product of cheese making and processed **dairy** foods. Lactitol is slightly less than half as sweet as sugar and is considered to have 2 calories per gram, which has been accepted by the Food and Drug Administration. In laboratory studies, lactitol has been shown to promote the growth of the two bacteria recognized to improve the health of the large intestine. As a result, the prebiotic potential of lactitol is sometimes highlighted for the foods using this sugar replacer. (F) (S)

- **Lactobacillus**. *It is known as* probiotic and bacteria to ferment yogurt and other such products. It is used to convert lactose and other simple sugars to lactic acid. Although often utilized in milk products to create lactic acid, on its own, this ingredient in itself should not be a concern. However, in some cases it may have been cultured or produced on dairy, and thus have the potential to contain trace amounts. (F), (S)

- **Lactose** is a form of sugar from milk. It is used as a filler and adjuvant to some medications and supplements. (F), (S).

- **Lactose monohydrate**. Lactose is a disaccharide sugar derived from galactose and glucose that is found in milk. Lactose monohydrate is a crystal form of a disaccharide sugar found naturally in milk. It aids in the formation of tablets due to its outstanding compressibility properties. This product can contain traces of milk proteins and for this reason should not be consumed by those diagnosed with a milk allergy. (F) (S) (P)

- **Lactoglobulin** is a crystalline protein fraction that is obtained from the whey of milk. (S)

- **Lactulose** is a synthetic disaccharide produce by isomerization of lactose into one molecule each of the monosaccharides fructose and galactose. It is a non-digestible sugar used in the treatment of chronic constipation and hepatic encephalopathy, a complication of liver disease. (F), (S)

- **Lassi** is a popular and traditional yogurt-based Indian drink consisting of a blend of yogurt, water, spices, and sometimes, fruit. (F)

- **Light cream** or **coffee cream** or **table cream** contains at least 18% but no more than 30% butterfat. It can be pasteurized, ultra-pasteurized and homogenized. (F)

- **Light whipping cream** or **whipping cream** contains not less than 30% but not more than 36% butterfat. It is pasteurized and may be homogenized. Whipping cream generally contains not less than 30% butterfat. (F)

- **Magnesium caseinate** is a form of magnesium from casein from milk. (F), (S)

- **Mascarpone** is an Italian cheese coming from the Lombardy region of Italy. It is made by curdling cream with citric acid, acetic acid or lemon juice. After coagulation is achieved, the whey is removed without pressing or aging. It is a thick, double or triple cream, soft cheese with a very high fat content ranging from 60% to 75%. Without mascarpone, the famous Tiramisu dessert or Italian cheese cakes could not exists. (F)

- **Milk** in all forms (acidophilus milk, buttermilk, chocolate milk, condensed milk, dry milk, evaporated milk, milk derivative, dry milk, evaporated milk, goat's milk and milk from other animals, low fat milk, malted milk, milk fat, milk powder, milk protein, milk solids, nonfat milk, pasteurized milk, skim milk, sour milk solids, strawberry milk, vanilla milk, and whole milk). (F)

- **Milk derivate** is a vague industry term used to describe any product that is made from milk. Instead, it should clearly say "contains milk". (F), (S)

- **Milk protein concentrate** or **MPC** is a whole protein produced by membrane filtration of milk. The ultrafiltration yields a protein end product that contains casein and whey – virtually the same as in the milk that it's derived from. MPC is outstandingly stable. Milk protein concentrate has virtually the same properties of native casein. (S)

- **Milk protein hydrolysate**. See casein hydrolysate. (F), (S)

- **Milk protein isolate** or **MPI** is the substance obtained by the partial removal of sufficient non-protein constituents (lactose and minerals) from skim milk so that the finished dry product contains 90% or more protein by weight. It may be produced by filtration, dialysis or any other process by which all or part of the lactose is removed. It still contains the casein and whey proteins in their original proportions found in milk. (F), (S)

- **Milk powder** or **dried milk**. See dried milk. (F)

- **Mineral concentrates** can come from the extraction of calcium from milk. (S)

- **Natural flavors** or **flavorings** is a confusing, misleading and mysterious name used by the food industry to hide what secret ingredient is used in their product. In our case (dairy), it's a substance that can be derived directly from a plant or animal or from the roasting, heating, or fermentation of said animal or plant. The source can be pretty much anything: fruits, veggies, herbs, spices, leaves, roots, bark, meat, eggs, and **dairy products**. (F), (S)

- **Native casein** or **raw milk casein** is the closest to the real thing and is one of the most effective proteins for muscle retention and buildup. It is not highly processed as other forms of protein. (F), (S)

- **Natural butter flavor**. See butter flavor. (F)

- **Paneer** is a fresh cheese commonly used in Indian cuisine. It is a non-melting farmer cheese made by curdling heated milk with an acid like lemon juice, vinegar, or any other food acid. (F)

- **Plastic cream** is an English term used to describe a butter-like product that contains 80% butterfat. It resembles butter in consistency but, in contrast to butter, it is an oil-in-water type of emulsion. It can be stored in frozen form. (F)

- **Potassium caseinate** is a potassium form of casein from milk. (F), (S)

- **Powdered milk**. See dry milk. (F)

- **Prebiotics** are a relatively new products on the digestive health scene. They are indigestible carbohydrates. They are quite different from probiotics, which are living microorganisms. Prebiotics, such as galacto-oligosaccharides, lactosucrose, lactulose and lactitol may be derived from milk-based foods. (F), (S)

- **Probiotics**: Probiotics come in various types and names. The most common are: *Lactobacillus acidophilus, Bifidobacterium bifidum, Lactobacillus casei, Lactobacillus plantarum, Lactobacillus paracasei, Lactobacillus rhamnosus, Lactobacillus reuteri, Saccharomyces boulardii, Lactobacillus reuteri , Lactobacillus plantarum , Lactobacillus bulgaricus, Streptococcus thermophilus, Lactobacillus bifidus,* etc. Typically, lactic acid is added to a nutrient-rich **dairy** culture, allowed to grow then extracted from the growth medium and usually freeze-dried before being packaged. Dairy could come from cows fed alfalfa, canola, corn, soy or cotton feed, all suspected GM crops. In many cases, probiotics are packed with maltodextrin (from GM corn) as a filler or flow agent. Most capsules are made of vegetable cellulose (see cellulose for details) from GM sources. (F) (S) (P)

- **Processed cheese**, also called American cheese, is a bad copy of the real thing – in my French opinion, of course. It usually contain unfermented dairy ingredients, emulsifiers, salt, food colorings, and whey. Many flavors, colors, and textures of processed cheese exist. (F)

- **Pudding** is usually a sweet dessert, but it can sometimes be a savory dish. The word pudding is believed to come from the French boudin, from the Latin botellus, meaning "small sausage", referring to encased meats used in medieval European puddings. Examples of English puddings can be plum pudding, rice pudding, black pudding or Christmas puddings. In America or Canada, the term pudding is usually associated with a milk-based dessert similar to an English custard or curd but set with gelatin. It can be vanilla, chocolate or any flavor you choose. Bread pudding is another common dessert. (F)

- **Quark** is a fresh dairy product made by warming soured milk until the desired degree of coagulation of the milk proteins is met, and then strained. It is fresh, soft, white, not aged, and similar to some types of fromage frais. (F)

- **Recaldent**(R) whose technical name is casein phosphopeptide or amorphous calcium phosphate, is a milk-derived product that can help remineralize teeth and helps prevent dental caries (tooth decay). (F), (S), (P)

- **Rennet** is a complex of enzymes found in any mammalian stomach. It is often used in the production of cheese. The enzymes contained in rennet, including the proteolytic enzyme protease, coagulates the milk, causing it to separate into solids called curds and liquid whey. The whey is then pressed out and drained to allow the cheese to ferment, age and dry. Other active enzymes in rennet are chymosin or rennin as well as pepsin and lipase. There are non-animal sources for rennet that are suitable for consumption by vegetarians. (F)

- **Rennet casein** is obtained by curdling milk with rennet (see above). In this process, the calcium remains bonded to the casein, which is the one of the main milk proteins. Thanks to its micellar structure and its calcium composition, rennet casein has a very high texturizing capacity. It is ideal for products such as sliced processed cheese where stretch and melting capacity are needed. (F)

- **Semifreddo** is a class of semi-frozen desserts, typically ice-cream cakes, semi-frozen custards, and certain frozen fruit desserts. It has the texture

of a frozen mousse because it is produced by mixing one part ice cream with one part whipped cream. (F)

- **Sherbet** is made with fruit, water and sugar but can also include egg whites, milk or milk fat, cream or gelatin. (F)

- **Sodium caseinate** is produced by reacting casein acid with sodium hydroxide. Sodium caseinate is a dietary supplement and is a modified dairy product. (F)

- **Sour cream** is obtained by fermenting a cream with certain kinds of lactic acid bacteria that sours and thickens it. It is fermented like yogurt but is thicker. (F)

- **Sour cream solids** is the dried form of sour cream used in coating chip snacks or in salad dressings. (F)

- **Soured milk**, a typical English product, is milk acidified by the addition of an acid, such as lemon juice or vinegar, or through bacterial fermentation. (F)

- **Sweetened condensed milk**. Like condensed milk but sweeter. (F)

- **Tagatose** is a functional sweetener. Tagatose is a natural sweetener present in only small amounts in fruits, cacao, and **dairy** products (potential GMO ingredient). Tagatose can be commercially produced from galactose through an enzymatic process, starting with lactose which is hydrolyzed to glucose and galactose. The galactose is isomerized under alkaline conditions to D-tagatose by calcium hydroxide. The resulting mixture can then be purified and solid tagatose produced by crystallization. It is 92% as sweet, but with only 38% of the calories. (F), (S)

- **Tyrosine** is a non-essential amino acid. The word "tyrosine" is from the Greek *tyri*, meaning *cheese*, as it was first discovered in 1846 by German chemist Justus von Liebig in the protein casein from cheese. Tyrosine,

which can also be synthesized in the body from phenylalanine, is found in many high-protein food products such as **dairy** products like milk, cheese, yogurt, cottage cheese, and soy products. See dairy and soy for potential GMO dangers.

- **Whey** (whey concentrate, sweet whey, whey products, and whey powder) is the liquid remaining after milk has been curdled with rennet and strained. It is a by-product of the manufacture of cheese or casein and is used widely in the food business, mostly in its powered form as a protein source for smoothies, shakes or infant formulas. (F), (S)

- **Whey protein hydrolysate**. There are three forms of whey protein: whey isolate, whey concentrate, and whey hydrolysate. The difference between the whey protein forms is the composition of the product, particularly the protein content. (F), (S)

- **Whey protein isolate**. There are three forms of whey protein: whey isolate, whey concentrate, and whey hydrolysate. Whey isolates contain the higher percentage of pure protein and can be pure enough to be virtually lactose free, carbohydrate free, fat free, and cholesterol free. This is typically the form used by athletes after a workout. (F), (S)

- **Whipped cream** is heavy cream whipped by an electric mixer, or a hand whisk until it is light and fluffy. Whipped cream is often sweetened and can have a wide assortment of flavors. In France, it is called crème Chantilly. (F)

- **Yoghurt** is a fermented milk product but not exclusively from cow's milk. Goat's milk, sheep's milk, mare's milk, soy milk, almond milk, and coconut milk can also be used. It is produced by bacterial fermentation using different strains of bacteria such as by Streptococcus salivarius thermophilus and Lactobacillus delbrueckii bulgaricus and sometimes with additional bacteria, such as Lactobacillus acidophilus. (F)

- **Zinc caseinate** is the zinc form of casein from milk. (F), (S)

SOY

Soybean – (Approx. 94% of U.S. crop in 2012). Soy beans are the most important crop worldwide for producing oil and protein. Soybean and it processed derivatives are used in a multitude of food, groceries, supplements and cosmetics. Additionally, the remaining soy mass is used as protein-rich animal feed for fish, poultry, pigs and beef.

Tolerance to herbicides is by far the most important commercial characteristic of GM-soybeans. So, not only it is a genetically engineered food crop but, because of adaptive super bugs and super weeds, farmers are forced to use more and more pesticides to combat them. It is a never ending war between chemical labs and nature and we, the customers, are losing our health in the process. Avoid or look for non-GMO certification.

Miso, natto, soy drink or milk, soy flour, soy sauce, soy lecithin, soy protein, soy yogurt, soybean oil, isolate, and isoflavone, tamari, tocopherol (vitamin E), texturized soy protein, tofu, tempeh, vegetable oil* and vegetable protein* and many other applications. See complete ingredients and additives list below.

Soy-based Food Products

- Bean curd
- Bean sprouts
- Edamame (soybeans in pods)
- Hydrolyzed soy protein
- Kinako
- Kinnoko flour
- Kyodofu (freeze dried tofu)
- Miso (fermented soy paste)
- Natto
- Nimame
- Okara (soy pulp)
- PEG 10 Soy Sterol
- Protein powder
- Roasted soy beans
- Shoyu sauce

- Soy albumin
- Soy bran
- Soy cheese
- Soy coffee
- Soy concentrate
- Soy fiber
- Soy flour
- Soy formula
- Soy germ extract
- Soy grits
- Soy lecithin
- Soy milk
- Soy nuts
- Soy nut butter
- Soy protein
- Soy protein concentrate
- Soy protein isolate
- Soy sauce
- Soy sprouts
- Soya
- Soya Flour
- Soybeans
- Soybean curd
- Soybean granules
- Soybean sprouts
- Soybean flour
- Soybean paste
- Soy nut butter
- Supro
- Tamari
- Tempeh
- Teriyaki sauce
- Textured soy flour (TSF)
- Textured soy protein (TSP)

- Textured vegetable protein (TVP)
- Tofu (dofu, kori-dofu)
- Yakidofu
- Yuba (bean curd)

Soy Ingredients or Derivatives in Food Products (see detailed explanations below)

- Asian food or cuisine
- Assorted chips, fried and baked
- Assorted bakery products
- Assorted candy products
- Assorted processed foods
- Baby food
- Baby formula
- Baking mixes
- Beef broth
- Beers and ales
- Beverage mixes
- Bouillon cubes and pastes
- Breads
- Breakfast cereals
- Broths (beef, chicken and vegetable)
- Bulking agent
- Burgers
- Chewing gums
- Chicken processed with chicken broth
- Chicken broth
- Chicken patties or nuggets
- Chinese food
- Chocolate and chocolate coatings
- Chocolate candies and bars
- Cookies
- Cookies topping
- Cooking oil

- Cooking sprays
- Crackers
- Dairy-free creamers
- Dairy-free ice cream
- Dairy-free milk
- Dairy-free products
- Deli meats
- Dietary products
- Dips
- Doughnut mix
- Emulsifying agents like lecithin
- Energy bars
- Fake crab (Surimi)
- Fast food products
- Fried foods
- Frozen desserts
- Frozen yogurt
- Gravies
- Grits
- Guar gum
- Gum Arabic
- Hamburgers
- High fiber breads (husks)
- Hot chocolate mixes
- Hot dogs
- Hypo-allergenic milk
- Ice cream
- Infant formula
- Japanese food
- Imitation bacon bits
- Imitation chicken patties
- Imitation dairy food
- Imitation lunch meats
- Instant milk drinks

- Korean food
- Lecithin
- Lemonade mixes
- Liquid shortenings
- Low-cost gruels
- Margarine
- Marinades
- Mayonnaise
- Meal replacements
- Meat replacements
- Mexican food like vegetarian chili, taco filling, and tamales
- Mixed spices
- Mixed tocopherols
- Mono and di-glycerides
- MSG (monosodium glutamate)
- Natural flavorings
- Noodles and pasta
- Non-dairy creamers
- Nutrition bars
- Nutrition supplements
- Nutritional diet products
- Pancake mixes
- Pan greaser extenders
- Peanut butter
- Peanut butter substitutes
- Pet food
- Pie crust
- Prepared frozen food and meals
- Prepared mixes
- Protein bars
- Protein powders
- Salad dressings
- Sandwich spreads
- Sauces

- Sausages
- Sausage casing
- Seafood prepared meals
- Seasoning blends
- Shortening
- Smoothies
- Snack foods
- Snack nuts
- Soups
- Spreads
- Soy cheese
- Soy creamer
- Soy isoflavones
- Soy meat substitutes
- Soy milk
- Soy noodle or pasta
- Soy protein
- Soy protein isolate
- Specialized diet food
- Spices mixes
- Stabilizer
- Stabilizing agents
- Stews
- Stocks (beef, chicken, and vegetable)
- Surimi (fake crab)
- Thai food
- Thickener
- Tocopherols
- Tuna – canned in soy oil
- Vegan cheese
- Vegan ice cream
- Vegan "meat"
- Vegetable-based fatty acids (when not specified)
- Vegetable broth

- Vegetable flavorings
- Vegetable gum
- Vegetable oils
- Vegetable shortening
- Vegetable starch
- Vegetarian and vegan dishes
- Vegetarian and vegan meat substitutes
- Veggie burgers
- Vietnamese food
- Worcestershire sauce
- Yeast

Soy Ingredients or Derivatives Around Your Home (see detailed explanations below)

- Artificial fire logs
- Bed mattress
- Board games printed with soy-based ink
- Books printed with soy-based ink
- Candles
- Carpet backing
- Cleaning products
- Crayons
- Crib mattress
- Inks and toners
- Modeling dough
- Puzzles printed with so-based ink
- Stuffed animals filling
- Synthetic fabrics

Soy Ingredients or Derivatives in Cosmetics and Pharmaceuticals (see detailed explanations below)

- Antibiotics
- Assorted vitamins
- Baby shampoo

- Fatty acids
- Fungicides
- Glycerol
- Glycerin
- Hair conditioner
- Hand sanitizer
- Lotion
- Medications
- Pharmaceuticals
- Soap
- Shampoo
- Skin products
- Toothpaste
- Supplements
- Vaccines
- Vitamin E

Soy Ingredients or Derivatives in Animal Production (see detailed explanations below)

- Antibiotics
- Aquaculture
- Bee food
- Calf milk replacer
- Dairy feed (husks)
- Fish food
- Fox and minx feed
- Livestock feed
- Pet food
- Poultry feed
- Protein concentrates
- Swine feed

Soy Ingredients or Derivatives in Industrial Production (see detailed explanations below)

- Adhesive
- Analytical reagents
- Antibiotics
- Anti-corrosive agents
- Anti-static agents
- Asphalt emulsions
- Binders, wood resin
- Biodiesel
- Cleansing materials
- Diesel fuel additives
- Detergents
- Disinfectants
- Dust control agent
- Electrical insulation
- Engine oils and lubricants
- Fermentation aids and nutrients
- Fertilizers
- Film for packaging
- Filter materials (husks)
- Flexible foam used in furniture padding
- Fungicides
- Graffiti removers
- Herbicides
- Insecticides
- Leather substitutes
- Linoleum backing
- Metal casting
- Newspaper or magazine Printing ink
- Oiled fabric
- Paints, oil
- Paints, water-based
- Paint strippers

- Particle board
- Pesticides
- Plasticizers
- Plastics
- Plywood
- Polyesters
- Printing press inks
- Protective coatings
- Putty
- Sealers
- Solvents
- Soy biodiesel
- Spray foam insulation
- Stains
- Sterols
- Tape joint cements
- Textiles
- Textured paints
- Vinyl plastics
- Waterproof cement
- Wallboard
- Waxes

Ingredients or Additives Coming From Soybean Oil

For all following ingredients or products, ask for source, USDA Organics or non-GMO certification.

Please note: To clarify in which industry each of the following products are used, I used (F) for food and drinks, (S) for supplements, (P) for pharmaceuticals, (C) for cosmetics, (A) for animals feed and pet food, and (I) for industrial uses.

- **Alanine** is a nonessential amino acid, meaning it can be manufactured by the human body. Alanine is found in a wide variety of foods, but is particularly concentrated in meats. Good sources of alanine include

meat, seafood, caseinate, dairy products, eggs, gelatin, lactalbumin or also from **soybeans**, whey, corn. If not coming from a USDA certified organic source, ask for source. (S) (C)

Related products or ingredients: 2-aminopropionic Acid, Acide Alpha-aminopropionique, Acide Aminé Alanine, Acide Aminé Non Essentiel, Ala, Alanine Amino Acid, Alfa-alanina, Alpha-aminopropionic Acid, D-alanine, D-alpha-alanine, DL-alanine, L-alanine, L-alpha-alanine, L-alpha-aminopropionic Acid, Non-essential Amino Acid.

- **Alkyl glucoside or Alkyl polyglucoside** (APG), **Alkyl glucose ester** (AGE) or **Alkyl Polyglycoside** are non-ionic surfactants made from vegetable oils (corn, **soy**, palm or coconut) and corn starch – GM crops. These new products have been replacing traditional petroleum-based like sodium lauryl sulfate (SLS) or sodium lauryl ether sulfate (SLES) products for the past few years and even other natural oils-based surfactants. Initially, surfactants initially were developed for home care and body wash applications, but have been expanded to facial cleansing lotions, shampoos, oral care products, wipes, laundry detergents, hard surface cleaners and industrial and institutional cleaning applications. (F) (C) (I)

- **Alpha tocopherol (TCP), E 307 or d-alpha tocopherol** is one of eight forms (4 tocopherols – alpha, beta, gamma and delta - and 4 tocotrienols) is a fat-soluble antioxidant and one of the forms or vitamin E. Alpha or d-alpha tocopherol is the natural form of vitamin E. Other natural forms are d-alpha tocopherol acid succinate and d-alpha tocopherol acetate.

  In the European diet, most alpha tocopherols come from olive and sunflower oils. In the American diet, gamma tocopherols mainly come from **soybean**, canola and corn oils – all suspected GM crops. Tocopherols and tocotrienols are fat-soluble antioxidants but have many other functions in our body. Although originally extracted from wheat germ oil, most natural vitamin E supplements are now derived from vegetable oils, usually soybean oil.

  Note: the dl-alpha tocopherol is the synthetic form of tocopherol made through the synthesis of petrochemicals with the help of a mixture of

eight stereoisomers to end with a condensate of a-tocopherol. It is only half as active as the natural version. It also can show on nutritional labels as mixed tocopherols. It can be used in supplements and in personal care products like skin creams, lip balm, hair styling products, moisturizers, shaving creams, soaps and sunscreens. (F) (S) (C) (P)

I suggest you get your natural vitamin E from food sources. The 10 highest food sources of natural vitamin E per 100 g serving are wheat germ oil (215.4 mg), sunflower oil (55.8 mg), almond oil (39.2 mg), sunflower seed (35.17 mg), almond (26.2 mg), hazelnut (26.0 mg), walnut oil (20.0 mg), peanut oil (17.2 mg), olive oil (12.0 mg), and poppy seed oil (11.4 mg).

- **Arabinogalactan** is used as a gelling agent, a bulking agent, an emulsifier, a stabilizer, a sweetener and a thickener. It is a biopolymer consisting of arabinose and galactose monosaccharides. It is vegan, vegetarian, and halal. It comes from genetically modified or genetically engineered wood, tobacco or **soybeans**. It could cause allergic reactions to sensitive individuals. Also known as: Larch gum (larix decidua), D-galacto-L-arabinan, Dextro-galacto-laevo-arabinan, Galactoarabinan, Larix decidua gum, larch turpentine, polyarabinogalactan or Venetian turpentine. (S) (C)

- **Beta carotene** is a precursor the body can convert to vitamin A. Unfortunately, as a supplement, synthetic beta carotene is usually "stabilized" in refined vegetable oils (corn, **soy** or cottonseed – all GM crops). In this transfatty acid form, oxidation occurs and the chemically "pure" beta carotene can no longer act as a nutrient, because it was changed. Almost all synthetic beta carotene is produced by the Swiss drug giant Hoffman-LaRoche. This form can no longer be converted to vitamin A. The best it can be is worthless, and the worst is toxic. Synthetic vitamins cannot prevent deficiencies. (S) (C)

- **Brominated vegetable oil** (BVO) is vegetable oil, derived from corn or **soy** – 2 suspected GM crops, bonded with the element bromine. Bromines are known endocrine disruptors. They are part of the

halide family, a group including fluorine, chlorine and iodine. It is added as an emulsifier in some soft drinks to prevent the citrus flavoring from separating and floating to the surface. (F) (S)

- **Calcium malate**, sometimes called dicalcium malate or sometimes bis-glycinate chelate is the calcium salt of malate or malic acid. It is typically chelated to glycine (from suspected GM **soybean**) and malic acid from corn (see malic acid), providing a combination of the two most health promoting and most absorbable forms of calcium available. (F) (S)

- **Calcium stearate** is an octodecanoic calcium salt and can be extracted from animal fat or triglyceride esters that can be derived from plants such as cottonseed, corn or **soybean** – all suspected GM crops. (F)

- **Calcium stearoyl lactylate** or CSL is an enzyme used as a food additive in a wide variety of products from baked goods and desserts to packaging**.** It comes from stearic acid (see below) that can be extracted from **soybean** or porcine sources. (F)

- **Cetearyl Alcohol** is a fatty alcohol made of a blend of cetyl and **stearyl alcohol** that can come from synthetic or vegetable sources like coconut, palm oil or corn and **soy** vegetable oil –both GM crops. It is used in cosmetics as a stabilizer to thicken an emulsion and keep it from separating, and as a foaming agent in food. (C)

- **Cetyl Dimethicone** is a silicone or siloxate polymer used as an antifoaming agent, a skin-conditioning agent and occlusive and an emollient in assorted cosmetics such as: sunscreen, foundation, concealer, lipstick, facial moisturizer, blush, eye cream and anti-aging treatment. Since it is processed with cetyl alcohol from corn (see cetyl alcohol) and stearic acid (see stearic acid) from **soybean** oil, beware. Also known as: Cetyl dimethicone copolyol. (F) (S) (C)

- **Cetyl myristoleate (CMO) or miristoleate** as oil, is the hexadecyl ester of the unsaturated fatty acid cis-9-tetradecenoic acid. It is created by the esterification of myristoleic acid found commonly in fish oils, whale oils,

dairy butter, kombo butter, sperm whale oil, and can be found in a small gland in the male beaver. It is used as a cure for rheumatoid and osteoarthritis. It can also be extracted from **bovine** sources (see bovine and GMOs above) and processed with cetyl alcohol (see cetyl alcohol). If coming from a vegetable source, it can come from palm or coconut oil but it could also contain stearic acid (see stearic acid) from **soybean** oil and cetyl esters. (C)

- **Cetearyl Alcohol** is a fatty alcohol made of a blend of cetyl and stearyl alcohol. It may come from coconut, palm oil or corn and **soybean** vegetable oil (2 GM crops) as well as synthetic sources. It is used in cosmetics as a stabilizer to thicken an emulsion and keep it from separating, and as a foaming agent. Cetearyl Alcohol also contains emollient properties which leave skin soft and smooth. It can be found in facial creams and lotions, body creams and lotions, hair conditioners, ointments, body butters, salt scrubs. It is also known as cetostearyl alcohol and cetylstearyl alcohol. (C)

- **Cetostearyl alcohol**, **Cetearyl alcohol** or **Cetylstearyl alcohol** is a mixture of fatty alcohols, predominantly cetyl and stearyl alcohol and is classified as a fatty alcohol from corn or **soy** – both GM crops. It is used as an emulsion stabilizer, opacifying agent, and foam boosting surfactant, as well as an aqueous and nonaqueous viscosity-increasing agent. It adds an emollient feel to your skin and can be used in water-in-oil emulsions or oil-in-water emulsions. It can be found in the same products as stearyl alcohol. (C)

- **Choline.** The most often available choline source, lecithin can be derived from **soy** or egg yolks, often used as a food additive. Soybean is a potential GM crop. Eggs can come from chicken fed corn, soy or cotton feed, all GM crops. (F) (S) (P)

  Note: **Choline chloride** and **Choline Bitartrate** are synthetic forms of choline. Choline dihydrogen citrate is the citrate salt of choline.

- **Coenzyme Q10** or **CoQ10** (ubiquinone, ubidecarenone, ubiquinol): There are three redox states of coenzyme Q10: fully oxidized (ubiquinone), semiquinone (ubisemiquinone), and fully reduced (ubiquinol). Some of the foods that are good sources of ubidecarenone include beef, salmon, mackerel, sardines, **soybeans**, peanuts, walnuts, broccoli, and spinach. Other sources include whole grains, wheat germ, and oils such as rapeseed (canola oil), **soybean**, and sesame. It can also be manufactured by fermenting beets (a GM crop) and sugar cane with special strains of yeast. Most other CoQ10 manufacturers ferment their products from bacteria or chemical synthetic from tobacco. (F) (S) (P) (C)

- **Cysteine** (E921): Is an amino acid. Is used as a flour treatment to make dough production easier. It can be produced with the help of genetic engineering. Cysteine is also found in most high-protein foods like dairy from **cows** fed GM crops like alfalfa, corn**,** cottonseed and **soy**. (F) (S)

- **Dehydroepiandrosterone** or **DHEA** is a prohormone made in the human body and secreted by the adrenal gland. DHEA is a precursor to male and female sex hormones (androgens and estrogens). When provided in supplement form, it can come in synthetic form or can be made from a substance called diosgenin from wild yam or **soybean** – a GM crop. Some companies use pig's adrenal gland extracts as a source. (S) (P)

- **Diglyceryl monooleate** is an emulsifier (like lecithin) or stabilizer in food and supplement production. These fatty acids can be made from a mixture from vegetal oils (cottonseed oil, **soybean** oil – both GM crops). (F) (S) (P)

- **DMAE** or **Dimethylaminoethanol or Dimethyl Amino Ethanol** (also known as *deaner, deanol, dimethylaminoethanol, Deanol Aceglumate, Deanol Acetamidobenzoate, Deanol Benzilate, Deanol Bisorcate, Deanol Cyclohexylpropionate, Deanol Hemisuccinate, Deanol Pidolate, Deanol Tartrate, Dimethylaminoethanol, Dimethylaminoethanol Bitartrate,*

Dimethylethanolamine, and DMAE BitartrateI). It is an anti-wrinkle and anti-aging ingredient that helps firm, tone and improve skin's elasticity. It can be derived from choline from corn or **soy** lecithin. (C)

- **Emulsifying wax** is a cosmetic emulsifying ingredient used primarily in the manufacturing of creams, lotions, and other beauty products. The wax itself is made of either petroleum or combination of vegetable ingredients (cetearyl alcohol, PEG-150 Stearate, Polysorbate 60, and Steareth-20 from soy – a GM crop), enhanced with a chemical detergent (most likely PEG - polyethylene glycol – a known carcinogen). These vegetable ingredients can be extracted from carnauba bean or **soybeans**. Ask for source. (C)

- **Emulsifying wax NF** is slightly different than emulsifying wax. It is a waxy solid made from Cetostearyl Alcohol (from soybean – a GM crop) containing a polyoxyethylene, an emulsifier made of a fatty acid ester of sorbitan – a derivative of sorbitol. See sorbitol. (C)

- **Emulsifier E472e.** Also known as Mono- and diacetyl tartaric acid esters of mono- and diglycerides of fatty acids. Fatty acid esters are commonly used in junk foods to keep them from getting stale. Often derived from GM **soybean** oil.

- **Emulsifier E481:** Emulsifier and stabilizer. Also known as Sodium stearoyl-2-lactylate. Vegetarians beware – it can be of animal origin. Also functions as a plasticizer, surfactant and is just as likely to be found in face cream and body lotions as in bread and other bakery products. Since animals can be fed GM corn, **soy** or cottonseed feed, ask for source. (F) (C)

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vegetable ingredients can be extracted from carnauba bean or soybeans. Ask for source. (C)

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- **Enzymes:** Commercial enzymes are grown on a glucose slurry from corn or sugar beet, or protein or fat substrates. The microorganisms feed on nutrients derived from e.g. maize (corn), **soybeans**, potatoes or sugars. But the right nutrients for the microorganisms depend on the enzyme which is to be produced. Today more than 90% of enzymes are made from GMOs. Enzymes are very powerful, and they must typically be diluted and standardized to a uniform usable strength. A common *diluent is* ***lactose****, so* one must be careful that ***papain*** *and* ***bromelain****,* for example, may be considered a dairy product for this reason. See dairy and corn. (F) (S) (P) (C) (I)

- **Fatty acid complex** can be a blend or contain phosphatidyl choline (PC) (from **soybean** lecithin), stearic acid (SA) (from corn or soybean), palmitic acid (PA) (from palm), decanoic acid (DA) (from coconut or palm) and decylamine (DE). Since corn and soybean are suspected GM crop, ask for source. (C)

- **Galactooligosaccharides** (GOS), which occur naturally, consist of short chains of galactose molecules. GOS is naturally found in **soybeans** (GM crop) and can be synthesized from lactose (milk sugar from cows fed GM crops). (S) (P)

- **Glycerides, Monoglycerides and Diacetyl Diglycerides:** Glycerides, or acylglycerols, are a chemical compound of glycerol and fatty acids. Glycerides are formed as monoglycerides, diglycerides or triglycerides. Monoglycerides and diglycerides are used as food additives to help

certain ingredients blend better. Various fatty acid compounds including mono- and diglycerides (E471) can come from **soy** – a potential GM crop or almonds. (F) (S) (P) (C)

- **Glycerol** (E 422) and **Glycerol monooleate** is a simple polyol compound. It's a colorless, odorless, viscous liquid that is widely used in pharmaceutical formulations. Glycerol is sweet-tasting and of low toxicity. Glycerol is a carbohydrate that can be made in the body from glucose and obtained through the diet as a food additive. It also exists naturally in triglycerides (TGs) and phospholipids (PLs). Glycerol has applications in food manufacturing as a sweetener, thickener, solvent and preservative. If non-synthetic, glycerol could come from corn or **soy** triglycerides. For human consumption, glycerol is classified by the U.S. FDA among the sugar alcohols as a caloric macronutrient. (F) (S) (P) (C)

  Synonym(s): 1,2,3-Propanetriol, Monoacetate; Acetyl Monoglyceride; Glycerin Monoacetate; 1-Monoacetin; Acetin; Glycerol, 1-Acetate; alpha-Monoacetin; Glycerol Monoacetate; glycerol alpha-monoacetate; glycerol monoacetate; Glyceryl Acetate; Glyceryl Monoacetate; Monoacetyl Glycerine.

- **Glyceryl, Glyceryl Stearate, Glyceryl Monostearate, Glyceryl Isostearate or Glyceryl Caprylate**. Glyceryl Stearate and Glyceryl Stearate SE are esterification products of glycerin (see glycerin) and stearic acid (see stearate - a vegetable fatty acid). They can be made from palm kernel oil or **soy** and corn oil, 2 GM crops. (F) (S) (P) (C)

- **Glycerophosphocholine** (from **soy** lecithin): It's the choline ester of glycerophosphoric acid. By extension, its fatty acid derivatives, the phosphatidylcholines from soy lecithin. (F) (S) (P) (C)

- **Glycol stearate or distearate**. This chemical compound is used as an emollient in cosmetic products, and is a combination of ethylene glycol (colorless chemical possibly coming from corn) and stearic acid (a common fatty acid from **soy** or canola). This chemical may be derived

either from animal sources (**cow** or **hog**-derived) or vegetable sources, such as soybean oil and canola oil. It can also be produced synthetically through processing stearic acid. (F) (S) (C)

Similar ingredients: Glycol Stearate SE, and Glycol Distearate. See Glycol.

- **Hydrolyzed vegetable protein**. Another name for hydrolyzed corn, **soy** or wheat protein. (F)

- **Inositol** is a carbohydrate found naturally in many fiber-rich foods (such as beans, brown rice, corn, sesame seeds, and wheat bran), inositol hexaphosphate is one of the most widely used forms of inositol. Inositol as it occurs in certain plant-derived substances such as lecithins, however, is well-absorbed and relatively bioavailable. Inositol can be extracted from the phytic acid naturally present in waste corn which is a potential GM crop. Beans like **soybean** (potential GM crop) and grains, as seeds contain large amounts of inositol as phytate. (F) (S)

- **Inversol** is a water soluble, complex ester based, lubricity additive designed for synthetic, water dilutable metalworking fluids. It can be made from **soy**, a GM crop. (C) (I)

- **Isoflavones** comprise a class of organic compounds, often naturally occurring, related to the isoflavonoids family. Isoflavones are produced almost exclusively from the members of the *Fabaceae* (i.e., *Leguminosae*, or bean) family, mostly **soybean**, a GM crop. Soybeans are the most common source of isoflavones in human food; the major isoflavones in soybean are genistein and daidzein. Other dietary sources of isoflavones include chick pea (biochanin A), alfalfa (formononetin), a potential GM crop, and peanut (genistein). (F) (S)

- **Isomalto-oligosaccharides** or **IMO** is created for the food industry from a starch processed from different cereal crops like, wheat, barley, corn, pulses (peas, **soybeans**, lentils) oats, tapioca, rice, potato and other starch sources. (F)

- **Lecithin** can be extracted from corn, **soy**, sunflower or egg yolks, often used as a food additive. Soy bean is a potential GM crop. Also, eggs can come from chicken fed corn, soy or cottonseed feed, all GM crops. (F) (S) (P) (C)

- **Lecithin liposome.** A liposome is a microscopic vesicle (bubble) made out of the similar material (phospholipids) as a cell membrane. Liposomes can be filled with drugs for medicines or vitamin E and A, Gingko biloba, grapeseed and green tea in cosmetics. They can be made of lecithin from egg, sunflower or **soy** – a GM crop. (F) (S) (P) (C)

- **Leucine** (E641) is an essential amino acid. As a food additive, leucine is used as flavor enhancer in form of sodium and potassium salts as well as for diets. Leucine is found in the lean meats**,** fish**,** poultry and dairy**.** It can also come from vegetable sources such as peanuts and **soybeans**. It is used as an additive in feed, especially for chickens. Leucine can be produced with help of genetically modified microorganisms. (F) (I)

- **Lignans** are a group of chemical compounds found in plants. They are one of the major classes of phytoestrogens, plant-based estrogen-like chemicals and also act as antioxidants. They highest amounts of lignans come from flax seeds and sesame seeds. Other sources include cereals like rye, wheat, oat and barley, **soybeans**, cruciferous vegetables such as broccoli and cabbage, and some fruits, particularly apricots and strawberries. Ask for source. (F) (S)

- **Linoleic and linolenic acids** are typically extracted from commodity **soybean** oil. They are composed of five fatty acids: palmitic acid (16:0), stearic acid (18:0), oleic acid (18:1), linoleic acid (18:2), and linolenic acid (18:3). (F) (S)

- **Lipase** - Used to enhance buttery flavors in oils by degrading some of the lipids. Lipases are generally animal sourced, but can also be sourced

microbially. If it comes from animals, they might be fed GM alfalfa, corn, **soy** and cottonseed feed. It could also be extracted from the scutella of corn, a GM crop.

- **Lysine** is the natural form of an essential amino acid that must be obtained from the diet because it can't be produced by our body. Good natural food sources of lysine are high-protein foods such as eggs, meat (specifically red meat such as beef, game meat as well as lamb, pork, chicken and turkey); fish (cod, sardines, bluefish, burbot, mahi-mahi, grouper, haddock, ling, mackerel, perch, pike, pollock, pout, roughy, salmon, sunfish, trout, tuna, turbot, yellowtail, etc.); beans (adzuki, **soybean**, kidney, navy, chickpea and lentils); grains (amaranth, quinoa); seeds (pumpkin); sprouts (**soybean**); peas, and cheese (Parmesan). But read L-lysine below. (F)

- **L-lysine** is the industrial version produced for supplementation. It is created by extracting it from **soybean** or by using bacteria, *corynebacterium glutamicum*, cultivated on a growth medium made of glucose from corn starch hydrolysis or fructose from corn and sucrose from sugar beets as present in molasses. Soybean, corn and sugar beets are suspected GM crops. (F) (S) (P)

- **Magnesium stearate or vegetable magnesium stearate (s**ee stearate), also called *octodecanoic acid, or magnesium salt*, is a white powder which becomes solid at room temperature. It used to be made from bovine source but because of the recent increase in the threat of bovine diseases such as mad cow disease, foot and mouth disease and others, many magnesium stearate manufacturers are switching over from an animal-based ingredient to a vegetable derived version. In its current form, it most likely is a combination of stearic acid and the mineral magnesium. It is commonly used as a flow agent to prevent sticking in the production of medical or supplement tablets, capsules and powders. This form of stearate is commonly sourced from hydrogenated oils such as corn, cottonseed or **soybean** oil – all suspected GM crops. (S) (P)

- **Mono and diglycerides** can come from GM **soybeans**, used as emulsifying agents in sweets, baking goods or ice-cream. (F) (S) (P)

- **Myristyl alcohol** or **1-Tetradecanol,** can be produced by the reduction of myristic acid or fatty acid esters from assorted sources (animal and vegetal) with reagents such as lithium aluminum hydride or sodium. Animal source can be sperm oil from whales or **beef** tallow. Vegetable sources can be jojoba, rapeseed (canola), mustard seed, coconut or palm kernel oil, as well as **soy** and corn oils. Fatty alcohols are also be prepared from petrochemical sources. Ask for source. (F) (D) (C) (I)

  Fatty alcohols are mainly used in the production of detergents and surfactants. They are also components of foods, cosmetics cold creams for its emulsifying and emollient properties, and as industrial solvents. Due to their amphipathic nature, fatty alcohols behave as nonionic surfactants for detergents.

  Also known as 1-Hydroxytetradecane; Tetradecanol; 1-Tetradecanol; Tetradecyl Alcohol; Dytol R-52; Lanette Wax Ks; Loxanol V; Myristic Alcohol; Myristyl Alcohol (Mixed Isomers) ; N-Tetradecanol-1; N-Tetradecyl Alcohol.

- **Natto or nattokinase:** Nattō is made from fermented **soybeans** and has been eaten in Japan for many years. Nattō is produced by fermentation by adding the bacterium *Bacillus natto* to boiled soybeans. Nattokinase is produced by the bacterium acting on the soybeans, a GM crop. (F)

- **Natural flavors** can come from processed proteins from GM corn (like maltodextrin, a sweetener) or **soybeans**, 2 GM crops. By the way, MSG is considered to be a natural flavoring agent by the FDA. See MSG above.

  The exact definition of natural flavorings & flavors from Title 21, Section 101, part 22 of the Code of Federal Regulations is as follows: "*The term natural flavor or natural flavoring means the essential oil, oleoresin, essence or extractive, protein hydrolysate, distillate, or any product of roasting, heating or enzymolysis, which contains the flavoring constituents derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud,*

root, leaf or similar plant material, meat, seafood, poultry, eggs, dairy products, or fermentation products thereof, whose significant function in food is flavoring rather than nutritional."

For the record, **castoreum**, a common ingredient in "natural flavors" which is the castor glands' secretion they use to mark their territory. I'm not sure I would want that kind of "flavoring" in my food. It can be used in foods and beverages as part of a substitute vanilla flavor, or less commonly used as a part of a raspberry or strawberry flavoring. In other words, natural flavors can be pretty much anything approved for use in food.

- **Oleic acid** is a fatty acid that occurs naturally in various vegetable fats and oils. Triglycerides of oleic acid compose 61% of canola oil – a potential GM crop. Oleic acid can also come from GM **soybean** (*Glycine max)* containing higher levels of oleic acid. Commodity soybean oil is composed of five fatty acids: palmitic acid (16:0), stearic acid (18:0), oleic acid (18:1), linoleic acid (18:2), and linolenic acid (18:3). (F) (S)

  The biosynthesis of oleic acid involves the action of the enzyme stearoyl-CoA 9-desaturase acting on stearoyl-CoA. In effect, stearic acid is dehydrogenated to give the monounsaturated derivative oleic acid. Small amounts of oleic acid are used as an excipient in pharmaceuticals and supplementation. Oleic acid is used as an emulsifying or solubilizing agent in aerosol products. (F) (S) (P) (C)

- **Olus Oil** is an emollient to soften and smooth the skin. Olus is a fancy Latin word for oil. It is an expressed oil of vegetable origin consisting primarily of triglycerides of fatty acids. If source is not clearly indicated, it could come from corn, **soy** or cottonseed oils – all GM crops. (C)

- **Omega 3, 6 and 9**. If the source is not specified, be cautious. In commercial supplements, they could be extracted from refined canola, corn, cottonseed, or **soybean** oils – all suspected GM crops. Adding to that fact is that English researchers hope to produce the world's first sustainable plant source of omega-3 fatty acids this year. This gene, normally found in oily fish, will be added by "cutting and pasting" taken

from marine algae into camelina, a member of the mustard family and a relative of canola plants. (F) (S) (C)

- **Ornithine or L-Ornithine** is a non-protein, non-essential amino acid. Is essential for making urea, which removes nitrogen and ammonia from the body and eliminates toxins and is easily found in common foods like fish, meat, nuts and beans. When produced industrially for supplementation, l-ornithine is extracted from **soybean** or using a bacteria, *Corynebacterium glutamicum*, cultivated on a growth medium made of glucose from corn starch hydrolysis or fructose from corn and sucrose from sugar beets as present in molasses. Other names: Chlorhydrate d'Ornithine, L-Ornithine, L-Ornithine HCl, L-Ornithine Hydrochloride, L-5-aminorvaline, L-2,5-diaminovaleric acid, Ornithine HCl, Ornitina. (F) (S)

- **Pancreatic enzymes**: Coming from animal source (cows and pigs) most likely fed with GM corn, **soy** or cottonseed feed. (S) (P)

- **Palmitic acid**: Commodity **soybean** oil is composed of five fatty acids: palmitic acid (16:0), stearic acid (18:0), oleic acid (18:1), linoleic acid (18:2), and linolenic acid (18:3). Soybean is a potential GM crop. (F) (S)

- **PEG-16 and 100 soy sterol**. Plant sterols, or phytosterols are plant-based cholesterol. In this case, since they can come from soybean, a GM crop, caution. (F) (S)

- **PEG 400 dioleate** is a polishing and shining agent. It comes from oleic acid that could come from canola, coconut, corn, cottonseed, olive palm or **soybean** oils. Ask for source. (C)

- **Pepsin** is a proteolytic enzyme generated by the gastric juice of mammals, humans, birds, reptiles, and fish. It helps break down proteins. It is formed from a precursor, pepsinogen, which is found in the stomach mucosa. Pepsin is prepared commercially from the

glandular layer of fresh hog stomachs (see ovine) fed GM crops (canola, corn, cottonseed or **soybean**). Pepsin is used for a variety of food manufacturing production; to modify soy protein and gelatin, thereby providing whipping qualities; to modify vegetable proteins for use in nondairy snack items; to make precooked cereals into instant hot cereals; and to prepare animal and vegetable protein hydrolysates for use in flavoring foods and beverages. (F)

- **Phenylalanine.** There are three forms: the L, D and DL forms. **L-Phenylalanine** is an essential amino acid typically found in proteins such as beef, dairy products, eggs, fish, poultry, pork, nuts and seeds, and GM **soy** products (like soy protein isolate, soybean flour, tofu and many more). Since the majority of commercial animals are fed GM alfalfa, canola, corn, cotton, and soybean feed, make sure the source is GMO-clean. (F) (S) (P)

- **Phosphatidic acid** is a glycerophospholipids and a component of **soy** lecithin – a GM crop. (C)

- **Phosphatidylcholines** (PC) are a class of phospholipids that incorporate choline as a headgroup. They are a major component of biological membranes and can be easily obtained from a variety of readily available sources such as egg yolk or **soybeans –** a suspected GM crop – from which they are mechanically extracted or chemically extracted using hexane.

- **Phosphatidylserine** is a phospholipid that used to be distilled from bovine brain cells but because of concerns about mad cow disease, it has been discontinued. Instead, commercially available products are now made from cabbage or **soybeans** (a suspected GM crop). Although the fatty acids attached to the serine in the plant-based products have a similar, but not identical, chemical structure, it does not have the risk of infection. (C)

Also known as BC-PS, Bovine Cortex Phosphatidylserine, Bovine Phosphatidylserine, Fosfatidilserina, LECI-PS, Lecithin Phosphatidylserine, Phosphatidylsérine, Phosphatidylsérine Bovine, Phosphatidylsérine de Soya, Phosphatidyl Serine, PS, PtdSer, Soy-PS, and Soy Phosphatidylserine.

- **Phosphatidylethanolamine** or **Phosphatidyl Ethanolamine** is a component of **soy** lecithin – a suspected GM crop. (C)

- **Phosphatidylinositol** or **Phosphatidyl Inositol** is a component of **soy** lecithin – a suspected GM crop.

- **Phytic acid** is found within the hulls of nuts, legumes like **soy**, seeds, and grains. Soy bean and soybean products are food sources of phytic acid, a known GM crops.

- **Plant sterols/stanols (or phytosterols)**: Plant sterols and stanols are extracted from the deodorizer distillates of vegetable oil refining and from tall oil, a by-product of paper pulping industry. Major refined vegetable oil sources of plant sterols include GM **soybean** oil, GM corn oil, sunflower oil, rapeseed oil (canola, a GM crop) and wheat germ oils. (F) (S) (C)

- **Pork or porcine gland or organ extracts:** Swine have a digestive system similar to humans and different from ruminants such as cattle and sheep, which can eat forages or grasses. Pigs are fed a diet that is primarily ground corn to supply heat and energy and **soybean** meal to provide protein. Vitamins and minerals are also added in their feed. Both crops are GM crops. (F) (S)

- **Potassium sorbate (**E202**):** Potassium Sorbate is the potassium salt of sorbic acid, a naturally occurring organic acid that has been used extensively as a fungistatic agent for foods. Today most potassium sorbate is made synthetically from corn and sometimes **soybean** – 2 GM crops. See Sorbic acid. (F) (C)

- **Probiotics**: Probiotics come in various types and names. The most common are: *Lactobacillus acidophilus, Bifidobacterium bifidum, Lactobacillus casei, Lactobacillus plantarum, Lactobacillus paracasei, Lactobacillus rhamnosus, Lactobacillus reuteri, Saccharomyces boulardii, Lactobacillus reuteri , Lactobacillus plantarum , Lactobacillus bulgaricus, Streptococcus thermophilus, Lactobacillus bifidus,* etc. Typically, lactic acid is added to a nutrient-rich dairy culture, allowed to grow then extracted from the growth medium and usually freeze-dried before being packaged. Dairy could come from cows fed alfalfa, canola, corn, **soy** or cottonseed feed, all suspected GM crops. In many cases, probiotics are packed with maltodextrin (from GM corn) as a filler or flow agent. Most capsules are made of vegetable cellulose (see cellulose for details) from GM sources. (F) (S) (P)

- **Propylene mono and di-esters** or propylene glycol esters of fatty acids (E477) is a combination of propanediol and fats that can come from animal fat or vegetable fats such as corn or **soybean**. This additive is used as an emulsifier and stabilizer in confectionary, soft drinks, sparkling drinks, cake icings, ice cream and frozen desserts as well as processed meat. (F)

- **Protein isolate** is a protein that is isolated from **soybean**. It is made from soybean meal that has been dehulled and defatted. They are then processed into three kinds of high protein commercial products: soy flour, concentrates, and isolates. Soy protein isolate has been used since 1959 in foods for its functional properties. (F)

- **Qsorb** ® ingredients: Purified Water, Ubiquinone (CoQ10), Medium Chain Triglycerides, Non-GMO Soy Lecithin, **Polysorbate** 80, **Citric Acid**, **Potassium Sorbate**, **Alpha Tocopherol** from GM corn or **soybean**. See each one separately. (F) (S)

- **Sodium Isostearoyl Lactylate. Lactylates** are organic compounds that are FDA approved for use as food additives and cosmetic ingredients

(i.e. lactylates are food grade emulsifiers). Current manufacturing practices were patented in January 1956 and combine fatty acids (e.g. naturally derived stearic acid) and lactic acid at elevated temperatures. For CSL and SSL, the stearic acid component is typically produced from vegetable oils such as **soybean** oil or palm oil. Lactic acid is primarily produced by lactic acid fermentation of sugar with lactic acid bacteria (similar to the bacteria used to produce yogurt). The sugar can be sucrose, fructose, or glucose obtained from corn, sugar beet or sugar cane. Since soy, corn and beet are potential GM crops, ask for non-GMO certification. (F) (C)

- **Sodium Stearoyl Lactylate (SSL) or sodium stearoyl lactate**: SSL is a food additive made from bio renewable feedstock like **soybean**. Vegetarians or vegan, please be aware that it can also be derived from cow or hog or milk. It is manufactured by the esterification of stearic acid (see stearic acid) with lactic acid (see lactic acid) and partially neutralized with either food-grade soda ash (sodium carbonate) or caustic soda (concentrated sodium hydroxide).

  Sodium stearoyl lactylate is an emulsifier and a dough strengthener in baked goods like breads, buns, tortillas and wraps, as well as candies and confections, cereals, desserts, fillings, icings, instant rice, pancakes, pasta, puddings, toppings, waffles. It can also be found in powdered beverage mixes and creamers, chewing gums, cream liqueurs, dehydrated potatoes, dietetic foods, dips, gravies and sauces, sliced and diced canned meats, and pet food. **Note:** When replacing the lactic acid with fumaric acid gives us sodium stearoyl fumarate, a compound with same uses as the two above. (F) (C)

- **Sorbic acid** (E200): Sorbic acid, or potassium sorbate (synthetic) or 2,4-hexadienoic acid, is a natural organic compound used as a food preservative. It is unsaturated fatty acid. It is an antimicrobial agent used as preservative in food and drinks to prevent the growth of mold, yeast, and fungi. It can be manufactured from corn and **soy** – 2 GM crops. (F) (C)

- **Soy germ extract** is used to extract isoflavones in soybeans. It can be used in supplements as an antioxidant. It is also used in skin products to make lips look plumper for example. (S) (C)

- **Soy isoflavones** are phytoestrogens (plant-derived estrogen) extracted from soy – a suspected GM crop. In soybeans, isoflavones are present as glycosides. Soy isoflavone glycosides are called genistin, daidzin, and glycitin. (F) (S) (C)

- **Soybean oil.** Besides being used as cooking oil in the food industry, cosmetic companies also add soybean oil in various forms to their skin-care products to make skin smoother. The oil of the soybean can be extracted using two different methods: In small quantities, soybeans can be pressed into oil. It is not used for large quantities because it is slow, time consuming and gives lower yields. The fiber is then used to feed cattle. In industrial processing facilities, the beans are cleaned, cracked and dehulled. They are then adjusted for moisture content, heated to between 60 and 88 ºC (140–190 °F), rolled into flakes, then extracted with a toxic solvent called hexane a component of gasoline. The oil is then refined, blended for different applications, and sometimes hydrogenated. For more details, see: http://www.soya.be/soybean-oil-production.php.

- **Stearic acid** (E570) or **vegetable stearic acid** is a saturated fatty acid. It is an emulsifier, thickener, and stabilizer. It occurs in many animal and vegetable fats and oils. Stearic acid is prepared by treating these fats and oils with water at a high pressure and temperature (above 200 °C), leading to the hydrolysis of triglycerides. The resulting mixture is then distilled. Stearic acid is used to produce dietary supplements. Commodity **soybean oil** is composed of five fatty acids: palmitic acid (16:0), stearic acid (18:0), oleic acid (18:1), linoleic acid (18:2), and linolenic acid (18:3). It can be found in butter flavoring, vanilla flavoring, chewing gum and candy, and fruit waxes. It is also used as coating for medicine and supplements tablets to ease unmolding. It can be made

from soybean, corn, cottonseed, coconut oil, the fat of cows (see bovine), pigs (see porcine) and sheep. Since alfalfa, corn, cottonseed, soybean oil and bovine/porcine fats are questionable, ask for certification. (F) (S) (P) (C)

- **Stearate** is the anion form of stearic acid (see stearic acid). It is a saturated fat that can come from animal or plant sources. If from plant sources, it can come from corn, cottonseed, and **soybean** sources. If it comes from animal source (beef tallow), it might come from cows fed with GE corn, alfalfa or soybean as well as GE growth hormones and thus be suspect. See bovine paragraph for GMO questions.

- **Stearin**(e) is a colorless, odorless, tasteless ester of glycerol and stearic acid, $C_3H_5(C_{18}H_{35}O_2)_3$, found in most animal and vegetable fats and used in the manufacture of soaps, candles, and adhesives and for textile sizing. Also called *tristearin*. It can be made from palm or **soybean** oil - a GM crop. (C) (I)

- **Stearoyl** is an enzyme extracted from stearic acid, a fatty acid that can come from cotton, corn or **soy**. (F) (S)

- **Stearyl Alcohol** is a fatty alcohol made from stearic acid and cetyl alcohol. It is an emulsifier, emollient, foam booster, stabilizer, and thickener in beauty products. It can be produced from sperm whale oil (rare and expensive) or from vegetable sources, typically coconut or sometimes corn or **soybean** oil – both GMO crops. (C)

  Similar ingredients: Isostearyl Isononanoate, Stearamine Oxide, Stearyl Acetate, Stearyl Caprylate, Stearyl Citrate, Stearyldimethyl Amine, Stearyl Glycyrrhetinate, Stearyl Heptanoate, Stearyl Octanoate, Stearyl Stearate.

- **Tamari**: See soy sauce or Shoyu. (F)

- **Tempeh**: A fermented form of soy beans – a potential GM crop.

- **Teriyaki marinades**: See soy sauce or Shoyu.

- **Textured vegetable protein**: Textured or texturized vegetable protein (TVP), also known as **textured soy protein** (TSP), **soy meat**, or **soya chunks** is a defatted soy flour product, a by-product of extracting soybean oil. TVP is usually made from high (50%) soy protein soy flour or concentrate, but can also be made from cotton seeds (a potential GM crop), wheat, and oats. (F)

- **Threonine** is an amino acid obtained from the hydrolysis of corn or **soy** protein – GM crops. The production of threonine with help of genetically modified microorganisms is spread worldwide. It is produced by fermentation technology using genetically modified strains of Escherichia coli. (F) (S)

- **Tocopherols** are the lower quality forms of vitamin E. As a food additive, they are **tocopherol** (E306), **alpha-tocopherol** (E307), **gamma-tocopherol** (E308) and **delta-tocopherols** (E309). They can be found naturally in sunflower, peanut, sesame, olive and walnut oils. Commercially, they are extracted from cheaper oils such as canola, corn**,** cottonseed and **soybean** – all GM crops. Although they are all approved in the USA, EU and Australia and New Zealand for use as antioxidants in food and vitamins, since they are typically coming from GM crops, caution. Ask for food source. (S) (C)

- **Tocopheryl Acetate** is a fat-soluble vitamin that can be isolated from vegetable oils (canola, corn, cottonseed and soy – all GM crops). It is also found in dairy products, meat, eggs, cereals, nuts, and leafy green and yellow vegetables. (S) (C)

- **Triglyceride** or **triacylglycerol**, or **triacylglyceride** is an ester derived from glycerol and three fatty acids. Triglycerides are the main constituents of vegetable oil (typically more unsaturated), most likely

canola (rapeseed or linseed) oil, corn oil, **soybean** oil or cottonseed oil – all potential GM crops. (F) (S) (C)

- **Tyrosine** is a non-essential amino acid. The word "tyrosine" is from the Greek *tyri*, meaning *cheese*, as it was first discovered in 1846 by German chemist Justus von Liebig in the protein casein from cheese. Tyrosine, which can also be synthesized in the body from phenylalanine, is found in many high-protein food products such as **dairy** products like milk, cheese, yogurt, cottage cheese, and **soy** products. See dairy and soy for potential GMO dangers.

- **Vegetable anything** that's not specific* can come from canola, cottonseed, corn or **soy** origins. (F) (S) (P) (C)

- **Vegetable-based fatty acids**, when not specified, could come from canola, corn**,** cottonseed or **soybean** – al GM crops. (F) (S) (C)

- **Vegetable fats** and **oils**. The vast majority of commercial oils used in restaurants, fast food establishments and sold at your local grocery store are from canola, corn, cottonseed and **soy**. Soybean oil by itself comprises about 80% of commercial oils. A large percentage of these crops come genetically engineered (see details above) and are usually blended into "regular" oils. Unless they are specifically labeled "USDA Certified Organic" or "non-GMO Verified, be cautious and ask for source. For cooking, you can look for untainted oils or fats such as butter (make sure is does not contain bovine growth hormones), olive, coconut, safflower, sunflower, and peanut oils; for cold applications, use flaxseed, walnut, hazelnut, and macadamia oils. (F) (S) (P) (C)

- **Vegetable lubricants**: They can be any of the following: Stearic acid or stearates, magnesium stearate, calcium stearate, ascorbyl palmitate, fractionated vegetable oil, hydrogenated vegetable oil, castor oil, etc. These are primarily triglyceride esters that can be derived from plants as well as animals. Other common vegetable-based lubricants are high oleic canola oil (GM crop), castor oil, palm oil, **soybean** oil (GM), sunflower seed oil and Tall oil from tree processing sources. Other deceptive names

such as Pharmaceutical Glaze, Confectioners Glaze or Natural Glaze are names for shellac. Natural Vegetable Coating, Natural Protein Coating, Vegetable Coating, and Maize Protein are names for Zein which is corn protein – a GM crop. (F) (S) (P) (C)

- **Vegetable stearate** can come from coconut oil, cocoa butter, palm oil, corn, cottonseed or **soybean** oils. They are high in stearic acid. These can also be used to make vegetable magnesium stearate. Ask for source. (F) (S) (P) (C)

- **Vitamin E** exists in eight different forms, four **tocotrienols** (alpha, beta, gamma and delta) and four **tocopherols** (alpha, beta, gamma and delta). Vitamin E is widely utilized in the supplements and cosmetic industry as an ingredient in the manufacture of soaps, creams, make-up and hair care products. (F) (S) (C)

  Tocotrienols are the natural form of vitamin E. Their three main commercial sources are rice bran, palm and annatto. In its natural form, it can be also be found in grains like barley, corn (a GM crop), oat, rye, wheat bran and wheat germ; they can also be found in vegetables like broccoli, cauliflowers, carrots, and olives; in fruits like apricots, avocado, black currants, blueberries, grapes and its seeds; nuts like almonds, cashews, coconut, macadamia, and pistachio; and even certain **meats** (lard) and eggs. (F) (S) (C)

  Tocopherols are the lower quality forms of vitamin E. As a food additive, they are **tocopherol** (E306), **alpha-tocopherol** (E307), **gamma-tocopherol** (E308) and **delta-tocopherols** (E309). They can be found naturally in sunflower, peanut, sesame, olive and walnut oils. Commercially, they are extracted from cheaper oils such as canola, corn, and **soybean** – all GM crops. Although they are all approved in the USA, EU and Australia and New Zealand for use as antioxidants in food and vitamins, since they are typically coming from GM crops, caution. Ask for food source. (F) (S) (C)

  Both members of the vitamin E family act as antioxidants. However, the natural vitamin E is a more powerful antioxidant due to its unique

molecular structure. Unfortunately, since the synthetic version is cheaper to produce, it is most likely that, if you do not pay attention, you will use the tocopherols extracted from GM crops. If you are looking for the real thing and the non-GMO version, look for the tocotrienol form of vitamin E. (F) (S) (C)

Mixed Tocopherols are a concentrated form of both forms of tocopherols derived from the same GM crops. Mixed tocopherols in the US are less fractionated "natural mixed tocopherols" and high d-gamma-tocopherol fraction supplements. These can still come from GM crops. (F) (S) (C)

Finally, you have the **synthetic vitamin E**, commonly referred to as **dl-alpha-tocopherol**, the cheapest form of vitamin E, most commonly sold supplement form usually as the acetate ester. Synthetic forms of the nutrient have "dl" or "all-rac" in front of the name, like "dl-alpha-tocopherol". This synthetic form of vitamin E is derived from **petroleum** products. Synthetic vitamin E is most commonly used in tablets and multiple vitamins. Only about 25% of synthetic vitamin E is used by our body. The present largest manufacturers of this type are DSM and BASF. Since it is synthetic and not coming from a natural source, one could say it is GMO-free, but I would still avoid it. (F) (S) (C)

- **Vitamin E acetate or Tocopheryl acetate**, is the acetic acid ester form of tocopherol isolated from vegetable oils (usually canola, corn and **soybean** – all GM crops). Because it contains antioxidants and do not oxidize as fast as tocopherol, it is a common vitamin supplement used in dermatological products such as skin cream, lipstick, eye shadow, blushers, face powders and foundations, moisturizers, skin care products, bath soaps and detergents, hair conditioners, and many other products. (C)

- **Vitamin K** (Phylloquinone; K1; Menaquinone; K2; Menadione; K3). As usual with vitamins, there are natural vitamin K from food and vitamin K coming out of a lab. Natural vitamin K1 (Phylloquinone) comes from eating green leafy vegetables, such as kale, spinach, turnip greens, collards, Swiss chard, mustard greens, parsley, romaine, and green leaf lettuce; vegetables such as Brussels sprouts, broccoli, cauliflower, and

cabbage; fish, liver, meat, eggs, and in some cereals in smaller amounts. Vitamin K2 (Menaquinone) is produced by our own gut friendly bacteria.

On the other hand, vitamin K3 (Menadione) is chemically synthesized from the fermentation of **soybean** protein isolate and corn starch – both GM crops, in the presence of Gram-positive bacterium Bacillus subtilis natto. So make sure to ask for the source. Better yet, get it from fresh food. (S)

- **Vitamins**. Most commercial vitamins are genetically engineered in a lab from corn, **soy** of sugar beet. (F) (S)

- **Yeast extract (or Autolyzed or hydrolyzed yeast)**, is similar in form as MSG (monosodium glutamate) from **soybean** – a GM crop. See MSG. Yeast extract contains an amount of naturally occurring glutamic acid or monosodium glutamate. This is produced from an acid-base fermentation cycle, and is only found in some yeasts, typically ones bred for use in baking. Many food producers have replaced monosodium glutamate with yeast extract, which is cheaper, requires no E-number labeling, and allows food producers to claim their product is 'all natural' or 'with natural flavorings'. Canned and frozen soups contain yeast extracts to enhance their taste and highlight the flavor of meaty or cheesy ingredients. (F)

SUGAR BEET

Sugar Beets – (About 95% of U.S. crop in 2010). Although GE sugar beets were temporarily taken out of production by a court ruling, they came back in 2009 and now have captured 95 percent of the market. They are engineered to be RoundUp ready, like corn. They are used in refined sugar production and the fiber left is used to feed CAFO animals. Traits: Resistance to glyphosate, glufosinate herbicides. Anything not listed as 100% cane sugar is suspect. Look for organic and non-GMO sweeteners, candy and chocolate products made with 100% cane sugar, evaporated cane juice or organic sugar, to avoid GM beet sugar.

Please note: To clarify in which industry each of the following products are used, I used (F) for food and drinks, (S) for supplements, (P) for pharmaceuticals, (C) for cosmetics, (A) for animals feed and pet food, and (I) for industrial uses.

Food made with sugar beets

As you know, sugar is everywhere in our food supply. There is no point in trying to list them all here. You already know where it is. Now that you know a little more about GMO, make sure to pick a natural sweetener that does NOT come from a potential GM source, like cane sugar (until itself become genetically engineered), coconut sugar, palm sugar, real honey, and organic agave nectar (be careful of other forms). You can also choose to sweeten your smoothies with dates, prunes or organic frozen fruits.

Unless specified as sugar cane, assume that all sweeteners labelled as "sugar" come from sugar beet, a GM crop. As usual, you have to be a label detective to know what's in your food.

Ingredients or Food Products Coming From Sugar Beets

For all following ingredients or products, ask for source, USDA Organics or non-GMO certification.

Please note: To clarify in which industry each of the following products are used, I used (F) for food and drinks, (S) for supplements, (P) for pharmaceuticals, (C) for cosmetics, (A) for animals feed and pet food, and (I) for industrial uses.

- **Acetic acid (**E260), also called **Ethanoic acid, Acetasol**, **Methanecarboxylic acid**, **Ethylic acid**, **Vinegar acid**, **Acetic acid**, **Glacial acetic acid**, **Acetate**, **Essigsaeure** is a colorless liquid. When undiluted, is called *glacial acetic acid*. Acetic acid is the main component (6 to 9%) of white vinegar. Some of it is manufactured from petrochemical or wood distillation. The remainder is produced by fermentation and subsequent oxidation of ethanol - produced from a variety of feedstocks such as **sugar beet**, **corn**, cotton- all suspected GM crops (see ethanol below). By the way, that makes white vinegar a suspect ingredient as well. (F) (S) (C) (P)

- **Alcohol** (ethanol, ethyl alcohol, methyl alcohol, denatured alcohol or grain alcohol) Besides alcohol by the natural fermentation of assorted fruits (like grapes in wine and many others) or grains (like rye in vodka and many others), the industrial version is a colorless volatile flammable liquid (C_2H_5OH) synthesized by hydration of ethylene or obtained by fermentation of sugars and starches from beet or corn (both suspected GM crops) used, either pure or denatured, in beverages, medicines or pharmaceutical drugs like cough medicine, lotions, tonics, colognes, supplements, cleaning solutions, explosives, and intoxicating beverages; can also be used as a solvent, rubbing compounds, automobile radiator antifreeze, and rocket fuel.

  Short chain alcohol like methanol, ethanol, ethyl alcohol and propanol can be made from corn or **sugar beet** – both GM crops. Higher alcohols such as C16 Cetyl alcohol, C18 Stearyl alcohol, Cetostearyl alcohol (a combination of cetyl and stearyl alcohols), C18 stearic acid, C18 oleic acid, or C22 behenyl alcohol can be extracted from corn and **sugar beets** as well as coconut and palm. Ask for source. (F) (S) (C) (P)

- **Aspartate** or **Aspartic acid** is not an essential amino acid, which means that it can be synthesized from central metabolic pathway intermediates in humans. Aspartic acid can be synthesized from molasses from **corn** sugar or **sugar beets**, both GM crops. (F) (S)

- **Aspartic acid** is an amino acid made synthetically using ammonium fumarate and aspartase from *E.coli*, *E.coli* usually breaks down the aspartic acid as a nitrogen source. Aspartic acid, which is available in all

protein foods, forms *aspartame* when it's combined with phenylalanine (another amino acid). It can come from sugar can or **sugar beet** – a GM crop. (S)

- **Betaine or Trimethylglycine (TMG** is the chemical term for betaine**),** can also be labeled "anhydrous betaine" (TMG without water), "betaine monohydrate" (TMG with one water molecule), "glycine betaine", or "oxyneurine". Betaine has a pH between 5 and 8, which is neutral. TMG is created by processing sucrose from **sugar beets** (a suspected GM crop) through chromatic separation, which yields glycine betaine as a byproduct. **Betaine hydrochloride or Betaine HCl** is betaine with added hydrochloric acid (HCl). It is often confused with betaine or TMG but they are not the same product. Due to its strong acidity, betaine HCl is usually sold as a digestive aid. Betaine HCL can be synthesized from TMG (betaine) from **sugar beets** – a potential GM crop. Also known as: Betaine, Betaine Chlorhydrate, Betaine HCl, Betaine Hydrochloric Acid, TMG, Trimethyl Glycine, and Trimethylglycine. (S)

- **Blended sugar** (sugaridextrose). It is a blended form of sugar, potentially from GM **sugar beets** and dextrose from GM **corn**. (F) (S)

- **Brewer's yeast** is made from a one-celled fungus called *Saccharomyces cerevisiae.* When bred as a food supplement, brewer's yeast is often grown on glucose or fructose, or on disaccharides such as sucrose and maltose from **sugar beets** or corn – 2 suspected GM crop. Sometimes potato starch dextrose or malt extract is used (mostly in Europe). When it is produced specifically for use as a food supplement, is dried at a higher temperature than baker's yeast, killing the live enzymes and producing no-leavening yeast that will not ferment. Brewer's yeast is often used as a source of B-complex vitamins, chromium, and selenium. The B-complex vitamins in brewer's yeast include B1 (thiamine), B2 (riboflavin), B3 (niacin), B5 (pantothenic acid), B6 (pyridoxine), B9 (folic acid), and H or B7 (biotin).

  If it is not clearly described as non-GMO, assume it has been genetically engineered. You should know that genetically modified yeasts long have

been in use in the production of medications, special chemical compounds, enzymes and food additives. With the use of recombinant-DNA techniques, labs have been creating specific breeding of yeast for brewing. Strains have been created with the ability to ferment a wider range of carbohydrates, with altered flocculation properties. They then can produce beers with modified flavors. In the US and Canada GM yeasts have been approved for primary use in the production of wine and beer. For example, the GM yeast labeled ML01 is used to improve the color stability and taste of wine and to avoid the production of undesirable compounds (histamines). (F) (S) (P)

- **Brown sugar** can be made from **sugar beets** (a GM crop) or contain caramel color from corn syrup – another GM crop. See caramel coloring below. (F)

- **Caramel** and **caramel color** is made by caramelizing **corn** syrup or sucrose from **sugar beets**. Corn and sugar beets are GM crops. It is used in soft drinks, baked goods, candy, ice cream, and meats to impart a brown color, and also as a flavoring. On a side note, Consumer Reports has revealed that the caramel coloring can contain a harmful carcinogenic chemical called 4-methylimidazole, or 4-MEI. Caution. (F) (S)

- **Cellulose** (E 460), Carboxymethyl Cellulose, Croscarmellose Sodium, Ethylcellulose, Hydroxypropyl Cellulose, Hydroxypropyl Methylcellulose, Hydroxymethyl Cellulose and Methylcellulose (E 461), Microcrystalline Cellulose, and Croscarmellose Sodium. They sometimes show on labels as crospovidone(s), bentonite, and polysorbate(s). They are used as filler, binder, or coating. Leftover cotton fibers that are too short to be spun into textiles consist almost completely of cellulose and can be used as food additives. Cellulose and methylcellulose can be used as thickeners, stabilizers, emulsifiers, or fillers in medication or supplements. Cotton is a potential GM crop. It can also come from **corn** or **sugar beets**, both suspected GM crops. (F) (S) (P)

- **Citric acid** (E 331, 332 and 333) (vitamin C): Citric acid was the first additive that was produced on a large scale biotechnically. The classic method used the metabolic power of certain fungi (*Aspergillus Niger*). Citric acid-producing microorganisms grow on culture media that

usually contain molasses (**sugar beet**) and/or glucose. It can be found in chips, tomato paste, and many other processed foods. Fructose and glucose can be produced form corn starch which can be derived from GM **corn**. (F) (S) (P) (C)

- **Confectioner's sugar**. It can come from **sugar beet**, a GM crop as well as contain a small percentage of corn starch as an anticaking agent from corn, a GM crop. (F)

- **Corn alcohol** is another name for ethanol, ethyl alcohol or grain alcohol used as carrier for fruit extract (lemon, orange) or vanilla extract. It is also used in pharmaceutical products such as cough syrup. See ethanol. Corn liquor or whiskey is an American-made liquor made from a mash of at least 80 percent corn mixed with sugar (from **sugar beets** – a GM crop). (F) (S) (P)

- **D-phenylalanine**, the non-food synthetic version of phenylalanine is the artificial sweetener aspartame. As you already know, aspartame is the result of genetically engineering *E. coli* fed glucose from **sugar beets** or **corn** fructose, both GM crops. This compound, sold under the trade names Equal and NutraSweet, is metabolized by the body into several chemical byproducts including phenylalanine. It is used in the manufacture of food and drink products and sold as a nutritional supplement for its reputed analgesic and antidepressant effects. The DL version is a combination of 50% D and 50% L forms. (F) (S)

- **Dihydroxyacetone** or DHA (a glycerone) is used as an ingredient in sunless tanning products. It is often derived from plant sources such as **sugar beets,** corn (GM crops) or sugar cane, and by the fermentation of glycerin. (S) (P)

- **Enzymes:** Commercial enzymes are grown on a glucose slurry from corn or **sugar beet**, or protein or fat substrates. The microorganisms feed on nutrients derived from e.g. maize (corn), soybeans, potatoes or sugars. But the right nutrients for the microorganisms depend on the enzyme which is to be produced. Today more than 90% of enzymes are made

from GMOs. Enzymes are very powerful, and they must typically be diluted and standardized to a uniform usable strength. A common *diluent is* ***lactose****, so* one must be careful that ***papain*** *and* ***bromelain****,* for example, may be considered a dairy product for this reason. See dairy. (F) (S) (P) (C) (I)

- **Erythrulose** is derived from **sugar beets** – a GM crop. Its active ingredient reacts with the keratin protein in the topmost dead skin layers to produce a natural color, providing a safe sunless self-tan. (C)

- **Ethanol,** also called **ethyl alcohol**, **pure alcohol**, **grain alcohol**, or **drinking alcohol**, **(**or C12-15 alkyl benzoate) is a long chain alcohol. During ethanol fermentation, glucose and other sugars that are converted into ethanol and carbon dioxide. Ethanol can be produced from a variety of feedstocks such as **sugar beet**, and corn **–** all these crops are potential GMO crops. Ethanol can also be distilled from petroleum. Ask for source. (F) (S) (P) (C)

- **Ethyl ester (EE) or Fatty Acid Ethyl Ester (FAEE)** is an alternate lipid class different than natural fish oil triglycerides. Natural triglycerides are a combination of three fatty acids (i.e. EPA and DHA) esterified (bonded) to a glycerol backbone. On the other hand ethyl esters are a class of fats that are derived by reacting free fatty acids with ethanol (see ethanol). This process, called trans-esterification, describes the process involving a reaction removing the glycerol backbone of a TG and substituting it with ethanol. The resulting EE allow for the fractional distillation (concentration) of the long chain fatty acids at lower temperatures. The result is concentrated EPA and DHA and is typically marketed and sold as "Fish Oil concentrate". Ethanol can come from corn or **sugar beet** distillation (see ethanol), a suspected GM crop. (C)

- **Fructan** is a fructose polymer like inulin. It is a plant storage carbohydrate made of chains of fructose rather than glucose units. It can

come from chicory or **sugar beet**. It can also be created by introducing specific onion fructosyltransferases into sugar beet – a GM crop. (S) (P)

- **Gluconic acid** is a mild organic acid derived from glucose (from corn or **sugar beet**) by a simple oxidation reaction. The reaction is facilitated by the enzyme glucose oxidase (fungi) and glucose dehydrogenase (bacteria such as *gluconobacter*). Microbial production of gluconic acid is the preferred method and it dates back to several decades. The most studied and widely used fermentation process involves the fungus *Aspergillus Niger*. Gluconic acid and its derivatives, the principal being sodium gluconate, have wide applications in food and pharmaceutical industry. (F) (S) (P)

- **Glycerin** (E422) or **Glycerine** or **vegetable glycerin(e)** is a simple polyol compound used as a humectant (it attracts water) in cosmetic products. It is a colorless, odorless, viscous liquid that is widely used in pharmaceutical formulations. As a food additive, glycerol is labeled as E number E422. It can be derived from the refining of biofuels from **corn** or **sugar beet**, both potential GM crops. In foods and beverages, glycerol serves as a humectant, solvent, and sweetener, and may help preserve foods. It is also used as filler in commercially prepared low-fat foods (e.g., cookies), and as a thickening agent in liqueurs. (F) (S) (P)

- **Golden syrup** is used in England, Scotland and Ireland in the same way as maple syrup is used in America and Canada, to drizzle over pancakes or desserts. It is a thick, clear honey-colored form of inverted sugar syrup transformed by the addition of an acid. It comes from the left material of refining sugar cane or **sugar beet** juice into table sugar. It can also be made by combining high fructose **corn** syrup colored with caramel. (F)

- **Glycolic acid or hydroxyacetic acid (AHA).** The most economical synthetic version comes from the catalyzed reaction of formaldehyde with a synthesis gas (carbonylation of formaldehyde). The natural version can be isolated from natural sources, such as sugarcane, GM **sugar beets,** pineapple, cantaloupe, as well as unripe grapes. It is used in cosmetics as an exfoliator or skin peel. (C)

- **Hyaluronic acid or Hyaluronan (HA),** also called **sodium hyaluronate.** This glycosaminoglycan has traditionally been extracted from animal tissues such as synovial fluid, rooster combs, cartilage, vitreous humor and umbilical cords; however, microbial fermentation by the bacteria *Streptococcus or Bacillus subtilis* generate yields with higher concentrations of HA at lower costs and with more efficient downstream processes. The sugar backbone of HA is derived from glucose-6-phosphate and fructose-6-phosphate. You basically have reactors with bacteria that are fed with plant sugars (peptone and glucose from GM corn and **sugar beets**, or wheat). (C)

- **Inulin**: Inulins are a group of naturally occurring polysaccharides produced by many types of plants. They mostly come from chicory root. Inulin carries many different names you're likely to find on the nutrition label like chicory root, Beta fructans, or oligosaccharides. Scientists are now working on genetically modified chicory with stabilized inulin levels. Recently, inulin is being made by introducing specific onion fructosyltransferases into **sugar beet** – a GM crop. (F) (S) (P)

- **Itaconic acid polymer** is a dispersant created through the fermentation of plant sugars (corn or **sugar beet**), both suspected GM crops. (C)

- **Lactic acid*** (E270). Although our body generates lactic acid as a natural function of all our muscles, lactic acid is also employed in the pharmaceutical industry to produce water-soluble lactates from otherwise insoluble active ingredients. Also used in topical preparations and cosmetics to adjust acidity as for its disinfectant and keratolytic properties. Commercially, lactic acid fermentation is performed by lactic acid bacteria, to convert glucose, sucrose or lactose into to lactic acid. Carbohydrate sources include corn, **sugar beets**, and cane sugar.

- **Levulinic Acid**: Levulinic acid is an organic acid prepared by heating sucrose (from corn or **sugar beet** – GM crops) with a concentrated acid. The process proceeds through the intermediacy of glucose, which

isomerizes to fructose and then undergoes dehydration into hydroxymethylfurfural (HMF). Other sugar-derivatives can be used in this process including levulose (D-fructose), inulin and starch. HMF hydrolyzes to formic acid and levulinic acid. It is used as a fragrance ingredient, skin-conditioning agent in the perfume and skin care business. (C)

Synonym(s): 3-acetylpropionic acid; 4-ketovaleric acid; 4-oxopentanoic acid; 4-oxovaleric acid; 4-oxo; pentanoic acid; acetoproprionic acid.

- **Lysine** is an essential amino acid for humans. As it cannot be produced by our body, it must be obtained from our diet. L-lysine is produced industrially for supplementation by extracting it from soybean by using a bacteria, *Corynebacterium glutamicum*, cultivated on a growth medium made of glucose from corn starch hydrolysis or fructose from corn and sucrose from **sugar beets** as present in molasses. Soybean, corn and sugar beets are suspected GM crops. (S)

- **L-lysine** is the industrial version produced for supplementation. It is created by extracting it from soybean or by using bacteria, *corynebacterium glutamicum*, cultivated on a growth medium made of glucose from corn starch hydrolysis or fructose from corn and sucrose from **sugar beets** as present in molasses. Soybean, corn and sugar beets are suspected GM crops. (F) (S) (P)

- **Magnesium Aspartate** is the magnesium salt of aspartic acid. Magnesium aspartate is a mineral amino acid chelate containing magnesium bound to the amino acid known as aspartate or aspartic acid. Aspartic acid or aspartate is a non-essential amino acid that can be extracted from asparagus, sprouting seeds, avocado, oat flakes. Most likely, industrial sources come **sugar beet** molasses – a GM crop. It is also considered to be an excitotoxin like its cousin: aspartame (NutraSweet, Equal, Caderel, etc.). (F) (S)

- **Maltose** is a monosaccharide that can come from **sugar beet** or corn. (F) (S)

- **Mannitol** (E 421) is part of the sugar alcohol family of sweeteners. Fructose from corn or **sugar beet** is the basic material for the production of mannitol. It is produced from plant starch during the process of the saccharification of starch. It can be used as a coating for hard candies, dried fruits, and chewing gums, and as an ingredient in candies and chewing gum. Its pleasant taste and mouth feel also makes it a popular excipient for chewable tablets. (F) (S) (P)

- **Methylcellulose** (E 461) is a chemical compound derived from cellulose, a polysaccharide made from glucose. It is sold under a variety of trade names and is used as a thickener and emulsifier in various food products. It can also be used as a thickening agent and binders in cosmetics. For industrial use, methyl cellulose today is mainly obtained from wood pulp or GM cotton, corn and **sugar beets**. (S) (P) (C)

- **Methyl Gluceth**, **Methyl Gluceth-10 or -20**, **Methyl Gluceth Benzoate**: Methyl Gluceth and its derivations are a water-soluble skin conditioner, emollient (skin softener) and humectant (aids in moisture retention) produced from fructose from GM corn or glucose from **sugar beets** and methyl alcohol. (C)

- **Monosaccharides** are the most basic units of carbohydrates. They are the simplest form of sugar and are found as colorless, crystalline and water-soluble solids. Most monosaccharides have a sweet taste but not all. Everyday examples of monosaccharides are glucose (dextrose), fructose (levulose) and galactose. Monosaccharides are the building blocks of disaccharides (such as sucrose or sugar), oligosaccharides and polysaccharides (such as cellulose and starch). Any of these could come from **corn** or **sugar beets**. (F) (S) (P) (C)

- **Mucopolysaccharide.** It is one of the many forms of saccharide, a carbohydrate present in common sugar. It could come from **corn** or **sugar beet**, 2 GM crops. (F) (S) (P)

- **Oligofructose is a type of** oligosaccharides (short-chain sugars) consisting of fructose molecules from **corn** – a GM crop. (F) (S) **Olestra or Olean (trade name)** is a triglyceride, a dietary fat that consists of three fatty acids bonded to a glycerol backbone (a simple polyol – sugar alcohol) Because olestra is synthesized from sucrose – a disaccharide composed of the glucose and fructose from corn or **sugar beets**, both suspected GM crops, avoid. (F)

- **Ornithine or L-Ornithine** is a non-protein, non-essential amino acid. Is essential for making urea, which removes nitrogen and ammonia from the body and eliminates toxins and is easily found in common foods like fish, meat, nuts and beans. When produced industrially for supplementation, l-ornithine is extracted from soybean or using a bacteria, *Corynebacterium glutamicum*, cultivated on a growth medium made of glucose from corn starch hydrolysis or fructose from corn and sucrose from **sugar beets** as present in molasses. Other names: Chlorhydrate d'Ornithine, L-Ornithine, L-Ornithine HCl, L-Ornithine Hydrochloride, L-5-aminorvaline, L-2,5-diaminovaleric acid, Ornithine HCl, Ornitina. (F) (S)

- **Polysaccharides** are a long chain of monosaccharides bound together. Good examples are starch and glycogen, and cellulose and chitin. They can come from corn or **sugar beets**. See saccharides. (F) (S)

- **Potassium gluconate** is the potassium salt of the conjugate base of gluconic acid from glucose. Also known as pentahydroxycaproic acid potassium salt, D-gluconic acid potassium salt, or potassium D-gluconate. Unless specified otherwise, since glucose usually comes from corn or **sugar beets**, both GM crops, be careful. (F) (S) (C)

- **Pullulan** is a naturally occurring cell wall component of the fungus *Aureobasidium pullulans* breaking down corn starch. Pullulan is a polysaccharide polymer consisting of maltotriose units. Commercially, Pullulan is resulting from a fermentation process. *Aureobasidium pullulans*

grow on the carbohydrate substrate (sugar or starch) from corn or **sugar beets**. Then *Aureobasidium pullulans* is harvested. (F) (S)

- **Saccharide**, is the biochemistry name used for carbohydrate. Carbohydrates, or saccharides can be then broken down into four chemical groups: monosaccharide (single saccharide, the most basic form of carbohydrate), disaccharides (a bond of two monosaccharides such as sucrose, maltose or galactose), oligosaccharides (a saccharide polymer containing a small number of simple sugars or monosaccharides), and polysaccharides (a long chains of monosaccharides bound together. Good examples are starch and glycogen, and cellulose and chitin). Since all of the above could come from corn or **sugar beets**, you know what to do. (F) (S) (P) (C) (I)

- **Sodium erythorbate** (E316) is the sodium salt of erythorbic acid (see above). It is produced from sugars derived from different sources, such as **sugar beets,** sugar cane, and corn**.** It is a food additive used predominantly in meats, poultry, and soft drinks production. It also used to preserve freshness in fruit and vegetables. It does this by preventing discoloration and development of off-flavors. (F)

- **Sodium Isostearoyl Lactylate. Lactylates** are organic compounds that are FDA approved for use as food additives and cosmetic ingredients (i.e. lactylates are food grade emulsifiers). Current manufacturing practices were patented in January 1956 and combine fatty acids (e.g. naturally derived stearic acid) and lactic acid at elevated temperatures. For CSL and SSL, the stearic acid component is typically produced from vegetable oils such as soybean oil or palm oil. Lactic acid is primarily produced by lactic acid fermentation of sugar with lactic acid bacteria (similar to the bacteria used to produce yogurt). The sugar can be sucrose, fructose, or glucose obtained from corn, **sugar beet** or sugar cane. Since soy, corn and beet are potential GM crops, ask for non-GMO certification. (F) (C)

- **Sodium lactate** is the sodium salt of lactic acid. It is produced by the fermentation of a sugar source, such as corn and **sugar beets** - both GM crop, and by neutralizing the resulting lactic acid. (F) (S) (C)

- **Sodium PCA** (Pyrollidone Carboxylic Acid) or **NaPCA** (Na PCA, Na-PCA) is a vegetable-derived humectant (to keep your skin moist) and emollient found in cosmetic products. It can be made from the fermentation of sugar (corn or **sugar beet**) or starches (corn). It can also come from coconut, cherries and seaweed. Caution: It can form carcinogenic nitrosamine compounds on the skin or in the body after absorption, if mixed with amines. If source is not specified, ask for source. (C)

- **Sodium polyaspartate** is a sodium salt coming from aspartic acid (see above) from **sugar beet** or corn. It is biodegradable polymer based on the amino acid aspartic acid. (C)

- **Sorbite**: Sugar substitutes such as sorbite can come from GM corn or **sugar beet**. (F)

- **Sorbitol (E420)**: Sorbitol, a sugar substitute also known as **glucitol**, is a sugar alcohol which our body metabolizes slowly. Most sorbitol is made from corn syrup but can also be found in apples, pears, peaches, and prunes. Since it contains almost one half (55%) less calories than refined sugar, it is often used in diet foods (diet drinks, ice cream and even in mayonnaise), mints, mouthwashes, toothpaste, cough syrups, and sugar-free chewing gum. It can be a as a carrier or stabilizer for supplements, vitamins and flavorings. Be careful not to take in too much sorbitol at once as it is a known laxative. If the source is not specified, it is safe to assume that it comes from GM corn or **sugar beet.** (F) (S) (C)

- **Sucrose**. If source is not specified, most likely sucrose has been extracted from corn or **sugar beet**, both suspected GM crops. (F)

- **Sugar***, if not identified as cane, can come from corn or **sugar beet** – both GM crops. (F)

- **Sugar Alcohols**: The common sugar alcohols – sorbitol, mannitol, maltitol, erythritol, and hydrogenated starch hydrolysates – are manufactured from GM corn starch. Xylitol, another common sugar alcohol, is manufactured from such sources as corn cobs (a GM crop), sugar cane bagasse (stalk residue remaining after sugar extraction), or birch wood waste. Isomalt and lactitol are becoming more common and are manufactured from sucrose (**sugar beet** – a GMO crop) and whey (see dairy), respectively. Isomalt and lactitol are commonly called bulk sweeteners because their sizes are nearly the same as sugar. See more under corn. (F) (S) (P) (C)

- **Trimethylglycine** (TMG) also called vegetable betaine is produced by processing sucrose from **sugar beets** (a GM crop) and yields glycine betaine as a byproduct. The value of the TMG rivals that of the sugar content in sugar beets. (S) (C)

- **Vanilla extract** or **Natural Vanilla**: Vanilla extract is made by macerating and percolating vanilla beans in a solution of ethyl alcohol (from GM corn) and water. Vanilla extract may contain one or more of the following optional ingredients: Glycerin (see glycerin); Propylene glycol (see propylene glycol). Sugar –possibly from **sugar beet**, a GM crop (including invert sugar); Dextrose (see dextrose); and Corn syrup (from GM corn). If you are vegetarian or vegan, please be aware that some manufacturers use a "natural" vanilla product prepared by hot-alcohol extraction of castoreum, the dried and macerated castor sac scent glands (and their secretions) from beavers. Castoreum as a food additive is classified by the Food and Drug Administration as "generally recognized as safe" (GRAS). (F) (S) (P) (C)

- **Vitamin A acetate, Retinol acetate or Retinyl acetate** is an ester (dry) form of vitamin A which makes it more shelf stable than the oils version.

It can be presented in a dispersion of a gelatin matrix with sucrose from **sugar beet**, a GM crop, food starch (corn – a GM crop), methylparabin, propylparabin, and potassium sorbate preservative. (S)

- **Vitamin B12** (cobalamin). There are three forms of cobalamins: **Hydroxocobalamin, Cyanocobalamin** and **Methylcobalamin**. While hydroxocobalamin is preferred over cyanocobalamin, another formulation called methylcobalamin is actually the best choice. Technically a `coenzyme` of vitamin B12, it is almost never used despite being effective, readily available, inexpensive and available in both sublingual preparations and injectable form. While Japan uses methylcobalamin nearly exclusively and it is the form present in prescription vitamin B12 there, the United States has virtually ignored the hundreds of studies that show the benefits this simple vitamin can bring.

  B12 can sometimes be found on the surface of plants, but commercial B12 production is partly based on growing B12 on the surface of glucose (GM corn) or molasses (GM **beet sugar**). Commercially, vitamin B12 is synthesized by microbial fermentation. The species *Pseudomonas denitrificans* and *Propionibacterium shermanii* are more commonly used today. These are frequently grown under special conditions to enhance yield, and at least one company, Rhône-Poulenc of France, which has recently merged into Sanofi-Aventis, used genetically engineered versions of one or both of these species. Genetic approaches like genome shuffling have also been applied in Propionibacterium shermanii to improve yields of vitamin B12. (F) (S) (P)

  Cyanocobalamin. This synthetic and the most commonly available form of vitamin B-12 on the market is the cheapest form that is actually bound to a cyanide molecule (yes, cyanide, the poison). It's called cyanocobalamin, and you'll find it in all the cheap vitamins made by pharmaceutical companies and sold at grocery stores and big box stores. Avoid.

- **Vitamins***. Most commercial vitamins are synthesized in a lab from corn, soy of **sugar beet**. (F) (S)

- **Xanthan gum or Dehydroxanthan** is a polysaccharide secreted by the bacterium *Xanthomonas campestris* from the digestion and fermentation of corn syrup or fructose from GM **sugar beet** under controlled conditions. It is commonly used as a food thickening agent (in salad dressings or gluten-free flours for example) and a stabilizer (in cosmetic products). (F) (C)

- **Yeast**: The most commonly used strain of yeast is ***Saccharomyces cerevisiae.*** All strains of *S. cerevisiae* can grow aerobically on **glucose**, **maltose**, and **trehalose** (a form of glucose) and fail to grow on lactose and cellobiose. However, growth on other sugars is variable. **Galactose** and **fructose** are shown to be two of the best fermenting sugars. The ability of yeasts to use different sugars can differ depending on whether they are grown aerobically or anaerobically. Some strains cannot grow anaerobically on sucrose and trehalose. All of the following sugars are used as growing medium for yeast: glucose, maltose, trehalose, galactose and fructose. They can come from corn or **sugar beets** – 2 GM crops. (F) (S)

TOBACCO

Tobacco. Even though technically tobacco is not a food product (unless you chew on it), there is a genetically modified tobacco product called Quest by Vector that was designed to produce low or no nicotine. I don't smoke so I am not qualified to advise you. Nevertheless, I would be careful about smoking this product.

A parting note on genetically engineered ingredients

Please keep in mind that, as our friendly scientists are a creative bunch, they will come up with more and more of these nasty buggers. If you cannot find one and it's not in this book, feel free to shoot me an email at alainbraux@gmail.com and I will be glad to research for you. Otherwise, look for it in my next edition.

I hope I have done my bit in helping you understand what GMOs are in a not-so-boring, yet complete way. Good luck out there. May we live in interesting times… and we sure are.

A Votre Sante – To Your Health

Chef Alain Braux

Non-GMO Information Resources

Non-GMO Organizations

Below are organizations I consult and stay in touch with on a regular basis to know what's going on in the non-GMO world. Won't you join us? In alphabetical order.

Allergy Kids Foundation: **http://www.robynobrien.com/Allergy-kids-foundation** led by Robyn O'Brien, a former food industry analyst, author and mother of four. Robyn brings compassion, insight and detailed analysis to her role as the founder of the organization and her research into the impact that the global food system is having on the health of children. I have seen her speak and she's very impressive: **https://www.youtube.com/watch?v=fWXrRftyOMY**

Center for Food Safety (CFS): http://www.centerforfoodsafety.org/ is a national non-profit public interest and environmental advocacy organization working to protect human health and the environment by curbing the use of harmful food production technologies and by promoting organic and other forms of sustainable agriculture.

Earth Open Source: http://www.earthopensource.org/ is a not-for-profit organization dedicated to assuring the sustainability, security, and safety of the global food system. We support agro ecological, farmer-based systems that conserve soil, water, and energy and that produce healthy and nutritious food free from unnecessary toxins. We challenge the use of pesticides, artificial fertilizer and genetically modified organisms (GMOs) in agriculture on the grounds of the scientifically proven hazards that they pose to health and the environment. See their latest report, ***GMO Myths and Truths*** here: http://earthopensource.org/index.php/reports/gmo-myths-and-truths

Global GMO Free Coalition (GGFC): **http://www.gmofreeglobal.org/en/** aim is to gain greater worldwide mainstream media exposure for the 'GMO-Free' movement – our coalition voice will be carefully managed so as to be inclusive of our partners' views. Although it is a global coalition, there are a lot of great GMO information from Europe.

GMO Evidence: **http://www.gmoevidence.com/** is a group of non-GMO scientists driven to prove through well-conducted studies that GM crops are harmful to animals and potentially to humans. Their main studies were led by **Prof. Seralini**: **http://www.gmoseralini.org/en/** on lab rats and **Dr. Carman**: **http://gmojudycarman.org/** study on pigs.

GMO Free USA: **http://gmofreeusa.org/** is led by **Diana Reeves**, GMO Free USA's mission is to harness independent science and agro ecological concepts to advocate for sustainable food and ecological systems. We will educate consumers and other stakeholders about the potential hazards of genetically engineered organisms and advance the application of the Precautionary Principle.

GMO Inside: **http://gmoinside.org/** is a campaign dedicated to helping all Americans know which foods have GMOs inside, and the non-GMO verified and organic certified alternatives to genetically engineered foods. We believe that everyone has a right to know what's in their food and to choose foods that are proven safe for themselves, their families, and the environment. I am one of their members. Won't you join us?

GM Watch: **http://www.gmwatch.org/** GM Watch is an independent organization that seeks to counter the enormous corporate political power and propaganda of the biotech industry and its supporters. GM Watch was founded in 1998 by **Jonathan Matthews** and its managing editors are **Jonathan Matthews** and **Claire Robinson**.

Just Label It: http://justlabelit.org/. Most Americans haven't been told about some of the ingredients that are in the food they eat. So it's no wonder that 92% of Americans want to label genetically engineered foods. If more of us speak out about why we care about the food we put in our own bodies and in our children's bodies, then we can convince the FDA to change its policy. Watch this video, featuring celebrities like **Michael J. Fox**, **Julie Bowen**, **Chevy Chase**, **Tom Colicchio** and many more to hear why we have the right to know what's in our food:
https://www.youtube.com/watch?v=TghIpBG5o3s

Kids Right to Know: **http://www.kidsrighttoknow.com/** is led by **Rachel Parent**, a young non-GMO activist in Canada that is trying to expose the

industry's ways of damaging Earth for future generations. If you are young (and not so young), I suggest you listen to her here: **https://www.youtube.com/watch?v=HIXER_yZUBg**

Label GMOs: **http://www.labelgmos.org/** is a political action group working on passing GMO labeling laws all over the country. If you are interested in actively participate, fee free to join them.

Moms Across America: **https://www.facebook.com/MomsAcrossAmerica** is a national group of about 16,000 Moms upset at how the agro and chemical industry is poisoning our children. They are mostly concerned about the effects of glyphosate on our health. I strongly recommend you join them to add your voice to this debate. Note: Dads are accepted too.

Organic Consumer Association (OCA): **http://www.organicconsumers.org/** is an online and grassroots non-profit 501(c)3 public interest organization campaigning for health, justice, and sustainability. We address the crucial issues of food safety, industrial agriculture, genetic engineering, children's health, corporate accountability, Fair Trade, and environmental sustainability.

Right to Know GMO: **http://www.righttoknow-gmo.org/** is a broad coalition of state leaders, nonprofit organization and organic companies that have a shared goal of winning mandatory labeling of genetically engineered foods in the U.S. We are a grassroots movement of mothers, farmers and citizens dedicated to regaining our basic right to know what we're eating and feeding our families.

The Institute for Responsible Technology (IRT): **http://www.responsibletechnology.org/**
Founded in 2003 by international bestselling author and GMO expert **Jeffrey Smith**, IRT is a world leader in educating policy makers and the public about genetically modified (GM) foods and crops and one of my leading source for non-GMO information.

The Non-GMO Project: **http://www.nongmoproject.org/** is a non-profit organization committed to preserving and building the non-GMO food supply, educating consumers, and providing verified non-GMO choices. We

believe that everyone deserves an informed choice about whether or not to consume genetically modified organisms. They have an amazing database of Non-GMO Certified products. I highly recommend you look at it.

Union of Concerned Scientists: http://www.ucsusa.org/ Although not specifically concerned about GMOs, they are warning us against its dangers in their ***Failure to Yield*** report: http://www.ucsusa.org/assets/documents/food_and_agriculture/failure-to-yield.pdf

Non-GMO Books

Here are a few of the books I have read on the non-GMO subject. If my book made you curious about this controversial subject, please read a few of these for more scientific and in-depth information.

- ***Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods*** by **Jeffrey Smith**: http://buff.ly/1nSyuhd
- ***Seeds of Deception*** by **Jeffrey Smith**: http://buff.ly/1nSyC0g
- ***Seeds of Destruction: The Hidden Agenda of Genetic Manipulation*** by **William F. Engdahl**: http://buff.ly/1q7PlSb
- ***Monsanto vs. the World: The Monsanto Protection Act, GMOs and Our Genetically Modified Future*** by **Jason Louv**: http://buff.ly/1nSz12Q
- ***The GMO Deception: What You Need to Know about the Food, Corporations, and Government Agencies Putting Our Families and Our Environment at Risk*** by **Sheldon Krimsky** (Editor), **Jeremy Gruber** (Editor), **Ralph Nader** (Foreword): http://buff.ly/1nSztOx

Non-GMO Documentaries

Here is a list of my favorite documentaries on the GMO subject. I hope you enjoy the information they provide. I sure did. It will open your eyes.

- ***Genetic Roulette*** **by Jeffrey Smith**: **https://www.youtube.com/watch?v=A7kkAUUNrLg**

- ***Seeds of Death*** **by Gary Null:** **https://www.youtube.com/watch?v=eUd9rRSLY4A**

- ***The World According to Monsanto*** **by Marie-Monique Robin:** **https://www.youtube.com/watch?v=N6_DbVdVo-k**

- ***Blue Gold – World Water Wars*** **by Sam Bozzo :** **https://www.youtube.com/watch?v=B1a3tjqQiBI**

My goal is not to scare you but to give you all the information you need to make an educated choice. I hope you will understand how important this issue is follow your heart – and your stomach – in making the right food decision for you and your family.

A Votre Santé – To Your Health

Alain Braux

Acknowledgments

I wrote this book to help you understand GMOs. I hope I accomplished my goal.

But I was not alone in this endeavor. I was helped tremendously by a small group of enthusiastic friends and professionals wanting me to spread the GMO bad news. In this ongoing culinary adventure, I would like to thank the following people for their constant inspiration, professional and volunteer help.

My grandmother **"Mamie"** for teaching me by example that simple food does not mean boring food. Stick to the basics of good quality food choice and you will continue to live a healthy and vibrant life.

My mother, **Bernadette Moulin-Braux,** who encouraged me to discover and apply my culinary and baking abilities. My mother-in-law, **Helene Jaboulay**, for opening my eyes to what Mediterranean cuisine is all about.

Janet Zand for being my first supporter even before I started writing my first food word. She has been my model and inspiration all along. Thank you, Janet, for your kind support. You are my writing fairy godmother.

My boss, **Bill Swail,** for his continuing behind-the-scenes support, for allowing my books to be sold in his stores, and for providing me the safety and security I needed during the writing of this book.

My mentor, **Mark Moxom** and co-host at the Low Carb Paleo Show for encouraging me to finish this book even when I was dragging my feet.

My very creative team:

My talented and very patient editor, **Rebecca Rider** at **Prestige Professional Copywriting,** for her caring work on my "charabia" or Frenglish gibberish. When I found her, I could tell we were kindred spirits when it came to food and health.

A young and talented artist, **Tatiana Vila** at **Vila Design,** for designing this beautiful and original book covers.

My artistic photographer, **Athena Danoy** for capturing that special spark in me in her portraits of me.

To my esteemed predecessors and guiding mentors:

Hippocrates 460-377 B.C.: the father of us all in the "food as a healing medium" movement, who affirmed, "Let thy food be thy medicine and thy medicine be thy food".

Jeffrey Smith for his tenacious work, teachings and guidance throughout my learning all about GMOs. You inspire me in my efforts to educate more people about this modern day plague.

Tim and Barbara Cook for their spiritual guidance and encouragement.

Last but by no means least, my son **Gilles Braux,** for inspiring me to be the best I can, just by being himself, no matter what. I hope this and my other books will show him the way to healthy living.

And finally you, my readers and companions through this adventure. Thank you for your continuous support in my belief that fresh and good-tasting food is the source of good health. Thanks again for your continuing support over the past few years.

Thank you all from the bottom of my GMO-free French heart.

Love and Dark Chocolate,

Chef Alain Braux.

Chef Alain Braux's Bio Short Version

Chef Alain Braux is an award-winning Executive Chef and Nutrition Therapist. He's an Amazon.com best-selling and award-winning food and health author. Chef Braux is the co-host on the podcast: Low Carb Paleo Show. Chef Braux is a food and health consultant, a speaker and panelist on food allergies, Paleo and anti-GMO issues.

Chef Alain is the co-host on the podcast, the Low Carb Paleo Show and the food and health contributor to the Low Carb Magazine**, Hip4Kids Magazine**, **Healthy Organic Women** **Stuffed Pepper**, and **Food Solutions Magazine**.

Chef Braux is an expert in food allergies diets and the author of multiple award-winning food and health books. "*How to Lower your Cholesterol with French Gourmet Food*", "*Living Gluten and Dairy-Free with French Gourmet Food*", "*Healthy French Cuisine for Less Than $10/Day*" and most recently "*Paleo French Cuisine*". Chef Braux upcoming book is titled: ***GMO 101***. **A Practical Guide.**

Chef Braux is the **Executive Chef** and **Culinary Nutritionist** at A Votre Santé – To Your Health Nutritional Services, a health food consulting private practice. Chef Braux provides customized food plans for a wide assortment of food allergies: Gluten-free, Dairy-free, Sugar-free, Paleo, Vegetarian and Vegan. He has helped clients with Celiac, Autism, ADD/ADHD, Diabetes, Crohns' disease, IBS and other diseases. Chef Braux is also an expert in GMO issues.

You can also find him on Facebook, LinkedIn, Google+ and Twitter**.**

Chef Alain Braux Bio Long Version

Chef Alain Braux is an award-winning pastry chef (two gold and three silver medals) and award-winning food and health author. Chef Braux has worked in the food industry for more than 40 years. He is a **Certified Executive Pastry Chef** with the **American Culinary Federation** and a **Certified Master Baker** with the **Retail Bakers of America**. He earned a **Bachelor of Science** degree in **Holistic Nutrition** and is also a **Macrobiotic Counselor**.

Chef Braux currently lives in Austin, Texas, where he is consulting in the field of culinary nutrition in his own private practice at A Votre Santé – To Your Health.

Chef Braux started his training in France at **Confiserie Pâtisserie Auer** in Nice, France. He then decided to improve his skills at some of the highest-rated hotels, restaurants and pastry shops of Europe. He refined his trade first at **Grand Hôtel du Cap d'Antibes** near Cannes, France; then the **Moulin de Mougins** in Mougins, France; and finally at the famous **Lenôtre** in Paris, France, and **Pâtisserie Wittamer** in Brussels, Belgium.

While in Paris, he was offered his first U.S. job at **Dumas Pastry Shop** in New York, New York. He then held the Executive Pastry Chef position in various companies such as **Délices la Côte Basque** in New York, New York; **Lenôtre Paris Inc.** in Houston, Texas; **The French Hearth Bakery and Café** in Sarasota, Florida, and **Texas French Bread** in Austin, Texas.

In 1988, Chef Braux opened his own business, **Amandine French Bakery and Café,** in Austin, Texas. Amandine Bakery was written about in numerous publications including the **New York Times**, **Texas Monthly**, the **Austin American Statesman** and the **Austin Chronicle,** and won a few "Best of Austin" awards over its 10-year lifetime. Please check Google to see copies of these articles.

After closing Amandine, Chef Braux found a new home at the **Barr Mansion** for his elegant cakes and fine pastries. Chef Braux then became the Pastry and Baking instructor for the **Culinary Academy of Austin**. He then became the Executive Chef and Nutrition Therapist at **People's Pharmacy** in Austin, Texas.

He is currently consulting with private clients, restaurants, businesses and organizations worldwide at his own consulting business, **A Votre Sante – To Your Health**. He is offering gluten and dairy-free, Paleo, raw, vegetarian, vegan and GMO-free menus and diets to his international clientele.

Chef Braux is also an award-winning health food author. He wrote his first book, ***How to Lower your Cholesterol with French Gourmet Food***, in 2009. This book earned:

- **Cookbook Award** at the **2010 Paris Book Festival**

- **Finalist** at the **2010 Indie Excellence Book Award**

- Honorable Mention at the **2010 New York Book Festival** and the **2010 San Francisco Book Festival**.

His second book, ***Living Gluten and Dairy-free with French Gourmet Food***, in 2010, has earned:

- **Winner** - Health: Diet & Weight Loss category of the 2013 International Book Awards

- **Winner** - Best Cookbook Award at the 2011 Paris Book Festival;

- **Winner** - Nutrition Category at the 2011 Indie Excellence Book Award

- **Honorable Mention** at the 2011 New York Book Festival

Chef Braux's third book, ***Healthy French Cuisine for Less Than $10/Day*** was published in October 2011. It has earned:

- **Winner** - Best Cookbook at the 2012 Paris Book Festival

Most recently, Chef Braux's newest book: ***Paleo French Cuisine*** offers a practical explanation of the Paleo diet from a French point of view. His book contains 130 delicious Paleo recipes with a French flair.

- **Winner** - Best Cookbook at the 2013 Paris Book Festival

- **Winner** – Best Cookbook – Health at the 2013 Indie Excellence Book Awards

- **Finalist** – Cookbook – International at the 2013 International Book Awards

I hope this new GMO 101 book will follow its predecessors in their path to success.

You can also find him on Facebook, LinkedIn, Google+ and Twitter**.**

Chef Alain Braux

A Votre Santé – To Your Health

Would You Like to Know More about Chef Braux?

If you are interested in:

- Consulting with me about creating special menus for your restaurant
- Creating and updating your corporate cafeteria's menu for fresh, healthy and tasty dishes
- Consulting privately with me regarding your health issues
- Having me create a customized diet for your specific food allergies
- Finding out about my cooking and baking classes
- Creating cooking or baking classes for your Cooking School
- Hiring me as a Health Food and Gluten-free consultant for your restaurant
- Interviewing me for a featured article
- Inviting me as a Food and Health and anti-GMO Speaker at your event
- Talking to me about any other health-related opportunities…

Check out my constantly updated website: **http//www.alainbraux.com**

Or contact me on my website's **Contact** page or send an email to: **alainbraux@gmail.com**

Thank you again for reading my book and "see" you soon in my next book.

Sincerely,

Chef Alain Braux

CEPC, CMB, B.S. in Holistic Nutrition, Macrobiotic Counselor.