Raymond Peat, Ph.D.

Food Quality

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JB – John Barkhausen
RP – Ray Peat

JB: This interview with Dr. Raymond Peat was recorded on January 7th, 2012. Well, welcome to Politics and Science. I'm your host, John Barkhausen, and this week I'm once again very pleased to have on my show Dr. Raymond Peat, who has a PhD in biology and also has studied extensively in the fields of physiology and endocrinology and, in my opinion, is a very learned science historian. Now, Ray, do you want to add anything to that bio or fix it?

RP: Oh, no, that's okay.

JB: This show is inspired by two letters that Ray Peat wrote. It's on his website, raypeat.com. I think both articles are up there. One is called "Milk and Context, Allergy, Ecology, and Some Myths," and the other is "Vegetables, etc. Who Defines Food?" And both of them take on the issue of the quality of our food and how it's evolved or devolved over the years.

And in this show today, I'd like to discuss various foods and how they've changed or been changed and how our culture and food production processes and our environment have influenced the changes. Many of us feel that if we eat the basic food groups, we'll get the nutrition we need to be healthy.
But, Ray, you write in these newsletters at one point that good nutrition involves much more than essential nutrients. So I'd just like to maybe back up a little bit and start at the beginning. How do we decide what is nutritious for us and how are these decisions traditionally made as opposed to now?

RP: Well, traditionally, people just would eat something that tasted good. And if they survived and stayed healthy, their families and descendants would keep eating it. So each area evolved pretty safe mixtures of foods. But as soon as organization got involved, pharaohs or kings and dukes and so on, and eventually corporations, they decided people should eat what gave them the best profit. And so the health of the people varied according to the convenience of who was in charge of the economy.

And since World War II, well, I guess the Germans really started it when they were blockaded in the first World War. They had a good advanced chemical industry, and so they started learning how to make substitute foods, substitute materials for war and so on. And so they used it for civilian survival. And by the second World War, they had developed pretty good imitation foods. For example, they fed their Russian prisoners of war on sawdust bread that resembled bread but had no nutritional value. And the FDA saw the success of that, I guess, and decided, even though in the 1940s, they had said that gums weren't decent for human consumption. They produced some kind of biological damage generally. But they finally agreed with the corporations that it was okay to add fillers like sawdust, cellulose, seaweed gum, various tree gums and so on. So that now a baker recently said that he hadn't realized he could make a good loaf of bread with 18% sawdust.

JB: That's astounding. I remember when the fiber craze sort of hit the general culture, there were breads in our supermarket here, I think maybe Arnold or I'm not too sure about that. But one of the brands definitely was advertising extra fiber in the ingredients was sawdust.

RP: Yeah, now I think they have a more diplomatic way of saying that. I think they say nutritional fiber.

JB: And that can be, when they say that, that can be sawdust, you believe?

RP: Yeah. Anytime there's a pleasant sounding unfamiliar ingredient in the food, it's probably a waste product from industry. The chitin, various waste products from the shrimp industry are now used in food as well as health foods. If you look at each industry and see what they had the problem getting rid of, then you'll see the food technologists learning how to make people eat it.

JB: That's very interesting. So the food waste just comes around again, gets recycled into the system again.

RP: Yeah, for example, the EPA was having complaints from insect infestation and such, and mountains of pulp waste from the orange juice industry. And they told the industry to do something with their horrendous quantities of pulp. And by using microbial enzymes, they found that they could make it water soluble and have creamy orange juice, pulpy, fibrous orange juice. But it happens to be a chemical that would never occur in the natural fruit. And it has very unpredictable health results in the intestine because it's something people would never have been exposed to naturally.

The fish industry had a similar interaction with the Environmental Protection Agency. They were either dumping their fish processing waste into the ocean where they were processing or hauling it inland for landfill. But it was so stinky, the EPA told them to find other ways to dispose of it. And that's where they came up with the fish protein powders for sending to famine areas or using as a food additive in the U.S. and fish oil. So the fat and protein found health food uses.

JB: Yeah, the solution to pollution is distribution is a saying I've heard.

RP: Yeah

JB: It's a saying I've heard well, that doesn't sound very appetizing, I must say. But I guess if you can sell it, this brings us back to convincing people to eat things as food when they otherwise might not think it is food. It is interesting that one culture will eat something that's completely abhorrent to another culture. Like they do eat insects in Africa, I believe, and consider them a delicacy. Whereas in this country, that's not considered to be a normal thing to do or even appetizing.

RP: Yeah, once when I was visiting friends in Mexico, I ate with them and there was a nice little thing that was sort of like a salmon cake, a patty, a mildly fishy tasting thing. And I asked what it was and they said, "We'll tell you after you've finished."

JB: Yikes.

RP: They said it was a mosquito cake.

JB: Wow.

RP: Mosquito larvae.

JB: You're kidding.

RP: Skimmed off a pond, I guess. And they can skim off enough larvae to make a cake. Yeah, they have very fine nets especially for that. They get some minnows, but that happened to be the very little mosquito wigglers.

JB: And that's a traditional food of Mexico?

RP: Yeah, that particular area. It was over on the eastern side, somewhere near Jalapa.

JB: And how did that sit in your stomach after you learned what it was?

RP: Very well. It tasted just like eating a salmon patty.

JB: Yeah, well that's interesting. So how do we decide what food is? It sounds like you're saying that basically we're told at this point what's food and what isn't and our instincts aren't really working?

RP: Oh yeah. I think it's the thought process. One of the ugliest Mexican food products I think is the fungus-infected corn kernel. It makes a big blue swelling on the corn cob. It's a mushroom growing in the corn, but it stimulates a tumor in the corn. So it's somewhere between a tumor and a fungus. But it makes a very pleasant -- you can buy them canned in the U.S. – but it's a very pleasant semi-mushroom tasting material.

JB: And that's something that isn't a traditional food, but is something that has been adapted for modern use ?

RP: Yeah, it is a traditional food, a very old source. It just occurs spontaneously in the corn, but I guess they can infect corn to make it industrially.

JB: Do you feel like most of the -- or a lot of the foods that we eat now are basically influenced by industrial marketing ?

RP: Yeah, almost entirely. About 40 or 50 years ago I read that the food industry had been testing various things against their panel of experts. And they found that the public taste preferred artificial flavors over real flavors in things like ice cream. They had been so trained.

JB: It's hard to know where to go. This is such a huge topic. But since you mentioned ice cream, I know that at one time -- and maybe it's still true – that they were actually exempt from revealing what their ingredients are. The ice cream lobby somehow obtained an exemption from the law by which people have to declare what's in the foods. So they can say artificial flavors and it's a bunch of chemicals, basically.

RP: Yeah, that's still the general practice. And worse than that, they don't even have to mention on the label something which is actually present. It was mostly removed. They call it a processing aid or incidental ingredient. And even though it's really there, even though they intended to remove the bulk of it, some of it's there and can cause allergic or toxic reactions. But they don't have to say it on the label.

JB: So that's a bunch of chemicals or one chemical or anything they want to use.

RP: Anything, yeah.

JB: Yeah.

RP: And even if everyone is following those extremely useless rules of the FDA, apparently the industry doesn't take the FDA very seriously because I've bought ice cream from companies that said all natural ingredients. And I would generally intend to buy just the vanilla because I didn't really trust them. But sometimes I bought vanilla pure white ice cream from the company that used only natural ingredients, but it would have a very intense strawberry flavor. And other times from the same company I bought what was labeled vanilla ice cream and it tasted just like vanilla ice cream, but it didn't have the black flecks that vanilla normally did. Instead it was dark brown chocolate colored, but absolutely vanilla tasting. From those two or three times that someone at the factory messed up, it proved that the use of brown coloring and a pink coloring and artificial flavoring instead of the three natural ingredients that they claim.

JB: Might as well just cut to the chase here. And one of the things I wanted to talk about today since we're on the subject of ice cream, and that is that a lot of times ice cream makers use thickeners. The gums you were speaking of, carrageenan and locust bean gum, and there's another one too I can't think of, guar gum. And in fact I think everybody thinks those might actually be good for you, but maybe you can explain to people, and a lot of people out there have allergic reactions to foods, why these gums may actually be the thing that's causing the allergic reaction and not the milk that the ice cream is made with.

RP: Oh, well the FDA recognized that problem 60 years ago, and the literature is full of published reactions to all of those gums. Carrageenan and alginate from seaweed are probably the worst of them. Carrageenan is recognized to be carcinogenic to the intestine and liver and to produce inflammation. It's a standard lab method for producing arthritis or inflammation of any organ that they want to study. But the assumption I guess is that if it only irritates the intestine and causes cancer in the liver, that is tolerable. But what they're neglecting is that these particles or fibers, even much bigger than the molecules that have the gum function, the particles of that size are fairly massively passed through the intestine. If you imagine that when a person is under stress, even bacteria and larger particles, up to the size of a red blood cell or larger, can go right from the intestine into the bloodstream, where then the immune system has direct interaction with them. And if the particle is big enough, it can stop the flow through a capillary or arteriole. So small additives aren't going to stay entirely in the intestine. The particles of silicon dioxide, people say, "Oh, that's just harmless, fen-like material." When it's produced by vaporization or precipitation, they might call it fumed silica or colloidal silica.

JB: What's it used for?

RP: Almost everything. They can use it to create a viscous consistency in cosmetics and soaps and any food that needs a new texture. Almost all vitamins and drugs are now using that or something like it to make the powder flow nicely when they're running it through the machine. And it's basically a very finely powdered glass. But the powder, it's much smaller than the particles of starch, for example, that can be preserved across into the bloodstream. And at a certain size, they very easily go from the blood into tissue cells. And at a certain size range, they are very able to cause sensitization so that something like silicosis, even though it's supposedly being amorphous rather than crystalline, supposedly they aren't going to cause the silicosis-like reaction, the things that people get from the silicon implants and so on. But there is an actual immunological similarity and overlap when the particles are of

a certain size. And there are various names for that, but silicon dioxide or silica is the basic description.

JB: Yeah. And so that gets into your tissues and causes--

RP: Chronic inflammation.

JB: Okay.

RP: Degenerative inflammatory changes. I see. Such as lupus-like symptoms. Scleroderma is probably the most common thing caused by the silica reaction.

JB: Now, it's actually hard to buy any processed food now that doesn't have some of these things. Carrageenan, I was very interested in your newsletter that we're talking about today. I think it was in Milk in Context, Allergies, Ecology, and Some Myths. That's available on your website, raypeat.com. You were saying carrageenan is some kind of a pseudo--causes a pseudo-latex allergy reaction. And I was wondering if you could talk about that because a lot of people are allergic to latex.

RP: Yeah, well, the carrageenan is--one of the arguments is that in its unbroken down form, fresh out of the seaweed, it doesn't cause cancer, even though it might cause horrible inflammation. But when you eat it, it passes through the intestine where bacteria break it down. And the broken down form of carrageenan is recognized as carcinogenic. But try to communicate the logic of that to any of the regulatory agencies. And they all just reveal that they're serving industry and convenience rather than protecting the public.

JB: Well, that seems sort of odd because a lot of things are fairly harmless when they're outside your body, but when you eat them, they're poisonous. So I don't see why that would be hard for them to understand.

RP: Well, they specifically say that undegraded--the fiber undegraded isn't carcinogenic,but degraded it is carcinogenic. But they neglect to point out that your intestine has bacteria that can degrade it. And the reaction to latex is really a general phenomenon that plants all have some kind of defense reaction. And even under the best conditions, they'll produce some of these. But they are able to adapt so that when they're injured, they increase their defensive material. So if a bug bites a plant, it expresses the enzyme that can break down the fibrous material of the bug, the chitin. And so chitinase is a general defensive enzyme that is intended to dissolve bugs and any pest that invades the plant. But when you stress a plant in any way, it defends itself and increases all of these defensive toxic chemicals. And simply mistreating a plant by growing it in a monoculture, forcing it with not well-balanced fertilizers and so on, the plant is intensely stressed and so produces increased amounts of these defensive toxins and enzymes.

And so a plant that's growing in the wild might not be allergenic or toxic. But once you've cultivated it under extreme conditions for generations, it will produce things such as toxic latex that will kill people who are sensitized to it. But lots of stressed plants can produce exactly the same kind of enzymes. So it isn't just literal latex, but it's any stressed plant that is able to produce similar enzymes.

JB: So you're saying that people are allergic to latex because the plant is purposely producing a toxic chemical to protect itself when it's wounded. Yeah. And like latex comes from a rubber tree, is that right?

RP: Yeah, bananas and rubber trees are the first ones to identify the same kind of allergic response across reaction between natural latex rubber, for example, surgical gloves or other surgical materials. And bananas, people who have a dangerous reaction to one will usually have it to the other. But those people will also react to many other kinds of fruit. I think kiwis are a major overlap. But probably almost any plant that is industrialized and forced into production will increase their production of these things. So recognizing that a person who is allergic to bananas is likely to be allergic to six or eight or ten other similar fruits, not even similar fruits, but industrialized fruits.

JB: And not all people are affected that way. Maybe this is too big a question, but why are some people affected by those plant toxins and others not ?

RP: The person who is under stress is, I think in that newsletter I mentioned that estrogen induces a similar protein in humans. And things like estrogen, which intensify the stress reaction, are probably increasing throughout especially the industrialized populations. And the biological function of estrogen is to stress and activate tissues to get them growing quickly. But it should only act for 12 or 24 hours per month to activate and make the tissues take up water, swell up, start growing and so on. But when we're chronically exposed to industrial estrogens in the environment, that activates our stress reactions.

In the intestine, for example, it makes the intestine more permeable and will simply take up more things. But it also activates particular patterns of enzymes. It activates enzymes in the intestine that overlap with the gluten molecule. And our immune systems, reacting to overdose of estrogen effect, don't distinguish that from gluten. And so the gluten interacts with chronic estrogen exposure to produce very serious chronic inflammatory symptoms. And that enzyme happens to be a cross-linker that estrogen activates in the skin, for example. It ties protein molecules together. And when this enzyme is extracted from microorganisms, bacteria make a similar enzyme, it can be used to tie any protein together that contains, I think it's lysine and glutamic acid, which is basically any protein.

And the food industry is widely using that enzyme to make artificial fish and meat products. So if you go to a fast food restaurant and order a fish patty, you're probably getting a mixture of seaweed gum and a fish waste fragment glued together with this enzyme, which cross-reacts with estrogen effects and gluten. And you would never expect that sort of enzyme to exist in a fish patty, but it's industrially useful. So that lunch meat, even things that are sold as, I guess, lamb chops, are imitated by gluing meat fragments together. They call it restructured meat.

We had been eating squid patties for years, and there was something in the meat case that looked like the usual product. And I cooked two of them, and they shrank down to about the size of a silver dollar from having been about four or five inches across. And we recognized something was wrong, but since that was what we had fixed for supper, we went ahead and ate them and got really sick. I was sick for over a week after eating it, and so I looked up what was happening to squid patties, and they use seaweed jelly like alginate or carrageenan to make a jelly, and then they sweep up all of the waste products that didn't have the right shape and grind them into a mush and add the cross-linking enzyme so that the mush coagulates. But it's intermixed with the seaweed jelly, so it contains a huge amount of water, much more water than the normal squid, so you get terrific shrinkage, as well as this weird

chemical composition, cross-linking the fish proteins, the squid proteins, with the seaweed jelly.

JB: I don't think that would sell well on the menu at a restaurant.

RP: No, but you get it very often, fast food places especially. They used to have textured soy protein that looked like chicken or ham. They were very skillful at making a fibrous meaty appearance in soybean protein, but now they don't even have to use that much of a natural product. It can be seaweed and waste meat scraps that are reshaped entirely.

JB: Well, I always, you do wonder when you go by the deli in the supermarket and you see all those hams and roast beefs and other cold cuts, and they're also uniform and perfect, a turkey loaf, and I suspect what you're talking about is how they achieve that uniform look.

RP: Yeah, and all the studies that I've seen comparing various foods, one of the most carcinogenic is processed meats, just as a big category, anything processed, but that mostly includes those loafy materials.

JB: So, I mean, those meats are also full of a lot of additives and preservatives and strange-looking acronyms that represent chemicals. I suppose it's a combination of all that that is making them carcinogenic.

RP: Yeah, and the aging process, they add deodorants and things to change the smell of aged meat, but just the practice of aging meat probably makes it more carcinogenic because when meat starts to rot, the odor chemicals are polyamines, cadaverine and putrescine are the chemical names of two of the things that aging produces, and those stimulate cell growth, and there are techniques being developed to block the production of those in tissues to stop cancer growth, so their connection with cancer is well-known, and just storage of the meat too long will produce those things, and then on top of that, they add the various preservatives and even the harmless-sounding things like citric acid because they're produced by microorganisms from waste byproducts. You get some of the chemicals from the industrial waste material that you started with and then some microbial additions to the mix, no matter how careful they are trying to refine out a pure citric acid, it always has traces of where it came from. So even the nice-sounding ingredients aren't really so nice when you might be sensitized to them.

JB: Yeah, that sounds rather discouraging. Oh, I did want to ask you about aging meats because a lot of people around here raise their own cattle and sheep and things, and it's just common knowledge that it doesn't taste good unless you age, you know, hang them for a few days or I think it's maybe five days at 40 degrees. The meat gets more tender and gets more flavor.

RP: It definitely gets more flavor, but that's mostly advertising. The people who are in the habit of doing it that way insist it tastes better, but the reason I eat more meat when I'm in Mexico is that it tastes better because it's fresh. Because in the small towns where they don't have refrigerators, they just sell it off the carcass, so they have to sell it within the first two or three or four days. And it always tastes really fresh. It's very rare to find fresh tasting meat in the U.S.

JB: I mean, up here the people I know who do it hang it for maybe four days at a very cold temperature like 40 degrees, which would be difficult to do in Mexico, I imagine.

RP: Yeah, but four or five days at 40 degrees, it still can taste very fresh. But in the supermarket, the food technology people have said that it gets tender after two weeks, so you shouldn't sell it before two weeks. But it also develops putrescine and spermidine and cadaverine that are mildly toxic, possibly carcinogenic.

JB: Yeah, I've got to say putrescine doesn't sound too good to me.

RP: And the FDA has never been very enthusiastic, or the Agriculture Department, about enforcing laws against chemical treatment of the animals while they're alive. There is some pressure to make them not inject chemicals in the last day or so before they kill the animal. But in Europe, recently there's been evidence that they're treating their living animals with big doses of glucocorticoid steroids to break down the fiber while they're alive to tenderize the meat.

JB: Now, I thought Europe was averse to that.

RP: Yeah, they are, but they, I guess, aren't spending enough enforcement money, and so the industry is getting away with breaking the rules.

JB: You were going to say something else when I interrupted there.

RP: Oh, just that even though the rules are in place, you can't trust anything that comes from a big corporation because the FDA is doing its best to look the other way.

JB: Yeah, I think that's--we've discussed this before on various shows, and it does seem that the regulatory agencies are really there to just absorb the liability of the corporation and be a buffer between them and the public. Yeah, I think so. We haven't discussed at all in detail growing practices. You said that growing crops in monoculture makes plants produce a lot more toxic chemicals, the chemicals we've been talking about somewhat. Is there a way of growing things that isn't so stressful?

RP: Yeah, if the plant grows more slowly, the soil will more naturally release chemicals that the plant can select from, but when they're adding chemicals that they know that the grower knows will stimulate the fastest maturation and production or whatever they're interested in, the plant isn't absorbing exactly the ideal combination of nutrients, and so it distorts the actual structure and physiology of the plant. There have been experiments in which corn was fertilized heavily with potassium in one case and with phosphate in the other group, and they found that--I forget which way it went. I think it was the potassium fertilizer caused the plants to emphasize their tassels, the male pollen-producing component, and I think it was the phosphate fertilizer that made them overproduce the female cob part of the reproductive material. So you can almost change the sex ratio, the balance between the male and female parts of the plant by pushing one or the other kind of fertilizer just for those two ingredients, and when they're designing a fertilizer to produce the most fruit or seed or whatever they're after, the plant isn't going to be as happy being forced in that direction, so since it's having its physiology warped, that's usually enough for it to also produce some of the toxic chemicals defensively.

And one of the things that people have known for many years is that the roots of plants generally have less of the defensive toxic chemicals that affect animals like us because they're defending against fungus and bacteria that live in the ground, where the upper part of the plant, the leaves and stems and seeds, are defending against grazing animals and insects and people that pluck off the easiest parts to get at. So the worst toxins are in the leaves and seeds, and in many cases the plants want to

spread their seeds, which are defended by internal toxins, but they want to spread them by having birds or other animals eat the fruit and pass the seeds through to propagate them elsewhere.

And so the fruits are evolved in many cases to be delicious, nutritious and non-toxic. So if you look at the plant's defense system, the fruits are almost always the safest part and the roots would come in next as the second safest. Seeds are the very worst for the plant's toxins and leaves are intermediate for toxicity.

JB: And is that in part why so many people have an intolerance of gluten and flour products?

RP: Yeah, all of the storage proteins have the multiple function not only to pack a lot of nitrogen into a small space in the seed so that when water is available, enzymes can rearrange the stored energy material with the nitrogen and double or triple the amount of protein because it basically just packs nitrogen into a specialized protein for storage. And those proteins also have the added benefit to the plant of being irritating, indigestible or toxic to lots of predators.

JB: I see. Somebody pointed out recently, I think it was on a show with you, that the gluten that a lot of people seem to be allergic to these days is considerably worse than it used to be because they've been actually breeding wheat plants to develop more gluten because it's useful industrially for producing food products. And that's actually made it easier for them to produce bread but harder for people to digest it.

RP: Yeah, that sounds reasonable.

JB: And that sort of brings up the subject of the agricultural practice of breeding and its new form of genetic engineering. A lot of food products are being bred, I think, more and more not for delightful eating but for marketing, meaning that they ship well and that they'll store well but they don't necessarily taste well.

RP: Yeah. In the 1940s, tomatoes often had a very intense, nice, aromatic flavor. And I haven't seen a tomato like that for about 50 years because they're all the commercial seeds. Even people who buy seeds at a seed store are going to get non-traditional fruits. Every farmer used to have their own variety of vegetables and those heirloom vegetables have largely been lost. Some people are storing the seeds but they aren't being widely propagated.

JB: Around here people are always buying, they are available, the heirloom tomatoes. We've been plagued by blight these last few years so I don't think many people have gotten great ones. What's your take on the effect of genetic engineering on food quality? Is there any benefit? We're mostly talking about the harmful effects of industrial practices on food, but perhaps there's a silver lining somewhere?

RP: No, the genetic engineering, the most common thing is to put an insecticide protein into the plant and people or animals are known to react allergically to a strange protein that wasn't there before and other insects, they're seeing butterflies killed by the insecticides that were put there to defend the plant or make it more profitable to produce. I think allergies are the main thing to worry about with meddling with genetic composition of plants.

JB: Well, allergies certainly seem to be on the rise from my observations. What's your take on people's allergy?

RP: I think all of the major allergic symptoms are increasing but some studies show that unsaturated omega-3 fatty acids in a woman's diet when she's pregnant seriously increase the allergies of the baby. So it isn't just the food supply is changing but the human supply is being sensitized by the stressful things in our national diet.

JB: Can you explain what that is, Ray ?

RP: Well, the omega-3 fats are… Grass, for example, has more than the grain seed product. The seeds have more of the omega-6 fats and they're a little more stable. The minus 3, I think, are in the leaves because they don't have to be stable for so long. And the cold temperature resistance corresponds to the highly unsaturated, especially N-3 fats. So the algae in the ocean at a low temperature will produce highly unsaturated N-3 fats that are known as fish oils when the fish elongate them. They're being highly promoted starting, I guess, with the waste from the fish industry and the discovery that the linoleic acid that was popularized as the essential fatty acid, they discovered that was pretty carcinogenic.

So there was a shift in marketing from the cotton seed oil or safflower oil type of fat over to the fish oil type. All kinds of arguments have been advanced to encourage people to eat more of those. A French group decided that since the brain of an adult contains lots of the fish oil-like fats on the diets that we've been exposed to, and babies, any mammal before it's born, synthesizes mostly saturated fats out of the glucose and fructose absorbed from the mother's blood. So this French group said, "The baby's brains aren't getting enough fish oil." So they set up an apparatus to make a sound and record the fetus's response to the sound so they could tell how alert the fetus's nervous system was. They were going to demonstrate that they could make the fetus learn faster by feeding the mother fish oil. What they found was that the nervous function was impaired in the women who ate the fish oil. Other studies showed that the babies would be more allergic too. But in the study of the learning ability, they also found that the babies were smaller, implying that their brains and bodies altogether grew less under the influence of the fish oil, probably because of the anti-progesterone effect, keeping the bias in the uterus towards estrogen against progesterone, progesterone being the brain growth factor, and lowering thyroid in proportion to the unsaturation of the fats. So the population which has its progesterone and thyroid suppressed is going to be the more allergic stressed population.

JB: And you're saying the fish oil is also included in the same category as vegetable oils like safflower oil and cotton oil and corn oil, all the unsaturated oils.

RP: The big difference is that the seed oils are highly unsaturated, but N-6 means that they have a tail of five carbon atoms that are saturated, like stearic acid and palmitic acid are things that we can synthesize in our bodies out of sugar, and those are all saturated and very stable. At least the seed oils have this chain of five completely saturated carbons at the tail end. The fish oils, N-3, have only two stable carbons at the end, so they oxidize much more easily.

JB: I get you. So in the few minutes we have left, Ray, perhaps we should try to strike some kind of a positive note. There is food out there to eat, and what in your opinion is the food that people should be focusing on both for pleasure and for health?

RP: Well, fruits, if you know that they're grown in a safe, unchemically treated environment, it's fairly hard to find really ripe fruit in the stores, but if you can find ripe oranges or tangerines, those are very safe for juicing, for example. And eggs, if you can find eggs that weren't fed linseed oil or soy oil or something that gives them a fishy taste, just go by the taste. Sweet oranges, eggs that taste like eggs and not like fish meal, and meats that taste fresh. Milk, it's important to judge the taste of the milk too, because there are so many different feeds that the cows get. If they feed a natural pasture that's full of allergenic weeds, organic milk, it can be allergenic just because the cow is eating a weird mixture of vegetables.

JB: Yeah, I just... go ahead, sir.

RP: Well, those foods are really the only ones I trust at all, and I'm suspicious of them in the American stores. Eggs, milk, some cheeses, you have to be very cautious with cheeses, because they're putting seaweed and other gums in them to increase their water content. Eggs and meat are among the safest.

JB: And just to go back to the dark side, they're increasing the water content, for what reason? To get more money for the cheese? To add to the weight?

RP: Oh, yeah, they can add 30% to the weight just by putting more jelly in it. There was a Wisconsin parmesan that I ate for years, and suddenly it got soft and moist and caused bowel inflammation in me. So I stopped that and found the real parmesan called Reggiano is the only one that I eat now, and a couple of other strange ethnic cheeses from Greece or Italy still have the traditional methods.

JB: And you said that... I thought I've heard you say that fresh cheeses are safer to eat than aged cheeses, but it sounds like you're eating some aged cheeses.

RP: Yeah, because I can't find any fresh cheeses in the US that don't have additives.

JB: And what's the difference between... in terms of benefit, what's the difference between fresh and aged ?

RP: They should be chemically and nutritionally very similar in value, but the aging process typically involves the growth of a fungus that improves the taste for giving them aromatic qualities, but it is also a risk if they use a different fungus than one you're accustomed to. So for security, cottage cheese, if they haven't added anything, is very safe. But I don't use any cottage cheese now without washing it, because the ones that I have access to add lactic acid and what they call dressing. So by rinsing it, I lose about 30% of the weight of the material, but it comes out to be a clean milk curd.

JB: So milk, eggs, and some meats, if you can find some that are... I guess any of these foods, if you can find them, that they're raised without pesticides.

RP: Yeah, and fruits. Some of the very specialty things that you only see once or twice a year, even in very adventurous stores, cury moyas and sapotas. I think California and Florida grow some good sapotes. And some of those very sweet, mushy papas are available in parts of the South especially. Occasionally they come out to the coast. But the southern states, they're a traditional fall fruit.

JB: I've never had any of them. They all sound very exotic.

RP: Well, they were. Like George Washington, I think, said the papa was his favorite dessert. Is that right? They're a very common native dessert, but it's the industrialization. They're tender and fragile, and so they aren't good fruit of commerce.

JB: Like a real peach, which I actually had one of those fairly recently. It's unbelievable when you get a real peach.

RP:Yeah

JB: Hey, you know one dairy product that we found recently that we think is pretty good is called Faya. It's a Greek strained yogurt.

RP: Yeah, it seems that they've got most of the lactic acid out of it.

JB: There's no extra ingredients listed on it, so it just seems to be milk, maybe some salt.

RP: Yeah, the main thing wrong with ordinary yogurt is that it's got lots of lactic acid in it. So it's basically the same as cottage cheese for safety. I think it's good. Yeah.

JB: So if you can strain the lactic acid, which we've covered in other shows, but you don't think it's a good idea to eat extra lactic acid, then it's a good food.

RP: It should be minimized. That's why I don't advocate aerobic exercise. People should do everything they can to minimize lactic acid. I think I'm going to do a newsletter on cancer and the role of lactic acid in cancerization. But it also promotes inflammation and fibrosis and degenerative diseases. It's good to avoid it in the foods as well as produced by stress.

JB: Well, I look forward to that newsletter, Ray. And now we are actually out of time, so I should tell everybody that we've been talking to Dr. Raymond Peat. He has a Ph.D. in biology and extensive studies under his belt in the fields of physiology and biology and endocrinology and knows a lot about science history. So you can visit his website at raypeat.com, where you'll find the articles we were discussing today in part and many, many others. Ray, thanks so much for coming on Politics and Science today.

RP: Okay, thank you.

JB: The interview you just heard with Dr. Raymond Peat was recorded on the 7th of January, 2012. Much more information can be found about Dr. Peat's work at raypeat.com. And podcasts of this show are sometimes, and hopefully will all be available at Politics and Science on radio4all.net. Radio4all.net and search for Politics and Science. I've been your host, John Barkhausen. Thanks for listening and tune in again next week for another edition of Politics and Science.