

## Milk, Calcium and Hormones

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*(Transcribed by Judi, verified by Burtlancastr)*

**JR:** *Today we're going to talk about dairy, and why Ray recommends it so much.*

**RP:** I've been interested in milk for a long time. Probably 55 years or so I've been studying what's going on with the cultural antagonisms to it. It was in the 50s when the government had been collecting samples of organisms from around the world to monitor the effects of the atom bomb tests. They wanted to know how it was accumulating in young people; so they started collecting baby teeth, and the isotopes that concentrated most in teeth happened to be strontium-90. Then after they'd been doing that for years, it came out that strontium-90 was causing leukemia in children (among other cancers). But when that got into the news, people said - well, baby teeth show the radioactive isotope which is similar to calcium, and milk is rich in calcium, and milk is probably the main place babies are getting their strontium-90. So a whole wave went through the culture for a few years advising people not to drink milk because of the strontium-90 in it. But already in the 1950s (56 or 57) people had analyzed the composition of diets and found that the fallout into the soil produced quite a high ratio of strontium-90 to available calcium. But plants extracted the calcium (since that was what their cells needed), and left behind a good proportion of the strontium. And then when cows ate the vegetation, they again extracted a high proportion of calcium and left out a lot of strontium. And so when you add up to get the essential nutrients, if you get them from vegetable matter rather than milk, you're getting extremely high concentrations of the fallout isotopes. And milk is a good filtering process to eliminate all kinds of contaminants, especially in a period of high radiation; it filters out the radioactive isotopes.

**JR:** *A lot of people say milk is for calves. Or they say only raw is good, pasteurized is bad. I think the biggest obstacle to milk is that a lot of people are intolerant to it. Why do you think it happens ?*

**RP:** Actually, the US cleaned up the commercial dairy industry 40 or 50 years ago.... cut out the use of the most dangerous insecticides, that had been getting into the milk, and were known to cause breast cancer and other things. But in the 60s, the environmental protection agency and the FDA banned the use of these insecticides around the cows and dairies, and they controlled somewhat the additives going into the cow food. Israel was quite a bit slower than the US to ban one of these insecticides in particular, but when they did in the 60s, their breast cancer rates plunged tremendously. But the US, on that particular issue, had been leading the world in cleaning up the milk supply. And that was far ahead of cleaning up the meat supply. So when you look at agricultural industry in general, dairy is still probably the cleanest food available.

**JR:** *Some people have talked about grazed plants which when stressed produce chitinase enzymes...*

**RP:** That's something that you find in lots of foods that are grown in stressed plants - that's a plant enzyme that is protective against insects in particular, but is strongly allergenic to any animal. And in small amounts it's produced in a stressed animal under the influence of estrogen. So it's possible that that's a factor in meat, and eggs

and milk, but probably not in the practical sense. The main allergens that get into milk are, for example, if they let cows graze on pastures that have lots of allergenic weeds, that will go right into the milk..... enough of the allergens that people can react. You can usually taste the funny foods in the milk if you go around the cow's pasture and see what it's eating, and squeeze some of the leaves; you'll often identify what it is that gives the milk a funny flavor. And some small dairies aren't very alert to what their cows are eating; and that can cause, just in the individual dairies' milk to be more allergenic than average.

**JR:** *Can you talk about people having a damaged metabolism and unable to regulate blood sugar, which in turn can trigger the milk intolerances people complain about?*

**RP:** The tests for allergens are really just a very vague indicator of the fact that your immune system reacts to everything you're exposed to, and usually, finding the antibodies to a particular substance means that you have become tolerant to that substance. So I just don't pay any attention to the lab tests for allergies.

The intestine adjusts its enzymes within just a few weeks; usually it only takes 2 weeks to have a complete adaptation of the digestive enzymes. But until your intestine has adjusted its enzymes to a new kind of diet, much of that food is going to be undigested, and it will feed bacteria rather than feeding the person. And the strange new growth of bacteria will produce lots of chemicals that can be toxic and allergenic. So if a person isn't used to eating vegetables, and they eat vegetables, they'll often get a sore throat and runny nose, sore joints, headaches, and so on. Much of the food sensitivities issues is just adapting too suddenly to a diet; failing to adapt when they change, because they do it too suddenly.

Even if a person does have lactose intolerance from a lactase deficiency, tests have found that if they drink a cup of milk per meal, or less, they don't have the diarrhea that could be produced by drinking a pint of milk on an empty stomach. And even if they have had biopsies that show a deficiency of the lactase enzyme, that can be induced in about 2 weeks, just by introducing an occasional small amount of milk with their diet. The cells sense the presence of a nutrient, and the enzymes are gradually induced until the intestine can then handle normal amounts. Bacterial infections and inflammation can cause the loss of lactase enzymes, and probably many other important digestive enzymes. And experiments with supplementing thyroid or progesterone have found that you can induce or restore the lactase that has been deficient just by increasing those anti-stress hormones.

**JR:** *Does this have to do with increasing metabolism, and helping regulate blood sugar, while down regulating estrogen ? And helping re establish that small intestine integrity, so you can break down the lactose ? Because I know you were talking about how hypothyroidism decreases lactase production, in causing a lot of intolerances. The same thing how progesterone deficiency is actually seen with lactose intolerant people, because they aren't releasing lactase ?*

**RP:** Yeah. Inflammation is probably the basic problem there. Thyroid and progesterone, by restoring energy and normal function, bypass the inflammatory processes. And inflammation shifts the cell function to an emergency state, and you tend to lose a lot of functional enzymes in an inflamed state.

**JR:** *Why do you think dairy's so important ? What are its benefits ?*

**RP:** The biggest part of it is probably the alternatives. In 1960 the main focus against milk was its strontium-90 content; but when you looked at the alternatives, it

turned out milk was the best food for avoiding strontium-90. And it's the same with industrial additives, accidental pollutants - just about every place you look in the food industry, things are far worse than milk. Some fruits – if you can find fruits that aren't grown in large scale industrial orchards – bananas are an example of one of the worst product for chemical use and overproduction, bad soil, stressful conditions – but if you can find unstressed fruits, those are very free of toxins and contaminants, relative to most other food products.

**JR:** *It's fair to say dairy's like a complete macronutrient; it's carbs, proteins, fats. It's very balanced in regards to regulating blood sugar, down regulating inflammation. It's got a lot of pro-thyroid and progesterone properties at the same time.*

**RP:** Yeah. Milk even some testosterone. Thyroid, progesterone and testosterone... are important for the young animal. They found that the human milk contains enough thyroid hormone that babies whose thyroid was destroyed by living near Three Mile Island during the accident, didn't suffer any symptoms of hypothyroidism as long as they were being breastfed, because of the high protective hormone content of the milk.

**JR:** *Can you talk about the calcium in the milk; how the calcium, parathyroid, all these things work together in assisting the body in having normal levels of calcium with chronic stress and so forth ?*

**RP:** That's really a subject for a week of seminars. It involves everything at every level of the organism. Calcium is potentially the thing that causes all of the problems, allergies, cancer, heart attacks and so on. But when calcium is regulated properly, calcium protects against all of those things. And one of the central things in regulating calcium, is the parathyroid hormone. And when you are deficient in calcium in your foods, your parathyroid hormone increases. And it can temporarily keep your blood calcium up to the proper level; but it does that by taking it out of the bones. And when you eat an excess of calcium, that tends to suppress the parathyroid hormone. And since they've been doing dialysis for kidney disease, that has been a way to get a better insight into how the parathyroid hormone works, than had been done in just ordinary research. They have found that if they remove the parathyroid gland entirely as far as they can, that they can solve many of the deadly effects of chronic kidney dialysis. Hypertension and insomnia for example are two of the things that are immediately corrected by removing the parathyroid gland. And when you look at the effects of the parathyroid hormone excess, in such things as dialysis patients, you can get an idea of the range of things that eating extra calcium can correct by suppressing the parathyroid hormone. Insomnia is just one of them. Probably everywhere calcium is involved in an excitatory inflammation-promoting way, you can probably reverse it most of the time just by increasing the calcium in your diet.

The two vitamins that are important for making the tissue handle calcium properly also contribute to lowering the parathyroid hormone – vitamin K and vitamin D help you to handle the calcium, so the parathyroid gland senses it and shuts down. Some other nutrients, for example, vitamin A and niacinamide work in that same direction as vitamin K and vitamin D, helping to balance the ratio of calcium to phosphorus and restrain the parathyroid gland. When they have put animals on a vitamin D deficient diet, they find that giving the animal sugar instead of starch will keep its bones from developing rickets. It isn't that sugar has a vitamin D action, it's just that it lowers the stress and makes the animal adapt better to a vitamin D deficiency. And if there is a calcium deficiency, letting the animal drink salty water will for a long

time make up for a calcium deficiency in the diet, by helping the kidneys retain the calcium, apparently by substituting loss of sodium for a loss of calcium.

**JR:** *From your work, we know parathyroid hormone is inflammatory, and we need to down regulate it and figure out why it's high. What are the implications of just taking straight up calcium for this ? Can one take too much calcium ?*

**RP:** I often see people with a blood calcium of 11, 12 or 13 (where it should be 9 or 10). And getting them to eat more calcium, and maybe take some vitamin D and vitamin K, they can very quickly get their calcium down to normal. And the reason it's high is generally because they're eating too much phosphate, and overdriving their parathyroid hormone.

**JR:** *Could things like eating a lot of muscle meats, and tryptophan, or even taking 5-HETE...those, it seems, create the facilitation of parathyroid hormone in itself, causing more inflammation ?*

**PR:** Yeah. Many things do increase the parathyroid hormone. Serotonin does have a direct action; estrogen, cortisol, prolactin – all have parallel and promoting effects on the parathyroid hormone.

Progesterone and thyroid are the main things that help to inhibit the parathyroid. Part of that is that carbon dioxide produced in the cell, as it flows out of the cell that's constantly respiring, it forces calcium to leave the cell. And that relaxes the cell, because calcium should be outside the cell. When it's in the cell, it tends to excite the cell, and cause inflammation and lactic acid production. So once you get the streaming flow of carbon dioxide out of the cell, you're getting calcium into the safe situation. And it happens that parathyroid hormone activates glycolysis and the formation of lactic acid. And that's a big part of how it dissolves the bone, to provide more calcium for the blood stream. So everything that shifts the balance away from lactic acid production and towards carbon dioxide production helps to regulate, get the calcium back into the blood stream, out of cells, ready to go back into the bones. When they do tissue culture of, for example a piece of a mouse skull, which is very thin and can be kept in culture, the parathyroid hormone tends to dissolve it, causing it to produce lactic acid. But if you increase the carbon dioxide, the carbon dioxide directly starts forming crystals of calcium carbonate, and restoring the mineral structure of the bone. The first crystal laid down in the bone is calcium carbonate, but as the bone matures, some of the carbon dioxide is replaced by phosphate.

**JR:** *You've mentioned how CO2 helps to regulate the thyroid; could we use CO2 to regulate parathyroid ? Can we use carbonated water or baking soda to facilitate that process ?*

**RP:** Yeah. People have found that the exchange between bicarbonate and carbon dioxide is so quick that when you give a person a dose of sodium bicarbonate, the exchange of the bicarbonate to carbon dioxide is quick at the cell surface of a stressed cell. And so you can actually acidify and restore to normal a stressed cell with baking soda, because the sodium will quickly get lost out the urine, leaving the body as needed, acidified with the intracellular carbon dioxide, which puts the cell back into its anti-inflammatory resting state. And the excess sodium is the same as in the rat experiment where if you let the rat drink salty water, it isn't so desperately dependent on calcium in its diet. The alkali minerals can substitute to a great extent for each other, so a slight excess of magnesium or sodium or potassium will help to spare calcium in a stress situation. And calcium can likewise make up for a

deficiency of one of the others. For example, if you're having cramps, it might essentially be a magnesium deficiency. But you can often stop the cramp with just baking soda (or salty water) or milk (for the calcium) or fruit (for the high potassium content). It lets you re-arrange the balance of your alkaline minerals and helps to make up for a crisis deficiency of one of them.

***JR:** You've talked about people not being able to handle raw milk, while others can; and you advised them to try pasteurized; why is that ?*

**RP:** Every cow has its particular balance of bacteria, many of which will be chronically living in their udder - and it's a natural thing. A healthy cow will have a very high bacteria count in its milk. And the individual cow will change its bacterial balance according to what it's eating and the season of the year, the particular weather. It's extremely variable. And if a person, in their own bacterial ecology has a bad reaction to some of the bacteria that they're getting from the cow, they can just try a different dairy. Might still be raw; but even pasteurized milk still has enough of these individual herd bacteria, that trying a different brand of pasteurized milk is sometimes all it takes. And I know a few people who tend to get gas or diarrhea from most of the supermarket milks; but if they drink only the ultra-pasteurized milk that has been heated to, I think 135F is the typical temperature, they tolerate that nicely. Ultra-pasteurized milk has somewhat lower vitamin content, and it doesn't taste as good, but some people do tolerate that better.

***JR:** Yes, we noted that with a lot of our clients. And it definitely goes against the norm, but it works. What about yoghourts? Should we eat it ?*

**RP:** The first worst concern is to make sure that it doesn't contain carrageenan and gums – those are showing up in more and more foods, especially yoghurt and kefir and cheeses and such. I think it even shows up in some so called plain milk products. I've seen products that were intended to add vitamin A and D to milk, that contained gums, such as alginate or carrageenan, so the added vitamin is one of the potential sources of contamination. But if it says that it's just fermented milk, yoghurt, that's the safest kind of yoghurt. Still, it's better not to eat more than a few spoonfuls per day, because any lactic acid, especially the kind formed by bacteria, is extra work for your liver. The lactic acid that contacts your intestine cells, for example, activates the fibrosis-producing system, stimulating collagen production. And a chronic exposure to lactic acid increases a general tendency to overproduction of all of the inflammatory system. But the cumulative thing is a collagen accumulation and aging. But the immediate effect of the lactic acid on the liver is that the liver is set up to turn lactic acid back into glucose but to do that it takes energy, and so it consumes glucose to get rid of the lactic acid, so it's basically a drain on your blood sugar reserves.

***JR:** Can you elaborate a little more on the carrageenan and other gums? They are now in a lot of things, like liver paté, etc....*

**RP:** OH ! Even in roast beef – they can inject a solution of carrageenan into roast beef. I've seen advertisements – you can increase the weight of your product and decrease the meat content by 30%! By plumping it up with this jelly, made from seaweed. And this stuff is analogous to our connective tissue, the cartilage material and the breakdown material in the blood stream, heparin – it's a sulfated polysaccharide and it's close enough to our own regulatory heparin and connective tissue system that it can be interpreted as a sign of damage to our own connective tissue, so it can cause a very acute immune reaction. It's used experimentally to

research inflammation. It's a very predictable and effective promoter of inflammation. For example, they'll inject it into a rat paw and then test anti-inflammatory things for their protective effects. The use of it in food is justified by experiments showing that the native carrageenan, as it is prepared right out of the seaweed, doesn't induce cancer in vitro tests. But if you allow bacteria to break down the carrageenan into smaller fragments that more easily get into cells, that WILL cause cancer. And our intestine contains bacteria that are able to do that breakdown. But there's such a big investment in using it in the food industry, that the cancer regulating agencies don't want to acknowledge that the fact that when you eat native carrageenan, your bacteria are a risk for producing the carcinogenic degraded carrageenan, which is well known as a carcinogen.

**JR:** *People should be aware that this stuff is into most dairy products; it's in a lot of beef products. I've seen it in organic liver pates. In ice creams (you'll know it's there because you're gonna get a lot of gas and bloating). So, start reading labels. Can you talk about dairy in regards to saturated fats ?*

**RP:** There is a liver disease research group led by AA Nanji: he has demonstrated curative effects on hepatitis and cirrhosis from adding the saturated fats of a great variety of them, all the way from coconut oil, through to butter fats, up into the waxy long chain saturated fats. And similarly, they have shown that fish oils and the various seed oils that are polyunsaturated exacerbate the liver diseases and inflammations. The breakdown products of the unsaturated fats produce a lot of the inflammatory diseases. And just by substituting saturated fats, you're going to have an anti-inflammatory effect generally, and somewhat of an antioxidant effect, by interrupting the free radical oxidation product of the polyunsaturates. Everyone's body, with aging, accumulates more and more of the polyunsaturated fats. And probably, the saturated fats become more important protectively and therapeutically after a person is metabolically slowing down in their 20s and 30s. A kid that is growing, like a small two- or three-year-old kid might have twice the metabolic rate of an adult. And they can burn up much more of the polyunsaturated fats. As the metabolism slows down, even small amounts of the polyunsaturated fats will tend to accumulate and increase the tissue inflammation and oxidation processes. So, there is constantly some turnover. So, if you can keep your food high on the saturation side, usually, progressively, you can make some headway against those stored polyunsaturates. It might take years to restore a good balance but it's worth the effort to minimise the polyunsaturated fats.

**JR:** *Milk is low in iron, correct ?*

**RP:** Yeah. The reason it's low in iron is that during pregnancy, the estrogen of the mother...one of its two functions is to make the intestine absorb more calcium and more iron – a woman will typically absorb 9-10 times as much iron out of her food than a man does (so an iron supplement is especially risky when your estrogen is high). One of the functions of estrogen is to lower oxygen tension. And the fetus is in a situation of low oxygen tension, so it accumulates iron partly from the estrogen exposure but partly from the oxygen deficit. So the fetus reaches its maturity and is born overcharged with iron. It typically has enough iron in its tissues that it doesn't need to eat any iron for about 6 months to a year. So milk is designed to let the baby grow into its potentially toxic overcharge with iron. So milk is relatively very free of iron. And that's one of the protective effects. Many of our foods have a potential overdose of iron, especially the meats. And men, by the time they're 50, are generally well overloaded with iron. And that contributes to free radical oxidation. And it's probably a big factor in heart disease, and liver disease, and so on. And

women, to some extent, are protected as long as they're menstruating – throwing off some of the iron every month. But when they stop menstruating, then their tissues start overloading with iron. And milk and cheese are foods that are deficient in iron, so adding them generously to the diet will help you prevent that chronic tendency to overcharge on iron.

**JR:** *What about cheese ? We must watch what type of cheese we eat, and what's in it, especially what bacterial cultures.*

**RP:** Yeah. Recently, I saw an advertisement for one of the big additive companies that says that 60-some percent of the cheeses now made in the world use their cultures. And their cultures are basically from bacteria and fungus. They're cheap substitutes for the naturally grown bacterial and fungal cultures. The traditional location and type of cow and so on has determined the type of bacteria and fungus. And traditionally they were made with bovine digestive enzymes as a way to clot the cheese. And they're now using fungal and bacterial substitutes for these beef enzymes. Almost all commercial cheeses now are risky because of those microorganisms that are used in substituting for the traditional methods. And that's besides any additives for modifying the texture.

**JR:** *So, it's not always the dairy itself which causes problems, but all it's additives, and production methods. Can you talk about whey protein powders? So many are using them.*

**RP:** About 40 or 50 years ago, the dairies that were producing cheese would give their whey in a liquid state, fresh out of the cheese factory, to hog farmers. And in that fresh state, it was mixed with other foods for hog slop, and it produced very healthy pigs. And as a stimulant to growth, when mixed with a lot of fruits and vegetables and other waste foods, it was very good pig food, compared to the corn and soy beans that pigs are now getting fed. But when it's sold (because pigs aren't eating it anymore), they have to dispose of it somehow. And the process of dehydrating it, turning it into a powder (since milk products are very high in the fragile amino acids, including tryptophan and cysteine) - the process of dehydrating it increases the oxidation of the protein, and not only lowers the protein value but increases its toxicity and allergenicity. So I don't recommend any dehydrated food except in emergency, where they're convenient for transportation and storage. But as a regular thing, dehydrated anything is a potential risk.

**JR:** *In your article, you talked about albumin, in regards to whey protein.*

**RP:** The casein that you get in the cheese (and you throw away largely the albumin fraction), the casein protein turns out to be anti-inflammatory and anti-stress, helps hold down the cortisol production. And you get the opposite effect from the whey fraction. So it has many direct nutritional problems – probably the worst one is that most of the calcium stays with the cheese. And so you have a protein which is easily degraded and lacks the anti-stress factors, and is deficient in calcium. One of the reasons a lot of people give, if they have overcome the idea that milk forms mucus, or is a risk for various diseases, and so on, one of their arguments is that it makes them fat. But all the research on animals, and as far as it goes, the human research, shows that milk is probably the best reducing food there is. Mechanisms for that are now known – not only the anti-stress effect of the casein and the good balance of the saturated fats and so on - but the calcium alone is a very important metabolic regulator. It happens to inhibit the fat-forming enzymes – fatty acid synthase - and incidentally, that's a characteristic enzyme that goes wild in cancer. But calcium and

milk inhibit that fatty acid synthase, reducing the formation of fats, and at the same time it activates the uncoupling proteins in the mitochondria, which are associated with increased longevity. Because by increasing the metabolic rate, the uncoupling proteins burn calories faster, but they protect against free radical oxidation. They pull the fuel through the oxidation process so fast in effect, that none of it goes astray in random oxidation. Whereas if you inhibit your energy producing enzymes, you tend to get random stray oxidations that damage mitochondria. So the uncoupling proteins burn calories faster at the same time that you're reducing fat synthesis. And milk is, as far as I know, the only food that does both of those things simultaneously.

**JR:** *What about pasteurized milk ? It gets synthetic vitamins added to it.*

**RP:** For one thing, it's a very small amount of the vitamins. And even though I'm allergic to just a tiny amount of synthetic vitamin A – [it] will give me a headache for a couple of days, just a trace of it- I can drink a gallon of milk containing their added vitamin A, and apparently other things in the milk protect me from that intense allergic reaction to synthetic A. But it is a problem that, anything but whole milk, they're required to add vitamin A and D in the US.

[A gallon of milk drank per day] – probably that's been my average for 35 years or so. Now I average probably only two, to two and half, to three quarts when I can get lots of orange juice.

**JR:** *So, when it comes to milk, the good outweighs the bad (because milk has a high level of tryptophan, among other things).*

**RP:** The calcium, by stimulating our metabolism, keeps us more like the teenager, metabolically, who can handle and balance those things. But that's where gelatin and fruit come in, helping to shift the balance somewhat away from that high tryptophan and cysteine content.

**JR:** *Should people get most of their calories from dairy ?*

**RP:** Ideally, I'd get half of my calories anyway from fruit. And the proportion of protein, carbohydrate and fat probably should be something like a third of each. But I'm not sure what the ideal is; it depends so much on the quality of each of them. Avoiding starch and avoiding polyunsaturated fats, and avoiding the very high tryptophan-content proteins, then you could go very high on any one of the major nutrients without problem.

**JR:** *There's a lot of high protein diets out there. Can high protein diets (or low carb/low fat diets) create over-stimulation of parathyroid hormone?*

**RP:** Yeah. Because most proteins come with lots of phosphate. The grains / beans are very bad protein, but very high in phosphate. Meats are good proteins but very high in phosphate. And the ratio between phosphate and calcium is the main thing that activates parathyroid hormone. So, minimizing phosphate or increasing calcium is extremely important.

**JR:** *Does cortisol and estrogen also play a part in the bone demineralization process (osteoporosis), apart from the parathyroid hormone?*

**RP:** Yeah. The parathyroid hormone increases with women's menstrual cycle. When estrogen is dominant, parathyroid hormone is highest. And prolactin, cortisol,



serotonin increase the parathyroid hormone. And it's interesting that the things that estrogen increases – prolactin, serotonin, parathyroid hormone, cortisol – all of these are known to dissolve the bones. So it's very interesting that they promote estrogen as a bone strengthener. And in the 50 or 60 years that women have been taught to use estrogen, so that almost all American women have used estrogen, the rate of breaking hips has increased. So, since all of the mechanisms through which estrogen affects the parathyroid hormone, serotonin, cortisol and prolactin – those are all well established: and those bone dissolving hormones are constantly present. For example, with aging, a person's parathyroid hormone increases as the bone mineral density decreases. And there is a tendency for the cortisol to become dominant with aging. And prolactin, both in men and women, has an increasing tendency to become dominant in aging.

**JR:** *Progesterone supplementation (or progesterone-rich foods), by stimulating the bone-building osteoblasts, fights bone demineralization caused by estrogen dominant –or progesterone deficient- situation (estrogen stimulates bone-resorption osteoclasts).*

**RP:** Yeah. And testosterone. These same factors that interrupt progesterone metabolism also interrupt testosterone's. High tryptophan or serotonin exposure will lower your testosterone. High polyunsaturated fats will lower your testosterone. And testosterone protects against the parathyroid hormone and strengthens the bones. (Testosterone is important for women too. The natural androgens, DHEA and testosterone are protective against hardening of the arteries in both men and women.)

**JR:** *People having calcium deposits or bone spurs, is it indicative of your calcium levels ?*

**RP:** I think it usually happens in people who are eating too much phosphate, not enough calcium. And sometimes, a general vitamin deficiency can be involved, because, for example, niacinamide and vitamin A work to regulate the phosphate-calcium balance, as well as vitamin D and K. Vitamin K is a very safe thing that currently is stylish. And it seems to be involved in our basic energy production the way thyroid and niacinamide are.

**JR:** *Regarding the protective effects of testosterone and androgens, would you advocate feeding the pathway from the top down? Like, eating pregnenolone ?*

**RP:** Cholesterol has a protective effect against excess parathyroid hormone because it's near the top [of the steroid tree] – feeding your liver just what it needs so it can make cholesterol, then the cholesterol, with thyroid and vitamin A will let your glands make pregnenolone, progesterone, testosterone, DHEA....

**JR:** *Is anemia connected to parathyroid hormone and inflammation ?*

**RP:** I'm not sure if there is a direct connection. But the thyroid and parathyroid tend to go in opposite directions. And the TSH definitely is involved in anemia, inflammation, liver malfunction and so on. So when a person is hypothyroid, they tend to have high parathyroid hormone and high TSH. And just looking at the individual who is hypothyroid, you can see that their parathyroid hormone must be having a role in such things. But experimentally, the TSH has a definite connection to malfunction of the bone marrow, and blood vessels, and serotonin metabolism, and liver metabolism.

**JR:** *What are other nutritional sources of calcium, besides dairy ?*

**RP:** For a person who wants a safe supplement, egg shells – if you boil (normally: no need for excess boiling) your eggs to get any additives and cleaners off them- egg shells are the purest form of calcium carbonate to use as a supplement. And calcium carbonate is probably the ideal form to use as a supplement. Crustaceans' shells, and mollusk shells, and egg shells are natural forms of calcium carbonate. But egg shells have been tested and are usually even cleaner than oyster shells as a calcium carbonate source.

**JR:** *How would you recommend ingesting them ? Pulverizing them to powder ?*

**RP:** Yeah. ¼ - ½ teaspoons per day if the person isn't taking it's milk calcium. Many years ago, I had a relative who was a baseball player, in his thirties. He kept breaking his arm throwing balls and his x-rays showed that he had the skeleton of a very old man. Just terrible osteoporosis. And his doctor prescribed a tablespoon of powdered egg shells every day. And in just 2 or 3 months his x-rays showed normal bones and he went back and played ball for another ten years or so. Never broke another bone.

**JR:** *So many women in their 40's and 50's are told to eat calcium.*

**RP:** The counter-ion is really important. For some reason, the drug industry wants to sell various things – calcium gluconate, calcium citrate, calcium lactate, even some fairly toxic things – calcium aspartate – things that have a toxic effect of their own.

**JR:** *So, some of these supplements could actually make matters worse.*

**RP:** Yeah. The counter-ion (gluconate, citrate, lactate, etc) in the calcium supplement is a significant problem.

**JR:** *Is there a correlation between aspirin and calcium regulation ?*

**RP:** Yes. Aspirin has some direct effects on the bone – blocking the prostaglandins that cause the inflammation related to parathyroid hormone's glycolysis. The prostaglandins are very important factors in osteoporosis, and aspirin blocks that. But aspirin also inhibits the pituitary stress hormones, and so tends to lower cortisol. And by lowering estrogen it reduces the prolactin - all working in the direction to strengthen your bones and keep calcium out of blood vessels, in your bones where it should be. [Aspirin stimulates carbon dioxide production.]

**JR:** *What about fibrosis and calcium in our body ?*

**RP:** Hans Selye was concentrating for several years on the process of - he called it either calyphylaxis or calcergy (?) - where calcium goes wild and causes spasms in blood vessels. Even shuts off circulation, causes gangrene of the extremities or the skin, and scleroderma, in which the skin progressively calcifies (rather than acutely). And he showed that serotonin was a major factor. The stress combined with local irritation causes the first fibrosis, and then the fibrotic tissue absorbs calcium and creates inflammation and calcification. The inflammation with lactic acid production and the influence of lactic acid displacing carbon dioxide is what most immediately leads to the overproduction of collagen, and eventually those same factors displacing carbon dioxide will cause the tissue to calcify.

**JR:** *Sometimes, calcification of tissues occur while calcium is low.*

**RP:** Yeah. That's where you get increased parathyroid hormone that displaces [calcium] – it takes calcium out of the bones and puts it into soft tissues. That can be offset by eating more calcium and taking vitamin K, for example.

**JR:** *Your take on fluoride?*

**RP:** I avoid fluoridated water carefully because, without thinking about it, during a stay in San Francisco – wasn't aware that the water was fluoridated- I started getting extreme hypothyroid symptom. And I realized that the water that I drank, had enough fluoride in it to totally destroy the thyroid supplement that I was taking. So the first place that fluoride can act is by destroying nutrients and hormones that you might be taking. But to the extent that fluoride circulates in your bloodstream, where T3, the active thyroid hormone, is also circulating – it just takes one fluoride atom to ruin the T3 molecule. So my own experience with it is as a thyroid toxin. John Yiamouyiannis and Dean Burk did some good studies, showing pretty conclusively that a population that is fluoridated has a higher cancer rate.

**JR:** *Since I'm 14, each time I consume dairy (milk, cheese, etc), it causes my acne to flare up.*

**RP:** The vitamin A and thyroid, and the hormones DHEA, androgens, testosterone and progesterone balance the inflammatory and anti-immune things that aren't normally present. I suspect that the connection between dairy and acne is that it's increasing your metabolic rate, and increasing your requirement for some nutrients; usually vitamin A is the limiting nutrient. And people who do anything that increases their metabolic rate (and calcium is a very powerful stimulant of metabolism), the increased metabolic rate makes you consume vitamin A (and probably several other nutrients involved in skin). But vitamin A is most commonly the limiting factor in acne.

**JR:** *You've written Vitamin A can actually be toxic to us; should it be rubbed on the skin, as opposed to ingesting it ?*

**RP:** My own experience with commercial vitamin A is that I used it for many years. But the product is being constantly being changed as they find cheaper ways to do it, and suddenly something about some of the products caused extreme sensitivity. I can use some forms of vitamin A wildly and generously with no effect, but some of them have additives that can make them very allergenic. And the basic toxic effect of giant doses of vitamin A, like several hundred thousand units a day, those invariably will reach a point where they will suppress your thyroid. Carotenes – the whole range of carotenes-aren't really vitamin A. But they, even more than vitamin A, have an anti-thyroid, and potentially anti-steroid action by accumulating and displacing the vitamin A that's necessary for metabolism in the skin, and making steroids. So you don't want to overload, especially on the carotenes. But eventually , vitamin A itself can be an anti-thyroid, anti-steroid problem.

I got interested in vitamin A because I found that every time I worked outside in the summer, I got acne. And people had told me that sunlight was good for the skin, but I invariable got acne in proportion to my exposure to sunlight. And I figured there was some toxic effect of ultraviolet light. But then, one night I went to sleep reading with a very bright light shining in my face, and slept 8 hours with that light just a foot and half from my eyes, and woke up starting to get pimples. And I suddenly

realized that it was activating not only my retinal vitamin A system, but via my eyes it was activating my hormonal system and consuming vitamin A. I found that in proportion to my light/sun exposure, if I increased the vitamin A, I could prevent acne. And it turns out to be protective in other ways. The nutrition researcher dentist Emanuel Cheraskin did surveys where he found that health complaints and symptoms decreased in a nice linear relation to increasing vitamin A, all the way up to 100,000 units per day. But anyone who is on the borderline for thyroid function, sometimes even 20,000 units will make their symptoms worse by suppressing their thyroid. So you just have to be very cautious and probably starting with 5,000 units and watching for allergic symptoms, and checking your temperature to see if it's inhibiting your thyroid. Very often people have to get up to 20 or 30 thousand units a day, before their acne improves.

***JR:** Are plant sources of vitamin A more toxic than animal sources ?*

**RP:** Yes, because it depends on vitamin B12 to be converted, and the thyroid function is inhibited if it isn't converted.

***JR:** But at the same time, if one eats enough eggs, dairy, liver, and your other recommendations, could you get enough Vitamin A that way ?*

**RP:** Yes. One serving of liver per week, and egg or two every day, and plenty of milk – for most people that's plenty of vitamin A.

***JR:** Please elaborate on claims about milk draining calcium out of bones due to the higher phosphorus to calcium ratio than human have.*

**RP:** No, the ratio in milk is very high towards calcium, so that even eating some meat or other foods that are high in phosphate, if you drink a good amount of milk, the high calcium will put these other excess phosphates into proportion. It should be 1.5 calcium per phosphate anyway.

On Pubmed you can find that discussed [the incorrect claims of high phosphate in ratio to calcium], and basically, milk is – next to egg shells – our best source of calcium. There are lots of movements trying to think up something wrong with milk. One of the recent ones is to say that all animal products – beef, pork, milk and cheese, and eggs, and so on – all of these contain sialic acid form that is allergenic, and so will cause cancer – that's probably just a sort of a sales pitch for a genetic engineering company. Anyone with some interesting bit of research will tend to do a lot of publicity against milk – they claim that it causes diabetes, and heart disease, and so on. But [high] blood pressure is one of the best researched topics that milk protects against, calcium in particular.

***JR:** Does dairy intake cause body weight increase ?*

**RP:** The mechanisms that I mentioned, inhibiting the fat-producing enzyme system and stimulating the calorie burning uncoupling protein, those are clearly established. Papers by Michael Zemel and his group (Sun, Shi and others) – they've done some very good studies on curing obesity with milk products. But there are a lot of other groups that have noticed that milk drinkers are very rarely obese (chronic users of a quart of milk or more a day).

***JR:** So, you're saying weight gain is actually a positive sign ?*

**RP:** No. Weight gain in obesity is not known to be produced by milk. If you ate nothing but Haagen Dazs ice cream, you could get fat. But milk, with it's high ratio of protein and calcium to the fat, is the best way to lose weight. Except that it does help to build muscle. Its anti-inflammatory, anabolic effect helps to build muscle, which is a good way to gain weight.

***JR:** Is dairy a natural source of trans-fats ?*

**RP:** Have you heard about conjugated linoleic acid and its therapeutic benefits? Conjugated linoleic acid is being sold therapeutically because it has so many protective effects, stimulating the metabolism and being anti-inflammatory, and anti-obesity, and so on. But that's a natural component of milk, and dairy fat in general. And the trans-fats are just in-process, on way to forming the conjugated linoleic acid (they are the precursors). And I think their benefit is that they block the polyunsaturated fats – linoleic acid in particular. Linoleic acid is the anti-thyroid, pro-cancer, pro-inflammatory, so called essential fatty acid. And there have been studies for about 20 years, showing that trans-fats can have a protective effect in themselves as an inhibitor of the linoleic acid's toxic effect. But more importantly, the dairy trans-fats are precursors to conjugated linoleic acid, which is specifically active biologically in a good way. And the mechanism by which these are formed, is – bacteria in the rumen hydrogenate in a protective detoxifying reaction – they detoxify the polyunsaturated fats in the vegetable material that the cow is eating. And if the cow is eating a natural diet, rich in vitamin E, such as leaves rather than grain, the vitamin E is a co-factor in the hydrogenating bacteria, turning the unsaturated fats to saturated fats. And in the 2% of the fats that are missed there is a small amount of intermediate, not fully hydrogenated material, which turns out to be the trans-fats and the conjugated linoleic acid. And those in themselves, in small amounts, I think there is good evidence showing that they, in themselves, have a protective effect.

***JR:** Does this small amount of trans fats represent the difference between trans-fats in dairy and trans-fats in partially hydrogenated oils ?*

**RP:** Well, the fact that they're partially hydrogenated means that there is still a lot of PUFA left in them (the vegetable oils). And I think that the defense of the idea of essential fatty acid, people are looking for anything to blame the toxic effects of margarine on... but, for a long time, it's been clear that even partially hydrogenated vegetable oil still has enough PUFA in it to have toxic effects.

***JR:** Are trans-fats themselves dangerous ?*

**RP:** Oh, probably in a large amount. But I'm not exactly sure what it is. Because the research I've seen doesn't really clarify what it is they're doing that could be harmful.

***JR:** Could they cause oxidation ?*

**RP:** Yes, but less than the purely polyunsaturated fats. Because they already have been partly hydrogenated. I think it was Clarence Ip (?) who did some of the first experiments, showing a slight anti-cancer effect of the trans-fatty acids.

***JR:** Thank you Ray. Have a nice day.*