



dr paul clayton's

Health Newsletter

Summer 2007

Vitamin D
and cancer

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Vitamin D - Breaking News

More and more scientists believe that the Recommended Nutrient Intake (RNI) for vitamin D is too low and should be increased; that most Americans and Europeans do not receive enough vitamin D, and that this could be putting them at a significantly increased risk of developing cancer. This position has been buttressed by a new study, carried out at the Creighton University School of Medicine, which found that post-menopausal women who took large amounts of vitamin D3 were 60 per cent less likely to develop cancer than a control group.

High-dose vitamin D trial on post-menopausal women

In this study of 1,179 healthy post-menopausal women, the trial group supplemented their diet for four years with a high dose of vitamin D3; at 1100 International Units (IU)/day, this was around 3 times the current and sadly inadequate RNI. The women, who were all 55 years or older, were free of known cancers for at least 10 years prior to entering the study; but as some of them might have entered the study with undiagnosed cancers, researchers eliminated the first-year results and examined the last three years of the 4 year study.

77% cancer risk reduction

This produced even more stunning results, with the vitamin D group showing a 77 per cent cancer-risk reduction compared to the non-supplementers.

In light of the ever-growing evidence linking vitamin D status with a reduced risk of breast, colorectal and prostate cancers, an international team of experts recently called for dietary recommendations for vitamin D to be reassessed (Hathcock et al '07), saying that the current advice is

outdated and puts the public at risk of deficiency.

Increase in RNI recommended

They recommended that the tolerable upper intake level for oral vitamin D3 should be increased five-fold from the current value of 2000 IU, equivalent to 50 micrograms per day, to 10,000 IU (250 mcg) per day). The Creighton University study strengthens their case, and increases the pressure on the authorities to change the RNI to a level which might actually lower the cancer burden, and improve public health.

Further support is provided by another very large study (10,578 pre-menopausal and 20,909 post-menopausal women with an average age of 55, followed up for 10 years), carried out at the Brigham and Women's Hospital and Harvard Medical School (Lin et al '07).

A third fewer cases of breast cancer

The pre-menopausal women who had the highest intakes of vitamin D and calcium had a third fewer cases of breast cancer than those in the low intake group. This protection was not seen in the post-menopausal group, which seems to contradict the study referred to above; but this may simply be because the range of vitamin D intakes in this group was not nearly as high as in the Lappe trial. Another confounding factor is that the scientists did not measure sun exposure, which is in many cases more important in determining vitamin D status than dietary habits; and they concluded – as ever – that their research, while provocative, could not be regarded as conclusive. More research needs to be done, and more research funding is essential to do this!

Vit D-cancer link long suspected

The idea that vitamin D might reduce the risk of cancer dates from the 1940s when Frank Apperly first demonstrated the link between latitude and deaths from cancer (Apperly '41), and suggested that sunlight gave "a relative cancer immunity". Since that time, many studies have indicated that he was right (Grant '06, Schwartz and Blot '06); making the current government recommendations to 'stay out of the sun at all costs' look increasingly wrong-headed and dangerous. Instead of skulking in the shadows, we should be taking more exercise in the fresh air and eating more of the sun-protecting, skin-protecting and cancer-protecting phytonutrients covered in the last newsletter.

RNI's too low/non-existent for many other nutrients too

In summary, for both vitamin D and choline (overleaf), it is becoming painfully obvious that the current RNI values are too low, and are causing us harm. The larger question is how many more micronutrients need to be evaluated? There is increasing evidence that the RNI for vitamin E (or, more accurately, the vitamin E family, consisting of a group of tocopherols and tocotrienols) should be considerably higher; and RNI values have yet to be set for lycopene, lutein and a host of other important phytonutrients.

As any farmer knows, good nutrition is the key to animal health. When will our drug-obsessed medical establishment pick up on this simple fact?

Choline - another unfamiliar 'vitamin'

Choline was formerly considered to be a B vitamin, although it fell from grace and is now more commonly thought of as a member of the large class of B-associated nutrients. In this system it is still referred to as nutrient Bp.

It is an essential part of phosphatidyl choline, which in turn is an essential constituent of cell membranes; and it is also, as a precursor to betaine, important as a supplier of methyl groups, which can lower homocysteine levels. High homocysteine levels are a marker for a heart attack.



Food sources of choline include liver, eggs, soybeans and wheatgerm; and perhaps because it does occur in so many foods, choline depletion or deficiency is rarely thought of as a cause of illness. The recommended dietary intake is around half a gram per day, which does not sound like much; but for many of us on a low-energy, 2,000 calorie a day lifestyle, levels of dietary choline are now low enough to cause health problems.

A recent study at Penn State University (Fischer et al '07) set out to measure healthy men and women's dietary requirements for choline, and look at the clinical consequences of choline deficiency. The 57 subjects received a diet containing 550mg choline for ten days, followed by less than 50mg for up to 42 days.

When consuming the lower dose of choline, around two thirds of the subjects showed fatty liver or muscle damage: the recognised and predictable signs of choline deficiency. A

significant number of the men showed these signs even when they were consuming the higher, current



recommended daily dose. They needed as much as 825mg of choline in order to avoid tissue damage; a finding which will undoubtedly lead to pressure to revise the current dietary recommendations upwards. The tissue damage was, at least at the early stages, reversible by taking higher doses of choline.

The researchers had previously shown that choline deficiency (da Costa et al '06) causes increased immune cell death and DNA damage, a combination of adverse effects which might be expected to increase the risk of cancer.



They said: "We hope these findings will aid the Institute of Medicine in refining the Dietary Reference Intake for this nutrient."

Meantime you can ensure adequate dietary intake of eggs, soybeans (which you can now buy fresh-frozen, rather like peas) and wholewheat foods.

Omega 3 for depression

If people ate more omega 3, they might just suffer from less depression. This is the message from a large Norwegian



study, which has reported that people who ate more omega 3 fatty acids were considerably less likely to develop depressive illness.

The scientists followed 21,835 subjects and found that the prevalence of depressive symptoms was 29 per cent lower in regular cod liver oil users than the rest of the population. What's more, there was a kind of dose relationship; the longer the duration of supplementation, the lower the prevalence of symptoms of depression.

There are a number of other studies which have hinted at such a relationship (Kiecolt-Glaser et al '07, Nemet et al '06); so this Norwegian trial hardly comes out of the blue.

And there are plausible mechanisms whereby omega 3s might positively affect brain cells, for example by altering ion channels in a way which could help them to work more effectively.

So if anyone close to you is suffering from depression, you might consider recommending that they take an omega-3 supplement, either on its own or in conjunction with antidepressant medication.

Omega 3 from whale meat - or even beef?

In some communities whale meat is still a staple food; in Japan, for example, and in parts of Scandinavia. I was offered whale sushi last time I was in Oslo, and can report



that it has an acquired taste, and a texture somewhere between cross-ply and radial. Now, regardless of what your views might be of the ethical aspects of eating whale, it is nutritionally prime. It has a high content of the beneficial omega 3 fatty acids, unlike most commercial meats which generally contain higher levels of saturated fats; and which are linked to increased inflammatory tendencies, and to an increased risk of heart disease.

Soon, however, it will be possible to purchase omega 3-enriched beef in the supermarkets, to go with the omega 3-enriched breads, eggs and yoghurts already on sale. This new kind of beef does not come from genetically modifying cattle, but from modifying their diet.

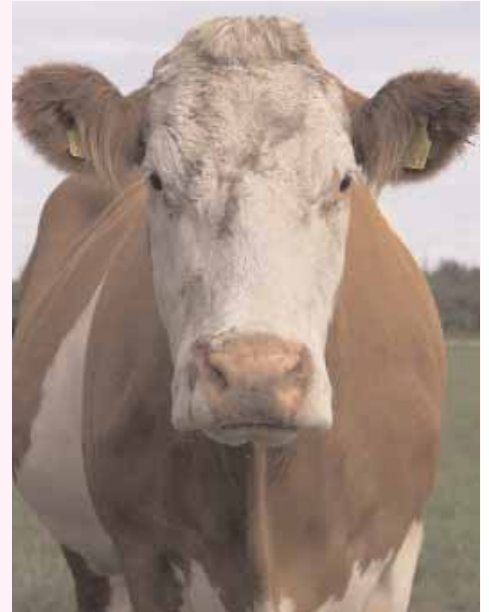
Scientists at Kansas State University (Medeiros et al '07) fed cows on flaxseed, which contains high levels of the omega-3 precursor alpha linoleic acid (ALA). They found that the cattle produced beef which contained raised levels of EPA and DHA, the polyunsaturated omega 3s (PUFAs) usually only found in oily fish.

When this meat was fed to rats (standing in here, as they so often do, for humans), the rats benefited in kind. Levels of the desirable omega 3s were raised in their tissues, inflammatory biomarkers were reduced, and their cholesterol levels fell significantly.

It is not clear whether the cows metabolised the ALA into EPA and DHA themselves, or whether it was the micro-flora in their rumens which did the trick; but the end result is the same, ie healthier beef.

As there is a considerable gap between current government recommendations for omega-3 and what people actually eat (450mg vs 280mg per day), the idea of omega-3 enriched steaks, mince and hamburgers is not a bad one.

Watch this space – or rather, watch the supermarket shelves.



Gout - not just for historians

Gout is hardly a fashionable ailment; one thinks of Galray's cartoons of choleric men in powdered wigs, frock coats, and hugely bandaged feet. But it is still around, a painful condition which affects as many as one in a hundred, with men about ten times more at risk than women; although in post-menopausal women, the risk rises to match the menfolk.

In this condition, excess uric acid in the body crystallises out in the joints, and causes intense pain and inflammation. A number of drugs are used to reduce symptoms (such as allopurinol, which reduces uric acid formation, and probenecid, which increases excretion of uric acid in the urine), but most people try to avoid attacks by modifying their diet. Excess alcohol, or eating animal foods rich in compounds called purines, makes attacks more likely, so cutting out red meat, organ meats such as liver and seafood is often helpful and can cut the incidence of attacks by as much as 50% (Choi et al '04).

Plant foods high in purines, however, do not appear to trigger attacks; peas, beans, mushrooms, cauliflower and spinach can be eaten with impunity, or even with relish.

Previously, many medical experts recommended gout

patients to avoid coffee as this beverage – along with tea, cocoa and alcohol – causes extra water loss from the body which can trigger an attack. Now however, a new paper from a group of researchers from Harvard, the Arthritis Research

Centre of Canada, and the University of British Columbia in Canada, has found that regular coffee drinking is associated with a reduced risk of gout.

This was a powerful study: they followed 45,869 men over the age of 40 for 12 years, and found that drinking four to five cups of coffee per day was associated with a 40 per cent lower risk of gout, while six or more cups were associated with a 59 per cent lower risk, compared to men who never drank coffee. Tea drinkers were not protected.

Coffee often gets a bad press, particularly from the less scientifically literate 'nutritionists'; but it is a major source of dietary antioxidants, and has already been linked to reduced risks of liver disease and diabetes. Now it seems to protect against gout also; and can claim its place as a health drink, along with tea, red wine and cocoa. (Given that women were excluded

from the study, it is not yet sure if they would benefit from coffee to the same extent but it would seem likely.)



Berries fight cancer

At a time when the evidence is that the Government's 5-a-day campaign should really be 7-a-day, comes fresh evidence for the health defensive power of especially berry fruits.

Christine Sardo manages clinical trials on berry fruit consumption and cancer prevention for Ohio State University's (OSU) College of Medicine. She recently told health practitioners at the Nutrition and Health Conference in New York City: "We are promoting the concept of 'fruitaceuticals' as opposed to pharmaceuticals for cancer, and emphasizing prevention vs. treatment."

Sardo quoted from a study published in the March 1, 2006, issue of *Cancer Research*, in which OSU Public Health professor Gary Stoner and four co-authors fed powerful cancer-causing nitrosamines to rats three times a week for five weeks (Stoner et al '06). After 20 additional weeks, rats that ate a diet consisting of 10% black raspberries showed reductions in oral, oesophageal and colon cancers of about 50 percent compared to rats that did not eat berries. "The berries prevented the entire spectrum of tumours from being initiated and promoted," Sardo reported.

Berries may be the natural counterparts of synthetic drugs such as Tamoxifen. Acting together, the compounds in black raspberries slow the growth rate of pre-malignant cancerous cells, and they stimulate those cells to die, a process called apoptosis.



Sardo is currently conducting human trials, focusing on people with pre-cancerous lesions of the oesophagus, mouth and colon, as these are the places where the compounds in black raspberries can be absorbed best. She feeds her human subjects about two ounces of freeze-dried black raspberries daily, the equivalent of about a pound of fresh black raspberries.

It is too soon to judge whether the human trials are a success, but if berries turn out to have the same chemopreventative action in humans as they do in rats, it could help prevent many tragic illnesses. "Oesophageal cancer has a very low survival rate, only about 10 percent," Sardo told the conference. "If we can prevent such cancers up front, it would be great."

Black raspberries do have a particularly high flavonoid content, but ordinary raspberries, strawberries, blueberries and blackberries all appear to have similar protective power.

References

Aperly FL. **The relation of solar radiation to cancer mortality in North America.** *Cancer Res* 1941;1:191-5.

Choi HK, Atkinson K, Karlson EW, Willett W, Curhan G. **Purine-rich foods, dairy and protein intake, and the risk of gout in men.** *N Engl J Med.* 2004 Mar 11;350(11):1093-103.

Choi HK, Willett W, Curhan G. **Coffee consumption and risk of incident gout in men: a prospective study.** *Arthritis Rheum.* 2007 Jun;56(6):2049-55.

da Costa KA, Niculescu MD, Craciunescu CN, Fischer LM, Zeisel SH. **Choline deficiency increases lymphocyte apoptosis and DNA damage in humans.** *Am J Clin Nut* 2006 Jul; 84(1): 88-94.

Fischer LM, daCosta KA, Kwok L, Stewart PW, Lu T-S, Stabler SP, Allen RH, Zeisel SH. **Sex and menopausal status influence human dietary requirements for the nutrient choline.** *Am J Clin Nut* 2007, 85:5, 1275-1285

Grant WB. **The likely role of vitamin D from solar ultraviolet-B irradiance in increasing cancer survival.** *Anticancer Res.* 2006 Jul-Aug;26(4A):2605-14.

Hathcock JN, Shao A, Vieth R, Heaney R. **Risk assessment for vitamin D.** *Am J Clin Nut.* 2007 Jan;85(1):6-18. Review.

Kiecolt-Glaser JK, Belury MA, Porter K, Beversdorf DQ, Lemeshow S, Glaser R. **Depressive symptoms, omega-6:omega-3 fatty acids, and inflammation in older adults.** *Psychosom Med.* 2007 Apr;69(3):217-24.

Lappe J, Travers-Gustafson D, Davies K, Recker R, Heaney R. **Vitamin D and calcium supplementation reduces cancer**

risk: results of a randomized trial. *Am J Clin Nut* 2007, 85:6, 1586-1591

Lin J, Manson JE, Lee I-M, Cook NR, Buring JE, Zhang SM. **Intakes of Calcium and Vitamin D and Breast Cancer Risk in Women.** *Arch Int Med* 2007, 167:10, 1050-1059

Medeiros DM, Hampton M, Kurtzer K, Parelman M, Al-Tamimi E, Drouillard JS. **Feeding enriched omega-3 fatty acid beef to rats increases omega-3 fatty acid content of heart and liver membranes and decreases serum vascular cell adhesion molecule-1 and cholesterol levels.** *Nutrition Research* 2007, 27:5, 295-299

Nemets H, Nemets B, Apter A, Bracha Z, Belmaker RH. **Omega-3 treatment of childhood depression: a controlled, double-blind pilot study.** *Am J Psychiatry.* 2006 Jun;163(6):1098-100.

Raeder MB, Steen VM, Vollset SE, Bjelland I. **Associations between cod liver oil use and symptoms of depression: The Hordaland Health Study.** *Journal of Affective Disorders* 2007, 101:1-3, 245-249.

Schwartz GG, Blot W. **Vitamin D Status and Cancer Incidence and Mortality: Something New Under the Sun.** *Journal of the National Cancer Institute* 2006; 98(7):428-430

Stoner GD, Chen T, Hwang H, Rose ME, Nines RG. **Chemopreventive Properties of Black Raspberries in N-Nitrosomethylbenzylamine-Induced Rat Esophageal Tumorigenesis: Down-regulation of Cyclooxygenase-2, Inducible Nitric Oxide Synthase, and c-Jun.** *Cancer Res.* 2006 66: 2853-2859.