UIC FAMILY MEDICINE

NUTRITALK-STAY HEALTHY EDITION

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TUNA VS. SALMON

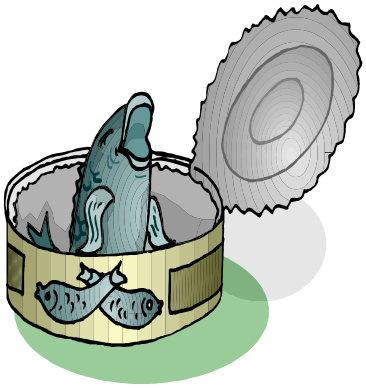
BY: AVERY WALKER, M3

The topic I have chosen to discuss involves the consumption of tuna vs. salmon and the risks of mercury contamination.

Fish contains eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), two long-chain omega-3 fats that aren't found in appreciable amounts in any other sort of readily available food. Those omega-3 fats may have all kinds of benefits, but so far the best evidence indicates that they're protective against fatal cardiac arrhythmias and heart attacks. In addition, DHA may be important to early brain development and to healthy pregnancies.

But there are contaminants to consider. It is well known that mercury accumulates in the lean tissue of some species. Mercury crosses the placenta, and high doses cause serious brain damage. In adults, the metal may harm the heart. PCBs and dioxin cause cancer in animal experiments, and there's evidence that they're human carcinogens, too. They may also

(See Page 2)



Inside this issue:

Special points of interest:

- Which fish is healthier for you: tuna or salmon?
- Reconsider coconuts, they might be good for you after all!
- Milk, is it still good for you with growth hormones?
- What should you eat to reduce your cancer risk?

A NEW LOOK AT COCONUT OIL

By: Sharon Walton, M3

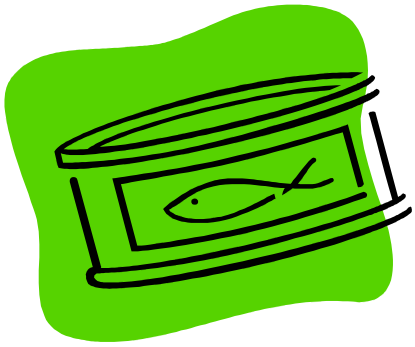
Coconut oil, also known as coconut butter, is a tropical oil with many applications. It is extracted from copra which means dried coconut in Malayam. Coconut oil is a fat consisting of about 90% saturated fat. The oil contains predominantly medium chain fatty acids, with roughly 92% saturated fatty acids, 6% monounsaturated fatty acids, and 2% polyunsaturated fatty acids. Of the saturated fatty acids, coconut oil is primarily 44.6% lauric acid, 16.8% myristic acid, 8.2% palmitic acid, and 8% caprylic acid. Its only monounsaturated fatty acid is oleic acid, while its only polyunsaturated fatty acid is linoleic acid.

Since saturated fatty acids have been linked to heart disease, (see Page 4)

TUNA VS. SALMON...CONTINUED

throw the immune system out of kilter and cause neurologic effects. The Perdue study cited in this paper state that average mercury levels are: canned tuna 188 ppb, salmon 45 ppb, and mackerel 55 ppb, all below the FDA Action Level of 1000 ppb. "Light tuna in water" contained lower mercury (54 ppb) compared with "white/albacore tuna in water," which contained higher EPA/DHA levels. Mercury residues in salmon (45 ppb) and mackerel (55 ppb) were lower than in tuna products, but the EPA/DHA levels were higher. It really is a decision that each individual will have to make based on the type of benefit they desire. I personally will take the risk of mercury exposure and take the benefits of the EPA and DHA.

A 3-ounce serving of farmed salmon contains over 2,000 milligrams of EPA and DHA omega-3 fats. A serving of catfish that size delivers less than a



tenth of that amount (about 150 mg). So not just any fish will do. Americans eat more shrimp than any other type of seafood, but a 3-ounce serving only has about 250 mg of omega-3 fats. Lobster, at 71 mg per 3 ounces, is also an omega-3 lightweight. Now when it comes to tuna, canned tuna is sold either as white tuna (sometimes called albacore) or as Light tuna. White tuna is almost always packed in water in solid form (a single, solid piece of loin, cut to fit in the can), whereas light tuna is often sold as chunk tuna (a mixture of cut pieces) in either oil or water. White tuna contains three times the omega-3 fats of light tuna, but it also has three times the mercury.

So basically eating fish is worth whatever risks the contaminants might entail. In general, the levels of pollutants in fish are below levels at which the FDA would take action. For most people, a healthful diet should include two 3-ounce servings per week. For adults, the benefits of modest fish consumption which they defined as one or two servings per week outweigh the risks. I will probably eat more salmon then tuna after reading about the risks of mercury poisoning, however, I probably won't be completely taking tuna out of my diet.

Reference

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The Efficacy of Cranberry Juice as a Remedy for UTIs

By: Mital Patel, M3

Before the advent of antibiotics, cranberry juice was often recommended as a treatment for urinary tract infections. However, despite today's abundance of antibiotics, many individuals still rely on a remedy that remains a mystery to most doctors and patients.

Proponents initially believed that cranberry juice acidified urine, rendering the urinary tract inhospitable for bacterial colonization. However, further investigation demonstrated that certain compounds in the juice actually disrupt bacterial binding to urinary epithelium. Researchers at the Worcester Polytechnic Institute showed that fimbria length of *E. coli* HB101pDC1 actually decreased from 148nm to 48nm after three hours of cranberry juice exposure. In addition, when cranberry juice pH was normalized to 7, similar outcomes were observed[1]. Further research published in the New England Journal of Medicine, isolated fructose and proanthocyanidin as key cranberry components responsible for decreased bacterial adhesion[2].

Randomized control trials comparing the effectiveness of cranberry juice as prophylaxis against UTIs to placebo have remained equivocal. In 2005, McMurdo found a 51% relative risk reduction in 376 elderly hospitalized patients who consumed 300ml of cranberry juice daily (14/189 in placebo group vs 7/187 in cranberry group). However, since the infection rate was (See Page 4)

USE AND IMPLICATIONS OF RBST

BY: DANIEL STEPHENS, M3

The first use of BST (Bovine Somatotropin) in 1937 experimentally showed that administration increased milk production in lactating cows by inhibiting mammary cell death, and also prevented the decline in milk production in the 300-day lactation cycle. The use of BST was limited in agriculture until the 1980s because until then, the only source of BST was bovine cadavers. In 1994, Monsanto, an agricultural biotech corporation developed and patented recombinant bovine Somatotropin (rBST), purified from E. coli. In recent years, the use of rBST has raised numerous health concerns amidst the organic food movement.

The issues raised in the debate over the use of rBST include animal welfare, and encroachment of large corporations onto small family farms. But the heart of the conflict is with the possible effects rBST has on the health of humans who consume cow's milk. Concerns of human absorption of rBST from cows' milk, increased levels of Insulin Growth Factor (IGF-I) in cows' milk, and increased incidence of mastitis have been raised, and subsequently studied extensively by the FDA's Center for Veterinary Medicine (CVM), and confirmed by multiple outside independent sources.

The concern for GI absorption of rBST by humans, whose long-term effects may be unknown, was raised when a study of rats resulted in low serum levels of antibodies which cross-reacted with rBST. The FDA states that this is not an indication of absorption, as proteins undergo degradation in the GI tract. The serum levels were not dose-related, and only occurred in rats exposed to levels 100 times that of cows. Additionally, GI antibodies can be produced and detected in serum, without actual absorption of the hormone. The level of antibodies are thought to have been so low that they would not cause any adverse effect. Despite antibodies, there was no rBST detected in the blood of the rats. Lastly, in hypophysectomized rats, rBST had no hormonal effects.

In another study of rats, the occurrence of thyroid cysts and prostate mononuclear cell infiltrate has raised the concern of cancer in humans. The incidence and severity of thyroid cysts in rats exposed to very high levels was not dose-related, and did not correlate to the exposed group over the control group. A dose related relationship was observed in regards to prostate mononuclear infiltrates, but there was again no difference between exposed and control groups. It is of note that neither of these changes represent cancer, pre-cancer, or risk factors for cancer.

In recent years, the use of rBST has raised numerous health concerns amidst the organic food movement.

Initial studies conducted by the FDA and repeated in Canada indicated slightly elevated levels of IGF-I in cows' milk, which may present a human health concern. The FDA considered this in the initial application for Posilac. The differences found were small amounts that were no greater than changes in untreated cows' milk between various points in the lactation cycle, were less than the difference between the control and treated cows prior to the rBST administration, and are still within the range of milk produced by untreated cows. A conservative calculation by the FDA, with an assumption that any increased IGF-I would actually be absorbed (a fact not supported by evidence), proposed an increase of human plasma IGF-I by only 2ng/mL, the majority of which would be rapidly bound by plasma proteins. IGF-I has been proposed in the pathogenesis of breast cancer, but no link has been proven. High levels of IGF-I have been correlated to prostate cancer, but have not been found to be a causative agent.

In cows, treatment with rBST has shown an increased incidence of mastitis. This is perhaps due to the increase in lactation with subsequent bacterial overgrowth. The CVM mandates that cows be treated with antibiotics. Groups have raised concerns about antibiotic residue being found in greater levels as a result of the treatment of mastitis in rBST cows. The FDA and CVM concluded that while the incidence of mastitis and antibiotics has increased in rBST treated cows, the increase was small, and could be managed by practices currently in use.

Milk: Do you know if yours has rBST?

Despite rejection by numerous other countries and approval agencies, the FDA has stood by its decision to allow the use of Posilac. In 2007, in Pennsylvania under pressure from Monsanto, a law prohibiting the labeling of (See Page 6)

CRANBERRIES AND UTI...CONTINUED

lower than anticipated, the results were deemed statistically insignificant[3]. A 2001 study followed 150 women for one year to determine whether daily consumption of 50 ml of cranberry-lingonberry juice concentrate led to a reduction in UTI incidence. The study revealed a 20% reduction in the cranberry juice group[4]. The American Geriatric Society published a report also showing a similar outcome where researchers followed 538 nursing home residents who ingested 6 cranberry extract capsules daily. At the end of the trial, UTI occurrence decreased from 27 cases/month to only 20 cases/month.

In contrast, a randomized cross-over study demonstrated that 40 kids with neurogenic bladders showed no benefit of drinking 15ml/kg/d for six months. A 2001 Danish study also failed to reveal a decrease in UTI incidence involving 2 geriatric units with 4 weeks of daily cranberry juice[6]. Raz and colleagues analyzed nearly a dozen studies investigating cranberry juice as UTI prophylaxis in 2004. Their review of the literature suggested that the current data was insufficient to make this a recommendation. However, they saw mild evidence suggesting that sexually active adult women with previous UTIs may have some benefit, although dosing remains unclear[6].

Frequent cranberry juice consumption has not shown any adverse herb-drug interactions. However, the American Family Physician cautioned patients with a history of oxalate calculi against long term cranberry juice intake, as cranberries significantly increase urinary oxalate[5].

Although in vitro studies have shown a valid mechanism of the effect of cranberry juice on bacteria adherence, similar outcomes clinically have not been shown. Larger scale studies need to be done to determine overall efficacy and dosage of cranberry juice to establish it as appropriate UTI prophylaxis.

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Cranberries are not just for Thanksgiving dinner...

A NEW LOOK AT COCONUT OIL ...continued

coconut oil has gotten bad coverage in the media. The problems for coconut oil started four decades ago when researchers fed animals hydrogenated coconut oil that was purposefully altered to make it completely devoid of any essential fatty acids. The animals that were fed the hydrogenated coconut oil (as the only fat source) naturally became essential fatty acid deficient; their serum cholesterol levels increased. Diets that cause an essential fatty acid deficiency always produce an increase in serum cholesterol levels as well as an increase in the atherosclerotic indices. However current research has proven that coconut oil does not increase the risks of heart disease. The study conducted by Nevin et al investigated the effect of consumption of virgin coconut oil (VCO) on various lipid parameters in comparison with copra oil (CO) showed coconut oil's heart protective factors. In addition, the preventive effect of polyphenol fraction (PF) from test oils on (see next page)

A NEW LOOK AT COCONUT OIL...continued

copper induced oxidation of LDL and carbonyl formation was also studied. After 45 days of oil feeding to Sprague-Dawley rats, several lipid parameters and lipoprotein levels were determined. Polyphenols were isolated from the oils and its effect on in vitro LDL oxidation was assessed. The results showed that VCO obtained by wet process has a beneficial effect in lowering lipid components compared to CO. It reduced total cholesterol, triglycerides, phospholipids, LDL, and VLDL cholesterol levels and increased HDL cholesterol in serum and tissues. The polyphenols of VCO was also found to be capable of preventing in vitro LDL oxidation with reduced carbonyl formation. The results also demonstrated the potential beneficiary effect of virgin coconut oil in lowering lipid levels in serum and tissues and LDL oxidation by physiological oxidants. This property of VCO may be attributed to the biologically active polyphenol components present in the oil.

The benefits of coconut oil can be seen when studying the health of those who live in traditional tropical cultures, where coconut has been a nutritious diet staple for thousands of years. People that live in areas where a diet high in coconut oil is normal have the lowest rate of heart disease. Coconut oil has also been known to promote weight loss, support your immune system health, provide you with an immediate energy source, help keep your skin healthy and youthful looking, and supports the proper functioning of your thyroid gland. Unlike other fats, the medium chain fatty acids are sent directly to your liver, where they are immediately converted into energy rather than being stored as fat.

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THE ROLE OF DIET IN DEVELOPMENT OF CANCER By: George Scaria, M3

It has long been known that a connection exists between someone's diet and his/her susceptibility to colon cancer. This fact is obvious when considering the differences in the incidence of cancer among populations in different geographical areas and how that incidence changes when individuals from that group immigrate to other areas with vastly different dietary norms.

A diet with increased caloric intake is one cause of an increased incidence of cancer. A number of experiments in animals have shown that calorie restriction has been shown to reduce the development of tumors. A likely mechanism to explain this effect is that an increased caloric intake leads to increased metabolic by-products and free radical creation. These free radicals subsequently cause DNA damage and lead to carcinogenesis. Increased caloric intake also results in increased fat deposition throughout one's lifetime. Endometrial and gall bladder cancer have been positively associated with increased obesity in both men and women.

Diet can also decrease one's risk for developing cancer.

Increases in dietary fat can also affect the chances of getting cancer. Dietary fat has been shown to increase the rate of tumor formation in many animal studies. Studies in humans have also demonstrated this relationship. In one large prospective study, the risk of the development of colon cancer in relation to a western diet (relatively high fat) was studied in a cohort study of Japanese individuals. From 1992 to 2000, 13,894 men and 16,327 women were followed. In this study, high consumption of processed meat increased the risk of developing colon cancer. The findings suggest a linkage between a western diet and increased risk of colon cancer. It has been theorized that dietary fat causes this increased risk through the action of bile acids which are subsequently converted to carcinogens in the colon. Increased fat intake has also been associated with greater incidences of prostate, breast, endometrial, and ovarian cancer, the latter two likely to be associated with increased production of estrogens in obese individuals.

Diet can also decrease one's risk for developing cancer. Hundreds of studies have demonstrated that a diet rich in fruits and vegetables decreases the chances of developing many types of cancers. The evidence is particularly strong for this relationship in lung, stomach, head and neck, endometrial, cervical, bladder, colon, (see page 8)

USE AND IMPLICATIONS OF RBST...CONTINUED

milk as "hormone-free," was reversed under pressure by consumer groups who say it would make it impossible for consumers to make their own decision regarding rBST. In spite of safety confirmed by the FDA, the demand for "organic" milk has increased 500% since the introduction of Posilac and numerous commercial groups have announced their rejection of rBST products.

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IRON-INDUCED ANEMIA

By: JoAnn Bolude, M3

Anemia is a condition that affects many Americans, more commonly found in African-Americans than Caucasians. Research shows that about 2% of adult, 9-12% of non-Hispanic white women and nearly 20% of African-American and Mexican-American women are affected by anemia. *(Killip, 2007)* Signs and symptoms of anemia are tiredness and decreased energy, being irritable and having trouble concentrating. On exertion, the individual might find it difficult to breathe, feel numbness, tingling or a sensation of coldness in hands or feet. There may be decreased desire to eat (especially in kids) and noticeable susceptibility to infection. *(Wade, 20)* In addition, dizziness, rapid heartbeat or a new heart murmur, sore tongue, brittle nails and pale skin color and nail beds can present itself in anemia. *(Killip, 2007)*

Anemia can be due to various causes but more often is nutrition-based. The three main causes of anemia are deficiency in iron, vitamin B12 and folate with iron being the lead culprit. Since iron deficiency is so rampant in our society and is quite avoidable if early attention is given we will focus on this nutritional enemy throughout this paper.

Iron-deficiency anemia means the body has been depleted of its iron stores. This is usually confirmed by low hemoglobin and hematocrit levels. For men, hemoglobin less than 13 and hematocrit less than 40% are considered qualifying criteria. For women, hemoglobin less than 12 and hematocrit less than 35% qualifies. *(NAAC, 2007)* Children with hemoglobin less than 11 are considered anemic. The daily recommended intake for men and nonmenstruating women is at least 8 mg/day, 18mg /day for menstruating and 16mg/day for vegetarians. *(Killip, 2007)* Iron-deficiency anemia most commonly affects babies (insufficient iron intake), children, teenage girls (especially in those with menorrhagia—who lose about 10-42mg of iron during cycle) and pregnant women (need 700 mg of iron throughout term), whereas men and nonmenstruating women only lose about 1 mg/day. Surprisingly, it can even show up in athletes who, it is thought, lose a great deal of iron through sweat.

What are some of the contributing factors to iron-deficiency? First is the issue of a diet deficient in iron. For every 10 to 20 mg of iron ingested, only 1 mg is absorbed. *(UMM, 2007)* In addition to this, poor absorption of iron due to stomach surgery or chronic diarrhea can cause deficiency. Secondly, iron deficiency can be due to excessive blood loss: ulcers, menorrhagia, malignancy or internal bleeding. Thirdly, some prescription and over the counter medications may hinder iron's absorption in the small intestine. Finally, body changes that occur in pregnancy often lead to iron deficiency, especially during the final trimester when the baby has the highest demand for satisfying its metabolic needs through its mother.

Tea, as well as coffee, inhibit iron absorption by as much as 40-60%...

So how can iron deficiency be most effectively treated? Well, the obvious solution would be to consume iron-rich foods in your diet. Foods such as oysters, beef liver, prune juice, clams, walnuts, ground beef, chickpeas, bran flakes, pork roast, cashew nuts, shrimp, raisins, sardines, spinach, lima beans, kidney beans, turkey, dark meat, prunes, roast beef, green peas, peanuts, potato, sweet potato, green beans and egg are fortified with iron. *(UMM, 2007)*

Research has shown that composition of concomitant food intake with iron-rich foods determines iron absorption. In simple terms iron has friends as well as enemies. There are foods found in plants and animals that are friends and help to increase our body's natural absorption of this nutrient. From plants, Vitamin C is the best friend of iron. The recommendation is for at least 75mg of Vit C to be taken in with iron to maximize iron intake. In case you would like to know which foods you can add to your diet as a natural source of vitamin C to help expedite the absorption of iron the following list is provided below: broccoli, brussel sprouts, cantaloupe, cauliflower, collard greens, cranberry juice, grapefruit juice, kale, orange juice, papaya chunks, pineapple juice, fresh and frozen strawberries. *(Wade, 25)*

Iron from animal sources, known as heme iron, is found predominantly in meats, poultry or fish. This type of iron not only increases iron absorption directly but indirectly helps to absorb iron from other foods in an individual's meal. Certain acidic substances such as citrus fruits, sauerkraut, etc. are (SEE NEXT PAGE IRON-INDUCED ANEMIA)

IRON-INDUCED ANEMIA...CONTINUED

also believed to help iron absorption by converting it to a more absorbable form.

On the other hand, the International Center for Control of Nutritional Anemia has also found some foods which inhibit the uptake of iron by the body. You might be surprised to find that tea as well as coffee inhibited iron absorption by as much as 40-60% when ingested concomitantly. It is therefore advised that if these beverages are to be consumed, the individual should let at least one hour pass between the meal and the beverage in order to absorb a maximal amount of iron possible from nutrients. Soy flour has enhancing and inhibiting factors. The following legumes are to be carefully avoided or consumed in moderation when attempting to replenish iron stores: soybeans, black beans, lentils, split peas and mung beans. In addition, dairy products and egg yolk reduce absorption of non-heme iron. This is especially important in children under 2 years of age who should have no more than 24 ounces of cow's milk/day. If too much cow's milk is consumed it can dampen a

child's appetite for other iron-rich foods and irritate the GI tract which may cause intestinal bleeding, discussed earlier in this paper. *(Frantz, 2007)* Lastly, in whole grain foods, fiber and phytate can reduce iron absorption. Thus, if an individual uses bran frequently, it is recommended to take a multi-mineral supplement as an added protection.

Finally, iron supplementation is also an alternative to replenishing iron stores. However, once iron-deficiency anemia develops, supplements are usually the only simple alternative for treating it. When treating iatrogenically, it should be noted that iron sulfate of 300mg provides 60mg of elemental iron, whereas 325mg of iron gluconate provides 36 mg of elemental iron. In a study conducted with over 2500 participants, it showed .04% receiving iron sodium ferric gluconate had life-threatening reactions compared with .61% receiving iron dextran. *(Killip, 2007)* It should be carefully noted that while iron supplements replete iron stores, there can be uncomfortable side effects, such as digestive discomfort, nausea, constipation. These side-effects are more often seen in high doses of supplementation and if experienced, the individual might want to consider reducing the dosage of iron supplement. In any event, the best choice is to consult with your doctor and together make a healthy, sound decision about your available choices and the most beneficial options for you and your health.

Citrus fruits ... are believed to help iron absorption by converting it to a more absorbable form.

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Adjacent caption: Milk and dairy products reduce iron absorption, especially in children under the age of 2.

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(Editor's note)

How does one maintain good health and fitness: Stay healthy by eating a variety of foods from plants, legumes, and dairy products. Eat meat and meat products in moderation, as desired. Drink plenty of thirst-quenching water, limit your intake of alcohol, caffeine and soda pop, and exercise regularly.

Talk to your trusted health care practitioner for more advice and guidance. (SNG)

THE ROLE OF DIET IN DEVELOPMENT OF CANCER ...continued

and breast cancers. The mechanism for the protective effects of fruits and vegetable consumption is still not completely understood, however chemical constituents such as carotenoids, flavonoids, folic acid, vitamin C, and isothiocyanates have all been shown to reduce carcinogenesis in vitro and in vivo. These compounds all act in reduction pathways which eliminate free radicals. Fiber can also act as a protective agent against cancer, in particular colon cancer. There are many theories as to how fiber works. It could speed the transit of carcinogens through the colon, bind to them directly, alter the colonic flora, or by reducing colonic pH.

Alcohol is also an important cause of cancer. In addition to liver cancer, alcohol, particularly in conjunction with cigarette smoking can cause head and neck cancers as well. Even moderate alcohol use (2 drinks/day) can increase a woman's risk for developing breast cancer because alcohol increases endogenous estrogen levels.

In summary, it has long been established that diet can have enormous effects on one's chances of developing cancer. However, simple changes in diet such as reducing weight, limiting caloric intake, limiting alcohol consumption and consuming at least 5 servings of fruit and vegetables per day can reduce the possibility that one has to face this dreaded disease.

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