

## Trans Fats May Increase, and Omega-3s May Decrease, Endometriosis Risk

Press Release -- March 24, 2010 -- Women whose diets are rich in foods containing Omega-3 oils might be less likely to develop endometriosis, while those whose diets are heavily laden with trans fats might be more likely to develop the debilitating condition, new research published today suggests.

The study - which is the largest to have investigated the link between diet and endometriosis risk and the first prospective study to identify a modifiable risk factor for the condition - found that while the total amount of fat in the diet did not matter, the type of fat did. Women who ate the highest amount of long-chain Omega-3 fatty acids were 22% less likely to be diagnosed with endometriosis than those who ate the least and that those who ate the most trans fats had a 48% increased risk, compared with those who ate the least.

The findings from 70,709 American nurses followed for 12 years, published online in Europe's leading reproductive medicine journal *Human Reproduction* [1], not only suggest that diet may be important in the development of endometriosis, but they also provide more evidence that a low fat diet is not necessarily the healthiest and further bolster the case for eliminating trans fats from the food supply, said the study's leader, Dr. Stacey Missmer, an assistant professor of obstetrics, gynaecology and reproductive biology at Brigham and Women's Hospital and Harvard Medical School in Boston, Massachusetts, USA.

"Millions of women worldwide suffer from endometriosis. Many women have been searching for something they can actually do for themselves, or their daughters, to reduce the risk of developing the disease, and these findings suggest that dietary changes may be something they can do. The results need to be confirmed by further research, but this study gives us a strong indication that we're on the right track in identifying food rich in Omega-3 oils as protective for endometriosis and trans fats as detrimental," Dr. Missmer added.

Endometriosis occurs when pieces of the womb lining, or endometrium, is found outside the womb. This tissue behaves in the same way as it does in the womb – growing during the menstrual cycle in response to oestrogen in anticipation of an egg being fertilized and shedding as blood when there's no pregnancy. However, when it grows outside the womb, it is trapped and cannot leave the body as menstruation. Some women experience no symptoms, but for many it is very incapacitating, causing severe pain. The tissue can also stick to other organs, sometimes leading to infertility. It afflicts about 10% of women. The cause is poorly understood and there is no cure. Symptoms are traditionally treated with pain medication, hormone drugs or surgery.

In the study, the researchers collected information from 1989 to 2001 on 70,709 women enrolled in the U.S. Nurses Health Study cohort. They used three food-frequency questionnaires spaced at four-year intervals to record the women's usual dietary habits over the preceding year. They categorized consumption of the various types of dietary fat into five levels and related that information to later confirmed diagnoses of endometriosis. A total of 1,199 women were diagnosed with the disease by the end of the study. The results were adjusted to eliminate any influence on the findings from factors such as total calorie intake, body mass index, number of children borne and race.

Long-chain Omega-3 fatty acids are found mostly in oily fish. They have been linked to reduced heart disease risk. In the study, the highest contributor was mayonnaise and full-fat salad dressing, followed by fatty fish such as tuna, salmon and mackerel.

Trans fats are artificially produced through hydrogenation, which turns liquid vegetable oil into solid fat. Used in thousands of processed foods, from snacks to ready-meals, they have already been linked to increased heart disease risk. Some countries and municipalities have banned them. The major sources of trans fats in this study were fried restaurant foods, margarine and crackers.

"Women tend to go to the Internet in particular to look for something they can do. The majority of the dietary recommendations they find there are the ones prescribed for heart health, but until now, those had not been evaluated specifically for endometriosis," Dr. Missmer said. "This gives them information that is more tailored and provides evidence for another disease where it is the type of fat in the diet, rather than the total amount, that is important."

Besides confirming the finding, a next step could be to investigate whether dietary intervention that reduces trans fats and increases Omega-3 oils can alleviate symptoms in women who already have endometriosis, Dr. Missmer added.

The U.S. National Institutes of Health funded the study.

[1] A prospective study of dietary fat consumption and endometriosis risk. *Human Reproduction* journal. doi:10.1093/humrep/deq044

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## Are the Health Benefits of Omega-3 ALA Being Overlooked?

RSSL -- July 3, 2008 -- For the last few years, the longer chain omega-3 fatty acids (eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)) have been in the spotlight over their health benefits. Recent headlines have warned consumers not to confuse these long chain omega-3 fatty acids with the shorter chain omega-3 fatty acid alpha-linolenic acid (ALA). Now Aliza Stark and colleagues from the Hebrew University of Jerusalem, Israel suggest that although ALA may not have the same health benefits as EPA and DHA, it does still have a place in a healthy diet.

The main dietary sources of EPA and DHA are seafoods, particularly oily fish. These omega-3s may aid brain and joint health and lower the risk of heart disease and inflammation. In contrast, the main dietary sources of ALA are vegetable oils including flaxseed, rapeseed, walnuts, and soya. ALA has been associated with improved cardiovascular health, improved blood lipids, neuroprotection, countering the inflammatory response and benefits against autoimmune disease.

Apparent confusion and misunderstanding manifested itself recently when the British consumer magazine Which? published a report calling for better distinction between the omega-3 fatty acids on products. This was because claims were being made for omega-3 fatty acids of a type which were not contained in the product. Dr Alex Richardson from the University of Oxford is quoted by Which? as saying that "the type of omega-3 found in oily fish is the best kind. There is no question that EPA and DHA are vital for hearts, brains and immune systems. But some food labels are muddling together things that have different biological effects. Omega-3 from vegetarian sources is different and does not have the same health benefits".

**Between eight and twenty percent of ALA is converted to EPA in humans, and between 0.5 and nine percent of ALA is converted to DHA. Women of reproductive age reportedly convert ALA to EPA at 2.5 times the rate of healthy men.** The conversion of ALA to EPA involves the delta 6-desaturase enzyme which facilitates the conversion of ALA to stearidonic acid (SDA). Then the co-enzyme, malonyl co-enzymeA which is a mediator of fatty acid synthesis, allows the elongation of SDA from 18 carbon chain to a 20-carbon chain. Further desaturation, this time by the delta 5-desaturase enzyme, results in the production of EPA.

These enzymes are also involved in the elongation of the omega-6 fatty acids found in plants, converting linoleic acid to gamma-linolenic acid and then to arachidonic acid. This results in competition for the 6-desaturase enzyme between ALA and the omega-6 fatty acids. Indeed a high omega-6 : omega-3 ratio is thought to promote disease, including cardiovascular disease, cancer, osteoporosis and inflammatory and autoimmune disease. (Published in Nutrition Reviews 66 (6), pp 326 - 332, 2008, doi: 10.1111/j.1753-4887.2008.00040.x. Two press releases from Nutra Ingredients(1) and NutraIngredients (2) on the omega-3 fatty acids.

Harvard Women's Health Watch suggests that much more research is needed to compare the various sources of omega-3 fatty acids but says that for now, it is best to include all three types in the diet. However, for healthy people who dislike or cannot consume fish, ALA provides a reasonable alternative. ALA is considered as an essential fatty acid since it cannot be synthesised in the body.

Also this week, an article in the New Scientist reports that the marine omega-3 fatty acids may be twice as important for boosting the brain power of girls compared to boys. William Lassek and colleagues from the University of Pittsburgh, Pennsylvania, US., compared consumption of omega-3 fatty acids with cognitive test scores in 4,000 children aged six to sixteen years. They found that the children scored better the more omega-3 they consumed. However omega-3s accounted for twice the improvement in girls compared to boys. Girls' test scores, but not boys', fell with increasing consumption of omega-6 fatty acids.

RSSL's Lipids Laboratory has expertise in all aspects of fat analysis and fatty acid profiling, including the determination of omega-3 and omega-6 fatty acids. For more information please contact Customer Services on Freephone 0800 243482 or e-mail [enquiries@rssl.com](mailto:enquiries@rssl.com)

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