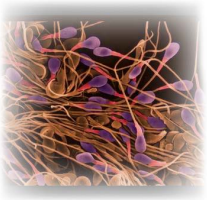
20 March 2008

By: Stefan Anitei, Science Editor



semenpro.com

Vitamins and Healthy Sperm

Low folate levels cause aneuploid chromosomes

Mexican men know the secret of the chili. It's about folate, a vitamin abundant in liver, leafy green vegetables, citrus fruits, sunflower seeds and legumes (beans and their relatives). It may sound more familiar to you that women of child-bearing age must have proper levels of folate (vitamin B9) in their diet for delivering healthy babies, but a new study published in the journal Human Reproduction and carried out by a team at the University of California, Berkeley, and the Lawrence Berkeley National Laboratory reveals that what the father eats counts too. And guess what? Folate levels in male diet appears to have the same importance. Low levels of this vitamin have been connected to sperm chromosomal abnormalities. "Our study is the first to look at the effects of diet on chromosomal abnormalities in sperm. These abnormalities would cause either miscarriages or children with genetic syndromes if the sperm fertilized an egg," said co-author Suzanne Young, at UC Berkeley's School of Public Health. Folate is required for the synthesis of DNA, RNA and proteins during cell division. It also controls the levels of homocysteine, an amino acid which can cause heart issues when overcoming a certain threshold.Low levels of folate in women just before and during pregnancy (less than 400 mg daily) has been connected to greatly increased risk of embryos developing neural tube malformations, like spina bifida or anencephaly (undeveloped brain). Many countries (US started from 1998) require the addition of folate to breads, cereals and other grain products. Follow-ups connected this measure with a drop in the cases of neural tube birth defects.Sperm health and diet 1 to 4 % of a healthy male's sperm displays abnormal chromosome numbers (aneuploidy), a result of defective meiosis. Eggs fertilized by such a sperm develop into an embryo prone to miscarriage or a fetus with aneuploidy, translated to severe conditions (for example, an extra chromosome 21 is the cause of Down syndrome while an extra X chromosome in boys triggers Klinefelter syndrome). The research was made on a poll of 97 men, aged 22 to 80, current or ex-employees of a government research laboratory. The subjects were chosen after excluding smokers and subjects with already known fertility issues. Questionnaires assessed average intake of dietary and supplemental nutrients. One week later, semen samples were collected. The team considered factors like age, alcohol use and medical history.Subjects having the highest consume of folate had 19 % less aneuploid sperm cells than those with moderate folate consume, and 20 % lower rates compared to subjects consuming low levels of folate."Increasing folate intake can be as simple as taking a vitamin supplement with at least 400 micrograms of folate or eating breakfast cereal fortified with 100% of the RDA [recommended daily intake] for folic acid. In addition, green leafy vegetables, such as spinach, can have up to 100 micrograms of folate per serving," said Young. Various nutrients in the diet were taken into account. "The results of the different analyses were different, which gave us some confidence that we could look at the effect of these micronutrients separately. The definitive way to answer this question would be with a randomized control trial with folate supplementation," said Young. The team did not find a connection between sperm aneuploidy and the other nutrients, like zinc, calcium, beta-carotene and other vitamins. Researchers warn that momentarily this is just a connection, as the cause-and-effect relationship has not been investigated."We did come up with enough evidence to justify a larger, clinical and pharmacological trial in men to examine the causal relationships between dietary folate levels and chromosomal abnormalities in their sperm. This information will help us set dietary folate levels that may reduce the risk of miscarriage or birth defects linked to the fathers," said lead researcher Andrew Wyrobek, chair of the Radiation Biosciences Department at Lawrence Berkeley

National Laboratory. So, did you get your daily 400 mg of folate?