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New Research Reveals How Healthy and Unhealthy Foods Affect Our Moods

Many nutrients, such as omega-3 fish oils and B vitamins, are known to enhance mood and reverse depression. Now, a study by a team of New Zealand researchers has shown that eating fruits and vegetables can help “keep the blues away.”

Tamlin S. Conner, PhD, and her colleagues at the University of Otago studied the eating habits of 281 students, whose average age was 20 years. The students kept an internet-based food diary each day for three weeks, while also reporting their consumption of five specific foods and their positive or negative moods.

The foods included fruit, vegetables, chocolate-coated or cream-filled cookies, chips (crisps), and cakes or buns. The negative-mood adjectives were depressed, sad, unhappy, anxious, nervous, tense, angry, hostile, and short-tempered. In contrast, the nine positive-mood adjectives were calm, content, relaxed, cheerful, happy, pleased, energetic, enthusiastic, and excited.

The individual students reported significantly better moods – such as being happy, calm, and energetic – on the days they ate more fruits and vegetables. A “lagged analysis” showed that eating fruits and vegetables predicted a positive mood the following day, suggesting that the healthy foods were leading to better moods (and not vice versa).

“Meaningful changes...were observed with the daily consumption of approximately seven to eight servings of fruit or vegetables,” wrote Conner and her colleagues.

In separate research, Ai Yoto, PhD, and her colleagues at the University of Shizuoka, Japan, studied the effects of L-theanine and caffeine on stress and anxiety. L-theanine, found in green tea, has neurotransmitter-like effects, improving both mental focus and a sense of calm. Caffeine, also found in green tea, tends to increase blood pressure.

Yoto’s study focused on eight men and eight women whose average age was 23 years. The

subjects were given either 200 mg of L-theanine or 100 mg of caffeine.

After taking one supplement or the other, the subjects were placed in a stressful setting, such as trying to answer arithmetic problems with one hand in a bucket of ice water.

Subjects were classified as “high-response” if they developed high blood pressure while trying to solve the problem.

Those subjects had a decrease in anxiety and a smaller increase in blood pressure after taking L-theanine.

References: White BA, Horwath CC, Conner TS. Many apples a day keep the blues away – daily experiences of negative and positive affect and food consumption in young adults. *British Journal of Health Psychology*, 2013;doi 10.1111.bjhp.12021. Yoto A, Motoki M, Murao S, et al. Effects of L-theanine or caffeine intake on changes in blood pressure under physical and psychological stress. *Journal of Physiological Anthropology*, 2012;31:28. □

Perspectives

Nutty Ideas in the Nutri-Sphere

One of the ideas floating around in the nutri-sphere is that you should eat specific foods seasonally. That is, you should eat foods, particularly fruits and vegetables, only when they are in season.

The idea, so far as I can tell, comes from some adherents to the Paleo diet. In ancient times, people had no choice but to eat seasonally. Later, some simple methods of food preservation developed, including drying or pickling foods for later consumption.

Adherents of this approach forget that ancient humans had to be dietary opportunists to survive. They didn’t have the luxury of picking and choosing their foods or when to eat them. They ate whatever they could get their hands on, whenever they could get their hands on food. The alternative was starvation.

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Personally, I think the idea of eating seasonally is a misguided and unhealthy. With rapid transportation of fresh foods from around the world, or the availability of frozen foods (which are almost as good), we can eat any number of fruit and vegetable varieties throughout the year.

The benefit, of course, is that we can consume nutrient-dense, vitamin-rich healthy foods all year long. Not availing ourselves of this opportunity would be a little like saying we should avoid nutritional supplements for half the year. It just doesn't make sense. It's far more important to consider the quality of food and to buy organic varieties whenever possible. —*JC*

Mediterranean Diet Slashes Risk of Cardiovascular Disease

The Mediterranean diet has long been associated with a relatively low risk of cardiovascular disease. A new large-scale study by Spanish researchers shows that adopting the diet can lead to a significantly reduced risk of disease.

Ramon Estruch, MD, of the University of Barcelona and his colleagues focused on 7,447 Spanish residents, ages 55 to 80 years, who did not have cardiovascular diseases but were at a high risk of developing them. They were overweight, had diabetes, smoked, or had other risk factors for heart disease.

The researchers divided the subject into three groups, with each instructed to eat a different type of diet. One group was coached on eating the Mediterranean diet with at least four tablespoons of extra-virgin olive oil each day. A second group was coached on eating the Mediterranean diet with about an ounce of nuts each day. (The olive oil and nuts were supplied by the researchers.) In general, the diets included fruits and vegetables, fish at least three times each week, legumes, white meat instead of red, and up to seven glasses of wine a week. Subjects were asked to minimize their intake of sweets, dairy products, and processed meats. Meanwhile, the third group was instructed to eat a low-fat diet.

The study was halted after a little less than five years because the results were so dramatic. People on either of the Mediterranean diets had approximately a 30 percent lower risk of a cardiovascular event, such as a heart attack or stroke.

“Perhaps there is a synergy among the nutrient-rich foods included in the Mediterranean diet that fosters favorable changes in intermediate pathways of cardiometabolic risk, such as blood lipids, insulin sensitivity, resistance to oxidation, inflammation, and

vasoreactivity,” wrote Estruch and his colleagues.

Reference: Estruch R, Ros E, Salas-Salvado J, et al. Primary prevention of cardiovascular disease with a Mediterranean diet. *New England Journal of Medicine*, 2013: doi 10.1056/NEJMoal200303. □

DHA, One of the Omega-3s, Reduces Preterm Delivery Risk

Chalk up one more benefit for omega-3s: Pregnant women who took the supplements had a lower risk of premature delivery and low birth weight babies.

Susan E. Carlson, PhD, of the University of Kansas, and her colleagues asked 350 women to take 600 mg of algae-source docosahexaenoic acid (DHA) daily and to also eat DHA-enriched eggs. After five years of an ongoing 10-year study, the researchers analyzed the effect of DHA on pregnancy outcomes.

Women taking DHA supplements had longer gestation durations and were less likely to have premature deliveries. When the DHA-consuming mothers did have preterm deliveries, their babies needed to be hospitalized for shorter times, compared with mothers who had been taking placebos. Furthermore, the babies of DHA-supplementing mothers weighed more, were longer, and had a larger head circumference.

Reference: Carlson SE, Columbo J, Gajewski BJ, et al. DHA supplementation and pregnancy outcomes. *American Journal of Clinical Nutrition*, 2013: doi 10.3945/ajcn.112.050021. □

Folic Acid and Vitamin B12 Aid Treatment of Schizophrenia

In the early 1950s, Abram Hoffer, MD, PhD, and his colleagues discovered that high-dose vitamins B3 and C were effective treatments for patients with recently diagnosed schizophrenia. Their finding was largely ignored after the discovery of drugs that sedated schizophrenic patients.

Flash forward. A study just published in *JAMA Psychiatry*, a journal published by the American Medical Association, has found that supplemental folic acid and vitamin B12 enhance the drug treatments of schizophrenic patients.

Joshua L. Roffman, MD, of Massachusetts General Hospital, Boston, and his colleagues treated 140 patients who still had persistent negative symptoms of schizophrenia even though they were taking antipsychotic medications. Some of the patients were given 2,000 mcg of folic acid and 400 mcg of vitamin B12, while others received placebos for 16 weeks.

The symptoms included flat and unexpressive

behavior, limited use of speech, poor interpersonal relationships, and inattentiveness.

All of the patients had modest benefits, but the most significant improvements occurred among patients with specific defects in genes involved in folic acid metabolism.

The findings are significant in part because folic acid deficiency is a risk factor for schizophrenia, as well as for autism and neural-tube defects.

“Folate plus vitamin B12 supplementation can improve negative symptoms of schizophrenia, but treatment response is influenced by genetic variations in folate absorption,” wrote Roffman.

Reference: Roffman JL, Lamberti JS, Achtyes E, et al. Randomized multicenter investigation of folate plus vitamin B12 supplementation in schizophrenia. *JAMA Psychiatry*, 2013: doi 10.1001/jamapsychiatry.2013.900. □

New Studies Strengthen Links Between Sugar and Disease

Two new studies have made strong independent links between the consumption of refined sugars, such as sucrose and high-fructose corn syrup, and the risk of overweight and type 2 diabetes.

While the relationship between refined sugars and disease risk has been known for some time, industry organizations have downplayed that risk.

In the first study, Jim Mann, PhD, and his colleagues at Otago University, New Zealand, analyzed data from 68 published studies. He calculated that people restricting their consumption of refined sugars weighed about 1.75 pounds less than average, whereas those with increased intake of refined sugars weighed about that much more. Carbohydrate intake apart from refined sugars did not appear to influence weight.

In a separate study, Robert H. Lustig, MD, of the University of California, San Francisco, and his colleagues investigated the relationship between refined sugar consumption and the risk of type 2 diabetes. They used United Nations Food and Agricultural Organization food supply data, focusing on people ages 20 to 79 years old from 2000 through 2010. The data included people in 175 countries.

Lustig found that nations whose populations consumed more refined sugars had a higher prevalence of diabetes, compared with nations in which less sugar was consumed.

He found that for every 150-calorie increase in sugar consumption per person – the equivalent of one soft drink daily – a nation’s prevalence of diabetes increased by just over 1 percent.

“No other food types yielded significant individual associations with diabetes prevalence after

controlling for obesity and other cofounders,” wrote the researchers.

In fact, the relationship between refined sugar consumption and diabetes was independent of the risk of obesity.

“Duration and degree of sugar exposure correlated significantly with diabetes prevalence in a dose-dependent manner, while declines in sugar exposure correlated with significant subsequent declines in diabetes rates...” wrote Lustig and his colleagues.

References: Te Morenga L, Mallard S, Mann J. Dietary sugars and body weight: systematic review and meta-analysis of randomised controlled trials and cohort studies. *BMJ*, 2012;345: doi 10.1136/bmj.e7492. Basu S, Yoffe P, Hills N, et al. The relationship of sugar to population-level diabetes prevalence: an econometric analysis of repeated cross-sectional data. *PLoS One*, 2013;8:e57873. □

Too Much Salt May Contribute to Risk of Autoimmune Diseases

Salt – sodium chloride – has been linked to high blood pressure, alterations in the body’s acid-alkaline balance, and other health problems. A new study has found that it might also increase the risk of autoimmune diseases.

Autoimmune diseases, such as rheumatoid arthritis and multiple sclerosis, are characterized by immune cells that attack the body itself.

David A. Hafler, MD, of the Yale School of Medicine, New Haven, Connecticut, and his colleagues had previously found that people who ate a lot of fast food – rich in salt – had large numbers of Th17 cells. These cells are a type of CD4 “helper” T cell, which regulates the body’s immune response, but can attack the body if misguided.

In the latest study, Hafler and his colleagues tested the effects of salt on immature, or nonspecialized, T cells and on laboratory mice.

Adding salt to the T cells boosted the number of mature Th17 cells by almost 10 times. These Th17 then started producing inflammation-promoting substances.

Next, Hafler and his colleagues triggered the development of the mouse equivalent of multiple sclerosis. Mice fed a high-salt diet comparable to what a typical American eats, developed their autoimmune disease faster and with more serious symptoms, compared with mice eating a low-salt diet.

In related studies, other researchers identified the genetic mechanism by which salt boosts the number of Th17 cells.

Reference: Kleiweiefeld M, Manzel A, Titze J, et al. Sodium chloride drives autoimmune disease by the induction of pathogenic Th17 cells. *Nature*, 2013: doi 10.1038/nature11868. □

More research summaries on the next page

Quick Reviews of Recent Research

• Processed meats boost risk of disease

Researchers from Switzerland analyzed dietary data from 448,568 men and women, ages 35 to 69 years when the study began. People who ate relatively large amounts of processed meats, such as bacon, sausage, hot dogs, and deli meats, were 18 percent more likely to die from any number of causes, including cardiovascular diseases and cancer. The researchers wrote that 3.3 percent of deaths could be prevented if all participants had a processed meat consumption of less than 20 grams per day.”

Rohrmann S. *BMC Medicine*, 2013;11;63.

• Diet restriction might help cancer patients

In a review article, researchers from the Kimmel Cancer Center, Philadelphia, discussed the potential role of calorie restriction or intermittent fasting by cancer patients. Based on published studies, calorie restriction and fasting appear to enhance some of the biochemical pathways that are altered in cancer. However, the researchers noted, these approaches are not suitable for people with muscle wasting (cachexia) or who are recovering from surgery.

Champ CE. *The Oncologist*, 2013;18: epub ahead of print.

• Vitamin D may ease asthma symptoms

Doctors from Mainz University Hospital in Germany studied 280 adults with asthma. Two-thirds of the patients were either deficient in vitamin D or had marginal deficiencies. People who were deficient in vitamin D were almost twice as likely to have severe or uncontrolled asthma symptoms, compared with those who had higher blood levels of the vitamin. In fact, 60 percent of people with poorly controlled asthma were deficient in vitamin D, compared with only 5 percent of people with intermittent asthma.

Korn S. *Respiratory Research*, 2013;14: epub ahead of print.

• Coenzyme Q10 reduces statin side effects

Statin-associated myopathy is a common side effect of cholesterol-lowering statin drugs. Doctors from Slovakia used 100 mg of coenzyme Q10 (CoQ10) twice daily to treat 60 patients with statin-associated myopathy. The supplements reduced muscle pain and muscle weakness by about half and muscle cramps to about one-third. The placebo group did not improve, and additional selenium did not enhance the benefits of CoQ10.

Fedacko J. *Canadian Journal of Physiology and Pharmacology*, 2013;91:165-170.

• Vitamin D anti-cancer mechanism identified

Researchers at the University of Wisconsin have identified a key mechanism that helps vitamin D prevent and possibly slow the development of cancer.

It is generally known that c-MYC is a transcription factor that activates genes involved in the proliferation of cancer. Activity of c-MYC is usually elevated in patients with cancer. In cell and mouse studies, the researchers found that vitamin D can suppress the activity of c-MYC. At the same time, vitamin D boosts the activity of MXD1, which helps control c-MYC. The researchers wrote that their findings “provide a compelling mechanism” to explain the role of vitamin D in cancer prevention.

Salehi-Tabar R. *Proceedings of the National Academy of Sciences*, 2012;109:18827-18832.

• Infant malnutrition affects adult personality

A study by researchers at the Harvard Medical School has found that malnutrition during an infant’s first year of life can set the stage for personality issues years later. The researchers focused on 77 people in the Barbados who had been hospitalized for malnutrition during their first year of life. After hospital admission and until age 12, the children and their families received food assistance and education. Still, as adults, both men and women had significantly more anxiety, stress sensitivity, anger, hostility, mistrust, and depression, when compared with 57 people who had not suffered malnutrition as infants. In addition, previously malnourished adults displayed less social warmth, cooperation, curiosity, and openness to new experiences.

Galler J. *Journal of Child Psychology and Psychiatry*, 2013: doi 10.1111/jcpp.12066.

• Vitamin D improves glucose tolerance

Researchers from the University of Missouri asked 35 obese adolescents to take 4,000 IU of vitamin D or placebos daily for six months. In response to supplementation, fasting insulin and other markers of glucose tolerance improved significantly.

Belenchia AM. *American Journal of Clinical Nutrition*, 2013;97:774-781.

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