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Human Technology Research Synopsis
52nd Issue Date 17 MAR 09
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Public release date: 3-Mar-2009

Moderate alcohol intake associated with bone protection

Epidemiological study examines effects of beer, wine and liquor on BMD

BOSTON - (March 3, 2009) In an epidemiological study of men and post-menopausal women primarily over 60 years of age, regular moderate alcohol intake was associated with greater bone mineral density (BMD). Researchers at the Jean Mayer USDA Human Nutrition Research Center on Aging (USDA HNRCA) at Tufts University found associations were strongest for beer and wine and, importantly, BMD was significantly lower in men drinking more than two servings of liquor per day. The results suggest that regular moderate consumption of beer or wine may have protective effects on bone, but that heavy drinking may contribute to bone loss.

"Previous research suggests that moderate alcohol consumption in older men and post-menopausal women may protect against BMD loss, a major risk factor for osteoporosis," said Katherine L. Tucker, PhD, corresponding author and director of the Dietary Assessment and Epidemiology Research Program at the USDA HNRCA. The 2005 Dietary Guidelines issued by the federal government defines moderate alcohol consumption as one drink per day for women and two drinks per day for men.

"Our study also looks at the possible effects of the three alcohol classes, beer, wine and liquor on BMD," Tucker continued. "We saw stronger associations between higher BMD and beer drinkers, who were mostly men, and wine drinkers, who were mostly women, compared to liquor drinkers." The results were published online February 25 by the American Journal of Clinical Nutrition.

Tucker, who is also a professor at the Friedman School of Nutrition Science and Policy at Tufts, and colleagues analyzed BMD measurements taken at three hip sites and the lumbar spine in 1,182 men, 1,289 post-menopausal women, and 248 pre-menopausal women whose parents or in-laws participated in the original Framingham Heart Study. There was not enough data to determine the effects of more than two servings of alcohol per day in post-menopausal women or the effects of daily alcohol consumption on BMD in pre-menopausal women. Participants self-reported their alcohol intake on dietary questionnaires. One serving of beer equaled a glass, bottle or can (356 mL), one serving of wine equaled a 4-oz. glass (118 mL), and one serving of liquor equaled one mixed drink or shot (42 mL).

After adjusting for several other factors that may have accounted for the higher BMD, such as silicon intake, calcium intake and smoking history, the authors still saw an association between higher BMD and moderate alcohol consumption. One of the

strongest associations was seen in men who reported consuming one or two servings of total alcohol (a combination of beer, wine and liquor) or one or two servings of beer per day. Hip BMD in this group was significantly greater compared to non-drinkers.

In contrast, the authors observed significantly lower BMD at the hip and spine in men who consumed more than two servings of liquor per day compared to men who consumed one or two servings of liquor per day. **"There is a body of research showing alcoholism is devastating to bones," Tucker said. "It's a major risk factor for osteoporosis. No one should depend solely on alcohol to maintain bone health."**

The authors hypothesize that the silicon found in beer is contributing to the higher BMD scores in the men who reported consuming one or two servings of total alcohol or beer per day, citing previous studies finding silicon has greater bioavailability as a liquid. It is less clear why liquor and wine might protect BMD.

"We cannot say definitively what component of these alcoholic drinks might be beneficial to bone health because our findings are from an observational study, as opposed to a clinical trial," Tucker said. "Future studies might dig deeper into patterns of alcohol consumption, as we relied on a self-reported dietary questionnaire. **Another component of data worthy of exploration is whether the antioxidants found in wine, such as resveratrol or polyphenols, have a protective effect on bone in addition to other health benefits**

Ralph's Note - Science is Science whether something makes us cringe or not. If this is what the Data shows, than it must be explored.

Public release date: 3-Mar-2009

NCRP Report No. 160 on increased average radiation exposure of the US population

Average radiation exposure of the US population requires perspective and caution COLLEGE PARK, MD (March 3, 2009) -- Scientists at the American Association of Physicists in Medicine (AAPM) are offering additional background information to help the public avoid misinterpreting the findings contained in a report issued today by the National Council on Radiation Protection and Measurements (NCRP), a non-profit body chartered by the U.S. Congress to make recommendations on radiation protection and measurements. The report is not without scientific controversy and requires careful interpretation

NCRP Report No. 160 updates the 1987 publication, NCRP report No. 93, on the sources of ionizing radiation to the general public in the United States. It examines the various sources of ionizing radiation in the United States, estimates the total amount of radiation

delivered in 2006, and compares those amounts to the estimates published in 1987. Among other findings, the naturally-occurring amounts of radiation have changed little in the last two decades. However, a key finding of the report is that there has been a dramatic increase in the amount of radiation from medical imaging procedures, including computed tomography (CT) and cardiac nuclear medicine examinations.

The report does not, however, "attempt to quantify the associated health risks nor specify the actions that should be taken in light of these latest data," and AAPM experts are cautioning that these data do not necessarily indicate that the U.S. population is at any higher risk due to this increased use of medical imaging. They caution that the new report should not deter patients from getting medically-appropriate imaging exams. The NCRP findings on average population dose could be easily misinterpreted if applied to an individual patient's medical situation.

"Tens of millions of CT scans are performed each year in the United States, and their benefits are enormous," says Gerald A. White, M.S., FAAPM, FACR, Chairman of the Board of the American Association of Physicists in Medicine (AAPM), the premiere professional and scientific association of medical physicists, which is comprised of research scientists and board-certified health professionals who specialize in the use of radiation in medicine.

Medical imaging, which includes procedures such as CT scans, cardiac catheterization studies, and nuclear medicine positron emission tomography (PET) exams, has revolutionized medicine in the last few decades. For example, CT scans provide pictures from deep inside a patient's body with unprecedented clarity. These images help doctors diagnose unseen illnesses and injuries, and they guide treatment for millions of patients annually in the United States.

"The medical information derived from CT scans literally saves thousands of American lives on a daily basis," says John M. Boone, Ph.D., FAAPM, FACR, Chairman of AAPM's Science Council and professor and vice chairman of radiology at the University of California, Davis Medical Center. "CT scans are critical for guiding the treatment of people who are in car accidents, people diagnosed with cancer, people who have blood clots in their lungs, and a vast number of other symptoms and conditions."

Even so, in the last few years reports in the medical literature and in the popular press have affected public perceptions of CT scans by raising questions of risk related to the use of X-rays, which in very high doses have the potential to damage cells and cause cancer.

The new NCRP report falls squarely into this controversy because it estimates the total U.S. exposure to all sources of ionizing radiation has increased six-fold since 1980 -- with about half of this increase due to CT scans.

This increase is easily misinterpreted, however, because the report calculates the total radiation dose for all CT scans performed in 2006 and divides that by the U.S. population for that year. What is not considered in this global averaging approach is that CT scans are given disproportionately to certain people and groups -- for example, the elderly, people admitted to hospitals for serious trauma, and cancer patients having scans to evaluate their response to treatment. The vast majority of Americans receive no radiation from medical imaging at all, or they receive imaging exams that do not use ionizing radiation, such as magnetic resonance imaging (MRI) or ultrasound procedures.

"Adding up all the doses and then spreading out the total over the entire population, no matter a person's age, occupation, location, or health status is not appropriate for assessing risk to the general population," says Cynthia McCollough, Ph.D., FAAPM, FACR, who is a professor of radiological physics at the Mayo Clinic and who chaired an AAPM Task Group that issued a CT radiation dose management report last year. "The NCRP report is very clear in this regard. The data summarize the sources and amounts of radiation exposure in the U.S. and the total values are normalized to the total U.S. population. The values reported are not appropriate for estimating potential health effects."

McCollough points out that the medical applications of CT have grown tremendously in the last few decades as the technology has become more and more sophisticated, often replacing more risky invasive or less accurate alternative tests. CT and other medical imaging procedures have nearly eliminated exploratory surgery and enabled minimally invasive surgery both which have shortened or eliminated hospitalization and reduced the risk of surgery related co-morbidity like infection. CT scanners have also reduced the volumes of radiation therapy fields, thereby reducing the probability of radiation harm, including second malignancies.

While the absolute number of CT exams has grown considerably since the 1980s, CT scanners can now tailor the radiation dose to the specific exam type and individual. All modern CT systems are now equipped with automatic exposure control systems that reduce patient dose levels to the minimum necessary for the examination.

In fact, adds McCollough, "The average dose per CT exam has fallen by a factor of 2-3 since the early 1980s. There are simply more people getting CT exams."

The AAPM strongly supports that appropriate utilization standards be applied for all procedures using ionizing radiation. AAPM members contribute to the safety and quality of CT imaging by developing reports such as Dr. McCollough's, which gives the most current standards for CT dose measurement techniques and discusses how facilities can reduce radiation dosages by adjusting the radiation exposure according to each patient's size. Steps like these are taken to ensure the maximum benefit to patients while minimizing their risk. In addition, medical physicists are required to be involved in ACR Accreditation programs, which ensure that radiation exposures are as low as reasonably achievable.

"For an appropriately ordered CT examination, an individual derives much greater benefit than risk," says AAPM past-president Richard L. Morin, Ph.D, FAAPM, FACR, who is a medical physicist and Brooks-Hollern Professor at Mayo Clinic Florida.

"Ultimately, people who are scheduled to have CT exams should understand why their doctors have requested the exam – if the test will provide information to assist in their medical care, they should not worry about having the exam. There are likely higher risks associated with failing to have a needed medical test, as the correct diagnosis or treatment decision could be delayed or missed."

Ralph's Note- I find it difficult to believe that just half of that can be from CAT scans.

Public release date: 3-Mar-2009

Half in US see another country emerging as world's technological leader

New national survey

DURHAM, N.C. — Half of all Americans expect another country to emerge this century as the world's leader in addressing technological challenges that range from the economy to global warming, according to a survey of U.S. public opinion released Tuesday by Duke University.

Although only 34 percent of Americans gave themselves a grade of A or B for understanding "the world of engineers and what they do," 72 percent nonetheless expect the technological advancements of the 21st century to surpass those of the previous century. However, only 49 percent predict the United States will lead the way in producing these advances, according to the survey of 808 adults carried out Jan. 22-25 by Hart Research Associates.

Duke's Pratt School of Engineering commissioned the survey, "Americans' Attitudes Toward Engineering and Engineering Challenges," for a national summit on engineering "grand challenges" it is co-hosting March 2-3 in Durham.

Americans with more education are even less optimistic about the likelihood the United States will be the world's technological leader in the 21st century. China was cited by 20 percent of all the respondents as being most likely to assume this position, followed by Japan and Europe at 10 percent each, and India at 4 percent. Americans were just as likely to say their country's ability to compete technologically over the past century has worsened as to say it has improved.

Among those who see a decline in America's ability to compete technologically, 55 percent say the situation is temporary and 39 percent say it is long term.

"Americans understand that innovation is critical to their future, but also recognize that our country's continued leadership isn't assured just because we invented everything from the airplane to the personal computer," said Thomas Katsouleas, dean of the Pratt School. "The survey shows that when Americans focus on how central engineers are to solving our biggest problems, they come to view the discipline as essential and want to attract more talented young people to it."

In response to a list of major engineering challenges facing the world, those surveyed gave highest priority to developing better medicines, providing clean water around the world and developing environmentally friendly power sources. They gave less priority to securing cyberspace against attacks or to restoring and improving deteriorating urban infrastructures.

The respondents said the best ways to improve U.S. global competitiveness are with more training for workers, improved K-12 math and science teaching, and tougher standards for public school teachers and students. They were much less likely to endorse tax breaks for business and investment, or new immigration policies to attract foreign engineers and other technical experts.

A majority of the respondents -- 58 percent -- said engineering is losing out to other professions when it comes to young people choosing careers. They said this is happening because engineering does not pay as much as other fields, requires extensive schooling and is seen as being difficult. "Not as glamorous" was cited least often among seven possible answers in explaining why engineering has been a less attractive career choice.

Katsouleas released the survey results Tuesday morning during the two-day summit Duke is hosting with the University of Southern California Viterbi School of Engineering and Olin College. More than 1,000 people registered for the event, which is bringing together "leading engineering, science, humanities and social science scholars from across the nation" to discuss a series of societal "grand challenges" laid out by the National Academy of Engineering.

Ralph's Note - Unacceptable, that our country should give in so easy.

Public release date: 3-Mar-2009

New study shows how spikes in nitrite can have a lasting impact on the heart

(BOSTON) - **A new study provides insight into how a short burst in nitrite can exert lasting beneficial effects on the heart, protecting it from stress and assaults such as heart attacks.** In this study, just published in *Circulation Research*, researchers at Boston University School of Medicine have demonstrated for the first time that short elevations in circulating levels of this simple anion are sufficient to have a lasting impact on the

heart by modulating its oxidation status and its protein machinery.

Nitrite, an oxidation product of the ubiquitous short-lived cell signaling molecule, nitric oxide (NO), was until recently thought to be biologically inert at the relatively low levels found in the body. Traces of nitrite are present in our diet and significant amounts are continuously produced from nitrate, another oxidation product of NO and a constituent of green, leafy vegetables. The suspicion that high levels of nitrite and nitrate may cause cancer, as well as concerns about their risk to compromise the ability of red blood cells to deliver oxygen to tissues, have led to strict regulations aimed at limiting our exposure to these substances through drinking water and food products.

In the past few years, however, multiple research groups have shown that low concentrations of nitrite exert numerous beneficial effects, ranging from anti-bacterial activities to increases in local blood flow, and that they can somehow protect tissues from damage when oxygen is suddenly cut off and then rapidly restored, as occurs during heart attacks and strokes.

To study the molecular underpinnings of this protective effect of nitrite, the researchers at Boston University School of Medicine used a rat model in which they administered nitrite only once, causing a short spike in circulating levels, as a way to simulate the types of naturally occurring increases in nitrite that follow exercise or consumption of a meal rich in nitrate.

The researchers used a systems-biology approach in which changes in multiple biological and biochemical systems (e.g., the composition of a large number of proteins, the concentration of several small molecule metabolites, and functional outcomes) are simultaneously monitored and then integrated to produce one final picture in order to provide a broader view of the impact of this treatment on the heart. They tested their theory that following these changes over time and at different doses of nitrite might help to explain the protective effects of nitrite on the heart.

"What we found was that a single brief nitrite treatment elicited persisting changes in the heart's oxidation status together with lasting alterations to numerous proteins involved in the heart's energy metabolism, redox regulation, and signaling," said David H. Perlman, a post-doctoral research associate in the Cardiovascular Proteomics Center at Boston University School of Medicine, and lead author of the study. "These alterations were particularly striking because they persisted at least 24 hours after the actual nitrite levels had returned back to normal, and they were correlated strongly with the improvements in heart function observed at the same time."

He noted that this type of protection, called 'cardiac preconditioning', is a recently discovered phenomenon shown to be caused by numerous pharmacological agents.

"The proteins we have implicated include some key proteins, such as mitochondrial aldehyde dehydrogenase, that have been shown by others to be critical to cardiac protection afforded by other agents and triggers," added Perlman. "This is exciting

because it ties nitrite-triggered cardioprotection into the broader preconditioning field. Our study complements and extends other work, and identifies new players of potential importance for protection of the heart."

Perlman explained that nitrite levels in our bodies change under a number of circumstances, such as when we run up a flight of stairs or eat a big serving of salad.

"For years, the resulting bursts in nitrite were considered to be of little if any physiological relevance. Now we have good reason to believe that even small spikes in nitrite concentration can alter protein function in the heart in ways that afford protection," noted Perlman.

"We are intrigued by the breadth and magnitude of the proteomic changes in heart mitochondria elicited by a single, short-lasting elevation in nitrite concentration and believe that our findings will have broad implications for mitochondrial signalling and cardiac energetics," commented Martin Feelisch, senior author of the study. "It looks as though nitrite is triggering an ancient program aimed at fine-tuning mitochondrial function. Although the present study focussed on the heart, our observations may extend to other tissues and translate into relevant changes in muscle function elsewhere. If true, this may help explain, for example, the training effects of very short periods of exercise, which are known to be associated with elevations in circulating nitrite concentrations."

Interestingly, only low and high doses of nitrite, but not those in-between, were found to be protective. Although further studies will be needed to fully delineate the mechanisms of nitrite-induced cardioprotection, this study informs ongoing basic and translational studies by highlighting the importance of the dose-effect relationship for nitrite and the broad array of downstream targets possibly involved in its cardioprotective efficacy, the researchers concluded.

Public release date: 3-Mar-2009

Normal Human Gut Bacteria May Inhibit Shiga Toxin Development Following Infection with E. coli O157:H7

A new study suggests that normal human intestinal bacteria may inhibit the development of Shiga toxin 2 (Stx2), the toxin responsible for causing the more severe symptoms associated with food-borne disease, following Escherichia coli O157:H7 infection. The researchers from France report their findings in the February 2009 issue of the journal *Infection and Immunity*.

Enterohemorrhagic E. coli O157:H7 causes food-borne disease with symptoms ranging from diarrhea and hemorrhagic colitis to potentially fatal hemolytic-uremic syndrome. Stx2 is released in the gut following oral ingestion of E. coli O157:H7 and is the main virulence factor responsible for the more serious complications from the disease. Despite what researchers already know about the role of Stx2 in the progression of the disease, how the molecules released by the normal intestinal bacteria impact Stx2 is largely

unknown.

In the study Stx2 synthesis was analyzed following the growth of *E. coli* O157:H7 in contents collected from the large bowel of rats colonized with normal human intestinal bacteria. Results showed that extracellular molecules, produced in part by *Bacteroides thetaiotaomicron* (a predominant species of the normal human intestine), repressed Stx2 development.

"Our findings demonstrate for the first time the regulatory activity of a soluble factor produced by the complex human digestive microbiota on a bacterial virulence factor in a physiologically relevant context," say the researchers.

(T. de Sablet, C. Chassard, A. Bernalier-Donadille, M. Vareille, A.P. Gobert, C. Martin. 2009. Human microbiota-secreted factors inhibit shiga toxin synthesis by enterohemorrhagic *Escherichia coli* O157:H7. *Infection and Immunity*, 77. 2: 783-790.)

Public release date: 3-Mar-2009

Grape Extracts May be Effective Against Harmful Gut Bacteria

In a new study researchers from Clemson University found various grape extracts and their compounds to be effective at inhibiting *Helicobacter pylori*, one of the leading causes of gastritis in humans. They report their findings in the February 2009 issue of the journal *Applied and Environmental Microbiology*.

H. pylori is the bacterial agent most commonly associated with peptic ulcers, gastritis, mucosa-associated lymphoid tissue lymphoma, and gastric cancer. Antibiotic therapy has proven effective at providing initial relief, however resistance can develop over time and relapse can occur. Previous studies have examined other natural plant extracts with anti-*H. pylori* activity such as garlic, broccoli, cranberries and green tea, however, grapes have yet to be evaluated despite being well known for their high levels of antioxidants and polyphenols.

The antibacterial effects of extracts from red, white, black and muscadine grapes as well as the pure compounds resveratrol, ellagic acid, and myricetin were tested for anti-*H. pylori* activity using agar dilution, laser scanning microscopy and cell proliferation. Following 24 hour treatment, **results showed that muscadine grape skin extract had the highest anti-*H. pylori* effect, followed by muscadine grape synergy and seed extract.** Additionally, two of the three compounds, resveratrol and ellagic acid, also inhibited *H. pylori*.

"In this study, grape extracts and their compounds were effective at inhibiting *H. pylori* in vitro, with highest efficacy by muscadine grape skin extract," say the researchers.

(J.C. Brown, G. Huang, V. Haley-Zitlin, X. Jiang. 2009. Antibacterial effects of grape extracts on *Helicobacter pylori*. *Applied and Environmental Microbiology*, 75. 3: 848-

852.)

Public release date: 4-Mar-2009

Pure fructose frequently confused with high fructose corn syrup

New studies, ongoing misunderstanding can lead to consumer confusion

WASHINGTON, DC – As researchers continue to examine the role of sweeteners in the diet, it's important that people understand the differences among various ingredients used in scientific studies, according to the Corn Refiners Association (CRA). Interchanging two distinctly different ingredients, such as pure fructose and high fructose corn syrup, creates factually incorrect conclusions and misleads consumers.

Recent studies using pure fructose that purport to show that the body processes high fructose corn syrup differently than other sugars due to fructose content are a classic example of this problem because pure fructose cannot be extrapolated to high fructose corn syrup. The abnormally high levels of pure fructose used in these studies are not found in the human diet.

Fructose consumption at normal human dietary levels and as part of a balanced diet has not been shown to yield such results. Moreover, human fructose intake is nearly always accompanied by the simultaneous and equivalent intake of glucose – a critical and distinguishing factor from pure fructose used in these studies.

Following are some facts about high fructose corn syrup and fructose:

High fructose corn syrup contains approximately equal ratios of fructose and glucose. Table sugar also contains equal ratios of fructose and glucose. High fructose corn syrup and sugar are equally sweet and both contain four calories per gram.

Fructose is a natural, simple sugar commonly found in fruits and honey. The absence of glucose makes pure fructose fundamentally different from high fructose corn syrup.

Common dietary sources of fructose and glucose include fruits, vegetables, nuts and sweeteners (sugar, honey, high fructose corn syrup, fruit juice concentrates and agave nectar).

There is no meaningful difference in how the body metabolizes table sugar and high fructose corn syrup. Once the combination of glucose and fructose found in high fructose corn syrup and sucrose are absorbed into the blood stream, the two types of

sweetener appear to be metabolized similarly using well-characterized metabolic pathways.

High fructose corn syrup meets the U.S. Food and Drug Administration's requirements for use of the term "natural." It is made from corn, a natural grain product and contains no artificial or synthetic ingredients or color additives.

The American Medical Association in June 2008 helped put to rest a common misunderstanding about high fructose corn syrup and obesity, stating that "high fructose syrup does not appear to contribute to obesity more than other caloric sweeteners." Even former critics of high fructose corn syrup dispelled long-held myths and distanced themselves from earlier speculation about the sweetener's link to obesity in a comprehensive scientific review published in a recent supplement of the American Journal of Clinical Nutrition (2008 Vol. 88).

Public release date: 5-Mar-2009

Not so sweet: Over-consumption of sugar linked to aging

University of Montreal scientists explain how sugar shortens lifespan in PLoS Genetics

Montreal, March 6, 2009 – We know that lifespan can be extended in animals by restricting calories such as sugar intake. Now, according to a study published in the journal PLoS Genetics, Université de Montréal scientists have discovered that it's not sugar itself that is important in this process but the ability of cells to sense its presence.

Aging is a complex phenomenon and the mechanisms underlying aging are yet to be explained. What researchers do know is that there is a clear relationship between aging and calorie intake. For example, mice fed with half the calories they usually eat can live 40 percent longer. How does this work?

As part of the PLoS Genetics study, Université de Montréal Biochemistry Professor Luis Rokeach and his student Antoine Roux discovered to their surprise that if they removed the gene for a glucose sensor from yeast cells, they lived just as long as those living on a glucose-restricted diet. **In short, the fate of these cells doesn't depend on what they eat but what they think they're eating.**

There are two obvious aspects of calorie intake: tasting and digestion. By the time nutrients get to our cells there is an analogous process: sensors on the surface of the cell detect the presence of, for example, the sugar glucose and molecules inside the cell break down the glucose, converting it to energy. Of these processes, it is widely thought that the by-products of broken down sugars are the culprits in aging. The study by Rokeach and Roux suggests otherwise.

To understand aging, Rokeach and Roux in collaboration with Université de Montréal Biochemistry Professors Pascal Chartrand and Gerardo Ferbeyre used yeast as a model organism. At a basic level, yeast cells are surprisingly similar and age much like human cells, as well as being easy to study.

The research team found that the lifespan of yeast cells increased when glucose was decreased from their diet. They then asked whether the increase in lifespan was due to cells decreasing their ability to produce energy or to the decrease in signal to the cells by the glucose sensor.

The scientists found that cells unable to consume glucose as energy source are still sensitive to the pro-aging effects of glucose. Conversely, obliterating the sensor that measures the levels of glucose significantly increased lifespan.

"Thanks to this study, the link between the rise in age-related diseases and the over-consumption of sugar in today's diet is clearer. Our research opens a door to new therapeutic strategies for fighting age-related diseases," says Professor Rokeach.

Public release date: 5-Mar-2009

Support for adjunctive vitamin C treatment in cancer

New Rochelle, NY, March 5, 2009—Serious flaws in a recent study, which concluded that high doses of vitamin C reduce the effectiveness of chemotherapeutic drugs in the treatment of cancer, are revealed in the current issue of *Alternative and Complementary Therapies*, a journal published by Mary Ann Liebert, Inc. (www.liebertpub.com). This report is available free online at www.liebertpub.com/act

In the Medical Journal Watch column of the latest issue, Jack Challem, a personal nutrition coach and nutrition author from Tucson, Arizona, and a regular contributor to the Journal, challenges the findings of a study published in *Cancer Research* (2008;68:8031-8038), in which the authors conclude that vitamin C given to mice or cultured cells treated with common anti-cancer drugs reduces the antitumor effects of the chemotherapeutic agents.

Challem points out two main problems with the study: the oxidized form of vitamin C (dehydroascorbic acid) and not actual vitamin C (ascorbic acid) was used; and in the mouse experiments, the animals were given toxic doses of dehydroascorbic acid, a compound that is not used as a dietary supplement in humans.

"This study and the subsequent headlines [it generated] were a grievous disservice to physicians and patients with cancer," says Challem. He adds that "considerable positive research...has shown striking benefits from high-dose vitamin C (ascorbic acid) in cancer cells and animals—and in actual human beings."

High-dose intravenous vitamin C is a common form of alternative and complementary therapy for patients receiving chemotherapeutic drugs and is believed to help bring about tumor cell death. In addition, it may promote postsurgical healing by enhancing collagen formation, and increase tissue resistance to tumor spread.

Challem suggests that, "The ideal therapeutic approach would be to tailor individual treatment, including IV vitamin C, from a menu of options."

Ralph's Note - Using Oxidized Vitamin C in a study, pretty much speaks for itself.

Public release date: 6-Mar-2009

'Holy powder' ingredient makes membranes behave for better health

ANN ARBOR, Mich.---Revered in India as "holy powder," the marigold-colored spice known as turmeric has been used for centuries to treat wounds, infections and other health problems. In recent years, research into the healing powers of turmeric's main ingredient, curcumin, has burgeoned, as its astonishing array of antioxidant, anti-cancer, antibiotic, antiviral and other properties has been revealed.

Yet little has been known about exactly how curcumin works inside the body.

Now, University of Michigan researchers led by Ayyalusamy Ramamoorthy have **discovered that curcumin acts as a disciplinarian, inserting itself into cell membranes and making them more orderly, a move that improves cells' resistance to infection and malignancy.**

"The membrane goes from being crazy and floppy to being more disciplined and ordered, so that information flow through it can be controlled," said Ramamoorthy, a professor of chemistry and biophysics. The findings were published online March 3 in the Journal of the American Chemical Society.

The research project melds Ramamoorthy's past with his current scientific interests. As a child in India, he was given turmeric-laced milk to drink when he had a cold, and he breathed steam infused with turmeric to relieve congestion. Now as researcher he is fascinated with proteins that are associated with biological membranes, and he uses a technique called solid-state NMR spectroscopy to reveal atom-level details of these important molecules and the membranous milieu in which they operate.

"Probing high-resolution intermolecular interactions in the messy membrane environment has been a major challenge to commonly-used biophysical techniques," Ramamoorthy said. His research group recently developed the two-dimensional solid-state NMR technique that they used to probe curcumin-membrane communication in this study.

Scientists have speculated that curcumin does its health-promoting work by interacting

directly with membrane proteins, but the U-M findings challenge that notion. Instead, the researchers found that curcumin regulates the action of membrane proteins indirectly, by changing the physical properties of the membrane.

Ramamoorthy's group now is collaborating with chemistry professor Masato Koreeda and U-M Life Sciences Institute researcher Jason Gestwicki to study a variety of curcumin derivatives, some of which have enhanced potency. "We want to see how these various derivatives interact with the membrane, to see if the interactions are the same as what we have observed in the current study," Ramamoorthy said. "Such a comparative study could lead to the development of potent compounds to treat infection and other diseases."

In a related line of research, Ramamoorthy's team is using the same methods to investigate the effects of curcumin on the formation of amyloids---clumps of fibrous protein believed to be involved in type 2 diabetes, Alzheimer's disease, Parkinson's disease, and many other maladies. In addition, the researchers are looking to see whether other natural products, such as polyphenols (compounds found in many plant foods that are known to have antioxidant properties) and capsaicin (a pain reliever derived from hot peppers), interact with membranes in the same way as curcumin.

Public release date: 7-Mar-2009

May supplementation of docosahexaenoic acid (DHA) suppress colon tumor cell growth?

Colon cancer is one of the leading causes of death in Western countries. The role of n-3 and n-6 PUFAs in colorectal carcinoma cell growth has not been well studied. It is known that PGE₂, generated from AA, is an important factor in the tumorigenesis of colorectal cancer. However, previous in vitro observations have led to uncertainty regarding a differential role of n-3 and n-6 PUFA for growth of tumor cells, as some findings are contradictory, and most studies have not addressed the effect of a changed n-3/n-6 PUFA ratio on cell proliferation.

A research article to be published on March 7, 2009 in the World Journal of Gastroenterology addresses this question. The research team around Piet Habel and Karsten H. Weylandt from the Charité University Hospital in Berlin (Germany) and led by Jing X. Kang from the Massachusetts General Hospital in Boston (USA) used the LS-174T colon cancer cell line, for which several previous studies have shown an important role of PGE₂ as growth promoting agent. The study showed differential effects of n-6 PUFA AA and n-3 PUFA DHA. While proliferation was promoted by AA, incubation with DHA reduced cell growth and viability. In addition, this study demonstrated that the n-3 PUFA DHA can directly suppress AA- as well as PGE₂-induced colon cancer cell growth.

These results add evidence to the argument that the ratio of n-6/n-3 PUFA (and in particular the ratio of AA versus DHA) may be a critical determinant of proliferation and tumor growth in the colon, **and that DHA supplementation can suppress tumor cell growth, even in the presence of high AA- and PGE2 levels.** These results suggest that supplementation of DHA may be a powerful tool to counteract AA- and PGE2-promoted colon cancer cell growth that is associated with the predominant Western diet.

Public release date: 9-Mar-2009

Vitamin C intake associated with lower risk of gout in men

Men with higher vitamin C intake appear less likely to develop gout, a painful type of arthritis, according to a report in the March 9 issue of Archives of Internal Medicine, one of the JAMA/Archives journals.

"Gout is the most common type of inflammatory arthritis in men," the authors write as background information in the article. "Epidemiologic studies suggest that the overall disease burden of gout is substantial and growing. The identification of the risk factors for gout that are modifiable with available measures is an important first step in the prevention and management of this common and excruciatingly painful condition."

Hyon K. Choi, M.D., Dr.P.H., then of University of British Columbia, Vancouver, and now of Boston University School of Medicine, and colleagues examined the relationship between vitamin C intake and gout in 46,994 men between 1986 and 2006. Every four years, the men completed a dietary questionnaire, and their vitamin C intake through food and supplements was computed. Every two years, participants reported whether they had been diagnosed with or developed symptoms of gout.

During 20 years of follow-up, 1,317 men developed gout. Compared with men who had a vitamin C intake of less than 250 milligrams per day, the relative risk of gout was 17 percent lower for those with a daily intake of 500 to 999 milligrams, 34 percent lower for those with an intake of 1,000 to 1,499 milligrams per day and 45 percent lower for those with an intake of 1,500 milligrams per day or higher. For every 500-milligram increase in their vitamin C intake, men's risk for gout appeared to decrease by 17 percent. Compared with men who did not take vitamin C supplements, those who took 1,000 to 1,499 supplemental milligrams per day had a 34 percent lower risk of gout and those who took 1,500 supplemental milligrams per day had a 45 percent lower risk.

Vitamin C appears to reduce levels of uric acid in the blood, the authors note; a buildup of this naturally occurring compound can form crystal deposits in and around joints,

leading to the pain, inflammation and swelling associated with gout. Vitamin C may affect reabsorption of uric acid by the kidneys, increase the speed at which the kidneys work or protect against inflammation, all of which may reduce gout risk, the authors note.

"Given the general safety profile associated with vitamin C intake, particularly in the generally consumed ranges as in the present study (e.g., tolerable upper intake level of vitamin C of less than 2,000 milligrams in adults according to the Food and Nutrition Board, Institute of Medicine), vitamin C intake may provide a useful option in the prevention of gout," they conclude.

Public release date: 9-Mar-2009

Teenage boys who eat fish at least once a week achieve higher intelligence scores

Fifteen-year-old males who ate fish at least once a week displayed higher cognitive skills at the age of 18 than those who ate it less frequently, according to a study of nearly 4,000 teenagers published in the March issue of *Acta Paediatrica*.

Eating fish once a week was enough to increase combined, verbal and visuospatial intelligence scores by an average of six per cent, while eating fish more than once a week increased them by just under 11 per cent.

Swedish researchers compared the responses of 3,972 males who took part in the survey with the cognitive scores recorded in their Swedish Military Conscription records three years later.

"We found a clear link between frequent fish consumption and higher scores when the teenagers ate fish at least once a week" says Professor Kjell Torén from the Sahlgrenska Academy at the University of Gothenburg, one of the senior scientists involved in the study. "When they ate fish more than once a week the improvement almost doubled.

"These findings are significant because the study was carried out between the ages of 15 and 18 when educational achievements can help to shape the rest of a young man's life."

The research team found that:

58 per cent of the boys who took part in the study ate fish at least once a week and a further 20 per cent ate fish more than once a week.

When male teenagers ate fish more than once a week their combined intelligence scores were on average 12 per cent higher than those who ate fish less than once a week. Teenagers who ate fish once a week scored seven per cent higher. The verbal intelligence scores for teenagers who ate fish more than once a week were on average nine per cent higher than those who ate fish less than once a week. Those who

ate fish once a week scored four per cent higher.

The same pattern was seen in the visuospatial intelligence scores, with teenagers who ate fish more than once a week scoring on average 11 per cent higher than those who ate fish less than once a week. Those who ate fish once a week scored seven per cent higher.

"A number of studies have already shown that fish can help neurodevelopment in infants, reduce the risk of impaired cognitive function from middle age onwards and benefit babies born to women who ate fish during pregnancy" says Professor Torén.

"However we believe that this is the first large-scale study to explore the effect on adolescents."

The exact mechanism that links fish consumption to improved cognitive performance is still not clear.

"The most widely held theory is that it is the long-chain polyunsaturated fatty acids found in fish that have positive effects on cognitive performance" explains Professor Torén.

"Fish contains both omega-3 and omega-6 fatty acids which are known to accumulate in the brain when the foetus is developing. Other theories have been put forward that highlight their vascular and anti-inflammatory properties and their role in suppressing cytokines, chemicals that can affect the immune system."

In order to isolate the effect of fish consumption on the study subjects, the research team looked at a wide range of variables, including ethnicity, where they lived, their parents' educational level, the teenagers' well-being, how frequently they exercised and their weight.

"Having looked very carefully at the wide range of variables explored by this study it was very clear that there was a significant association between regular fish consumption at 15 and improved cognitive performance at 18" concludes lead author Dr Maria Aberg from the Centre for Brain Repair and Rehabilitation at the University of Gothenburg.

"We also found the same association between fish and intelligence in the teenagers regardless of their parents' level of education."

The researchers are now keen to carry out further research to see if the kind of fish consumed - for example lean fish in fish fingers or fatty fish such as salmon - makes any difference to the results.

"But for the time being it appears that including fish in a diet can make a valuable contribution to cognitive performance in male teenagers" says Dr Aberg.

Public release date: 9-Mar-2009

UI study suggests salt might be 'nature's antidepressant'

Most people consume far too much salt, and a University of Iowa researcher has discovered one potential reason we crave it: it might put us in a better mood.

UI psychologist Kim Johnson and colleagues found in their research that when rats are deficient in sodium chloride, common table salt, they shy away from activities they normally enjoy, like drinking a sugary substance or pressing a bar that stimulates a pleasant sensation in their brains.

"Things that normally would be pleasurable for rats didn't elicit the same degree of relish, which leads us to believe that a salt deficit and the craving associated with it can induce one of the key symptoms associated with depression," Johnson said.

The UI researchers can't say it is full-blown depression because several criteria factor into such a diagnosis, but a loss of pleasure in normally pleasing activities is one of the most important features of psychological depression. And, the idea that salt is a natural mood-elevating substance could help explain why we're so tempted to over-ingest it, even though it's known to contribute to high blood pressure, heart disease and other health problems.

Past research has shown that the worldwide average for salt intake per individual is about 10 grams per day, which is greater than the U.S. Food and Drug Administration recommended intake by about 4 grams, and may exceed what the body actually needs by more than 8 grams.

Johnson, who holds appointments in psychology and integrative physiology in the College of Liberal Arts and Sciences and in pharmacology in the Carver College of Medicine, published a review of these findings in the July issue of the journal "Physiology & Behavior" with Michael J. Morris and Elisa S. Na, UI graduate students. In addition to reporting their own findings, the authors reviewed others' research on the reasons behind salt appetite.

High levels of salt are contained in everything from pancakes to pasta these days, but once upon a time, it was hard to come by. Salt consumption and its price skyrocketed around 2000 B.C. when it was discovered as a food preservative. Roman soldiers were paid in salt; the word salary is derived from the Latin for salt. Even when mechanical refrigeration lessened the need for salt in the 19th century, consumption continued in excess because people liked the taste and it had become fairly inexpensive. Today, 77 percent of our salt intake comes from processed and restaurant foods, like frozen dinners and fast food.

Evolution might have played an important part in the human hankering for salt. Humans evolved from creatures that lived in salty ocean water. Once on land, the body continued to need sodium and chloride because minerals play key roles in allowing fluids to pass in and out of cells, and in helping nerve cells transfer information throughout the brain and body. But as man evolved in the hot climate of Africa, perspiration robbed the body of

sodium. Salt was scarce because our early ancestors ate a veggie-rich diet and lived far from the ocean.

"Most of our biological systems require sodium to function properly, but as a species that didn't have ready access to it, our kidneys evolved to become salt misers," Johnson said.

Behavior also came to play a key role in making sure we have enough salt on board. Animals like us come equipped with a taste system designed to detect salt and a brain that remembers the location of salt sources -- like salt licks in a pasture. A pleasure mechanism in the brain is activated when salt is consumed.

So the body needs salt and knows how to find it and how to conserve it. But today scientists are finding evidence that it's an abused, addictive substance -- almost like a drug.

One sign of addiction is using a substance even when it's known to be harmful. Many people are told to reduce sodium due to health concerns, but they have trouble doing so because they like the taste and find low-sodium foods bland.

Another strong aspect of addiction is the development of intense cravings when drugs are withheld. Experiments by Johnson and colleagues indicate similar changes in brain activity whether rats are exposed to drugs or salt deficiency.

"This suggests that salt need and cravings may be linked to the same brain pathways as those related to drug addiction and abuse," Johnson said.

STORY SOURCE: University of Iowa News Services, 300 Plaza Centre One, Suite 371, Iowa City, Iowa 52242-2500

Public release date: 9-Mar-2009

Low vitamin D levels associated with several risk factors in teenagers

Study highlights:

- Low levels of vitamin D were associated with increased risk of high blood pressure, high blood sugar and metabolic syndrome in teenagers.
- The highest levels of vitamin D were found in whites, the lowest levels in blacks and intermediate levels in Mexican-Americans.

PALM HARBOR, Fla., March 11, 2009 — Low levels of vitamin D were associated with an increased risk of high blood pressure, high blood sugar and metabolic syndrome in teenagers, researchers reported at the American Heart Association's 49th Annual Conference on Cardiovascular Disease Epidemiology and Prevention.

In the study, researchers analyzed 3,577 adolescents, 12 to 19 years old (51 percent boys), who participated in the nationally representative National Health and Nutrition Examination Survey (NHANES) conducted from 2001–2004.

After adjusting for age, sex, race/ethnicity, body mass index, socioeconomic status and physical activity, researchers found the adolescents with the lowest levels of vitamin D were:

- **2.36 times more likely to have high blood pressure;**
- **2.54 times more likely to have high blood sugar; and**
- **3.99 times more likely to have metabolic syndrome.**

Metabolic syndrome is a cluster of cardiovascular disease and diabetes risk factors including elevated waist circumference, high blood pressure, elevated triglycerides, low levels of high-density lipoprotein (HDL or “good”) cholesterol and high fasting glucose levels. The presence of three or more of the factors increases a person’s risk of developing diabetes and cardiovascular disease.

“We showed strong associations between low levels of vitamin D and higher risk of high blood pressure, hyperglycemia and metabolic syndrome among adolescents, confirming the results of studies among adults,” said Jared P. Reis, Ph.D., the study’s lead author and post-doctoral research fellow at Johns Hopkins Bloomberg School of Public Health in Baltimore.

Researchers used a biomarker of vitamin D to measure levels in blood. The biomarker measures vitamin D obtained from food, vitamin supplementation and exposure to sunlight.

The ethnic breakdown was similar to the general U.S. population: 64.7 percent non-Hispanic whites; 13.5 percent non-Hispanic blacks; and 11 percent Mexican Americans.

The study highlights the association between high levels of vitamin D and lower risk of heart disease. The highest levels of vitamin D were found in whites, the lowest levels in blacks and intermediate levels in Mexican Americans. Whites had almost twice as high levels as blacks.

In whites, the average level of vitamin D was 28.0 nanograms per milliliter (ng/mL); in blacks, 15.5 ng/mL; and in Mexican Americans, 21.5 ng/mL.

“Although our study is important, we believe clinical trials designed to determine the effects of vitamin D supplementation on the risk of heart disease risk factors in adolescents should be conducted before recommendations can be made for vitamin D in the prevention of cardiovascular disease,” Reis said.

The Institute of Medicine recommends a daily intake of vitamin D of 200 International Units (IU) for those less than 50 years, which includes children and adolescents. More

recent recommendations, however, from the American Academy of Pediatrics suggests a daily intake of 400 IU daily. While these intakes have been shown to be important in the prevention of skeletal conditions such as rickets in children and osteoporosis in adults, some specialists have suggested intakes of at least 1,000 IU daily may be needed for overall health.

Low levels of vitamin D are strongly associated with overweight and abdominal obesity. Since vitamin D is a fat-soluble vitamin, it may be sequestered within adipose tissue. This may explain why those who are obese are more likely to be vitamin D deficient, Reis said.

Vitamin D plays a useful role in general human health, particularly in bone health. Other roles are emerging, Reis said. "This is an exciting time; since we are just now beginning to understand the role that vitamin D may play in cardiovascular health."

"These data on serum vitamin D levels in young people raise some concern about their food choices and even the amount of time they spend in the sunshine," said Robert H. Eckel, M.D., American Heart Association past president. "The American Heart Association recommends an overall healthy diet and lifestyle, and that people get their nutrients primarily from food sources rather than supplements

Public release date: 9-Mar-2009

AMERICAN ADULTS FLUNK BASIC SCIENCE

**NATIONAL SURVEY SHOWS ONLY ONE-IN-FIVE ADULTS CAN ANSWER
THREE SCIENCE QUESTIONS CORRECTLY**

California Academy of Sciences conducted omnibus survey

SAN FRANCISCO (February 25, 2009) — Are Americans flunking science? A new national survey commissioned by the California Academy of Sciences and conducted by Harris Interactive® reveals that the U.S. public is unable to pass even a basic scientific literacy test.

Over the past few months, the American government has allocated hundreds of billions of dollars for economic bailout plans. While this spending may provide a short-term solution to the country's economic woes, most analysts agree that the long-term solution must include a transition to a more knowledge-based economy, including a focus on science, which is now widely recognized as a major driver of innovation and industry. Despite its importance to economic growth, environmental protection, and global health and energy issues, scientific literacy is currently low among American adults. According to the national survey commissioned by the California Academy of Sciences:

- **Only 53% of adults know how long it takes for the Earth to revolve around the Sun.**
- **Only 59% of adults know that the earliest humans and dinosaurs did not live at the same time.**
- **Only 47% of adults can roughly approximate the percent of the Earth's surface that is covered with water.***
- **Only 21% of adults answered all three questions correctly.**

Knowledge about some key scientific issues is also low. Despite the fact that access to fresh water is likely to be one of the most pressing environmental issues over the coming years, less than 1% of U.S. adults know what percent of the planet's water is fresh (the correct answer is 3%). Nearly half didn't even hazard a guess. Additionally, 40% of U.S. adults say they are "not at all knowledgeable" about sustainability.

Despite this lack of knowledge, U.S. adults do believe that scientific research and education are important. About 4 in 5 adults think science education is "absolutely essential" or "very important" to the U.S. healthcare system (86%), the U.S. global reputation (79%), and the U.S. economy (77%).

"There has never been a greater need for investment in scientific research and education," said Academy Executive Director Dr. Gregory Farrington. "Many of the most pressing issues of our time—from global climate change to resource management and disease—can only be addressed with the help of science."

To test your own scientific knowledge, please visit the California Academy of Sciences' website at www.calacademy.org.

Methodology

This survey was conducted by telephone within the United States by Harris Interactive on behalf of the California Academy of Science between December 17 and December 21, 2008 among 1,002 adults ages 18+. For complete methodology, including weighting variables, please contact Andrew Ng at 415.379.5123 or Kelly Taylor at 415.359.2313.

Education and Research at the California Academy of Sciences

The California Academy of Sciences is one of the world's preeminent natural history museums and is an international leader in scientific research about the natural world. In addition to its public exhibits and aquarium displays, the Academy is home to over 100 scientists and educators, as well as over 20 million scientific specimens. These specimens span several centuries and all seven continents, and they are used to study everything from the historical presence of environmental toxins to the spread of parasites. They are also the foundation for determining the evolutionary tree of life and creating maps that are used to identify conservation priorities. Through research expeditions to some of the least-known places on the planet, Academy scientists continue to build these collections, strengthening our understanding of the world around us. Meanwhile, Academy educators

are working with both museum visitors and school teachers to share this information in creative, engaging ways, inspiring a passion for science and the natural world.

Public release date: 12-Mar-2009

Older patients with 1 type of heart failure may receive little or no benefit from drugs

Digoxin and diuretics, in particular, should be prescribed sparingly for patients who have heart failure with 'preserved ejection fraction,' according to a pilot study
LOS ANGELES (EMBARGOED UNTIL: 9 a.m. EST, March 12, 2009) – People over 80 years of age suffering from a certain type of heart failure do not appear to benefit from most commonly prescribed heart medications, according to a study conducted at the Cedars-Sinai Heart Institute and published in the March 15 issue of The American Journal of Cardiology.

"The American population continues to live longer lives, often surviving with heart failure and other chronic conditions, but patients in this age range are typically excluded from medical research. **Our review of 142 patient cases found that medications had little if any beneficial effect on five-year survival or rehospitalization for heart problems among elderly patients who have heart failure but an ejection fraction of at least 50 percent.**" said Cedars-Sinai Heart Institute cardiologist Ernst R. Schwarz, M.D., Ph.D., the article's senior author.

Ejection fraction is a measure of the pumping capacity of the left ventricle, the main pumping chamber of the heart. Heart failure with "preserved ejection fraction" – a prevalent condition in the geriatric population – is characterized by the heart contracting well but failing to relax, which prevents the chamber from properly filling with blood. Often termed "diastolic heart failure," this type of heart failure is more prominent than other forms among the elderly, women, and obese people but, like other types of heart failure, it typically has a poor prognosis and a very high mortality rate.

The authors noted that while the study found no proven benefit for drug therapy in this group of patients, cardiovascular medications are often prescribed, at both financial and physiologic cost. They urge special caution in prescribing digoxin and diuretics – medications that are often used to treat congestive heart failure and other cardiac conditions – because the study showed a trend toward increased mortality.

The average age of patients in this study was 87 years at the time of initial hospitalization with heart failure; 31 percent of the subjects were men. Sixty-nine percent of the patients died during the five-year follow-up, and none of the drug therapies – statins, angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers, beta blockers, diuretics, calcium channel blockers, nitrates, and digoxin – appeared to make a significant difference in which patients survived and which did not.

"The risk of adverse drug effects in the geriatric population is high. Because older

patients may be taking multiple medications for a variety of medical conditions, and because drugs may affect older people differently than they do younger people, it is important for physicians to prescribe heart medications judiciously and account for a different and often more severe side effect spectrum" said Schwarz, professor of medicine at Cedars-Sinai Medical Center, medical director of the Cardiac Support Program and co-director of the Heart Transplant Program at the Cedars-Sinai Heart Institute. The study points out that more research is needed to evaluate the effects of therapies among the very elderly patients with heart failure.

Public release date: 12-Mar-2009

A diet rich in calcium aids weight loss

Québec City, March 12, 2009 – Boosting calcium consumption spurs weight loss, according to a study published in the most recent issue of the British Journal of Nutrition, but only in people whose diets are calcium deficient.

Angelo Tremblay and his team at Université Laval's Faculty of Medicine made the discovery in a 15-week weight loss program they conducted on obese women. The participants consumed on average less than 600 mg of calcium per day, whereas recommended daily intake is 1000 mg. In addition to following a low calorie diet, the women were instructed to take two tablets a day containing either a total of 1200 mg of calcium or a placebo. **Those who took the calcium tablets lost nearly 6 kg over the course of the program, the researchers found, compared to 1 kg for women in the control group.**

"Our hypothesis is that the brain can detect the lack of calcium and seeks to compensate by spurring food intake, which obviously works against the goals of any weight loss program," said Angelo Tremblay, holder of the Canada Research Chair in Environment and Energy Balance. "Sufficient calcium intake seems to stifle the desire to eat more," he added.

Consuming sufficient calcium is therefore important to ensuring the success of any weight loss program. According to the researcher, over 50% of obese women who come to the clinic run by his research team do not consume the recommended daily intake.

Professor Tremblay and his team have studied the link between calcium and obesity for several years. Their first findings, published in 2003, revealed that women who consumed diets poor in calcium had more body fat, bigger waistlines, and higher bad cholesterol levels than those who consumed moderate or large amounts of calcium. A second study showed that the more people reduced their consumption of dairy products over the six-year period examined, the more weight and body fat they gained and the bigger their waistlines grew. In 2007, Angelo Tremblay and his team established a direct link between calcium and a lower cardiovascular risk profile among dieters.

In addition to Angelo Tremblay, this study was co-authored by Geneviève Major,

Francine Alarie, and Jean Doré.

**These reports are done with the appreciation of all the Doctors, Scientist, and other Medical Researchers who sacrificed their time and effort. In order to give people the ability to empower themselves. Without the base aspirations for fame, or fortune.
Just honorable people, doing honorable things.**