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Our February 2010 Newsletter for Healthy Living

The Hunger Hormone

The premise that hunger makes food look more appealing is a widely held belief – just ask those who cruise grocery store aisles on an empty stomach, only to go home with a full basket and an empty wallet. The so-called hunger hormone ghrelin, which the body produces when it's hungry, might act on the brain to trigger this behavior. New research in mice by University of Texas-Southwestern Medical Center scientists suggest that ghrelin might also work in the brain to make some people keep eating "pleasurable" foods when they're already full.



"What we show is that there may be situations where we are driven to seek out and eat very rewarding foods, even if we're full, for no other reason than our brain

tells us to," said Dr. Jeffrey Zigman, assistant professor of internal medicine and psychiatry at UT Southwestern and co-senior author of the study published in *Biological Psychiatry*. Scientists previously have linked increased levels of ghrelin to intensifying the rewarding or pleasurable feelings one gets from cocaine or alcohol. Dr. Zigman said his team speculated that ghrelin might also increase specific rewarding aspects of eating.

Rewards, he said, generally can be defined as things that make us feel better. "They give us sensory pleasure, and they motivate us to work to obtain them," he said. "They also help us reor-

ganize our memory so that we remember how to get them." Dr. Mario Perello, postdoctoral researcher in internal medicine and lead author of the current study, said the idea was to determine "why someone who is stuffed from lunch still eats – and wants to eat – that high-calorie dessert."

For this study, the researchers conducted two standard behavioral tests. In

in order to receive a pellet of high-fat food. "The animals that didn't receive ghrelin gave up much sooner than the ones that did receive ghrelin," Dr. Zigman said. Humans and mice share the same type of brain-cell connections and hormones, as well as similar architectures in the so-called "pleasure centers" of the brain. In addition, the behavior of the mice in this study is consistent with

"We are driven to seek out rewarding foods because our brain tells us to."

the first, they evaluated whether mice that were fully sated preferred a room where they had previously found high-fat food over one that had only offered regular bland chow. They found that when mice in this situation were administered ghrelin, they strongly preferred the room that had been paired with the high-fat diet. Mice without ghrelin showed no preference. "We think the ghrelin prompted the mice to pursue the high-fat chow because they remembered how much they enjoyed it," Dr. Perello said. "It didn't matter that the room was now empty; they still associated it with something pleasurable."

The researchers also found that blocking the action of ghrelin, which is normally secreted into the bloodstream upon fasting or caloric restriction, prevented the mice from spending as much time in the room they associated with the high-fat food. For the second test, the team observed how long mice would continue to poke their noses into a hole

pleasure- or reward-seeking behavior seen in other animal studies of addiction, Dr. Zigman said.

As this new study suggests, one of the forces driving you to eat a second helping or an extra dessert even though you're full is the hormone ghrelin. Ghrelin (pronounced GRELL-in) is produced mainly by your stomach, although it is also made in other organs, such as your intestines and your kidneys. Ghrelin has been dubbed the "hunger hormone" because in previous studies people given the hormone became so ravenous, they ate markedly more than their usual food intake. Ghrelin, it appears, may also act on your brain's "pleasure centers," driving you to reach for another slice of cheesecake simply because you remember how good the first one tasted and made you feel (at least in that moment).

Your body's level of ghrelin can be influenced by many factors, including your lifestyle habits. For instance,

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Easy Road to Heart Health

It's already known that oxytocin exposure brings greater heart health, but researchers have just found that oxytocin infusion reduces cell deaths in an injured heart and reduces certain inflammatory factors that can slow healing. Other than going into labor, the number one means of acquiring the neuropeptide oxytocin is through skin-to-

skin contact with another human being - simple touch and closeness. Contact with animals has some beneficial effect as well.

are prairie voles. These small, highly sociable animals have been a focus of scientific research into the nature of love. Prairie voles bond for life after a short mating period. Once bonded, they do everything together and show no interest in other potential mates. The male becomes protective of the female, and both sexes are affectionate, attentive

“Oxytocin has been called the cuddle hormone because of its effect on relationships.”

Oxytocin has a powerful effect on infants, but has potential to increase bonding and mental and physical health for everyone. The neuropeptide oxytocin, released by your pituitary gland, is a naturally-occurring hormone in your body with incredibly powerful, health-giving properties. Oxytocin has long been associated with matters of the heart. It has been called the “pair bonding” and “cuddle” hormone for its effect on stable monogamous relationships. The release of oxytocin during childbirth stimulates the contractions which move the baby through the birth canal toward delivery. During breastfeeding, the presence of oxytocin promotes the release of milk and facilitates maternal behavior and bonding between new mothers and their infants. Oxytocin is released by both men and women during sexual intercourse, and even having a meal with other people can elevate the levels of this hormone in your body.

parents. Contrast the prairie voles with their very close cousin, the montane vole. The montane vole has no interest in bonding and engages in sex with multiple partners throughout life.

The difference between these two vole species, which are otherwise 99% alike? Receptors for the “love” hormone oxytocin and its pal, vasopressin. Research indicates the location of receptors for oxytocin and another similar hormone, vasopressin, makes all the difference when it comes to long-term social bonding and monogamy. The more of these receptors you have in areas of your brain associated with reward and reinforcement, the more likely you are to fall in love and remain monogamous. The more oxytocin your pituitary gland releases, the better able you are to handle life's stressors.

Research into oxytocin has revealed its far-reaching health benefits. The key mechanism seems to be the hormone's ability to counteract stress. Oxytocin decreases the level of stress hormones (primarily cortisol) your body manufactures and lowers your blood-pressure response to anxiety-producing events. Oxytocin quite likely plays a role in why pet owners heal more quickly from illness, why couples live longer than singles, and why support groups work for people with addictions and chronic diseases. Oxytocin has also been found to

reduce the cravings of drug and alcohol addiction, as well as for sweets.

There is an elegant logic to emerging science suggesting oxytocin has the power to not only keep your heart in good shape, but also to heal it from damage by reducing cell death and inflammation. Scientists have also tested the healing effect of oxytocin on skin wounds in hamsters. Wounds on animals that were living with a sibling healed almost twice as quickly as those on isolated animals, and the paired hamsters also produced lower amounts of cortisol.

If you're not currently in a life situation conducive to producing enough of your own oxytocin on a regular basis, the good news is there are some alternatives you can use to help you deal in a healthy way with your emotional response to stress and anxiety. With the already known and still-to-emerge health and quality of life benefits to be derived from the natural release of oxytocin in your body, your best course of action is to make sure you're cultivating warm, loving, intimate relationships, no matter what stage of life you're in. Additionally, if you have a pet, just a few minutes petting your dog or cat can promote the release of your body's “happiness” hormones, including oxytocin.

Since touch anywhere on your body, as well as positive interactions and psychological support, are known to increase oxytocin levels, you might also consider: holding hands, kissing and hugging, giving and receiving a backrub, nurturing others, getting a massage or practicing mind-body therapies like breathing exercises and yoga. It is another marvel of the human mind-body connection that intimacy can protect us from disease. Conversely, a lack of intimacy can bring on a wide range of health problems.

Reference: *Basic Research in Cardiology* January 2010
Medical News Today August 2007
Pediatrics March 2006
New Scientist January 26, 2006



February Event Schedule

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B12: The Energy Vitamin

Vitamin B12 is known as the “energy vitamin,” and it is essential for many critical functions in your body, including energy production, supporting your immune system, and regulating the formation of red blood cells.

Recent studies from the US Framingham trial show that one in four adults in the US are deficient in this vitally important nutrient and nearly half of the population has suboptimal blood levels.

Vitamin B12 is present only in animal sources of food, which may be a concern for those who are strict vegetarian or a vegan. This deficiency can result in less than optimal nervous system function, a tendency toward nervousness, and even less-than-optimal eye health. The older you get the more likely you are to have a vitamin B12 deficiency. The two ways that you become deficient in vitamin B12 are from not getting enough in your diet and from losing the ability to absorb it.

On the Indian subcontinent, where cultures are predominantly vegetarian-based, current studies show that approxi-

mately 80% of the adults are deficient in vitamin B12. However, vegans are not the only ones who can become vitamin B12 deficient. The older you get, the more your digestive system breaks down, especially if you have been following the standard American diet. Specifically the lining of your stomach gradually loses its ability to produce hydrochloric acid which releases vitamin B12 from your food. The use of antacids or anti-ulcer drugs will also lower your stomach acid secretion and decrease your ability to absorb vitamin B12. Infection with *Helicobacter pylori*, a common contributor to stomach ulcers, can also result in vitamin B12 deficiency.

However, the main cause of vitamin B12 deficiency is a term researchers call food-cobalamin malabsorption syndrome. Cobalamin is the scientific term for vitamin B12. This typically results when your stomach lining loses its ability to produce intrinsic factor, which is a protein that binds to vitamin B12 and allows your body to absorb it at the end of your small intestine. If you often feel

tired, run-down, and lacking in energy, you're not alone. Low energy is one of our country's biggest health complaints. Vitamin B12 may be helpful for you and is available for supplementation in three forms: methylcobalamin, hydroxycobalamin and cyanocobalamin, in a wide range of potencies. Consult your doctor or practitioner for medical advice.

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The Hunger Hormone *continued from page one*

chronic lack of sleep increases ghrelin, making you feel hungry when you don't really need to eat. This is likely one reason why a lack of sleep can make you gain weight.

Insulin may also play a role in regulating ghrelin levels. In one study, ghrelin levels were monitored in non-diabetic adults as they were given a two-hour infusion of insulin.

Shortly after the infusion began, levels of ghrelin began to drop. When the insulin infusion was stopped, levels of the hunger hormone began to rise

and rapidly returned to normal. Since insulin is already known to increase levels of leptin -- the "obesity hormone" that tells your brain to curb your appetite after eating -- the findings suggest that insulin plays an important role in controlling what you eat. For example, when you eat a sugary dessert, your production of insulin increases so that the sugar in your blood can be taken to cells and used for energy. Eating this sugar also increases production of leptin, which regulates your appetite and fat storage, and

decreases production of ghrelin, which helps regulate your food intake.

The idea is that when you eat, your body knows it should feel less hungry. However, when you eat certain foods, namely those that contain fructose, this important cycle does not occur. Fructose, a cheap form of sugar used in thousands of food products and soft drinks, can damage human metabolism and is possibly fueling increases in obesity. This is because your body metabolizes fructose in a much different way than glucose. Fructose is now being consumed in enormous quantities, which has made the negative effects much more profound. This may be occurring

drome -- not to mention the long list of chronic diseases that are related to these conditions.

Ghrelin, leptin and insulin responses in your body may be major players in your ability to regulate your food intake, but they are not the only ones. Stress, anger, sadness and just about any other negative emotion can also lead you to seek food as a coping mechanism and ultimately overeat. Subconscious cues you pick up from portion sizes, food visibility (passing by a candy dish) and food proximity (standing near food at a party) can also influence how much you eat. The solution to normalizing your ghrelin,

“Fructose interferes with the brain’s communication.”

because glucose suppresses the hunger hormone ghrelin and stimulates leptin, which suppresses your appetite.

Fructose, however, has no effect on ghrelin and interferes with your brain's communication with leptin, resulting in overeating. Thus, fructose may contribute to weight gain, increased belly fat, insulin resistance and metabolic syn-

leptin and insulin levels is fairly straightforward, and that is to eat a diet that emphasizes healthy fats, lean grass-fed meats and fresh vegetables, and limiting the sugars and grains contributing to blood sugar spikes.

Reference: Reference: *Eurekalert* December 28 2009
Biological Chemistry December 23 2009 *Cell Metabolism* April 2005, Vol. 1, Issue 4: 279-86 *Journal of Endocrinology and Metabolism* 2002;87:3997-4000, 4005-4008



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