



# Nutrition for Family Living

Susan Nitzke, Nutrition Specialist; [susan.nitzke@ces.uwex.edu](mailto:susan.nitzke@ces.uwex.edu)  
Sherry Tanumihardjo, Nutrition Specialist; [sherry.tan@ces.uwex.edu](mailto:sherry.tan@ces.uwex.edu)  
Amy Rettammel, Outreach Specialist; [arettamm@facstaff.wisc.edu](mailto:arettamm@facstaff.wisc.edu)  
Betsy Kelley, Outreach Specialist; [kelly@nutrisci.wisc.edu](mailto:kelly@nutrisci.wisc.edu)

---

## June, 2003 Topics

Children eat more when served more

How active were U.S. adults in 2000?

To answer your question: coral calcium

What's the latest scoop on sugars and health?

Phytoestrogens in soy-based infant formulas: a human health concern?

---

## Children eat more when served more

---

A new study from Pennsylvania State University and the Baylor College of Medicine looked at young children's responses when served large portions of food. This study was conducted by the same researchers who have extensively studied preschool children's eating habits (Parents serve as role models for eating fruits and vegetables ([Feb. 2002](#)), Parents' effects on young children's eating ([March 2001](#)).

Thirty preschoolers at a university day care center participated in the study. The children were offered age-appropriate portions of macaroni and cheese once a week for several weeks, then double portions once a week for two weeks after that. Researchers measured the total number of bites, the size of the bites, and the total amount of food consumed at each meal. They also recorded the children's comments about the size of the portions. As a second part of the investigation, the researchers provided the same double portions in a separate serving dish and allowed the children to serve themselves, and measured the amount served and the amount eaten.

When the researchers doubled the portions on the children's plates, the children ate about 25% more. The children ate the same amount of the other foods served at the meal, regardless of the amount of macaroni and cheese they were served. Interestingly, the children took the same number of bites of the entrée, but took larger bites when the larger portion was served. When the children were allowed to serve themselves, they chose portions roughly the same size as the age-appropriate serving they received at the beginning of the study.

Heavier children tended to take larger bites. Using data from a previous study with the same children on eating in the absence of hunger, the researchers found that children who ate even when they weren't hungry also ate more of the larger portion size when it was served to them.

Implications for educators: this study showed that young children do tend to eat more when larger portions are served to them. Overweight children and children who tended to eat when they weren't hungry were even more likely to do this. Educators can help parents learn appropriate serving sizes for young children to avoid exposing them to unnecessarily large portions. Educators can also emphasize the parent's and child's role in the feeding relationship: the parent provides healthy food choices, and the child decides how much they want to eat. For recommended teaching resources compatible with this message, see "Parents and Children Sharing Food Tasks" and other resources listed at [http://cf.uwex.edu/ces/wnep/tch\\_res/res\\_list.cfm?topic\\_id=16](http://cf.uwex.edu/ces/wnep/tch_res/res_list.cfm?topic_id=16).

Fisher JO, Rolls BJ, Birch LL. Children's bite size and intake of an entrée are greater with large portions than with age-appropriate or self-selected portions. *Am J Clin Nutr.* 2003;77:1164-70.



## How active were U.S. adults in 2000?

---

A new report from the Centers for Disease Control and Prevention (CDC) shows that about 1 in 5 American adults engages in a high level of overall physical activity, including both activity at work and in leisure time. At the other end of the spectrum, about 1 in 4 American adults engages in little or no regular physical activity.

Data was collected as part of the 2000 National Health Interview Survey (NHIS) conducted by the CDC. A sample of 32,374 adults over age 18 was interviewed. The survey included questions about usual daily activity as well as leisure time physical activity, to provide a picture of overall physical activity levels. Duration and intensity of the activity were measured.

Usual daily activity, in addition to work, includes commuting, running errands, doing household chores, or any other activities not conducted during leisure time. The level of physical activity is determined by how much “moving around and lifting or carrying things” occurs during these usual daily activities. Leisure time physical activity consists of exercise, sports or active hobbies that cause light sweating or a slight to moderate increase in breathing or heart rate, occurring 5 or more times per week for at least 30 minutes each time.

### Results:

- Overall in 2000, about one-half of adults walked and more than one-third of adults sat during their usual daily activities.
- Over one-fourth of adults did not lift or carry anything during their usual daily activities.
- About one-third of adults engaged in regular leisure-time physical activity. Men were more likely than women to engage in regular leisure time physical activity.
- Adults who walked or carried moderate to heavy loads during their usual daily activity were more likely to engage in regular leisure-time physical activity.
- About one in ten individuals was never physically active.
- Women were more likely than men to never engage in any physical activity.
- Older adults, and those with less education and income, were more likely to never be physically active.
- Black adults were almost twice as likely as white adults to never be physically active.

### *Implications for educators:*

Wisconsin residents have much room for improvement in being physically active. Since many people have little control over how active they can be in their job, educators can help them look for ways to be more active during breaks or on the way home. Educators can also help learners to find ways to be active in their other daily activities, and promote leisure-time activity as well.

WNEP resources for promoting physical activity can be found at

<http://www.uwex.edu/ces/wnep/p6/pdfs/phactres.pdf>

Barnes PM, Schoenborn CA. *Physical activity among adults: United States, 2000*. Advance data from vital and health statistics; no.333. Hyattsville, MD: National Center for Health Statistics, 2003.



## Nutrition for Family Living June, 2003

---

### To answer your question: coral calcium

---

We've had several questions from county staff about coral calcium. These comments from two experts in the field cover the topic pretty well.

From Robert P. Heaney, a calcium researcher at Creighton University School of Medicine, as submitted to the Society for Nutrition Education listserv:

A barrage of advertising, Internet marketing, and TV infomercials is aggressively promoting coral calcium to consumers. Unfortunately, many of these promotional communications are highly misleading and could be confusing for consumers.

No scientific studies or valid clinical trials support claims being made that coral calcium is beneficial for up to 200 diseases and health conditions. Likewise, claims of higher absorption levels are unsubstantiated and improbable on their face. There is virtually no scientific evidence available that compares the absorption of coral calcium with any other marketed calcium supplement.

The single published study comparing coral calcium to another form of calcium carbonate interpreted greater urinary calcium excretion as evidence of superior absorption for coral calcium. However, the authors did not compare apples to apples in this small human study. While both products contained the same amount of calcium (525 mg), one contained 252 mg of magnesium and the other, only 42 mg of magnesium. Higher magnesium intakes are known to increase urinary calcium excretion, so this study actually compared the effects of low and high magnesium intakes on calcium excretion, not the absorption of the two calcium sources. Moreover, urinary calcium excretion is not a widely accepted way to measure calcium absorption, both because it is too insensitive to detect useful differences in calcium absorption, and because it is affected by so many extraneous factors (magnesium is but one example).

In contrast to the unsupported claims of coral calcium, there are well-established, leading calcium supplements that base their health claims on well-controlled studies that have been independently reviewed for their methodology and results. These calcium supplements are readily available, usually at substantially lower cost than coral calcium.

In the past many poorly formulated calcium supplements were simply not absorbed. Whether that is true of coral calcium I cannot say, but so far as I can determine, there are no bioavailability studies for this type of calcium.

Consumers should choose only calcium supplement products with demonstrated bioavailability, and consumer advocacy groups should insist that manufacturers provide such data.

Further comments from Stephen Barrett, MD on the Quackwatch website, [www.quackwatch.org](http://www.quackwatch.org):

“Calcium intake is an important factor in bone health and may play some role in the prevention of colon cancer. [The infomercial host, Robert] Barefoot has embellished these simple facts to create an elaborate scheme to promote his publications and coral calcium products. Your best bet is to ... follow a medically approved program that includes adequate calcium and other measures for preventing osteoporosis. The National Academy of Sciences advises Americans and Canadians at risk for osteoporosis to consume between 1,000 and 1,300 milligrams of calcium per day. This can be done with



## **Nutrition for Family Living**

### **June, 2003**

---

dairy products, supplements, or both. Readily absorbable supplements need not cost more than a few cents a day. Coral calcium products are a waste of money, and some are irrationally formulated. For professional advice on calcium intake, ask a registered dietitian (R.D.) or physician to help you.”



## What's the Latest Scoop on Sugars and Health?

---

There are many current controversies and confusing media reports about sugar and its role in a healthful diet. You can find useful background information to help answer questions and perhaps update your knowledge in two articles from the International Food Information Council. One is "Calories Count: Balancing the Energy Equation"

(<http://ific.org/proactive/newsroom/release.vtml?id=21261>) and the other is "What's the Latest Scoop on Sugars and Health" (<http://ific.org/proactive/newsroom/release.vtml?id=21142>).

The sugars article is based on a scientific session at the 2002 American Dietetic Association annual meeting, jointly sponsored by the International Food Information Council (IFIC) and the International Life Sciences Institute (ILSI). That session considered the question "what does consuming sugar mean for our health?" A panel of experts presented the latest consensus science regarding the impact of sugars on health, and offered guidelines for effectively communicating with consumers about this often-confusing topic.

### **Challenges to Interpreting the Science: How much sugar do people consume?**

Several challenges complicate the interpretation of the science surrounding sugars and health. For instance, there are a number of definitions used to describe the sugars in foods and beverages. See the chart below. It's important to know which types of sugars researchers are talking about.

It's difficult to accurately measure how much sugar people consume each day. In 2000, the food supply provided 32 teaspoons of caloric sweeteners per person per day, up 23 percent since the 1980-1984 survey. However, food supply data may overestimate how much sugar people consume because the data include food that is disposed of, not finished, inedible, or lost through spoilage or waste.

When people are asked how much sugar they consume, the results are different. Self-reported data derived from the USDA Continuing Survey of Food Intakes of Individuals (CSFII) indicate that during 1994-1996, mean intakes of added sugars were 20.5 teaspoons per day for people older than 2 years of age, up 31 percent from 1989-1991. CSFII defines "added sugars" as sugars eaten separately or used as ingredients in processed or prepared foods, such as white sugar or corn syrup.

Different sources make different recommendations for sugar intake. The 2000 Dietary Guidelines for Americans say, "Choose beverages and foods to moderate your intake of sugars." The Institute of Medicine's (IOM's) 2002 Dietary Reference Intakes for Macronutrients did not set a Tolerable Upper Intake Level for sugars, but suggests a maximum intake of 25 percent of calories from added sugars. According to the IOM report, higher intakes are associated with a dramatic decrease in vitamin and mineral intakes, especially calcium. The IOM panel determined no other adverse effects.

### **Sugars and Health: What the Latest Science Says**

Despite the continuous controversy that swirls around sugars' impact on health, scientific consensus indicates that no adverse health effects can be directly attributed to sugars consumption, other than an association with dental carries. The following sections highlight the science in several key areas.

**Obesity:** Obesity results when more calories are eaten than expended, whatever the source of the extra calories. Although there is no direct connection between added sugars and obesity, health guidelines to prevent or reduce obesity generally recommend increasing physical activity and reducing extra calories by eating fewer fats and sugars.



## Nutrition for Family Living June, 2003

**Diabetes and Insulin Sensitivity:** The sugars in foods do not increase blood glucose levels any higher or faster than starches do. Therefore, current American Diabetes Association nutritional recommendations do not provide specific guidelines for sugars intake, except that sugars should be substituted on a calorie-for-calorie basis with other carbohydrates. Debate continues regarding the merit of using the glycemic index of starches and sugars in nutritional planning for people with diabetes.

Epidemiological studies do not show a link between sucrose consumption and insulin sensitivity independent of other dietary factors. More research is needed to determine the effect of sugars on insulin sensitivity in humans.

**Serum Triglycerides and Heart Disease:** Short-term studies show that sugars produce a dose-dependent increase in serum triglyceride levels – the more sugar one consumes, the greater the rise in triglycerides. However, diets that meet recommendations for fiber, saturated fat, and unsaturated fat lessen this effect. Carefully controlled clinical studies are needed to determine whether an increase in triglyceride levels resulting from diets high in sugars affects the risk for heart disease.

**Dental Caries:** Sugars and cooked starches (i.e., bread, pasta, crackers, and chips) are fermentable carbohydrates that contribute to the risk for caries. The degree of risk from a carbohydrate-rich food is related to several factors such as form, stickiness, exposure time, and frequency of consumption. However, risk is decreased by several factors, with the most important being the use of topical fluorides and fluoridated water. Also important are good oral hygiene and eating a balanced diet in line with current dietary guidelines.

**The Bottom Line:** Research into potential links between sugars and health continues in several areas. Meanwhile, experts agree that a health risk is not posed by enjoying sweet foods and beverages in moderation as part of a balanced diet and a physically active lifestyle.

The following tables are from “What’s the Latest Scoop on Sugars and Health?”, IFIC *Food Insight*, January/February, 2003.

### ***Sugars: No Crystal Clear Definition***

*The chart below shows the definitions commonly used to describe sugars in food.*

TERMINOLOGY	DEFINITION	SOURCE
Added sugars	Sugars eaten separately or used as ingredients in processed or prepared foods. Examples include white sugar, corn syrup and honey.	Food Guide Pyramid, USDA/DHHS
Sugar	Indicates sucrose (table sugar) in food label ingredients statement.	FDA
Sugars	All monosaccharides and disaccharides appearing on the Nutrition Facts panel. Includes both naturally occurring and added sugars.	FDA
Caloric Sweeteners	Sweeteners consumed directly as food ingredients. Examples include sucrose, honey, and corn sweeteners.	Food Disappearance Data, ERS, USDA

NOTE: USDA = U.S. Department of Agriculture; DHHS = U.S. Department of Health and Human Services; FDA = Food and Drug Administration; ERS = Economic Research Service



## Nutrition for Family Living June, 2003

---

### *Sweet Messages and Tips with Consumer Appeal*

*Quantitative research conducted by IFIC shows that most consumers agreed with the messages below and would be likely to try the supporting action tips.*

MESSAGE	ACTION TIPS
You can enjoy sweet foods in moderation as part of a healthy eating plan.	<ul style="list-style-type: none"><li>• Share the experience. Split dessert with a friend or take half home to enjoy the next day.</li><li>• For a snack, fruit-flavored yogurt or chocolate pudding tastes great and provides bone-building calcium, too.</li><li>• If you enjoy chocolate, try packing a snack-size chocolate bar in your well-balanced bag lunch.</li></ul>
Children can enjoy sweet foods and drinks as part of a healthy eating plan.	<ul style="list-style-type: none"><li>• Banning sweets can backfire. When you allow kids some sweet treats, they're less likely to overdo it.</li><li>• Milk and cereal are a welcoming after-school snack. Sweetened or unsweetened, you make the choice.</li><li>• Pack your kids a well-balanced lunch that includes their favorite treat.</li></ul>
Most kids love sweets: show them how to enjoy them in moderation.	<ul style="list-style-type: none"><li>• A snack-size treat is a good size for a smaller tummy.</li><li>• Set an example. Order a small to medium soft drink instead of an extra-large, and skip the refills.</li><li>• For younger children, serve up just the right portion with kid-size bowls, cups, and plates.</li></ul>

---



## **Phytoestrogens In Soy-Based Infant Formulas: A Human Health Concern?**

---

A research summary by Rebecca Surles and Sherry Tanumihardjo

Case study: You have a friend that has decided to switch her baby to soy infant formula and quit breast feeding because she has read about the health benefits of soy. What is the current research on soy infant formula and health?

Soybeans contain a group of compounds called phytoestrogens. These are plant-derived compounds that are found in fruits, vegetables, and whole grains commonly consumed by humans. Recently, there has been a large increase in research on the beneficial roles of dietary phytoestrogens. It has been suggested that consumption of phytoestrogens may reduce the risk of menopausal symptoms, osteoporosis, cancer, and heart disease. The Food and Drug Administration has approved a health claim for soy protein that states “25 g of soy protein a day, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease.” The consumption of soy and soy-derived compounds has increased by Americans. The question now is, what are the effects of consuming increased soy?

During the fetal and early postnatal period, when reproductive organs are developing, changes in hormones induce dramatic structural and functional alterations in the reproductive tracts of both males and females. Many of these changes are permanent, and some appear later in life. Phytoestrogens are known hormone disrupters, so it is important to look at their effects in relatively high doses, especially in early developmental stages of human infants. In the past 60 years, there has been an increase in the use of soy-based formulas. Fifteen percent of all infants in the U.S. (750,000 infants/year) use soy formula as an alternative to milk-based formula. Do soy products, with estrogen-like compounds, affect growth and development?

Isoflavones are a type of phytoestrogen that are well absorbed in human infants, however, they are largely attached to other substances that allow them to be excreted through both urine and bile. Consumption of soy-based formula exposes infants to high levels of the isoflavones genistein and daidzein. This is equivalent to 6.0-11.9 mg of isoflavones/kg per day, a quantity greater than adults eating high-soy diets. This results in total plasma levels of isoflavones and genistein ranging from 2.0 to 6.6 and 1.5 to 4.4  $\mu\text{mol/liter}$ , respectively, which is 10-fold greater than levels in Japanese whose diets have historically included soy.

Evidence in animals has shown adverse effects on reproduction associated with ingestion of food rich in phytoestrogens in sheep, cattle, cheetahs and mice. To examine if feeding infants fed a soy-based formula is associated with detrimental effects on their reproduction as adults, Strom et al. conducted a cohort study in 1999. They studied 248 adults fed a soy formula as infants and 563 adults who had been fed a cow milk formula as infants during 1965-1978. They looked at 30 outcomes and found no significant difference in weight and height or effects on puberty or fertility between the two groups. The only significant difference between the groups was slightly longer duration and greater discomfort with menstruation in the female participants that were fed the soy formula. The researchers concluded there was no systematic cause for concern for infants fed a soy-based formula.

While to date there is no evidence that feeding infants soy formula has an adverse effect on their reproductive organs as adults, recent work in mice has looked at the role of high concentrations of genistein and its association with immune function. The thymus gland, important to immune function, was reduced in weight and size after genistein treatment in mice whose ovaries had been



## Nutrition for Family Living June, 2003

---

removed. The authors concluded that genistein could be immunosuppressive but this has not been studied in humans.

The question now is whether these results can be extrapolated to infants fed soy formula as the mice were fed genistein alone. The dietary soy in food consumed by humans and animals is mostly in the form of soy protein isolate or soy flour. Both of these products are compound mixtures that contain other isoflavones in addition to genistein, as well as other bioactive compounds. These other ingredients could potentially have additive or inhibitory effects on genistein's ability to produce thymic and immune effects, so it remains to be established whether soy protein isolate or soy flour would have the same effects as genistein alone.

Today there is an extensive amount of research showing the benefits of a diet rich in soy. However, as with most chemicals, "the dose makes the toxin." The general public, at times, abuse substances thinking more is better. As of now, there is no strong evidence that phytoestrogens interfere with reproductive organs or immunity in humans. However, given the results from animal studies, the uncertainty of the effects of phytoestrogens in infants calls for further research. Until strong evidence indicates that there are no harmful effects in infants ingesting phytoestrogens, one should continue to promote breastfeeding and use soy formula as advised by a physician.

### Resources used:

Kurzer M.S., Xu X. 1997. Dietary Phytoestrogens. *Ann. Rev. Nutr.* 17:353-81.

Lamartiniere C.A., Wang J., Smith-Johnson M., Eltoum I.E. 2002. Daidzein: Bioavailability, potential for reproductive toxicity, and breast cancer chemoprevention in female rats. *Toxicological Sciences.* 65:228-238.

Strom B.L., Schinnar R., Ziegler E.E., Barnhart K.T., Sammel M.D., Macones G.A., Stallings V.A., Drulis J.M., Nelson S.E., Hanson S.A. 2001. Exposure to soy-based formula in infancy and endocrinological and reproductive outcomes in young adults. *JAMA.* 286:807-814.

Yellayi S., Naaz A., Szewczykowski M.A., Sato T., Woods J.A., Chang J., Segre M., Allred C.D., Helferich W.G., Cooke P.S. 2002. The phytoestrogen genistein induces thymic and immune changes: A human health concern? *PNAS.* 99:7616-7621.

Yellayi S., Zakroczymski, Selvaraj V., Valli V.E., Ghanta V., Helferich W.G., Cooke P.S. 2003. The phytoestrogen genistein suppresses cell-mediated immunity in mice. 176:267-274.