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WEALTH OF NUTRITIONAL INFORMATION AT YOUR FINGERTIPS

Parents and others interested in eating healthy can find many useful nutrition resources and tools all in one spot—the website of the USDA/ARS Children’s Nutrition Research Center at Baylor College of Medicine.

The CNRC website can be found online at www.kidsnutrition.org.

Information on the site includes everything from a video series on building healthy families to information on how to enroll in the important research studies that are conducted at the CNRC.

“Our goal through the website is to provide parents and families with information and tools to help them nurture healthy, happy children,” said Dr. Dennis Bier, director of the CNRC and professor of pediatrics at BCM.

Highlights of the CNRC website include:

- Kids’ BMI Calculator – this tool helps determine if a child is at a healthy weight for his or her age, height and gender: www.bcm.edu/cnrc/bodycomp/bmi2.html

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CNRC Researchers Strive for Success
AS DIETARY RECALL ENTERS COMPUTER AGE

Most kids today have grown up in an electronic world where computer use is an everyday experience. USDA/ARS Children’s Nutrition Research Center researchers are utilizing this for nutritional purposes and have developed dietary recall computer programs specifically for children.

Dietary recalls are one common way to measure what adults or children eat to inform researchers in managing diseases. They have traditionally been conducted by a trained dietitian who leads study participants through the process of recalling what they consumed the previous day.

Dietary recalls are important, but they can be costly and time consuming. The CNRC is working with the National Cancer Institute to develop a computer-based 24-hour dietary recall program for children.

“If we could get a computer to simulate what a dietitian does, we could hopefully collect the same quality of data

but much more cost-effectively,” said Dr. Tom Baranowski, professor of pediatrics—nutrition and physical activity at BCM and a CNRC researcher.

Studies use the recalls to look at how dietary intake relates to health outcomes – for example, whether sweetened beverage consumption predisposes children to obesity or whether increasing consumption of fruit and vegetables offers protection against obesity.

“Measuring these variables is critical to public policy,” Baranowski said. “If we can’t measure these variables we’ll never know which programs work and which ones don’t.”

Computer recall needs to be child-friendly to be successful. If it is too difficult or takes too long, children may not finish the recall or report accurate information. CNRC researchers conducted two recent studies—one evaluated the best method for children to categorize foods and another examined the accuracy of estimating portion sizes. They were published

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Improving Child Health
IN DEVELOPING COUNTRIES

Children in developing countries have dietary deficiencies in the minerals iron and zinc. Experts at the USDA/ARS Children’s Nutrition Research Center at Baylor College of Medicine are working to incorporate a beneficial mix of both zinc and iron supplements into traditional foods eaten in different countries. Having one of these nutrients without the other may actually make children less healthy overall.

In a study published in the *British Journal of Nutrition*, researchers reported on the

benefits of different zinc and iron ratios in Thripasha, a precooked cereal-based food given to children in Sri Lanka.

“The goal is to provide interventions that supply the right amount of both iron and zinc in a form that’s absorbable by the children,” said Dr. Steven Abrams, professor of pediatrics-nutrition at BCM.

Iron deficiencies cause anemia, which can result in fatigue and poor brain development

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Improving Childhood Health *(continued from page 1)*

in small children. Zinc deficiency causes a decreased appetite, slow growth and poor immune function, which causes more infections in children, said Abrams.

Researchers experimented with different amounts of iron and zinc in Thriplosa and looked at what fraction of the minerals are absorbed as well as how the fraction that is absorbed changes if the ratios of zinc and iron are changed.

"Sometimes if you increase the iron relative to the zinc, you may block the absorption of zinc to some degree, but still end up with a better relationship between the two," said Abrams. "There's no exact optimal amount that we're looking for; we're just trying to get an idea of how as we change ratios we make sure that we're not changing things so much that we stop the absorption of the other mineral."

Researchers found that increasing the levels of iron in Thriplosa to a fairly high amount to help resolve iron deficiency did not harm the absorption of zinc.

In the future, researchers hope to look at gradually increasing the amount of zinc in the supplement.

"One of the goals of our research is to try a variety of foods and look at the absorption and the effects of different amounts of iron and zinc in

them. We have to make sure that any food or beverage that's consumed by poor children meets both their iron and zinc needs as opposed to giving too high or too low amounts of one mineral and sacrificing the other, which would not help their overall health," said Abrams.

Abrams and colleagues conduct ongoing research in developing countries worldwide to help identify the best sources and amounts of minerals to give children with nutrient deficiencies.

Others who took part in this study include Manjula Hettiarachchi and Chandrani Liyanage of the University of Ruhuna in Sri Lanka, and Drs. David Hilmers of BCM and Ian Griffin, who was at BCM at the time of publication.



Sri Lankan children eat Thriplosa as part of a CNRC study.

Nutritional Information Online *(continued from page 1)*

- **Building Healthy Families Step-by-Step Video Series** – a six-part video series with supporting materials to help families create healthy home food environments. Available in English and Spanish: www.bcm.edu/cnrc/buildinghealthyfamilies/
- **Kid Energy Needs Calculator** – find out how many calories to eat each day and how much of the different food groups are needed to provide those calories for a healthy diet for ages 2 to 20 years: www.bcm.edu/cnrc/healthyeatingcalculator/eatingCal.html
- **Adult Energy Needs and BMI Calculator** – figure out your BMI and how many calories it takes per day to maintain your current weight: www.bcm.edu/cnrc/caloriesneed.cfm
- **Portion Distortion Quiz (from the National Institutes of Health)** – insightful information on the trend of "super-sized" food portions: <http://hp2010.nhlbi.nih.gov/portion/>
- **How to Join a Study** – find a list and contact information of the many important studies at the CNRC: www.bcm.edu/cnrc/index.cfm?PMID=9509
- **Eating Healthy Posters** – downloadable posters for use in schools and snack rooms: www.bcm.edu/cnrc/index.cfm?pmid=9874
- **Nutrition and Your Child Previous editions** – find archives of past issues of the CNRC publication: <http://www.bcm.edu/cnrc/index.cfm?PMID=9883>

Childhood and Adolescent Growth and Development Studies

Calorie and Physical Activity Study for Preschoolers **NEW!**

Healthy 3- to 5-year-old children are needed for a study on the caloric needs and physical

activity of preschoolers while resting and playing. The study includes two visits to the Children's Nutrition Research Center. Financial compensation provided. Call Marilyn, 713-798-7002.

Exercise Studies **NEW!**

Overweight Hispanic boys and girls, ages 13 to 17, who are not involved in any school or after-school sports, are wanted for a study on the effects of a 12-week exercise or exercise plus diet program, or for a study on the natural development of fitness and muscle strength over a 12-week period. Participants will receive a stipend. Call Marilyn, 713-798-7002, or e-mail: ig16@bcm.edu.

Do You Have a Hispanic Preschooler? **NEW!**

We are seeking parents of healthy 3- to 5-year-old Hispanic children to talk to us about

children's physical activity. The aim is to better understand preschoolers' physical activity and how to promote activity among young children. We welcome English or Spanish speaking parents to contact us to learn more. Parking and \$20 compensation is provided. Call Marilyn, 713-798-7002.

Internet Survey for Parents **NEW!**

Cell phone users who have children ages 3 to 5 are invited to log on to two different 10-minute Internet surveys at www.parentingyourchild.com and www.cnrcparentsurvey.com. Information gathered from these surveys will be used in the design of a cell phone game to help parents learn ways to teach their children to eat vegetables. There will be a drawing for two \$100 local department store gift certificates from all entries.

Diet and Stomach Pain **NEW!**

Does your child have stomach pain that you

Volunteers

Houston-area residents are invited to participate in the following nutrition research projects designed to help CNRC scientists

learn more about the nutritional needs of children. Free transportation and parking are available.



THE ROLE OF GLUCOSE DURING PREGNANCY

Throughout the world, teenage girls account for a significant number of pregnancies. Teenage pregnancies are associated with a high prevalence of low-birth weight and premature infants. These babies often have problems breathing, are prone to a host of metabolic diseases later in life such as hypertension and type 2 diabetes, and have increased mortality rates. Experts at the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine sought to determine the biological cause. Their findings were published in the *American Journal of Clinical Nutrition*.

"One of the things we are looking at is whether the pregnant teenage girl is capable of providing sufficient glucose to the fetus for optimal growth," said Dr. Farook Jahoor, professor of pediatrics – nutrition at BCM. "This is important because, unlike the mature human, the fetus can only utilize glucose and amino acids as the source of energy for growth. So the pregnant mother has to increase the amount of glucose that she's producing, especially when she's not eating, like during an overnight fast. She has to make a sufficient amount of glucose not only for herself, but for the growing fetus."

Adult women are able to do this by increasing the amount of glucose that they produce from scratch, a process called gluconeogenesis. This glucose is made from amino acids that their body releases as proteins break down during brief fasting.

Studies suggest that women increase the rate at which they break down protein when they are pregnant. The greater a woman's body mass index is, the more protein she is able to break down. However, some pregnant teenagers do not have as much body mass or body protein. Jahoor, senior author of the paper, and colleagues sought to find out whether teenage girls, ages 13 through 17, are able to increase the amount of glucose they produce after a brief period of fasting, such as overnight.

The researchers measured the amount of glucose adult women produced compared to the amount of glucose teenage girls produced

at the end of the first trimester of pregnancy and again at the beginning of the third trimester of pregnancy. They found that both the adult women and the teenage girls increased the amount of glucose they produced, but the adult women made more.

The adult women increased the amount of glucose produced by increasing gluconeogenesis, suggesting that the adult women had a sufficient supply of amino acids to maintain the increase in newly synthesized glucose.

In contrast, the teenage girls did not make new glucose through gluconeogenesis, and the amount of glucose through gluconeogenesis fell after an overnight fast. Rather they produced more by breaking down glycogen stored in the liver, a process called glycogenolysis. Most people do not make glucose predominantly through glycogenolysis after an overnight fast, said Jahoor.

The teenage girls did not have sufficient amino acids to make new glucose, so they made new glucose in the short-term by breaking down glycogen. The liver has only a limited amount of glycogen, which can be used up completely after several days of fasting.

This has several implications for teenage girls in developing countries, especially where famine or high rates of food insecurity are issues. Women in these countries typically have more low birth-weight babies, and teenage girls in such countries have an even greater number of low birth-weight babies.

Jahoor emphasizes that pregnant teenagers should not go for long periods of time without eating, and teenage girls in developing countries should take extra precautions to be sure they are eating sufficiently during pregnancy.

Others who took part in the study include Minerva M. Thame, Horace M. Fletcher and Tameka M. Baker from the University of the West Indies in Jamaica.

Funding for this study came from the U.S. Department of Agriculture, Agricultural Research Service.



believe is related to his/her diet? Children between the ages of 7 and 17 are needed for a research study to learn more about the role of diet in childhood stomach pain. Some children will be asked to start a specific diet to see if it will help. Compensation is provided. Call Francis Whalen, 832-822-3602, or e-mail chumpita@bcm.edu.

DHA for Children

Healthy children, 5 to 12 years old, are needed for a 48-week study examining a certain type of fatty acid (an omega-3 fatty acid called DHA) in the diet of children. Because dietary DHA is usually low in children and may affect their cognitive function, we wish to determine if DHA levels can be increased by a DHA supplement. The study includes seven visits to the CNRC. There will be three blood draws (once at the beginning, again after eight weeks

and one at the end). Compensation is provided. Call Marilyn, 713-798-7002.

Family Eats

African American families with children between 8 and 12 years of age are needed for an eight-session Internet program on healthy eating. Volunteers will log on to the website once a week for eight weeks to view the program. Participants must have Internet access. Compensation provided. Call Mamie, 713-798-0501, or e-mail mawhite@bcm.edu.

Girls Only

Healthy girls, ages 5 to 17 years, are needed to participate in a research project on female hormones. Free physical exam, labs and stipend provided. Call Betty, 832-824-1257, or e-mail baw@bcm.edu.

Lactation Study

Pregnant mothers who are healthy, between 13 and 35 years of age, who will exclusively breastfeed for the first two months and who will be delivering at St. Luke's or Ben Taub hospitals are needed for a research study that will investigate factors (the regulation of gene expression) that affect breast milk production during the first six weeks. Compensation provided. Call Janette, 713-798-7003, or e-mail jg16@bcm.edu.

Teen Choice: Food and Fitness

12- to 17-year-old boys and girls are needed for an eight-week web-based program on healthy eating and physical activity. Participants will log on to the website to view the eight-week program. Participants must have Internet access. Compensation provided. Call Mamie, 713-798-0501, or e-mail mawhite@bcm.edu.

Dietary Recall (continued from page 1)

in the *Journal of the American Dietetic Association* and *Public Health Nutrition*, respectively.

One of the major sources of error in computerized dietary recall systems has been portion size estimation. People tend not to be able to provide accurate estimates of how much they consumed, Baranowski said.

In their study, researchers presented children ages 8 to 13 with two methods to estimate portion size. In both methods, realistic food models were placed next to the children so they could compare the food portion image on a computer screen and match it to the food models. In one method they looked at food portion pictures one at a time, and in the alternate method they viewed all eight pictures on the screen at the same time.

There was no difference in accuracy between the two methods, Baranowski said. The kids picked the food pictured that corresponded exactly to the food model 60 percent of the time, and they were within one size 99 percent of the time. But the children's speed was quicker using the multiple-picture method, and so they preferred that system.

Speed was also a major factor in the food categorization study. The two methods in this study sought to find out how accurately kids could sort pictures of different foods into the appropriate category. One method was the "tree structure." Participants would click on a broad category folder on the computer into which the food best fit, and then the folder would open to more specific subcategories.

The other method was the "cover flow" procedure. This is similar to the system for finding songs on iTunes®, but adapted for food categorization. Participants would click on a broad food category album "cover," like fruit, which displayed a collage of different fruit, then the cover would flip over and display a list of different fruit.

"The accuracy of the placement of the food was equal but the task was performed much quicker in the tree method," Baranowski said. "Kids don't like food categorization tasks and want to minimize the time and effort that it takes, so they liked that method better."

These two studies are part of a series of studies that are being used to adapt the NCI's adult dietary recall program, called ASA-24, into a program for children.

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