Children's Nutrition Research Center

Nutrition & Your Child

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Large portion sizes and high energy density = more calories consumed

Large portion sizes can be part of an environment that leads to obesity. The average portion size of foods consumed both inside and outside the home began increasing in the 1970s. Research suggests that doubling the portion size of an entrée for preschool aged children increases the child's total calories consumed at a meal by 15 to 39%. Most often, when young children are given large portions of an entrée, they do not eat less of other items.

Dr. Jennifer Fisher and her colleagues at the USDA/ARS Children's Nutrition Research Center recently tested the impact of changing both portion size and dietary energy density (calories per weight) of an entrée eaten by young children. Her article is available in the July, 2007 issue of the *American Journal of Clinical Nutrition* (www.ajcn.org/cgi/reprint/86/1/174).

In the study, 5 to 6 year old children ate 4 weighed dinner meals one week apart. Each meal was the same except for modifications of the entrée (baked macaroni and cheese):

- Regular portion entrée (~1 cup) with traditional energy density (1.3 cal/gram)
- Regular portion entrée (~1 cup) with high energy density (1.8 cal/gram)
- Large portion entrée (~2 cups) with traditional energy density (1.3 cal/gram)
- Large portion entrée (~2 cups) with high energy density (1.8 cal/gram)

The results were fascinating. Children consumed one-third more of the entrée and about 15% more calories when served the larger portion size. When the entrée

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Recruiting Human Research Volunteers

The USDA/ARS Children's Nutrition Research Center (CNRC) is world renown for its research and scientific discoveries related to the importance of nutrition for growth and development during childhood and for health maintenance for adults. Although some preliminary and biochemical studies can be conducted in a laboratory using sophisticated equipment and technology, ultimately all theories about human nutrition should be confirmed with the help of human research volunteers.

Recruiting and coordinating the more than 5,000 volunteers that are part of the CNRC research studies each year is a major task. Marilyn Navarette is a key person behind the scenes for recruitment and coordinating activities. Fluent in both English and Spanish, she maintains a database of over 9,000 families. Although the database is computerized, many times the CNRC researchers rely upon Marilyn's expertise and knowledge of "her" families to find the volunteers that fit the study protocol. Marilyn has located volunteers as young as 2 days for a study about breastfeeding.

When asked if she has any concerns about recruiting volunteers for studies, she responds with a vehement no. "All of the studies have undergone the vigorous scrutiny of the Institutional Review Board of the Baylor College of Medicine and affiliated institutions. There is full disclosure to parents and older children about what will be happening and why it is important." She adds, "Some volunteer families have been in our database for over 20 years. Children who have participated in studies often tell their younger brothers and sisters and their friends, about how well they are treated

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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.

NEW

VIDEO & WEB GAMES FOR HEALTHY EATING AND PHYSICAL ACTIVITY

Children, 10 to 12 year olds, who love to play computer games are needed for a 4-month study to learn if video or web games can help children eat healthier and be more physically active. Must be fluent in English, have high-speed Internet connection at home and be available for 6 visits to the CNRC within 4 months. Stipend. Call Marilyn, 713-798-7002.

NEW

FORMULA AND INFANT BONE STATUS

Pregnant moms planning to exclusively formula feed their infants are needed for a study on bone status. Must make first visit to the CNRC before the infant is 8 days old. Stipend and formula provided. Call Marilyn, 713-798-7002.

NEWBORN NUTRITION STUDY

Babies taking formula and less than 10 weeks of age are needed for a study in newborn nutrition. Formula and stipend provided. Call Marilyn, 713-798-7002.

KIDS' CHOICE TOO

4 and 5 year old children are needed for a study of children's food preferences and intake patterns. Children must like macaroni and cheese. Both children and parents must be fluent in English. Families should not have participated in previous Supertaster studies. Stipend. Call Marilyn, 713-798-7002.

CARBOHYDRATE AND SUGAR METABOLISM

Normal weight and overweight Hispanic teens, ages 13 to 17 years, are needed for metabolism studies. Teens should be healthy, not on medications, not have a diabetic parent or sibling, not be enrolled in sports nor currently trying to diet. Study includes 12 weeks of supervised exercise with an exercise physiologist. Stipend. Call Marilyn, 713-798-7002.

BREAST-FEEDING STUDIES

New mothers, 18 to 35 years old, healthy, non-obese, not taking any medications (including birth control) and exclusively breastfeeding infants less than 10 weeks of age are needed for two studies investigating metabolic factors that affect breast milk production. Participants should not have parents or siblings with diabetes. Stipend. Call Marilyn, 713-798-7002. ❖

CHILDREN EAT MORE FRUIT AND VEGETABLES AFTER FOOD PREPARATION ACTIVITIES

Encouraging food preparation activities and personal goal setting has been recommended as a way to increase children's consumption of healthy food. Dr. Karen Cullen and her colleagues at the USDA/ARS Children's Nutrition Research Center evaluated the impact of combining both food preparation and goal setting with 4th grade students.

Fruit and vegetable intake of 671 4th grade students were determined before, during and after participation in a 10 week computerized intervention. In six sessions, children had a chance to set a personal goal related to preparing a fruit and/or vegetable recipe at home. Fifteen recipes were provided. Five recipes were chosen and prepared at home by over 30% of the youth:

- Razzle Dazzle (fruit juice mix)
- Royal Slush (fruit slushy)
- Wizard's Magic Pocket (pita pocket)
- Great Shake (fruit smoothie treat)
- Golden Knight Burrito (veggie burrito)

Analysis of the results demonstrated:

- An average increase of one serving of fruit, 100% fruit juice, or vegetable from the beginning of the study.
- Girls and Hispanic students achieved the most food preparation goals.
- Youth were more successful in achieving fruit preparation goals than vegetable preparation goals.
- Higher parental education was associated with vegetable preparation while lower parental education was association with fruit juice preparation.

Dr Cullen concludes, "Although the relationships among goal setting, recipe preparation and dietary intake may be more complex than previously thought, the increase in dietary fruit, 100% fruit juice and vegetables is encouraging." Dr. Cullen's article appeared in the June 2007 issue of the *International Journal of Behavioral Nutrition and Physical Activity*. (www.ijbnpa.org/content/4/1/28). ❖

NOTE TO PRACTITIONERS:
Consider including recipe goal setting in education programs and include assessment of goal setting in evaluations.

Increasing Bone Mineral Mass: Tips for Teens

Adolescence is a critical time for bone mineral mass accumulation. In the May 2007 issue of *Bone*, the official journal of the International Bone and Mineral Society (www.ibmsonline.org/), Dr. Steven Abrams at the USDA/ARS Children's Nutrition Research Center shared his perspectives on the importance of bone mineral mass accumulation during the teen years.

In girls, almost half of all total body bone mineral accumulation occurs within five years after puberty. This programmed increase in calcium absorption and bone growth is related to hormonal changes of puberty. Obtaining a high bone mineral mass lessens the risk of developing osteoporosis later in life. It may also be a factor in decreasing adolescent fractures. Most adolescents take in less calcium than current recommendations. Fortunately, some catch-up acquisition of bone mineral mass continues in early adult life as long as dietary calcium intake is not too low. Perhaps for this reason, interventions to increase the total absorption of calcium using dietary strategies or supplements have had minimal long-term success in the United States. Moreover, they have not been well accepted by adolescents.

Dr. Abrams believes that more research is needed to understand factors that influence the acquisition of peak bone mineral density. He also believes it is time to revise the dietary requirements for calcium and vitamin D to include both an estimated average intake (AI) and a recommended daily intake (RDA). However, he recognizes that these changes may be slow to occur. In the interim, he provides these recommendations for adolescents:

- Avoid very low calcium intakes (<600-800 mg/d),
- Maintain adequate intake of dietary vitamin D intake (good sources are fortified dairy products, salmon and shrimp),
- Avoid routine supplementation with > 400 IU Vitamin D unless advised by a physician, and
- Follow appropriate lifestyle habits including exercise and weight-bearing activities such as walking, jogging or weight lifting. Mowing the lawn is a great exercise for teenagers too.❖

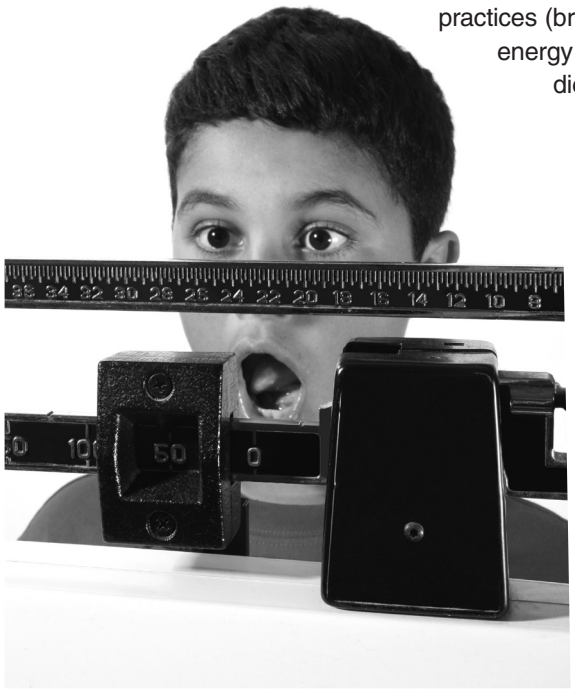
Predicting Weight Gain in Hispanic Children

The increase in childhood obesity in the United States involves genetics as well as an environment which encourages excess food intake and a sedentary lifestyle. Risk factors for the development of childhood overweight in non-Hispanics include:

- Overweight parents
- Social factors
- Birth weight
- Timing of sexual maturity
- Physical activity
- Dietary intake

Although Hispanic youth in the US have some of the greatest rates of overweight, risk factors that lead to overweight in Hispanic youth have not been identified. Dr. Nancy Butte and her colleagues at the USDA/ARS Children's Nutrition Research Center have followed over 850 Hispanic children for one year to determine their risk factors for weight gain.

Their results show that weight gain increased with age and was higher in overweight than nonoverweight children and in boys than in girls. Weight gain peaked at about 10 years for girls and at 11 years for boys. Other factors that were positively associated with weight gain were the mother's body mass index (BMI), some biochemical measures, and the amount of sedentary activity. For the Hispanic youth, infant feeding practices (breast-fed vs. formula-fed), family income, energy density, fiber, fat or protein in the diet, the amount of moderate-vigorous activity, or the amount of sleep were not related to the rate of weight gain between 4 and 19 years.



Dr. Butte concludes, "Knowing factors which predict weight gain in a given population group can be helpful for designing education programs and weight management interventions. In addition, educators should remember individual differences. Not every child with a risk factor will gain weight excessively."

Additional information about this study can be found in the June, 2007 issue of *American Journal of Clinical Nutrition* (www.ajcn.org/cgi/reprint/85/6/1478).❖

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Recruiting Human Research Volunteers *(Continued from page 1)*

at the CNRC. Serving as a volunteer in a research study, encouraged some of our volunteers to consider further study in medicine, biology, genetics and nutrition. You should hear them brag, 'I'm helping science.'"

Additional information about the current CNRC research studies can be found in the Nutrition & Your Child newsletter and on the CNRC website at www.kidsnutrition.org/studies/index.html. ❖

Large Portion Sizes *(Continued from page 1)*

had the higher dietary energy density, children consumed about 18% more calories. Moreover, the effects of portion size and energy density differences were independent and additive. When a large portion of an energy-dense entrée was served, the calorie intake for the meal was 34% greater. There was little change in the amount of other foods consumed.

Dr. Fisher concludes, "These results strongly suggest that serving large portions of energy-dense foods may cause children to consume excess calories at meals." ❖

NOTE TO PRACTITIONERS:
Remember both portion size and energy density when preparing food for young children.

Nutrition & Your Child is published quarterly by Baylor College of Medicine as a research and information update for the general public and Center volunteers and supporters.

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