Children's Nutrition Research Center

Nutrition & Your Child

Children's Nutrition Research Center • 1100 Bates • Houston, Texas 77030 • No. 2, 2007

Increasing Children's Fruit and Vegetable Consumption

How can we get children to eat fruit and vegetables? If you are a parent, you know that this is not an easy question. If you are a health professional concerned about childhood obesity and health, you may wonder how you can encourage parents to buy fruits and vegetables and make them available so children will eat more of them.

Dr. Tom Baranowski and his colleagues at the Children's Nutrition Research Center have shown that children will eat more fruits and vegetables if parents make them available. Now they are trying to understand why adult food shoppers do not buy more fruit and vegetables and how buying patterns could be influenced. They used outcome expectancies [*the good or not so good things that one believes will happen as a result of a behavior*], item response theory and other statistical procedures to discover information about fruit and vegetable purchasing behaviors. (More information about the research and scientific methods used is available in the March 2007 issue of *Public Health Nutrition*.) Refer to www.nutritionsociety.org for additional information about this article.

Parents responded to a number of statements including: I like to eat fruits/vegetables because

- they are good for your health.
- I grew up eating them.
- they are easy to prepare.
- they are inexpensive.

Although responses differed, when the data were analyzed it was clear that parents were convinced that eating fruit and vegetables was good for health. This suggests that the nutritional quality of fruit and vegetables is well known. Providing more information about health benefits of fruits and vegetables most likely would not lead to increased consumption. Many consumers did not agree with the statement that fruits and vegetables were inexpensive. This suggests that educational efforts should highlight the nutrient content of fruit and vegetables compared to cost. Analysis of the taste preferences showed that adults liked fruit better than vegetables and preferred fresh vegetables over cooked vegetables. This may suggest that tasty, simple, quick and easy-to-prepare recipes should be developed for vegetables and introduced to food shoppers.

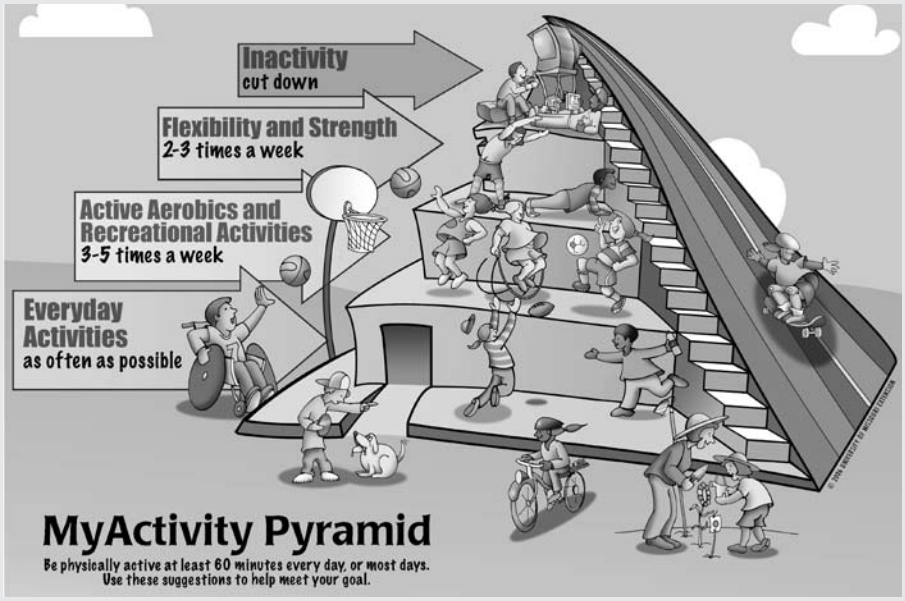
Dr. Baranowski concluded, "Behaviors such as purchasing fruit and vegetables are usually done for a reason. If we can understand the reasons or "motivating factors", we should have a better chance to influence purchasing behavior, leading to more successful interventions to increase fruit and vegetable consumption for our children." ❖

Get Out and Play

Most people are familiar with USDA's MyPyramid food guide and MyPyramid for Kids (www.MyPyramid.gov) which provide personal eating plans and activities. University of Missouri-Columbia Extension health educators expanded on the MyPyramid concept and developed the MyActivity Pyramid designed to show children ages 6 to 11 how to include physical activities into their daily lives.

The design is similar to USDA's MyPyramid. Cartoon-like drawings and multiple activity levels in the

(Continued on page 4)



INSIDE THIS ISSUE

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 WHAT'S YOUR PROP?

9 to 10 and 17 to 18 year olds are needed for a study to learn if people who can taste PROP (a natural substance found in some vegetables) eat differently from others who cannot. Stipend. Call Marilyn, 713-798-7002.

NEW VIDEO & WEB GAMES FOR DIABETES PREVENTION

10 to 12 year olds are needed for a study to learn if video or web games can help prevent Type 2 Diabetes. Must be fluent in English, have high-speed Internet connection at home, love playing on computers, and be available for 4 visits to CNRC within 4 months. Stipend. Call Marilyn, 713-798-7002.

NEW SUGAR AND FAT METABOLISM

15 to 17 year old overweight but otherwise healthy Hispanic and African American males are needed for a study to determine how the body handles fat and keeps blood sugar levels normal after a meal. Stipend. Call Marilyn, 713-798-7002.

NEW ZINC METABOLISM AND CYSTIC FIBROSIS

10 to 15 year old healthy control white males and females are needed for a 5 day in-hospital study to determine whether zinc supplementation will improve the health of children with Cystic Fibrosis. Stipend. 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.

PROBLEM SOLVERS NEEDED

14 to 17 year olds, fluent in English, are needed to complete questionnaires about physical activity and problem solving in young people. 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. ❖

SLEEP PATTERNS AND OBESITY

Obesity is a major health concern today. A simple explanation for weight gain is excess calories and too little physical activity; however researchers are examining additional factors to help explain the dramatic increase in obesity throughout the world.

Drs. Molly Bray and Martin Young at the USDA/ARS Children's Nutrition Research Center are exploring the role of the circadian clock in the development of obesity. Circadian clocks are defined as fundamental molecular mechanisms that help condition the organism to environmental changes that occur throughout the day.

Biological rhythms, such as sleep/wake cycles, are a central part of all aspects of life. Recent reports suggest that disruptions in sleep patterns, often linked to today's 24-7 lifestyle, are associated with more body fat and altered metabolism. Abnormal sleep/wake patterns may change the intracellular circadian clocks that allow the cell/tissue/ organism to anticipate diurnal variations in its environment, such as circulating levels of nutrients (e.g. glucose, fatty acids and triglycerides) and various hormones (e.g. insulin).

Their research of the potential role of the circadian clock in obesity was published in the March 2007 issue of *Obesity Reviews* and is available at www.kidsnutrition.org/faculty/bray2.htm. Although their research focused on mechanisms at the cellular level, they are optimistic that the circadian clock mechanism within fat cells may be a new field of study to help understand the increasing prevalence of obesity, as well as the timing of obesity therapies. Dr Bray adds, "The consistent sleep schedule recommended for young children may not only influence attention and fatigue but may also be optimal for maintaining coordinated circadian rhythms within fat cells." ❖

Influence of Child Care Providers on Children's Eating

Eating behaviors of young children are influenced by their eating environment. Today many young children spend considerable time in child care settings. A major responsibility for feeding, (which is part of the eating environment) has shifted from family members to child care providers.

Most research on the impact of feeding practices of young children has focused on parents in controlled laboratory settings. Drs. Sheryl Hughes and Theresa Nicklas and others at the USDA/ARS Children's Nutrition Research Center in Houston are investigating the impact of the feeding styles of caregivers and young children's eating patterns in Head Start centers. Child care providers, much like parents, influence what and how much children eat by:

- serving as an example (modeling),
- providing instruction through directives, and/or
- providing little or no instruction, leaving children to their own devices.

In their research, published in the April 2007 *Journal of Development and Behavioral Pediatrics*, child care providers were observed at three mealtime occasions. Self-reported feeding styles were assessed using the Caregivers Feeding Styles Questionnaire (CFSQ), available on the CNRC website at www.kidsnutrition.org/faculty/hughes.htm. The researchers examined the association between observed feeding styles of child care providers and what and how much children ate. An observational checklist was used to associate observed behaviors with child intake.

The caregiver's feeding style was categorized as authoritarian, authoritative, indulgent or uninvolved. Overall, indulgent feeding styles led to young children eating more food. Examples of indulgent feeding behaviors include:

- Gives seconds,
- Offers seconds verbally, and
- Gives multiple servings.

Although characteristics of indulgent feeding behaviors might be encouraged when the food being served is nutritious and healthful, efforts should be made to minimize indulgent feeding behaviors of caregivers when the food is less healthful.❖

Infant Feeding Trends over 25 years

A symposium, "Advances in Meeting the Nutritional Needs of Infants Worldwide" organized by Dr. William Heird from the USDA/ARS Children's Nutrition Research Center and sponsored by the International Formula Council was presented at the 2006 annual meeting of the American Society for Nutrition. Dr. Heird started the symposium by summarizing the progress made over the past 25 years in promoting breastfeeding, combating malnutrition, and improving the composition of infant formula. Symposium papers were published in the February 2007 supplement of *The Journal of Nutrition* and are available at jn.nutrition.org/content/vol137/issue2.

According to Dr. Heird more than 90% of women in developing countries and 50% to 90% of women in industrialized countries now start breastfeeding, a marked improvement over the past 25 years. Although the duration of breastfeeding also has increased, fewer than 35% of infants worldwide are exclusively breastfed at 4 months of age despite the recommendation that exclusive breastfeeding should continue for at least 6 months.

Parallel to the greater prevalence of breastfeeding, progress has been made in combating malnutrition. Stunting (low length/height for age) in children younger than 5 years in developing countries has decreased from 49% in 1980 to 23% in 2005.

Along with more widespread breastfeeding, there have also been other positive trends in infant feeding practices over the past 25 years, including:

- Delayed introduction of cow's milk;
- Increased use of iron-fortified formulas which has been credited with reducing the prevalence of iron deficiency anemia in infants who receive formula; and
- Modification of formulas by the addition of taurine, carnitine, nucleotides, and long-chain polyunsaturated fatty acids.

The use of whey-predominant rather than casein-predominant formulas also has increased over the past 25 years. Although the protein in whey-predominant formulas is more similar to human milk protein, there is no clear evidence that whey-predominant formulas provide a major benefit for infants.❖

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Get Out and Play *(Continued from page 1)*

MyActivity Pyramid show children kinds of activity needed and how much.

Everyday activities - where children should accumulate most of the physical activity time - are at the bottom of the pyramid. These activities make-up the largest area of MyActivity Pyramid.

The next level describes **more vigorous activities** that children need at least three to five times a week. Active aerobic and recreational activities include sports, jogging or running, rollerblading and vigorous playground games.

Flexibility and strength activities fill the third level of MyActivity Pyramid. Two to three times a week, children should be involved in activities that promote muscle fitness and flexibility, such as stretching, push-ups, practicing martial arts or yoga.

Many activities that young children enjoy can fit into more than one level. Ideally, kids should accumulate their 60 minutes, and up to several hours a day, from all three levels.

The top of the MyActivity Pyramid represents inactivity. Watching TV or playing video and computer games should be limited to two hours or less each day.

MyActivity Pyramid has an accompanying activity log to help children chart their own activity on a daily, weekly and monthly basis.

Dr. Marilyn Swanson, CSREES National Program Leader for Maternal and Child Health, stationed at the USDA/ARS Children's Nutrition Research Center considers this an example of a state expanding upon Federal information to promote physical activity for young children. Additional information can be found at http://extension.missouri.edu/explorepdf/hesguide/foodnut/n00386.pdf or through a link on the CNRC website (www.kidsnutrition.org).❖

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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The Children's Nutrition Research Center is operated by Baylor College of Medicine, in cooperation with Texas Children's Hospital, for the Agricultural Research Service of the United States Department of Agriculture.