# Future of fiber: Researcher seeks to update fiber recommendation in children, increase understanding of nutrient

July 30 2012, By Casey Weber

(Medical Xpress) -- Experts have long since determined the recommended daily amounts of certain nutrients, such as calcium and vitamin D, but the numbers for nutrients like fiber have proven more difficult to nail down.

One researcher at Kansas State University is seeking to clear the fog, particularly when it comes to the recommended daily allowance of fiber for children. Casey Weber, doctoral student in human nutrition from Mound City, recently completed his first of two studies examining dietary fiber in children.

"Fiber essentially is anything that is not digested or provides a functional benefit, but there's no easy way to classify what that fiber is," Weber said. "While findings exist for adults, there isn't a lot of information about children and the effects of their fiber intake."

How a child's -- or an adult's -- body ferments fiber after it is consumed is significant for more reasons than digestive regularity. Weber said higher levels of fermentation could mean increased short-chain fatty acid production, which may prevent colon cancer. In addition, these products of fermentation provide a source of fuel for colonocytes and beneficial effects in regards to blood lipids, which are linked to cardiovascular disease.

Children as young as 1-year-old have a dietary reference intake -- or DRI -- indicating how much of a nutrient to consume. Weber said the intake amount for fiber is listed as an adequate intake amount -- or AI -- because not enough information exists about fiber intake to list a specific recommended daily allowance, or RDA.

Younger children may have a daily fiber adequate intake amount of 19 grams. However, Weber said there is little research with appropriate context to support that number. But recent technology has allowed improved ways of measuring variables that could not be previously measured in populations of young children.

"I want to determine if more information should be available before we really push for this recommended number," he said. "Most people view the recommended intakes as black-and-white. They think it is the concrete amount needed, but that isn't necessarily the case. I'm interested in how fiber interacts with the large intestines of children. The interactions are a potential measure of other beneficial mechanisms that are taking place."

Weber's first study opened the door for further investigation. Working with the university's Hoeflin Stone House Early Childhood Education Center, Weber spent five weeks measuring the fiber fermentation levels of 20 healthy children after they ate a fiber-dense breakfast cereal.

The fiber was measured through a breath hydrogen test that indicates the level of fermentation by bacteria in the colon. As the fiber passes through the large intestine, it is fermented into a hydrogen and methane gas, which is measurable through the breath hydrogen test after the children were given differing amounts of the fiber cereal.

"The fermentation is measured because it's an indicator of suggested healthy metabolism that is happening in the large intestine," Weber said.

"We can measure it without actually looking inside."

To be relative to the daily recommendations for children, Weber said he gave the children 25, 50 and 75 percent of the recommended daily amount to determine whether every child ferments fiber in the same way.

"We anticipated that as the fiber increased, so would the production of methane and hydrogen," Weber said. "However, we didn't see a significant difference. Literature has shown some individuals do not produce any gas with any level of fiber. In-vitro and adult studies indicate that more gas will be produced with increased food supply. There is much to learn about the way fiber is handled in growing children."

Weber said the study also illustrated some of the challenges faced when studying the outcomes of food intake on health in children, such as increased selectiveness in food choices. This presents difficulty in getting children to consume more fiber.

"Adults and children have the same recommendation of fiber per calorie consumed," Weber said. "According to the recommendations, a 5-year-old can need up to 25 grams of fiber. Parents and caregivers are often surprised that the amount we encourage their children to eat is typically only 50 percent of the daily recommendation. Our goal is to provide a science-based fiber recommendation to give children the tools for a healthy start."

The biggest surprise while preparing for and conducting this preliminary study, Weber said, was the realization of how vague the scientific world's understanding is of dietary fiber in children.

"We're finding out how many doors are closed that we need to open," he

said.

Weber's next study will continue to look at fiber consumption, this time focusing on fiber adaptations between children and adults while using the same cereal and the breath hydrogen test. During a three-week study, adults and children will be provided about 10 grams of fiber per day to incorporate into their regular diet to determine what adaptations are occurring and if they increase in fermentative capacity.

Provided by Kansas State University