FITS: New Insights and Lessons Learned

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This supplement to the *Journal of the American Dietetic Association* provides valuable, detailed, and timely information on the dietary intakes of US infants and young children. It is gratifying that the survey was designed and carried out so that new models and techniques for assessing dietary intakes could be used, and that recommended methods (1) were used to compare nutrient intakes to the Food & Nutrition Board's new Dietary Reference Intakes (DRIs) (2-6). The Feeding Infants and Toddlers Study (FITS) sets a standard for analyses in the future. FITS also provides information that will be useful in planning the dietary intakes of infants and young children and making recommendations for feeding them (7).

GOOD AND BAD NEWS

In agreement with a recent survey by Ross Laboratories (8) and a prior survey (9), the FITS shows that many more infants breastfed when they left the hospital than decades ago, and they continued breastfeeding longer. Nonetheless, breastfeeding rates still fell short of 2010 goals of 50% at 6 months and 25% at 1 year (10). When infants were fed formula, virtually all were fed iron-fortified formula. For the most part, solids were introduced at an appropriate time. Furthermore, early introduction of unmodified whole cow's milk to infants less than 6 months of age is becoming a thing of the past. However, by 24 months, some infants drank little or no milk in a day. If this practice continued, it would be a cause for concern because milk is still the major source of calcium in the young child's diet (11). Although mean calcium intakes of toddlers exceeded the adequate intake (AI), low milk intakes in this age group may set the stage for long-term patterns of inadequate calcium intakes. We know that older children, especially girls and teenagers, have calcium intakes that are well below recommendations (12).

Despite this potential concern about the long-term implications of low or no milk intake by some toddlers, it is good news that infants and toddlers in the United States get enough of most nutrients without getting too much. This finding may not be surprising to dietetics professionals, but likely will be reassuring to parents. Even those infants whose motor skills developed relatively slowly and so-called picky eaters had adequate intakes of almost all nutrients.

NEW CONCERNS

Energy Intakes

Caregivers can provide too much of good things to infants and toddlers, and the FITS data suggest that many caregivers may be overfeeding their children. Reported energy intakes in the FITS, particularly of toddlers, are higher than the levels recommended using the new Dietary Reference Intake (DRI) standard for energy called the estimated energy requirement (EER) (6). Although the FITS data on energy intake are in line with data from other studies of infants and toddlers, the discrepancy between mean EERs and mean energy intakes is large and troubling.

The large difference between estimated intake and expenditure could be explained by errors in the reported food intake or in the EER, or both. The size of the discrepancy between estimated intake and expenditure leads to the suspicion that overreporting of food intake occurred and that estimates of nutrient intakes also are too high. If intakes actually were somewhat lower than reported, the overall picture of nutrient adequacy among these infants and toddlers might be less rosy, and the differences observed between picky and nonpicky eaters, for example, might be more important.

Usually, reports of energy intake in older children and adults underestimate actual intakes (13).However when mothers or other surrogate respondents report their infants' intakes, they may feel strong social pressures to overreport rather than underreport intakes, in part to make themselves and their child "look good" and in part to avoid being accused of underfeeding. After all, the dangers of underfeeding and social strictures against the practice are so severe that an infant can be removed from a parent's custody if underfeeding is proven to occur. Overreporting also could result from overlooking losses of food served to but not eaten by the child. For example, spills and playing with food could account for substantial losses. We suspect that at least some parents are overfeeding their children, but not to the extent suggested by the results reported in the FITS. It will be important to find out whether such a social desirability bias exists and, if so, whether it translates into overfeeding.

Errors relating to the EER must also be considered. The EER is based on the energy expenditure of healthy infants and toddlers estimated using doubly labeled water techniques (6)—generally considered to be the gold

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standard. However, the regression equations estimated from these data may be too simplistic. For children under age 2, only the child's age and weight are included as independent variables, and yet we know that breastfeeding status and other factors also affect the EER. Therefore, although the EER may be more accurate than older standards based on theoretical estimates of the components of energy need or on the intakes of healthy growing infants, the accuracy of these equations for young children requires further investigation.

NEW INSIGHTS

The findings in several of these articles point to the overarching influence of feeding practices and family eating practices on the intakes of infants and toddlers. The child's nutritional future literally is in the caregiver's hands. Parents really seem to be trying to follow expert recommendations, especially in the year after birth. However as the infant and toddler progress to table foods, the family diet seems to exert more and more of an influence. Contradictions between what is served and what is optimal emerge more starkly. If parents and caregivers eat french fries and consume calorically sweetened beverages such as colas and fruitades often, should we be surprised that these foods creep into the diets of very young children as well?

Developmental transitions further complicate the feeding of the young child. The child becomes increasingly independent and develops a will of his or her own with respect to food choice and preferences. Parents want to please and cater to the child and to minimize or avoid confrontations with the child about food, but at the same time they worry about the child's health. We believe that family-based approaches to food guidance are warranted—approaches that emphasize that everyone needs a healthy start when it comes to food.

NEW QUESTIONS FOR FUTURE RESEARCH

The FITS is a landmark study that dietetics professionals and all professionals who care about the health of infants and children in this country will find valuable for many years. Any new dietary survey raises new questions, and so it is with the FITS. A wealth of additional analyses of the FITS, new studies, and deliberations will help to answer them.

Foods Offered by Caregivers

It is troubling that relatively small percentages of the children consumed a variety of fruits and vegetables but that sizable percentages of toddlers consumed high-calorie, high-fat, and salty snacks, and carbonated beverages and sweetened fruit drinks. However, the articles in this supplement report mentions of foods eaten in any amount (no matter how small) but not the amounts of specific foods eaten. Quantity must be considered when assessing the magnitude of the problem, and additional analyses will be necessary to estimate the magnitude of the problem. Although small amounts of less nutritious foods may have their place, more micronutrient-dense and less energy-dense options might be better fare, especially in view of the estimated high energy intakes relative to expenditures. Such options include milk and milk products and fresh fruits.

Food Intake and Usual Food Consumption. The FITS provides a great deal of information about usual intakes of nutrients, but less about usual intakes of foods that are not eaten frequently. Although the sample is probably adequate to support analyses of consumption of very frequently consumed foods such as milk and meat, the sample sizes were too small to provide valid information about intakes of infrequently consumed foods. The DRI standards assume that infants under 6 months of age do not eat solids, but in the FITS the vast majority of the infants studied did. The implications of these assumptions also need study. More information on usual food consumption to supplement the data from a single day would also be useful.

Feeding Approaches. We look forward to analyses that examine different approaches to child feeding and how food intakes vary in different settings, such as day-care.

Questions Related to DRIs for Nutrients

The FITS data allow useful comparisons of reported intakes with the new reference standards, but some of the standards may need further consideration.

Estimating Breast Milk Intake. The FITS made several assumptions about the amounts of breast milk consumed based on data presented in the first and subsequent volumes of *Dietary Reference Intakes* (3-6). Possible effects of these assumptions need to be considered in examining some of the FITS findings.

Iron and Zinc. Studies of infants' intakes that used the 1989 Recommended Dietary Allowances (14) as a standard usually found that intakes of iron and zinc fell short (15). Using the lower 2001 Estimated Average Requirements as a standard (4), usual intakes of these micronutrients by nearly all subjects in the FITS were adequate. It remains to be seen whether other studies that provide biochemical and clinical data on iron and zinc nutriture confirm that these intakes are adequate. If not, overestimation of intake or a standard that is too low may be the cause of a discrepancy.

Vitamin E. At least two studies (11,17) of other US populations report high proportions with inadequate vitamin E intakes, and the FITS analysis found inadequate intakes for many toddlers as well. However, there are no clinical or biochemical data to suggest that those toddlers are in fact malnourished with regard to this vitamin.

Fiber. A high proportion of toddlers failed to meet the AI for fiber; only those above the 99th percentile of intake met the AI. At 19 g/day, the AI for fiber for 1- to 3-year-old children is much higher than the amount recommended by other groups. The Committee on Nutrition of the American Academy of Pediatrics recommends an intake of age in years plus 5 g/day, or about 7 g for young toddlers age 2 years (18). The prevention of coronary heart disease is the functional criterion on which the AI is based. Other criteria might also be considered (19). Perhaps a more relevant functional criterion is needed for toddlers and young children.

Upper Levels for Vitamin A and Zinc. In a day, many children exceeded the tolerable upper intake levels (UL) for vitamin A (retinol only) and zinc, even in the absence of the intake of dietary supplements. Because 32 oz or more of breast milk daily might lead to exceeding the UL for retinol, it seems that the UL may be somewhat lower than is warranted. The method used for deriving the UL

for zinc, although different from that for vitamin A, also gives a conservative estimate of the UL. We suspect that there is little reason for concern about excessive vitamin A or zinc intakes among unsupplemented infants and toddlers.

Acceptable Macronutrient Distribution Range for Fat. The acceptable macronutrient distribution range for fat also was problematic and merits a second look. The data suggest that considerable proportions of toddlers had low fat intakes, but neither nutrient intakes nor weight seemed to be compromised.

LESSONS LEARNED

The FITS shows that there is a great deal still to learn about how infants and toddlers make the transition to family fare. The FITS provides warnings about a few infant and child feeding practices that may need attention, but at the same time it points to the tender loving care that US parents bring to feeding their young children. Analysis of the data using the DRIs also is a new achievement—one that sheds new light on questions about dietary intake. Wise use of the findings can lead to the development of better nutrition education materials and to recommendations for child feeding practices that will meet the child's needs without inadvertent overfeeding. Coupled with appropriate assessment of growth and body composition, health supervision, and interventions on both dietary intake and physical activity, it may be possible to provide even more healthy starts for our children (20).

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