The Evolution of a New Research Field: Metabolic Programming by Early Nutrition

Susan B. Roberts and Roger McDonald*

The Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, MA 02111, and *Department of Nutrition, University of California at Davis, Davis, CA 95616

The possibility that the foods consumed during the first weeks and months of life may have permanent effects on metabolism was recognized more than 30 y ago in rodents (McCance 1962). Subsequent studies, also in animals, demonstrated permanent effects of early diet on adult metabolism, body composition and cognitive function (Hahn 1984, Smart 1986). These results are without question dramatic but failed to generate sustained interest because it was not known whether similar long-term effects of early diet might be found in humans. Indeed, the fact that humans are developmentally more mature at birth than laboratory rodents suggests that they may be much less susceptible to the long-term influences of early diet.

This symposium brings together three scientists actively investigating metabolic programming by early diet in humans, to discuss new evidence from humans and nonhuman primates that the foods consumed during infancy and childhood may indeed have long-term, and perhaps permanent, effects on health and metabolism. The presentations by Drs. Lucas, Dietz and Sawaya (Dietz 1998, Lucas 1998, Sawaya et al. 1998) provide strong preliminary evidence suggesting that there may be long-term effects of early diet on health and metabolism in humans. In addition, their results also indicate that males and females may have a differential susceptibility to nutritional programming and that the vulnerable period for programming may extend past infancy and childhood into adolescence. The fourth presentation in the symposium, by Dr. Birch (1998), discusses some of the factors influencing the food intake of children, because if the food consumed before adulthood has potential long-term effects, it becomes extremely important to know how food intake can be manipulated towards desired goals during this period when achieving good nutritional intakes can be challenging.

With this recognition that humans, as well as animals, can experience long-term effects of the diet they consume during childhood, it is now imperative that we define the magnitude of the effects of different nutrients consumed during early life on long-term metabolism and health, as well as the critical time periods during which each different nutrient exerts its particular effects. Because it is unlikely that current RDAs for infants and children (NRC 1989) represent optimal intakes for long-term good health, we must also work towards more fully identifying the best diet for the youngest and most vulnerable members of our society.

LITERATURE CITED


