Preface

It has been 30 y since publication of the landmark report Maternal Nutrition and the Course of Pregnancy, by the Food and Nutrition Board of the National Academy of Sciences (1). Shortly thereafter, the Supplemental Food Program for Women, Infants, and Children was established by the US Department of Agriculture to improve the nutritional health of these vulnerable groups. Since then, the fields of nutrition and obstetrics have changed greatly. Many of those changes stemmed from research stimulated by this landmark report and the Women, Infants, and Children program. Those research findings were summarized in the 1990 report, Nutrition During Pregnancy: Weight Gain and Nutrient Supplements (2) and a symposium published 5 y ago in the American Journal of Clinical Nutrition (3). Many advances in maternal nutrition have been published since 1994. The purpose of this symposium was to review those findings and to describe the major role that nutrition plays in maternal and child health.

We now know that the reproductive cycle is a continuum—a woman’s nutritional status at the time she conceives influences her physiologic response to pregnancy, and her nutrition during pregnancy influences preparation for lactation. Stages of reproduction cannot be studied in isolation; efforts to integrate relations across the entire cycle are necessary. Pregnancy also is a period of increased elasticity or flexibility in metabolism. For example, energy metabolism may be modified in several different ways to meet the needs for fetal growth and development. Those metabolic adjustments appear to depend, at least in part, on the woman’s energy status at conception and her lifestyle during pregnancy.

Accumulating data also suggest that micronutrient requirements depend on the genetic characteristics and nutritional status of the woman at conception. Folic acid, for example, plays an important role in reducing the risk of neural tube defects and the outcome of pregnancy. A new dietary reference intake for folic acid intake during pregnancy of 600 μg/d was recently established by the US Food and Nutrition Board; supplementation with folic acid may be necessary to meet this standard (4). Identification and treatment of iron deficiency continues to be a challenge during pregnancy. Articles in this symposium clarify the effect of maternal iron status on pregnancy outcome, detail how to differentiate between iron deficiency and anemia, and assess the advantages and disadvantages of weekly compared with daily iron supplementation.

The role of calcium in reducing the risk of future bone disease and hypertensive disorders of pregnancy, collectively known as preeclampsia, is reviewed. Maternal bone calcium is mobilized during early lactation, but not during pregnancy. There is no evidence, however, of a net loss of bone at the end of the reproductive cycle suggesting that this bone loss is replaced. Some clinical trials in which pregnant women were given calcium supplements suggest a lowered frequency of preeclampsia. The mechanisms underlying these observations and implications of clinical practice are reviewed.

The hypothesis that fetal nutrition influences the development of adult disease is gaining wider support and recognition. Underlying mechanisms responsible for imprinting risk of chronic disease by early diet remain to be elucidated; however, the observation raises many questions. What are the vulnerable periods of development? What type and degree of fetal malnutrition leads to disease risk? Is there a generational carryover? The implications of this association between fetal nutrition and adult disease are immense and, if substantiated, demand intense scrutiny of current prenatal nutrition policies. Finally, the last paper in this symposium reminds us that nutritional health is influenced not only by what is consumed but also by the socio-cultural and behavioral characteristics of the woman. For a nutrition intervention program to be successful, the socio-cultural needs and nutritional inadequacies of the population need to be addressed.

The organizers of this international symposium, Maternal Nutrition: New Developments and Implications, gratefully acknowledge the support of CERIN, the Center for Research and Information on Nutrition, located in Paris. Without their generous support, the outstanding experts who prepared the following papers could not have been convened from all over the world.

Janet C King
Paul Sachet

REFERENCES