

Early nutrition has a long-term metabolic impact

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Nutrition during the first days or weeks of life may have long-term consequences on health, potentially via a phenomenon known as the metabolic programming effect, according to a study to be presented Monday, May 2, at the Pediatric Academic Societies (PAS) annual meeting in Denver.

Metabolic programming is the concept that differences in nutritional experiences at critical periods early in life can program a person's metabolism and health for the future.

In this study, researchers compared growth, body composition and blood pressure in three groups of healthy, full-term newborns in the Neonatal Department of Hospices Civils de Lyon, Claude Bernard University, Lyon, France. One group received only [breast milk](#) for the first four months of life. The two other groups were randomized to receive either a low-protein formula with 1.8 grams of protein/100 kilocalories (g/kcal) or a high-protein formula with 2.7 g/100 kcal. The protein content of both formulas was within the recommended levels of 1.8 to 3 g/100 kcal.

After four months, the formula-fed infants continued to receive the same formula, and the breastfed infants were assigned to the low-protein formula, if needed.

Researchers, who followed 234 children for three years, found that exclusive breastfeeding during the first weeks of life induced a specific pattern of growth and a specific metabolic profile, which appeared to

differ in formula-fed infants. The [protein content](#) in infant formula may be a key factor in inducing these differences, according to study co-author Guy Putet, MD.

As early as 15 days of life, blood [insulin levels](#) were lower in breastfed infants than in formula-fed infants. These differences persisted at 4 months of age, but no differences were seen at 9 months.

Growth patterns also were different between groups during the first year of life, but by 3 years of age, there no longer was any difference in length, weight or [body composition](#) (fat mass, lean body mass) between groups. The exception was head circumference, which was slightly lower in the low-protein formula group but still well within the normal range.

At 3 years, an unexpected result was that diastolic and mean blood pressures were higher in the infants who had been fed the high-protein formula compared to the breastfed infants, Dr. Putet noted. However, these levels were still within the normal range.

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"It appears that formula feeding induces differences in some hormonal profiles as well as in patterns of growth compared with breastfeeding," Dr. Putet said. "The long-term consequences of such changes are not well-understood in humans and may play a role in later health. Well-designed studies with long-term follow-up are needed."

If breastfeeding is not possible, Dr. Putet concluded, infants should be fed formulas that allow a growth pattern and a [metabolic profile](#) similar to that of breastfed infants.

More information: To view the abstract, go to www.abstracts2view.com/pas/view.php?nu=PAS11L1_925

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