

Maternal Influences on Child Health: A Look at the Early Years

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Mothers need to eat for themselves and their babies. How mothers adapt to the demands of pregnancy and breastfeeding remains a central question in evolution and human health. During this period, female hormones influence numerous organs, regulating and altering their structure and functions – changes that are crucial for maternal health and the development of the offspring. Although it has long been known that pregnant women have increased nutritional needs, this fundamental aspect has not been sufficiently investigated scientifically.

Recent studies on genetically modified mice and so-called intestinal organoids – self-organizing three-dimensional tissues derived from stem cells of the mouse or human gut – show that the intestine undergoes massive changes during pregnancy and lactation. The intestinal surface area nearly doubles, and the architecture of the villi responsible for nutrient absorption is profoundly remodeled. More specifically, this process is controlled by sex and pregnancy hormones, which alter the intestinal stem cells via the so-called RANK/RANKL system and then signal the intestinal cells to grow. This growth process likely slows the passage of food, which in turn maximizes nutrient absorption.

Ultimately, these research findings not only reveal how mothers' bodies change to keep their babies healthy but also offer promising approaches for gaining a better understanding of intestinal cancer and developing new therapies for gut regeneration.