

OBESITY

Leptin intake during the suckling period may protect against obesity and metabolic-related disorders

The intake of leptin during the suckling period in neonatal rats programs an improved response of adipose tissue to a high-fat diet, a recent Spanish study reports.

Leptin feeding resulted in an increased oxidative capacity of adipose tissue and prevented a decrease in the leptin receptor level. "Adipose tissue is a key organ involved in energy handling and storage" explains Andreu Palou one of the research team. "Therefore, changes in the level of leptin receptor can be of great importance." Humans with morbid obesity have a low level of leptin receptor, as do male rats that have been fed a high-fat diet.

The researchers supplemented the diet of male neonatal rats with a physiological dose of leptin (similar to that found in breast milk) or water daily during the suckling period. After this period, animals were fed a normal diet or a high-fat diet until the age of 6 months.

Protein and messenger RNA levels of leptin receptor were reduced in control animals but were maintained in animals supplemented with leptin. This maintenance of leptin receptor levels was accompanied by increased expression of genes related to energy uptake, fatty acid oxidation and lipogenesis. The administration of leptin was also shown to ameliorate hepatic fat accumulation induced by a high-fat diet.

"This programming effect of leptin may contribute to [an] improved capacity to control body weight and avoid metabolic disturbances under dietary stressors, such as high-fat diet," says Palou.

The team hope their work can be used as a basis for further research on the use of leptin in the design of more appropriate infant formula and to identify optimum nutrition levels of leptin in maternal milk. "These aspects are of great relevance," says Palou, "given the increased



© iStockphoto

prevalence of obesity and associated health complications." The group are now working to identify biomarkers for leptin programming and obesity prevention.

Rachel Jones

Original article Priego, T. *et al.* Leptin intake during the suckling period improves the metabolic response of adipose tissue to a high-fat diet. *Int. J. Obes.* 34, 809–819 (2010)