

Nutritional control of intestinal lactase in the rat. I Duluc, M Galluser, JN Freund, F Raul (*INSERM U61, 3 avenue Molière, 67200 Strasbourg, France*)

Many variations occur in the expression of intestinal hydrolases at weaning. For instance, the specific activity of lactase-phlorizin hydrolase (LPH), the disaccharidase responsible for lactose hydrolysis, decreases during this period in the small intestine. In addition, we have shown that the longitudinal distribution of LPH mRNA is modified at weaning: this mRNA which is present up to the distal extremity of the small intestine in suckling rats, specifically disappears in the distal ileum at this stage, while it is maintained at a high level in the jejunum throughout adulthood (Freund *et al*, 1990).

In this study, we have investigated the role of factors in the intestinal lumen on the expression of lactase, firstly in suckling rats and secondly in adults. The suckling rats were submitted to a fasting period or to force-feeding with an artificial diet. Controls were permitted to suckle over the normal period of weaning. Adult rats were submitted to different surgical intestinal interventions (bypass, resection,

transposition of proximal or distal segments of the small intestine) and analyzed after an adaptation period of 1 or 2 months for all animals; cytoplasmic RNA was extracted from the proximal and distal segments of the small intestine and the LPH mRNA content was measured by hybridization with a specific cDNA. Lactase specific activity was determined in isolated brush border membranes.

The results showed that the administration of an adult-type diet caused a precocious decline in lactase activity throughout the small intestine and induced a modification in the longitudinal distribution of the LPH mRNA, namely a precocious decay of this transcript in the distal ileum. On the other hand, none of the experimental conditions tested in adults modified the genetic and enzymatic expression of lactase throughout the small intestine.

This suggests that nutritional factors might participate in the control of lactase expression at weaning, whereas such factors would not be essential for lactase expression in adults.

Reference

Freund JN, Duluc I, Raul F (1990) *Gastroenterology* 100, 388-394