

Weaning is a minor event for altered intestinal mucosa morphology and cell renewal in the sheep. D Attaix¹, JC Meslin² (¹ INRA, Métabolisme Azoté, Theix, 63122, Saint-Genès-Champanelle; ² INRA, Laboratoire de Nutrition et Sécurité Alimentaire, 78352 Jouy-en-Josas, Cedex France)

In most large domestic animal species like sheep and in humans, small intestinal crypt-villus differentiation and cell renewal occur very early *in utero* (Klein, 1989; Attaix and Meslin, 1991). By contrast, these events are only observed during the later stages of fetal growth in rodents, but are strongly altered during the weaning period. The effects of weaning on intestinal cell proliferation are unknown in large domestic animals. Therefore, we investigated changes in intestinal morphology and epithelial cell migration in 3 groups of 1-, 5- and 8-wk-old suckling lambs, and in a group of 8-wk-old weaned animals.

Eight to 10 lambs in each group received a single injection of [³H]-thymidine and were killed between 24 and 96 h thereafter. Animal breeding and diets were as previously described (Attaix *et al.*, 1989). Sample processing and autoradiographic techniques were as described by Attaix *et al.* (1984).

In suckling lambs, small intestinal morphology was significantly altered with age. Crypt depth increased, especially in the proximal intestine, whereas villus height decreased in the distal regions. At 8 wk of age weaned and pro-

longed suckling lambs exhibited no significant differences in crypt depth throughout the intestine. However, weaned lambs had shorter villi in the jejunum and ileum. The highest enterocyte migration rates (4.4–9.7 $\mu\text{m}/\text{h}$) were observed in 1-wk-old animals. In suckling lambs, migration rates decreased with age by 60, 51 and 11% in the duodenum, jejunum and ileum respectively. By contrast, weaned and prolonged-suckling 8-wk-old animals had a similar rate of enterocyte migration in the ileum; ruminating lambs exhibited only slightly higher migration rates in the duodenum and the jejunum (53 and 13% respectively).

These data are in striking contrast with all observations reported in rodents. They suggest that the weaning but not the suckling period in the sheep is a minor event for altered intestinal mucosal morphology and cell migration. Although obtained in a ruminant species, they may reflect events occurring in other species with early intestinal differentiation *in utero*.

References

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