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Species specifics in gastro-intestinal function

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A large number of investigators have been carried out in different species to elucidate the characteristics in gastro-intestinal functions. It is very interesting article to compare these characteristics in various species having different feeding behaviour. In this lecture, findings by mainly my own studies will be described about following three sections.

1. Postnatal developments in neonate and milk

The postnatal ontogeny of the mammalian gut is reflected in changes in milk composition and in the nutrient and nonnutrient requirements and growth rate of the newborn. One of the most characteristic developments in the gastro-intestinal tract is cessation of intestinal macromolecular transport (gut closure) which has an important role as an intestinal barrier. In this section, comparison of the gut closure in several animals and its mechanism will be discussed (Harada et al. 1992; Harada and Syuto 1993; Harada 1994).

2. Secretory response of pancreatic digestive enzymes

Pancreatic exocrine secretion is regulated by the autonomic nervous system and hormonal and humoral factors. Thomas (1950) has suggested that cephalic, gastric and intestinal phases all contribute to the total response of the exocrine pancreas to feeding. The importance of each phase has been documented in experiments on a few species.

This investigation was carried out to compare the pancreatic exocrine secretions induced

by vagal stimulation and endogenous and exogenous cholecystokinin under almost constant conditions in the several animals which have a different feeding behaviour (Harada et al. 1982).

3. Characteristics of pancreatic secretion in ruminant

The predominant factor regulating pancreatic exocrine secretion may differ among species and related to specific feeding behaviour (Harada et al. 1982). In the ruminant, short chain fatty acids (SCFA), which are major end products of microbial fermentation in the rumen, are potent stimulators of pancreatic endocrine (Manns et al. 1967) and exocrine secretions (Harada and Kato 1983). Comparison of pancreatic secretory response to SCFA in several species (Harada 1985), a physiological significance of SCFA as stimulator and secretory mechanism by SCFA will be described with our recent studies.

References

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