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**E-1. Effects of nutritional conditions on metabolic parameters and growth around weaning time in young calves**

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After birth, weaning time is the crucial period for neonates because of drastic changes in food quality. Nutritional conditions during the weaning time also affects digestive, hormonal and metabolic parameters, reflecting to animal performance in the future. We have investigated changes in growth hormone (GH) secretions in young calves when nutritional conditions are changed.

Milk feeding increased plasma GH levels in the pre-weaning ruminant, which is being declined with aging and was finally changed to be suppression when the microbial fermentation has been established in the rumen. This declining response with aging was observed even in the age-matched animals fed with milk alone. These findings indicate that aging as well as nutritional levels is one of factors that massively affect plasma GH levels.

Plasma concentrations of GH fluctuating in a pulse manner were decreased in response to feeding in the adult ruminant. This postprandial suppression in GH concentrations was mimicked by administration of short-chain fatty acids either in the rumen or in peripheral blood stream. These findings suggest that establishment of the ruminal microbial fermentation may diminish the secretory response of somatotrophs in the anterior pituitary gland.

In the adult ruminant, high nutritional foods (rich in energy or proteins) are known to accelerate the decrease in GH levels. In pre-weaning calves, however, feeding of starter with milk or double amounts of milk significantly increased body weight gain without suppressing GH levels. These findings indicate that intake of high nutritional foods accelerates body weight gain without causing suppression of plasma GH in pre-weaning calves.

From these results, we conclude that accelerate of the postprandial increase in plasma GH levels in milk-fed calves, which is dependent on nutritional conditions, seems to be advantageous, while quicker establishment of the ruminal microbial fermentation seems to be disadvantageous, for growth of the pre-weaning ruminant.