

Effects of Seasonality and Fasting on the Body Mass and Plasma Growth Hormone Concentrations of the Raccoon Dog (*Nyctereutes procyonoides*) and the Blue Fox (*Alopex lagopus*)

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Growth hormone (GH) promotes growth and endochondral ossification, but it is also important in the response to fasting due to its effects of increasing gluconeogenesis and lipolysis. In this study eleven raccoon dogs and blue foxes were followed for six months and their body mass and GH levels were measured. In November half of the animals of both species were put to a three-week fast. There were no significant differences in the GH levels between the animals of different ages and the subadults and adults both had quite low GH levels in the summer. Fasting had no effect on the GH levels of the raccoon dogs, but the fasting blue foxes had lower GH concentrations than the controls in Nov 16th. The control blue foxes experienced a significant increase in the GH levels in early November and the fasting blue foxes in late November. The GH concentrations of all the raccoon dogs rose in early December. As fasting did not cause an elevation in the GH levels but the concentrations increased with decreasing temperature and shortening daylength, the autumnal GH secretion of these species could be regulated by endogenous seasonal rhythms entrained by exogenous *Zeitgebers* such as temperature or photoperiod. The autumnal increase of GH levels contributes to the response to fasting as an adaptation to survive the winter months with inadequate nutrition. The raccoon dog which spends the coldest part of the winter in winter sleep seems to be better adapted to a total fast than the actively wintering blue fox.