

Neural pathways regulating feed intake in ruminants, impacts of disease and relationship to reproduction

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Regulation of appetite has its primary control within the central nervous system, primarily the hypothalamus and the brain stem. Within the hypothalamus, the neurotransmitters neuropeptide Y, agouti-related protein, orexin and melanin concentrating hormone represent the major appetite stimulating neurotransmitters while melanocyte-stimulating hormone represents the primary inhibitory molecule regulating appetite. Hormones and metabolites, as well as physicochemical factors in the gastrointestinal tract may modify the activity of these central appetite pathways. In addition to basic appetite control, these neurotransmitters and their receptor are impacted by disease to reduce appetite and increase metabolic rate. Hence these neurotransmitters or their receptors may represent opportunities for intervention in animals with cachexia. Moreover, some of the neural appetite control pathways and reproductive control pathways may have bidirectional effects to integrate reproduction with nutrient availability and metabolism.

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