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Muscle characteristics and corresponding hormone concentrations in different types of cattle

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Abstract

Ruminants transform feed components preferentially in body mass or milk. The accretion type of cattle are apt in accreting feed as meat and fat, while the secretion type of cattle secrete metabolised feed as milk. The objective of this study was to investigate the growth- and type-related differences in muscle fibers, adipocytes, and hormones in two metabolic types of cattle. Biopsy samples of *semitendinosus muscle* and blood were taken at 6, 8, 10, 13, and 16 months of age from 13 bulls of each metabolic type (Charolais—CH, German Holstein—H). Postnatal growth was characterized by a nearly 2-fold increase in muscle fiber area, while a constant fiber type frequency was observed. Differences in the growth potential between CH and H bulls were not only found in a higher daily weight gain or higher weight for CH cattle, but were also caused by stronger muscle fiber growth in that cattle type. The higher muscle growth potential of CH was accompanied by lower fat accretion and metabolically linked with lower plasma concentrations of insulin, glucagon, and leptin. The amount of subcutaneous adipose tissue was directly correlated with leptin in CH and with insulin and glucagon in H bulls.

Keywords : Metabolism; Hormone; Muscle; Growth; Cattle; Leptin