

Growth-related changes in dairy and meat cattle

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Dairy breeds (German Holstein) secrete metabolised feed in milk, whereas beef cattle (Charolais) accrete synthesized substances as meat. The objective of this study was to investigate the growth- and breed- related changes of muscle fibre, adipocyte and hormones. Ten bulls of each breed were raised. Muscle samples of semitendinosus muscle were taken by shot biopsy, blood samples from jugular vein at 180, 240, 300, 400, 500 days of life. The postnatal growth in cattle shows a nearly 2-fold increase of muscle fibre area from day 180 to 500. The fibre type frequency was unaffected by age. Between beef and dairy cattle we found differences in cross sectional area but not in muscle fibre type frequencies. Subcutaneous adipocyte size is influenced by breed. The plasma insulin concentration in German Holstein bulls is higher than in Charolais. After day 500 the increasing body fat amount leads to differences in the leptin concentration. In Glucagon the differences at day 240 and 400 were found to be higher in Holstein bulls. For the time of growth the higher insulin level plays no role concerning the muscle development in Holstein bulls, but the higher sensitivity to insulin in Charolais can explain the positive correlation between insulin/glucagon and mean muscle fibre cross section area. More investigation is needed to find the physiological basics of nutrient transformation.