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**CHANGES OF MUSCLE FIBRES AND FAT CELLS IN DIFFERENT CATTLE
BREEDS DURING GROWTH**

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Muscle fibres and fat cells from biopsy samples were examined to characterize the growth of muscle and fat tissue in live animals and to find out causal relations to meat quality and carcass composition.

Fifteen bulls each of White-Blue Belgian, German Angus, Galloway and Black Pied breeds were reared under the same conditions until 700 days of life. Biopsy samples of semiten-dinosus muscle were taken by the shot biopsy device DUMEG at the age of 140, 180, 240, 300, 400, 500, 600, 700 days, respectively. Muscle and subcutaneous fat samples were immediately frozen in liquid nitrogen and cut with a cryostat microtome. Sections were stained for fibre typing by proof of myosin adenosine triphosphatase activity after alkaline preincubation. The diameters of 500 muscle fibres and 200 fat cells per sample, respectively, were measured. The muscle fibre diameter increased from 140 to 700 days of age from about 50 μm to 90 μm . The increase was nearly linear, until 400 days of age. The four breeds were not significantly different. Consequently, the double muscle size of White-Blue Belgians must be attained by doubling the number of muscle fibres. The fat cell diameter increased markedly until about 400 days of age and afterwards stagnated. The fat cell growth of White-Blue Belgians was significantly lower as compared to the other breeds. This is consistent with the extreme low fat content of both muscle and carcass in this breed. Changes in muscle fibre diameter of different fibre types showed a similar trend during growth. The fast twitch fibres were greater at all stages of growth and in all breeds. The greatest differences between fast and slow twitch fibres were found in White-Blue Belgian. The comparison of muscle fibre type frequencies of four different breeds of cattle demonstrates that breeding for a high percentage of muscle changed the muscle fibre type frequencies. The Galloway (extensive breed) and the Black Pied (dairy breed) had a lower percentage of fast twitch fibres (approx. 70%) and the White-Blue Belgian (beef breed) had the highest percentage (approx. 80%). The muscle fibre type profile changed during growth. A newborn calf had approx. 40% fast twitch fibres. From about 400 days of age the percentage of fast twitch fibres slightly decreased again. The results suggest that muscle fibre and fat cell diameters and the transformation of fibre types are modified by breeding. The muscle fibre number in a skeletal muscle is the main factor for differences in the meat potential of cattle.