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Effect of long ageing time on beef quality of Aberdeen Angus

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Beef cattle farming have expanded rapidly over the last decade in Estonia. At the beginning of 2013, the number of beef cattle was 50,977, whereas Aberdeen Angus was the second largest (25 %) breed.

The structure of beef meat is generally tough, so it must be allowed to age between slaughter and cooking. Wet ageing of beef is relatively uncommon in Estonia. The objective of this work was to study the effect of longer ageing time on the quality of meat of the Aberdeen Angus breed reared in Estonia.

Six free-range beef bulls, aged 18 to 33 months, were slaughtered and dissected according to EU standards. Six m. teres major (MTM) and three m. longissimus dorsi (MLD) muscles were removed and vacuum packed to carry out the 60-day ageing process at –1 °C. Technological traits were analysed at 14, 28, 35 and 60 days, and chemical parameters at 14 days of ageing. To determine beef texture, an analyser with Warner-Bratzler shear blade was used. Samples were drilled with an 11 mm hollow borer, and boiled at inner temperature of 72–76 °C. Six samples from each muscle were selected to measure the shear force.

No differences were found between the moisture, ash and protein contents of the muscles, while intramuscular fat content ranged from 0.15 to 2.62 % in MTM and 0.87 to 1.62 % in MLD. Decline in pH was observed, whereas electroconductivity, ageing and boiling loss increased during ageing. The water binding capacity of both MTM and MLD showed opposite results.

The shear force energy until the cutting point of MTM fibres was 221.1–271.1 mJ. Even though the highest energy level was detected at 35 days, this value differed significantly ($p < 0.05$) from that observed at other days of ageing, which might have been due to the presence of facia in the samples. A similar fluctuation was observed in the breaking point of muscle fibres, where it was also the highest (38.5 N) at 35 days of

storing. Still, significantly lower force (29.6 N) was needed to break fibres at 60 days. No differences were found between 14 and 28 days of ageing, and also the shear force and the energy level did not differ at different days of ageing. The MLD muscle showed a clear trend towards tenderizing during ageing (139.1–80.4 mJ). The energy consumption value decreased at 35 days, while the shear force was significantly lower already at 28 days compared to 14 days of ageing (27.8 vs. 22.5 N). At 60 days, the shear force was 16.6 N. It can be concluded that ageing did not affected MTM muscle tenderness during 14 to 35 days of storing, and had only a modest effect at 60 days. However, ageing time had a significant effect on the tenderness of MLD. Therefore, to select an ageing time, the type of muscle shall be considered.