

Changes in proteins and tenderness of meat from young bulls of four breeds at three ages over 10 day

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Abstract :

The study aimed at analysing the changes taking place in the muscle tissue of cattle during meat cold storage in relation to animal genotype (breed) and age. Investigations were conducted on the thoracic and lumbar part of the longissimus dorsi (LD) muscle of Polish Holstein-Friesian (PHF) Black-and-White variety, Polish Red (PR), Hereford (H) and Limousine (L) bulls slaughtered at the age of 6, 9 and 12 months. Muscle analyses were carried out 45 min and 48, 96 and 240 h postslaughter, separating proteins with the assistance of SDS-PAGE (electrophoresis in polyacrylamide gel using SDS). To identify titin, desmin and troponin T (Tn-T), their antibodies and western blotting were employed. The breed occurred to be the key factor affecting proteins' changes in the muscle tissue. The process of protein degradation in PHF was similar to that found in H while in PR – to that occurring in L bulls, despite the genotype differences between them. The greatest differences in protein changes were found between the meat obtained from bulls at the age of 6 vs. 12 months. During meat cold storage, day 10 turned out to be critical with regard to the degradation of almost all proteins. The drop of the content of titin, desmin and Tn-T was observed, simultaneously with the increase in their degradation products. The highest myofibrillar protein degradation observed on day 10 of cold storage proves these changes.

Key Word :

beef, tenderness, myofibrillar proteins, proteolysis, SDS-PAGE, immunoblotting

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