

The effects of sex and slaughter weight on muscle fibre characteristics and physico-chemical properties of lamb longissimus thoracis muscle

Dorota Wojtysiak^{1,*}, Urszula Kaczor², Katarzyna Połtowicz³, Krzysztof Krzysztoforski⁴

¹ Department of Reproduction and Animal Anatomy, Agricultural University of Cracow, Poland, ² Department of Swine and Small Ruminant Breeding, Agricultural University of Cracow, Poland, ³ Department of Animal Genetics and Breeding, National Research Institute of Animal Production, Balice, Poland, ⁴ Department of Animal Products Technology, Agricultural University of Cracow, Poland

Abstract :

quality traits of longissimus thoracis (LT) muscle in lambs. Used were 22 female and 30 male lambs of Polish Longwool sheep from two slaughter weight groups: I – 15-20 kg and II – 25-30 kg. LT muscle samples were taken to categorize fibre types (I, IIA and IIB) according to their NADHtetrazolium reductase activity and to determine the pH₂₄, colour L*a*b*, drip loss, thermal loss, and Warner-Bratzler shear force of meat. Fibre type percentage, fibre diameter and phenotypic correlation between fibre traits and meat quality traits were estimated. Sex and slaughter weight had no effect on muscle fibre types percentage, but affected the diameter of fibres. Likewise, pH₂₄, drip loss and thermal loss were not affected by these two factors. On the other hand, in males compared to females and with increasing slaughter weight, meat lightness decreased, whereas shear force values and diameter of muscle fibres increased. The phenotypic correlations between histological and meat quality traits were generally low. The percentage of type I, unlike that of type IIB fibres, positively correlated with meat pH₂₄ and shear force, while negatively with meat lightness. Meat yellowness was positively related to percentage of type IIB fibres. A trend was found between redness and percentage of type I fibres. Moreover, increased diameter of type IIB fibres was found to be related to the increased shear force values.

Key Word :

body weight, lamb, meat quality, sex, muscle fibres

Volume 28, Number 1, - 2010