ON THE PURE MUSCULAR AND CONNECTIVE COMPONENTS PROPORTIONS IN PORK PRODUCED BY FOUR SWINE GENOTYPES

A.A. Casapu*, G.V. Hoha, B. Păsărin

"Ion Ionescu de la Brad" Iasi University of Life Sciences, Romania
**e-mail: casapualexandru27@gmail.com*

Abstract

Meat texture is a major determinant of consumer satisfaction, influenced by factors such as muscle structure, connective tissue, and intramuscular fat. It shapes perceptions of tenderness, juiciness, and overall quality. Histological analysis-microscopic evaluation of muscle fibers, fascicles, and connective tissue-is used to assess meat quality and verify authenticity. Texture is affected by genetics, age, feeding, pre-slaughter handling, anatomical location, and post-slaughter processes such as aging and cooking. The study aimed to determine how genetic origin affects the histological structure and, subsequently, the texture of pork in three economically valuable cuts: Loin (Longissimus dorsi), Sirloin (Psoas major), Ham (Semimembranosus). Four pig genetic groups were tested: L – Landrace (control); LD – Landrace × Duroc; LY – Landrace × Yorkshire; LDY – Landrace × Duroc × Yorkshire. Muscle samples were collected from 10 carcasses per group (after 48 h chilling) and processed using a standard paraffin embedding histological protocol. Microscopy measurements included: myocyte (muscle fiber) diameter, circumference, area, 1st-order muscle fascicle area, proportion of muscle tissue vs. connective stroma. Genetic origin significantly ($p<0.001$) influences muscle histology and thus meat quality. Across all three cuts, the LDY and LY (Landrace × Yorkshire) groups consistently showed higher muscle fiber density, lower connective tissue content, more favorable muscle: connective tissue ratios. LD produced thick muscle fibers and larger fascicles but not necessarily optimal tenderness due to higher connective tissue. Pure Landrace (L) showed the least favorable tissue profile: highest connective stroma and lowest muscle proportion. Therefore, among the tested variants, the best overall genetic options for high-quality pork are the LDY and LY hybrids, based on their optimized histological structure for consumer-preferred tenderness, juiciness, and processing efficiency.

Key words: *meat structure, pure muscular tissue, connective stroma, Landrace, Duroc, Yorkshire*