Genotype × environment interactions for fatty acid profiles in Bos indicus and Bos taurus finished on pasture or grain


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ABSTRACT: A study was conducted to characterize lipid profiles in the M. longissimus thoracis of commercial Brazilian beef and to assess how these profiles are influenced by finishing system, genetic group, and their interaction. Intramuscular fat (IMF) and fatty acid (FA) profiles were determined in 160 bulls of the Bos taurus (n = 75) and Bos indicus (n = 85) genetic groups, finished on pasture (n = 46) or with grain supplementation (n = 114) and slaughtered in a commercial abattoir. Finishing system had a major impact on the deposition of IMF, as well as on the concentration of SFA, PUFA, and their ratio, but genetic groups showed important differences in the ability to convert SFA into cis-9 MUFA and to convert 16:0 into 18:0. When compared with pasture-finished animals, those finished with grain had greater content of IMF and SFA (P < 0.01), similar amounts of MUFA (P > 0.05), and about one-half the amount of PUFA (P < 0.01). Except for MUFA, differences in FA profiles among finishing systems were mostly mediated through their effect on IMF, even though the relationship of IMF with groups of FA differed among finishing systems. Under grain finishing, B. taurus had less SFA and greater MUFA than B. indicus (P < 0.01), but no differences were observed in PUFA (P > 0.05). With pasture-finishing, no differences were observed among the 2 genetic groups in SFA and MUFA (P > 0.05), but PUFA were decreased in B. taurus (P < 0.01). When genetic groups were compared in grain-finishing, B. taurus had a decreased ability for elongation and B. indicus had a decreased aptitude for desaturation of FA. On the other hand, with pasture-finishing a greater deposition of intermediate FA from ruminal bihydrogenation was observed in B. indicus than in B. taurus. Overall, FA profiles were affected more by finishing system in B. indicus than in B. taurus.

Key words: beef cattle, fatty acid, finishing system, genetic group, genotype-environment interaction


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