

Comparison of the quality of beef from Polish Red cattle and selected beef breeds for the purpose of raising consumer awareness

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Summary

Scientists have long drawn attention to the impact of diet on health. Our daily food choices have a huge impact not only on human health but also on the environment and climate change. The production of animal protein in particular is highly resource-intensive. To ensure global food security, protein sources contributing less to environmental degradation are needed. With regard to beef, a production model ensuring more sustainable production should be implemented and promoted. The study compared selected quality parameters of beef from beef cattle breeds with varying production potential, i.e. the indigenous breed Polish Red, considered to be autochthonous, and high-production beef breeds commonly used in Poland: Limousin, Hereford, Angus and Charolais. The animals were kept in a sustainable, free-range production system, which involved keeping them year-round in pastures, while in winter a bale grazing system was used, in which the animals received hay, straw from various types of cereals, and/or haylage. The aim of the study was to determine the effect of free-range cattle farming and a bale feeding system on the content of intramuscular fat and the fatty acid profile of the longissimus dorsi muscle in beef steaks from five breeds. Two feeding models were compared. The first was based solely on year-round rotational grazing, and in winter the animals had access to straw. The second was based on the bale grazing system, i.e. the animals remained in the pasture year-round, and in winter they additionally received bales of hay or haylage supplemented with a small amount of concentrate feed. Each group consisted of five animals. Charolais steaks had the highest intramuscular fat content, and Limousin steaks had the lowest. A higher content ($P \geq 0.05$) of essential fatty acids (EFA) was found in beef from year-round pasture farming. The n-6/n-3 fatty acid ratio in the muscle tissue ranged from 1.2 to 1.5. The introduction of bale grazing increased the n-6/n-3 ratio and reduced the total EFA content in the muscle tissue. There were no differences in the lipid profile of beef steaks between feeding models, except for the CLA level, which was higher in the case of traditional grazing, especially in Polish Red and Angus cattle. This work is a compilation of the results of the authors' own research and original studies on the composition of beef and the health benefits of its consumption, in the context of the expectations of informed consumers.

KEY WORDS: cattle, beef, quality parameters, bale feeding system