

Housing system and meat quality in organic Podolian young bulls

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ABSTRACT

Consumer awareness of food safety issues and environmental concerns have mostly increased. Extensive rearing systems can meet most of consumers' requirements. These systems minimise the use of chemicals and provide animals a natural production environment, with a sustainable use of natural ecosystems. In addition, finishing beef cattle on pasture, with an appropriate supplementation, could provide a cost effective alternative to finishing in confinement on diets mainly based on grain for producers located in grain-deficient regions such as southern Italy. The present study aimed to assess the influence of housing system (confined and free-range) on colour (L^* , a^* , b^*), water holding capacity (centrifugation, thawing and cooking losses) and sensory properties of meat from Podolian young bulls. The experiment was conducted from March to July 2007 in an organic farm located in Basilicata (southern Italy) at 338 m a.s.l. Twelve Podolian subjects, aged about 10 months at the start of the experiment (310.54 ± 18.76 kg of average live weight), were divided in two groups: confined and free-ranging. Free-ranging animals were allowed to graze on a natural fenced pasture (18 ha of grassland, 2 ha of shrub vegetation) until slaughter (14 months of age). They were supplemented with 3-4 kg of mixed flour containing 33% of oat, 33% of barley, 33% of field bean (*Vicia faba minor*), 1% of mineral mix. Confined subjects were kept in straw-bedded barn provided with an ample outdoor paddock and received 8 kg of the same flour and straw *ad libitum*. Animals were slaughtered at 14 months of age. Vacuum packaged loin from each right side were aged for 8 days at 4°C and evaluated by a trained taste panel. Although confined animals showed higher final weights (458.17 ± 19.83 vs. 433.33 ± 19.83 kg, respectively), average daily gains (1.17 ± 0.06 vs. 1.07 ± 0.06 kg, respectively) and carcass yields (56.22 ± 2.58 vs. 54.35 ± 2.58 %, respectively) than free-ranging subjects, differences were not significant. Colour was significantly ($P < 0.001$) affected by housing system with higher L^* (35.14 ± 0.47 vs. 32.79 ± 0.47) and b^* (3.22 ± 0.19 vs. 1.45 ± 0.19) for meat from confined animals. Meat from beef cattle kept on pasture is often darker than beef finished indoors as a possible consequence of the greater exercise/activity of grazing animals. Water holding capacity was higher in meat from confined subjects as centrifugation (12.65 ± 0.83 vs. 21.68 ± 0.83 %) and thawing losses (1.42 ± 0.32 vs. 2.80 ± 0.32 %) were lower in their meat as compared with free-ranging animals ($P < 0.01$). Odour ($P < 0.05$), flavour ($P < 0.05$) and salted intensity ($P < 0.001$) were higher in meat from confined subjects. Flavour of red meat is highly dependent on diet and high-energy grains may determine an intense flavour than grass-based diets. However, meat from free-ranging young bulls was more tender than meat produced by confined animals (67.79 ± 2.00 vs. 61.48 ± 1.85 , $P < 0.05$). Although confined animals showed higher productive performances and meat quality, our results also indicate that marginal areas may be conveniently used for the production of organic beef with an adequate feeding supplementation programme.

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