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Carcass and meat characteristics of mixed-breed cull heifers fed diets with different sources of non-protein nitrogen in feedlots

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Little information is available in the literature on carcass and meat characteristics of beef heifers. The objective was to evaluate the effect of genetic group (GG) and non-protein nitrogen (NPN) sources added to the total ration on the carcass and meat characteristics of cull heifers finished in confinement. The meat used was from 40 females, 20 ½ Angus ½ Nellore (A×N) and 20 ½ Charolais ½ Nellore (C×N), with an average initial weight of 374.23 ± 55 kg and age of 24.0 ± 2 months. The diets evaluated had the same protein and energy levels, but different sources of NPN. The first diet contained a combination of livestock urea and protected urea (LPU), while the second diet contained only extruded urea (EU). After 102 days of confinement, the heifers were weighed and sent to slaughter. Hot carcass weight (HCW), carcass yield (CY), carcass pH, conformation, fat distribution, subcutaneous fat thickness (SFT) and rib eye area (LEA) were measured on the carcass. A sample of the Longissimus muscle was used to determine moisture, crude protein, mineral matter and ethereal extract. Myofibrillar fragmentation index, cholesterol, collagen, meat pH and color, lipid oxidation, cooking losses, shear force (SF) and fatty acid (FA) profile of fat and meat were also determined. The data were analyzed in a 2×2 factorial scheme, two diets and two genetic groups, and subjected to analysis of variance and Tukey's test at 5%. There was no significant interaction between GG and diet for carcass variables and meat composition. The A×N heifers showed higher final weight, HCW, SFT and better fat distribution. Likewise, a higher concentration of EE and lower SF were observed in the meat of A×N heifers. There was a significant interaction for the proportion of saturated FA (SFA), with a higher average in the meat of A×N heifers on the LPU diet, with no significant difference for the GG. There was no effect of GG or diet on the proportions of monounsaturated FA (MUFA, 46.6%), polyunsaturated FA (PUFA, 4.0%), the PUFA/SFA ratio (0.08) and the amount of n-3 (1.3) in the Longissimus muscle. Meat from A×N heifers fed the EU diet had a higher amount of n-6 (∑n-6). The n-6/n-3 ratio was higher in meat from C×N heifers fed the EU diet. Regarding the fat fatty acid profile, there was an interaction between GG and diet only for ∑n-3. The fat from A×N heifers showed a higher proportion of SFA (49.1%), while in the fat from C×N heifers, a higher proportion of MUFA (52.4%) was observed. The ∑n-6 was higher in the EU diet, and there was no effect of GG or diet on the proportion of PUFA and on the PUFA/SFA and n-6/n3 ratios in fat. The A×N heifers have better carcass characteristics, softer meat and higher lipid content than C×N heifers. The C×N heifers have a lower concentration of SFA in meat and fat, which provides a better fatty acid profile for this genetic group.

Keywords: collagen, fatty acid profile, genetic group, meat, urea.

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