Effects of Total Mixed Ration pH on Carcass Characteristics, Subprimal Yields and Fatty Acid Composition when Fed to Brahman or Holstein Cross Steers

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Objectives

The objective of this study was to determine the effects of total mixed ration (TMR) pH on carcass characteristics and fatty acid profiles when fed to Brahman cross (BC) or Holstein cross (HC) steers.

Materials and Methods

Eighteen steers (6 Brahman × Thai native and 12 Holstein × Zebu) were blocked by breed and stratified by weight before being randomly assigned 1 of 3 treatment diets, fed individually ad libitum including: fresh grass mixed-TMR (GTMR; pH 4.70 to 4.99), grass silage mixed-TMR (STMR; pH 4.00 to 4.40), and fermented-TMR (FTMR; pH 3.5 to 3.87). After 460 d all steers were slaughtered after a 24 h fast. During slaughter offal items were weighed to determine if breed or diet impacted visceral weight. After 7-d post-mortem carcasses were separated at the 12th to 13th rib for collection of ribeye area (REA), fat thickness, marbling score, objective color, or cook loss and Warner-Bratzler shear force (WBSF). However, BC had greater HCW, DP, REA, and WBSF than HC (P < 0.05). Marbling scores were greater (P < 0.05) for steers fed STMR and FTMR than GTMR, otherwise diet did not impact carcass traits (P > 0.05). Non-carcass components were a greater percentage of live weight for HC than BC. There was a breed by diet interaction (P < 0.05) for subprimal cuts of the macreuse (clod), knuckle, and bottom round (P < 0.05). Brahman cross steers had a greater percentage of weight in the chuck, sirloin, strip loin, and bottom round (P < 0.05); however, HC had a greater percentage of weight in the macreuse, knuckle, nerveux (heel), and bone (P < 0.05). There was no breed by diet interaction or main effects for chemical composition except percent fat where FTMR > STMR > GTMR (P < 0.01). For fatty acids there was no difference in total SFA or n6:n3 (P > 0.10), however, there were breed by diet interactions (P < 0.01) for total PUFA, n-6, n-3 and PUFA:SFA where LT from BC fed GTMR had greater percentages than all other treatment combinations.

Conclusion

Rations consisting of STMR and FTMR may be utilized to increase marbling and maximize tenderness for finishing Holstein cross steers, while feeding GTMR to Brahman cross steers could be an appropriate method for producing lean beef with a greater percentage of polyunsaturated fatty acids.