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Fatty Acid Composition of Honduran Beef from Various Finishing Diets

H. R. Voegele*, N. C. Hardcastle, J. F. Legako, A. J. Garmyn, M. M. Brashears, and M. F. Miller

Animal Science- Meat Science, Texas Tech University, Lubbock, TX, 79409, USA
*Corresponding author. Email: hope_v2010@yahoo.com (H. R. Voegele)

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Objectives

The objective of this study was to evaluate the impact of experimental finishing diets on meat quality of Honduran beef, specifically focusing on fatty acid composition.

Materials and Methods

A total of 275 Honduran *Bos indicus* cross-bred bulls were fed 1 of 7 finishing diets: grass finished (CON), dry distillers grain (DDG), palm kernel meal (PKM), palm kernel meal replicate (PKMR), sorghum (SORG), soybean meal and corn (SBMC), or sugarcane (SC). After harvest, 15 strip loins were selected randomly within each treatment ($n = 105$) and aged for 21 d prior to freezing. During fabrication, all external fat was removed as the most anterior steak of each strip loin was retained for fatty acid analysis.

Results

Significant differences were found in the dodecanoic fatty acid ($P < 0.01$). Dodecanoic acid was prevalent in the DDG, PKM, PKMR, SC, and SBMC diets and was found in lower quantities in the SORG and CON diets ($P < 0.05$). Differences were observed in 2 of the 18 carbon fatty acids: linoleic acid and linolenic acid methyl ester. Linoleic acid displayed a greater concentration in the DDG diet ($P < 0.05$). This indicates that DDGs will increase linoleic concentrations in beef. Linolenic acid methyl ester was found in greater amounts in both the CON and SORG diets, with no differences in the amount found in the PKM, PKMR, SC, or SBMC diets. The DDG had less linoleic acid ($P < 0.01$). Significant differences were also found in the C20 fatty acid ($P < 0.01$). Eicosadienoic acid displayed the greatest concentration within the DDG diet and the least amount in the CON diet with all diets displaying intermediate amounts. Similarly, the DDG diet showed the greatest amount of arachidonic acid compared to all other treatments ($P < 0.05$). Additionally, differences were observed in the dihomo-γ-linolenic fatty acid in which, both SORG and CON diets displayed the greatest amount; while SC, SBMC, PKM, and PKMR showed intermediate amounts and DDG had lower concentrations ($P < 0.05$). Cumulative unsaturated fatty acids (UFA) and monounsaturated fatty acids (MUFA) were greater ($P < 0.05$) in PKM, PKMR and DDG compared with all other treatments. Additionally, differences were detected with the SFA content ($P < 0.05$). The PKM and PKMR had the greatest amount of SFA (41.63 and 34.72 mg/1g, respectively), while the DDG, SC, SBMC and SORG diets (30.28, 26.78, 24.54, and 17.94 mg/1g, respectively) had intermediate SFA values that were not statistically different. Therefore, the lowest SFA content was obtained within the CON diet (13.07 mg/1g). No differences were observed in the amounts of PUFA content across dietary treatments ($p = 0.28$).

Conclusion

Results of this study indicate grain and various by-products in the finishing diet can alter fatty acid profiles of beef compared to beef from grass-finished cattle.Specifically, this study showed a greater amount of unsaturated and saturated fatty acids, in addition to greater amounts of MUFA content in beef where diets included grain or by-products.

