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Comparison of Nutrient Composition, Quality, and Sensory Differences among Dorper, Domestic Commercial Crossbred and Australian Commercial Crossbred Lamb Meat

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Objectives

The Dorper sheep breed is gaining popularity in the U.S. because of the general perception that Dorper breed produces lamb meat with greater tenderness, milder flavor, and greater consumer preference in comparison to the wool sheep breeds. However, limited research has been conducted to characterize the genetic effects on lamb meat quality and comparative information on the Dorper sheep breed. Thus, the objective of this study was to compare the nutritional, quality, and sensory attributes among Dorper sheep breed, domestic commercial crossbred (DCC) and Australian crossbred lamb meat.

Materials and Methods

A total of 60 untrimmed lamb saddles (NAMP #231) from 3 treatments (Dorper, n = 20; DCC, n = 20; and Australian, n = 20) were purchased from commercial packing plants and warehouses. Lamb saddles from all treatments were aged in cooler (2°C) according to their production dates to achieve an aging time between 29 and 32 d. All aged saddles were frozen (–20°C) until sample preparation. On the sample preparation day, each saddle was cut on a bandsaw to 2.54 cm chops, deboned and trimmed to 0.30 cm subcutaneous fat. The chops were used to measure pH, objective color (L*, a*, and b*), objective tenderness [Warner-Bratzler Shear Force (WBSF)], cook loss (differences in weight between raw and cooked samples) and nutrient analysis (moisture, protein, fat, ash, carbohydrate, and calories). A consumer panel of 120 untrained participants was used to evaluate tenderness, flavor, juiciness, and overall acceptance using a 9-point hedonic scale (1 = Dislike extremely and 9 = Like extremely). A trained panel with 6 trained panelists was used to evaluate flavor intensity, tenderness, and off-flavor intensity using an unstructured line scale anchored at both ends (0 = absence or low intensity of specified attribute, 100 = extreme intensity of specified flavor attribute).

Results

The DCC lamb meat had lower ($P < 0.05$) pH, carbohydrate content and off-flavor intensity compared to Australian and Dorper lamb meat. The DCC lamb meat was also rated with more flavor acceptability ($P < 0.05$) compared to Dorper lamb meat by untrained panelists, while Australian lamb meat was rated similar ($P > 0.05$) in flavor acceptability compared to DCC and Dorper lamb meat. Untrained panelists preferred ($P < 0.05$) the tenderness of Australian lamb, which was also rated with greater ($P < 0.05$) tenderness by trained panelists compared to Dorper lamb. Finally, Dorper lamb meat had greater ($P < 0.05$) WBSF value and was rated with the lowest ($P < 0.05$) rating in overall acceptance by the untrained panelists compared to Australian and DCC lamb meat. No differences ($P > 0.05$) were found for L*, a*, b*, cook loss, moisture, fat, ash, calories, juiciness and flavor intensity among the treatments.

Conclusion

These results indicated that there are apparent meat quality differences among the 3 lamb meat sources. Overall, consumers preferred DCC lamb meat compared to Dorper and Australian lamb meat. However, factors such as specific genetic makeups, age, and diets were not accounted in this research. Additional research with a more controlled environment is needed to shed light on the true palatability traits of Dorper lamb meat.

