

Carcass Traits and Palatability of Barbados Sheep and Spanish Goats Raised Under Feedlot Conditions

S. A. Williams

P. A. Will*

P. R. Weyerts

Sul Ross State University, Box C-110, Alpine TX 79832

ABSTRACT

Data from 72 adult females consisting of 36 Barbados ewes and 36 Spanish goat nannies with their offspring were used to determine carcass traits, dressing weights, shear force values and eating quality of the two species. An analysis of variance for carcass weights, dressed weights, shear force values, uncooked weights, cooked weights, and weight loss showed no significant differences ($P > 0.05$) between weights of Barbados lambs and Spanish kids. In sensory evaluation of the Barbados sheep and the Spanish goats, the seven sensory panelists evaluated both meat of the lambs and kids as acceptable. Panelists were unable to tell the difference between the meat of the two species. Shear force values did not differ significantly between species. Therefore, this study suggests that Barbados lamb may be interchangeable with Spanish goat meat (of similar maturity and weight) with regard to palatability attributes.

KEY WORDS: sensory evaluation, lamb, kid, *Ovis corsican*, *Capra hircus*

Barbados sheep (*Ovis corsican*) originated in West Africa and were introduced to the Island of Barbados well over 300 years ago (Mason, 1980). This breed of sheep was introduced to the United States by the USDA in 1904 (Shelton, 1979). The Barbados sheep of the United States have many of the characteristics of the breed on the Island of Barbados, but differ in that the rams of the U.S. strain generally are horned, vary more in color pattern, and individual sheep have some wool (Levene and Spurlock, 1983). This breed of sheep retains at least some of the year-round breeding tendency of the original strain.

Barbados sheep are raised on many ranches in western Texas for three reasons: 1) meat--the flavor of the meat is similar to that of Spanish goat; 2) hunting--rams have large horns which make the head a trophy for hunters; and 3) novelty--Barbados is a non-wool producing breed with an exotic appearance (Shelton, 1979).

The Spanish goat (*Capra hircus*) is referred to as the "roughneck" of the domestic breeds. This breed of goat in the American Southwest is considered a mixed breed and is kept mainly for meat production. The Spanish goat breed is derived from the Granada, Murcia, and Malaga breeds of Spain (Ensminger and Parker, 1984). Due to this origin they are highly variable in appearance. Colors range from solid black, black and white, solid brown, to brown and white in a variety of patterns. Most males and females are horned.

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The ability of the Spanish goat to exist largely upon brush and yet yield acceptable quantities of edible meat is unparalleled among domestic farm animals (Dollahite, 1972). There is little classification or grading of live goat or goat carcass. The animal typically is sold by the head without regard to size, sex or condition.

MATERIALS AND METHODS

Barbados lambs and Spanish goat kids were produced and raised in a feedlot system. All lambs and kids were fed a complete feed containing 16% protein, with supplemental alfalfa hay daily. From 66 lambs and kids produced in this system, 18 were selected for slaughter and further analysis. The selection process was based on weight (24.0 to 85 lbs.) and age (44 to 185 days). For slaughter the range was narrowed (48 to 70 lbs.) to reduce variation in size.

Nine Barbados lambs and nine Spanish goat kids were slaughtered at the Sul Ross State University Meat Laboratory following conventional procedures. Hot carcass weights were obtained by rail scale. Carcasses were chilled at 38 °F for 24 hours postmortem. The carcasses were removed from the cooler and weights were obtained using electronic scales. *Longissimus dorsi* (LD) muscles were removed from the carcasses from the 6th to the 12th rib. The posterior portion of the loin was designated for sensory. Shear force analysis was obtained from the anterior of the loin. The *psaos major* (PM) muscles also were removed. The remaining portion of the loin was used for sensory evaluation. The LD and PM were placed in individual freezer bags, frozen at 6 °F, and stored for subsequent analysis.

For shear force testing the anterior 3.5 inch portion of the loin was removed from the freezer and thawed for about 24 hours at 38 °F. The conventional oven was preheated to 350 °F. Internal temperatures of the LD muscles were taken using a meat thermometer. The LD muscles were cooked fat side up until reaching 120 °F, then turned and cooked until reaching a final temperature of 150 °F. Cooking loss was determined after the LD cooled for 15 minutes. The LD portions were placed in the cooler at 38 °F for 24 hours, then removed from the cooler and cut into 1 inch steaks. Two cores (1.3 cm diameter) were removed from each steak and shear analyses were done (two analyses per core) using the Warner-Bratzler shear.

For the sensory evaluation, similar thawing, cooking and holding procedures were followed as for shear force evaluation. The sensory evaluation was composed of seven panelists who evaluated the Barbados lambs and Spanish goat LD and PM muscles. The panelists indicated whether or not they could distinguish a difference between lamb and goat meat samples, and judged the acceptability of the samples. The rating system was based on overall juiciness, and tenderness: 1. Highly unacceptable, 2. Unacceptable, 3. Slightly unacceptable, 4. Slightly acceptable, 5. Acceptable, and 6. Highly acceptable.

RESULTS AND DISCUSSION

Presented in Table 1 are the means and standard deviations for: carcass and dressed carcass weight, uncooked, cooked, weight loss for shear and sensory evaluation and shear force values. Analysis of this data revealed no significant difference ($P > 0.05$) between Barbados lambs and Spanish kids for any traits.

Table 1. Means and standard deviations (SD) of carcass weights and shear force values (Kg) for Barbados lambs and Spanish kids. None of the differences between species was significant ($P > 0.05$).

Traits	BARBADOS LAMBS (n=9)		SPANISH KIDS (n=9)	
	Mean	SD	Mean	SD
Live Weight	24.96	3.03	25.97	3.32
Hot Carcass Weight	11.99	1.28	12.41	1.69
Weight Loss	12.91	1.94	13.52	1.82
Cold Carcass Weight	11.28	1.19	11.68	1.68
Total Weight Loss	13.62	1.93	14.22	1.66
Shear % Cooking Yield	75.00	0.33	72.70	0.40
Sensory % Cooking Yield	60.20	0.50	59.70	0.50
Shear Force Values	9.98	4.08	11.89	5.26

The sensory traits of the LD and the PM muscles of the Barbados lambs and Spanish kids were evaluated as acceptable (data not shown). In 52% of evaluations, panelists could not tell the difference between lamb and kid meat.

CONCLUSION

Both Barbados lamb meat and Spanish kid meat were evaluated as acceptable in sensory traits. Slightly more than one-half of the panelists could not detect a difference in the two meats. The shear force values of the Barbados lamb and the Spanish kids showed no significant differences. The data indicated that Barbados lamb meat may be interchangeable with Spanish goat meat (of the same approximate maturity and weight) with regard to palatability attributes.

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