Evaluation of terminal sire breeds in hair sheep production systems

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Goal:
Develop crossbreeding systems which will improve lamb performance and market acceptability, without sacrificing the fitness traits of parasite resistance and forage adaptability.

Methods:
Breeding Program/Animal Management
The existing flock of 100 Katahdin ewes at the Southwest AREC was utilized. The ewe flock was randomly assigned to three breeding groups of ~30 ewes each. One-third of the flock was mated to Katahdin, Texel or Suffolk rams. Katahdin rams which are owned by the SWAREC were used to generate the purebred hair lambs (controls) and use of these existing genetics will maintain genetic ties to previous work at the station. Suffolk rams originated from the Virginia Tech Sheep Center on campus. Texel rams were purchased from industry sources. Ewes were mated in the fall to lamb in March. Ewes were randomly assigned to a pasture group or dry lot group after lambing. The lambs maintained in the dry lot went to West Virginia University after weaning and were fed in an expanded metal floor facility free of parasites.

Measurement of Lamb Performance
At both locations, data was collected on number of lambs born, birth weight, lambing difficulty, and lamb survival for comparison between sire breeds. Lambs remained on the ewe until weaning, and therefore were exposed to internal parasites through natural infection. Lamb growth was measured at weaning (60 d age).

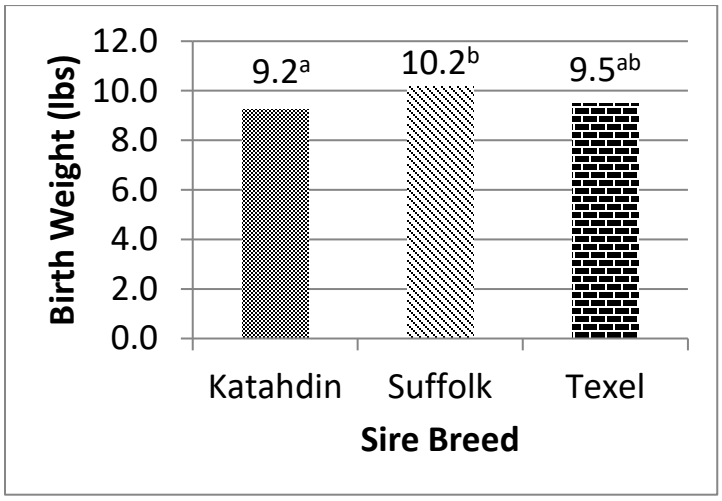
Post-weaning lambs were moved to clean pastures (not grazed by sheep during current grazing season). Lambs received supplemental feed (75% TDN, 13% CP) at a rate of 2.0% of body weight daily. Body weights and parasitism assessment (FEC/PCV/FAMANCHA) were conducted at 14 d intervals. Lambs were dewormed as necessary. Lambs will be grown post-weaning to a target body weight of 110 lbs.

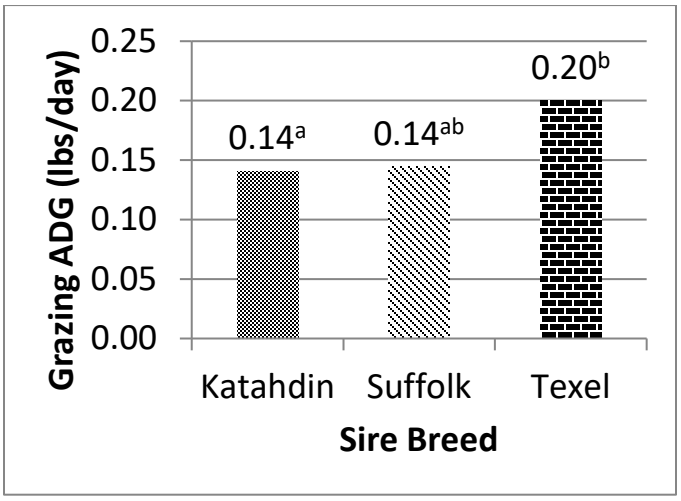
At WVU, lambs were given a primary challenge of *H. contortus* parasite larvae, and FEC response measured for 5 weeks. After deworming and a short rest period, these same lambs were administered a second *H. contortus* challenge and response measured for an additional 5 weeks. Body weight and FEC measurements were recorded throughout the period.

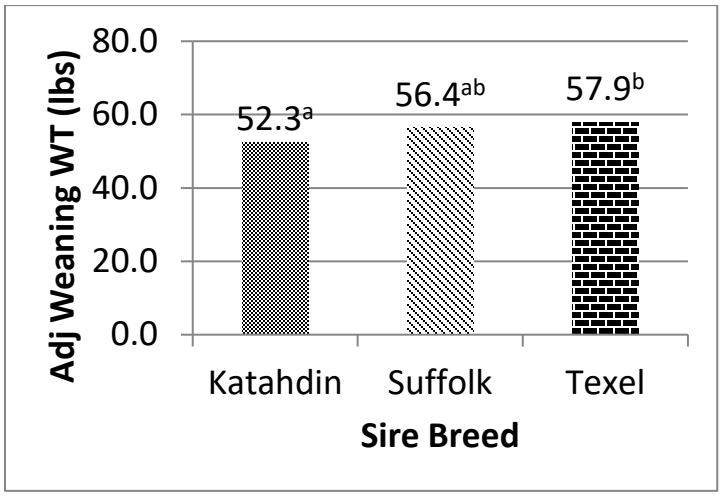
Upon reaching a final market weight a subsample of six lambs per breed group will be harvested at the Virginia Tech Meat Center for determination of carcass merit.

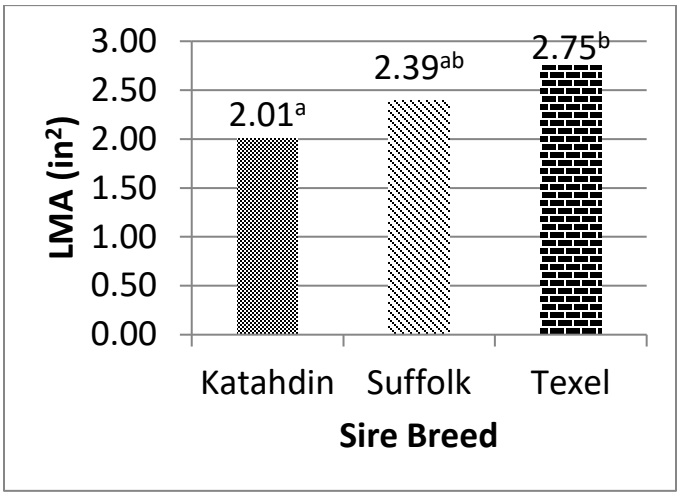
Collaboration with WVU on this project provides a unique opportunity to quantify differences in parasite tolerance among the sire breeds using both controlled and natural-infection research protocols which may subsequently be compared to better understand the biology of parasite resistance.

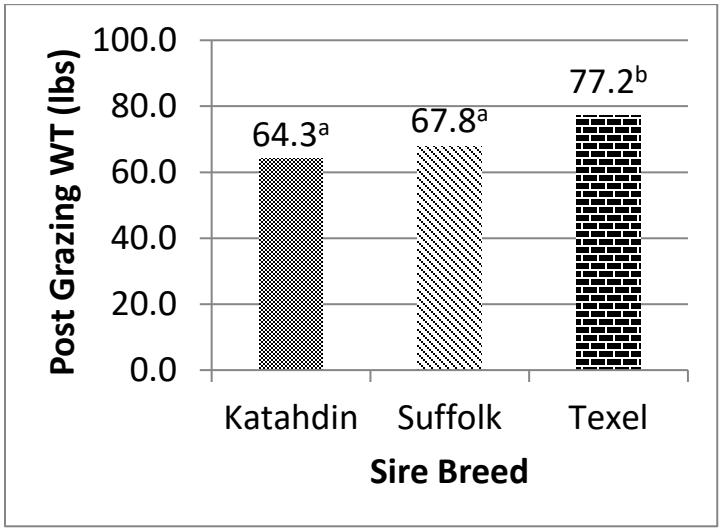
2015 Summary

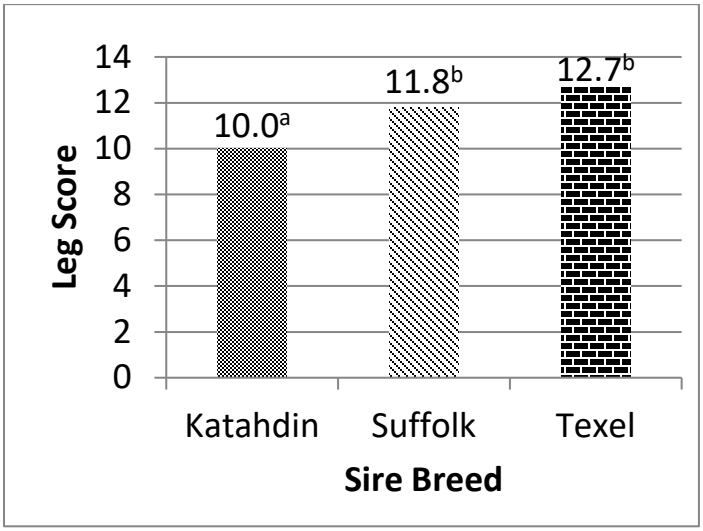




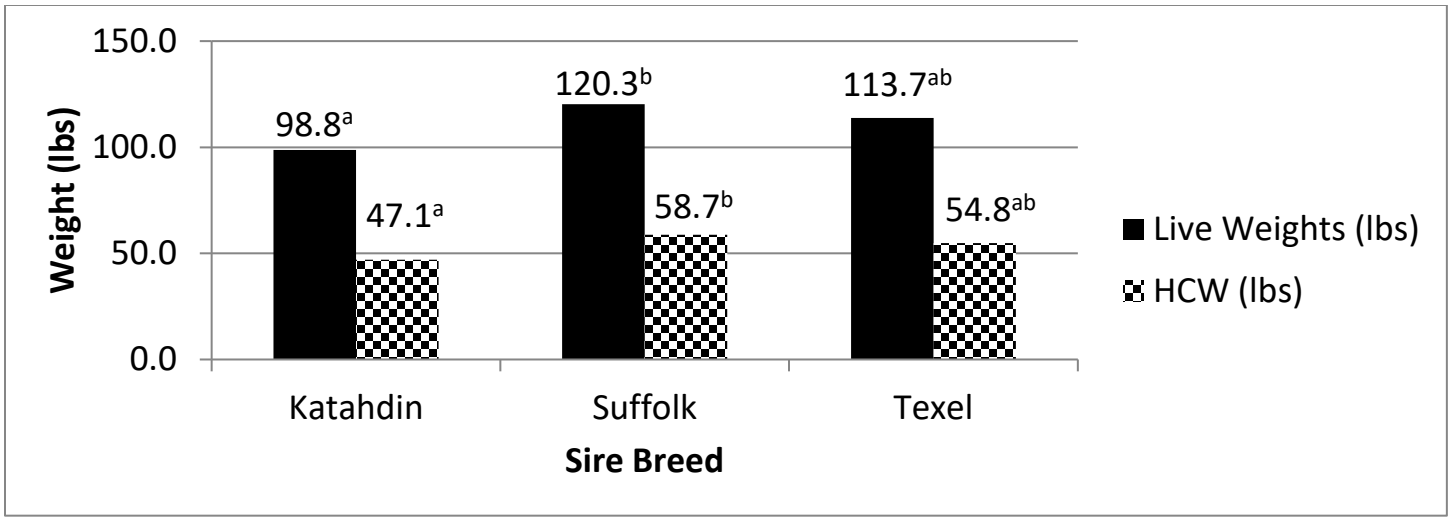


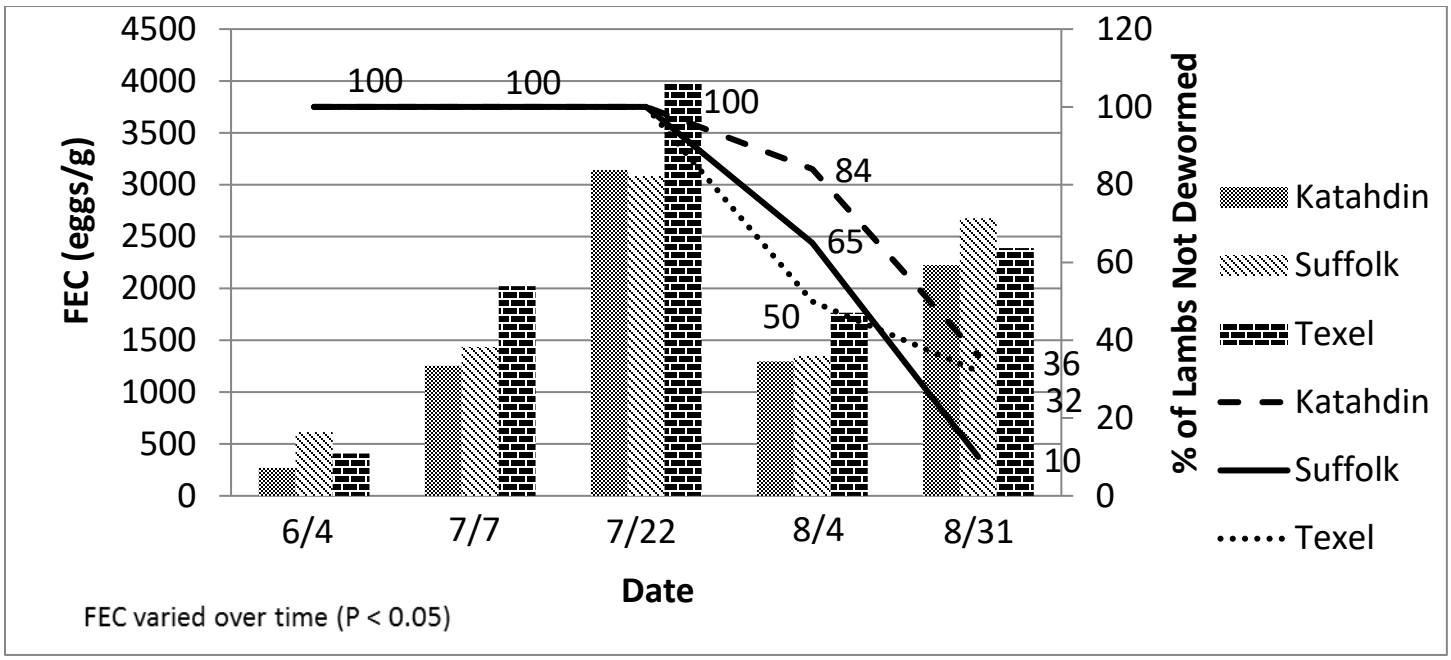




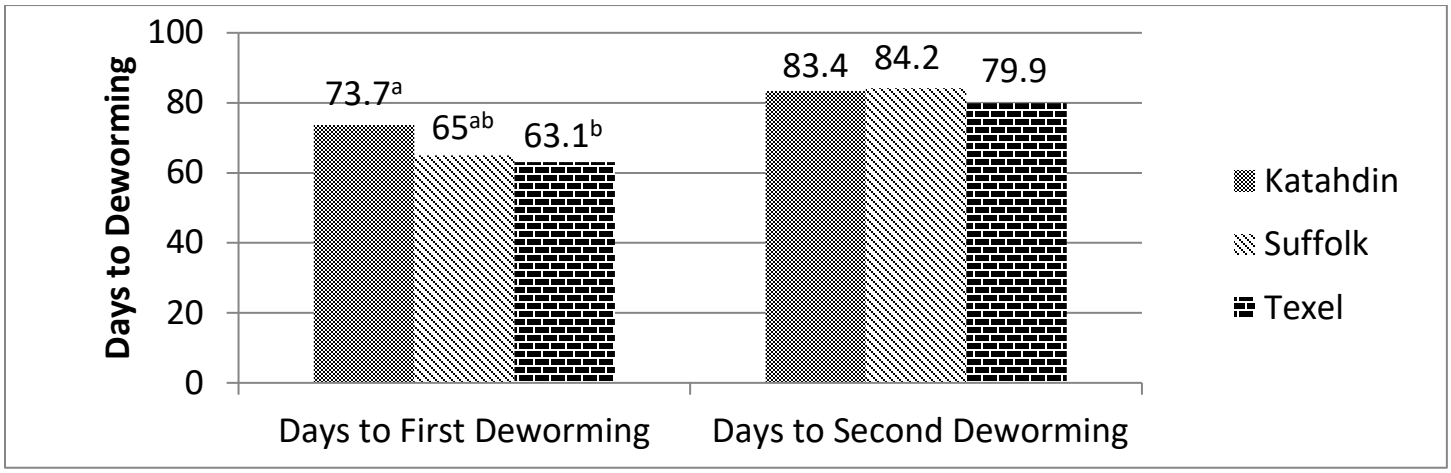


*Points denoted by different letters are significant to P < 0.05





FEC varied over time ($P < 0.05$)



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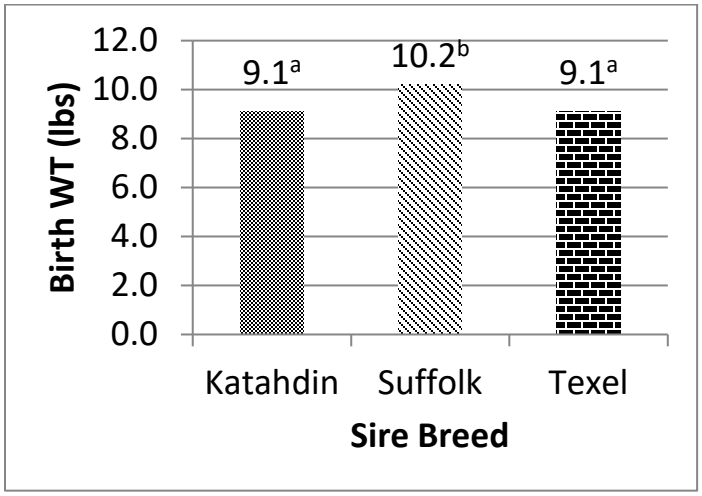
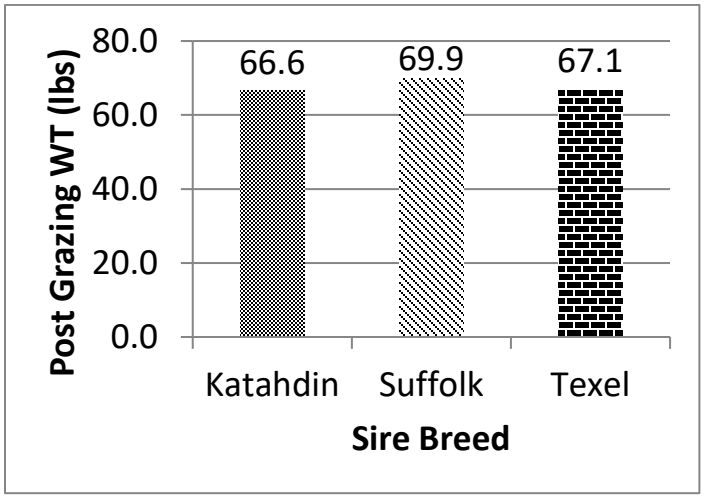
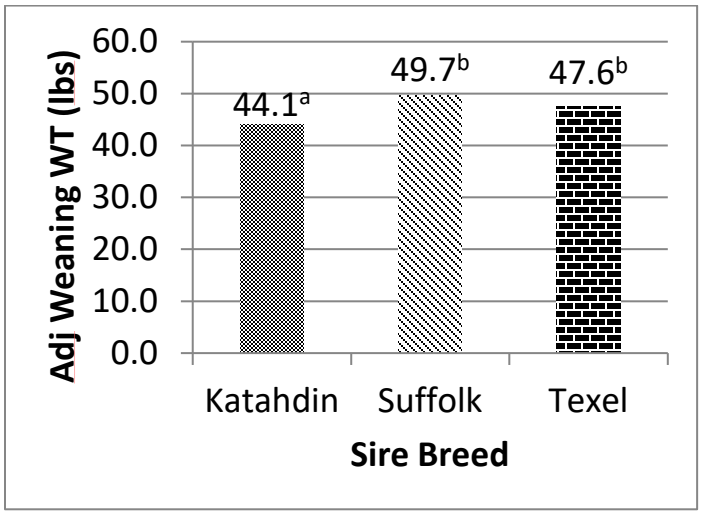
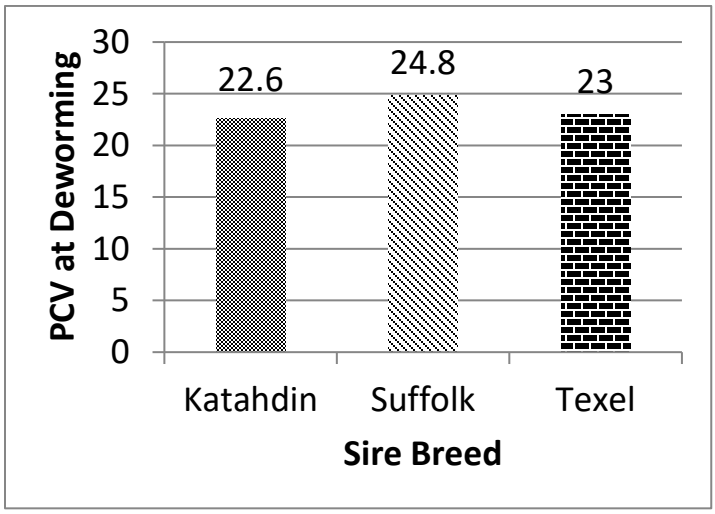
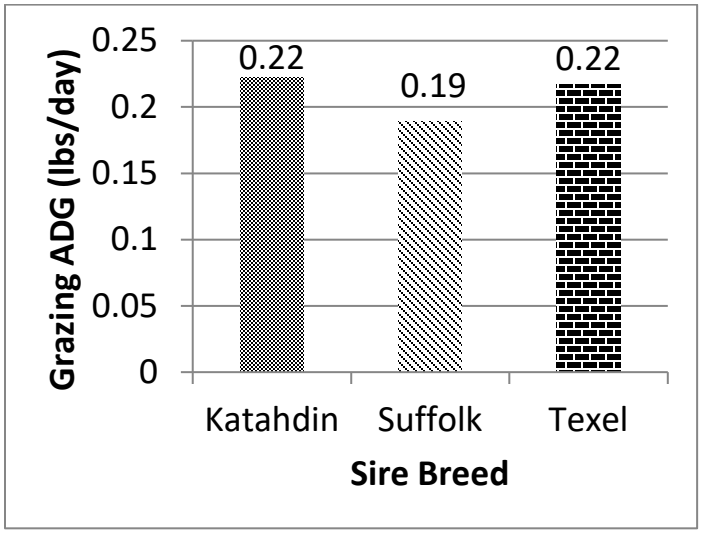
2016 Summary

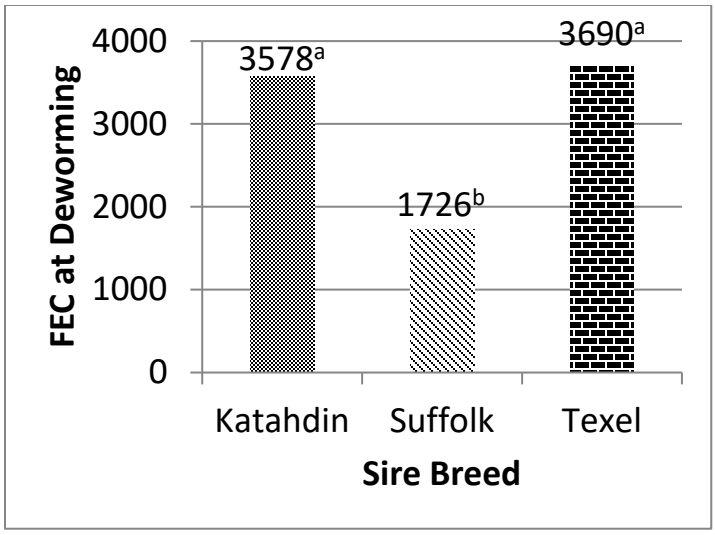












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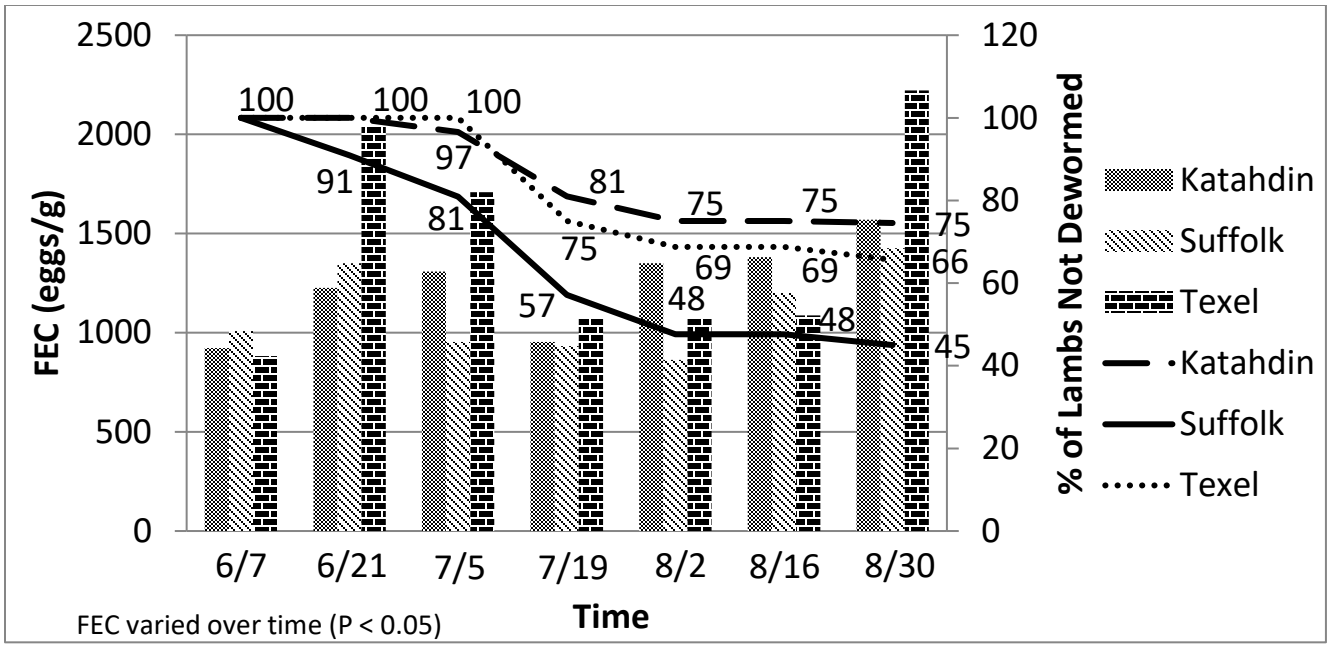
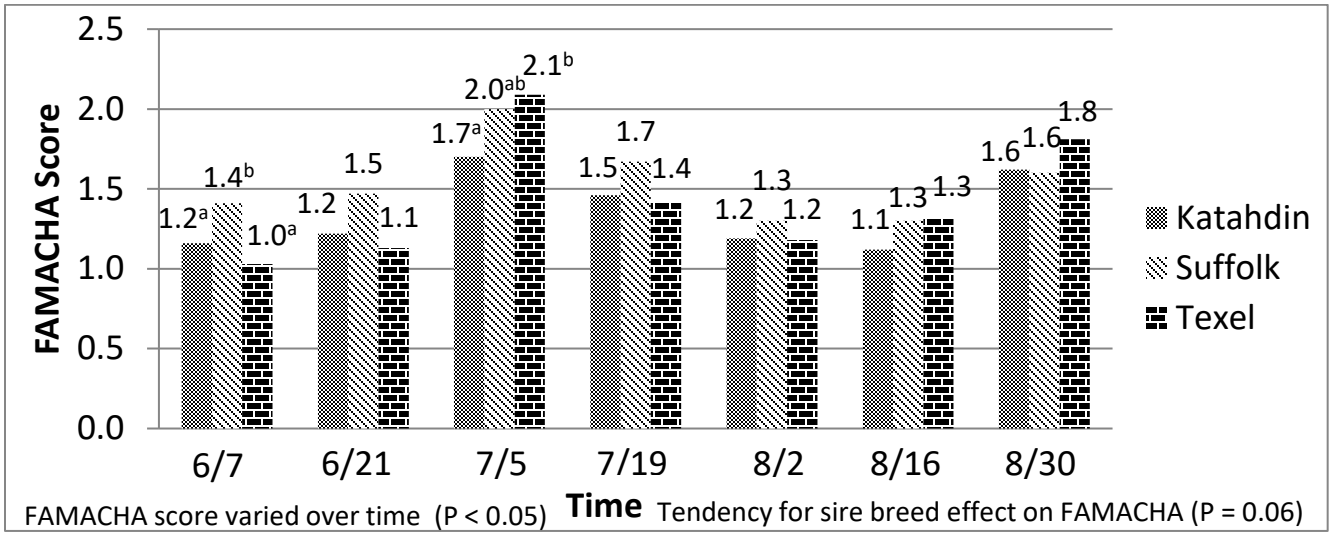
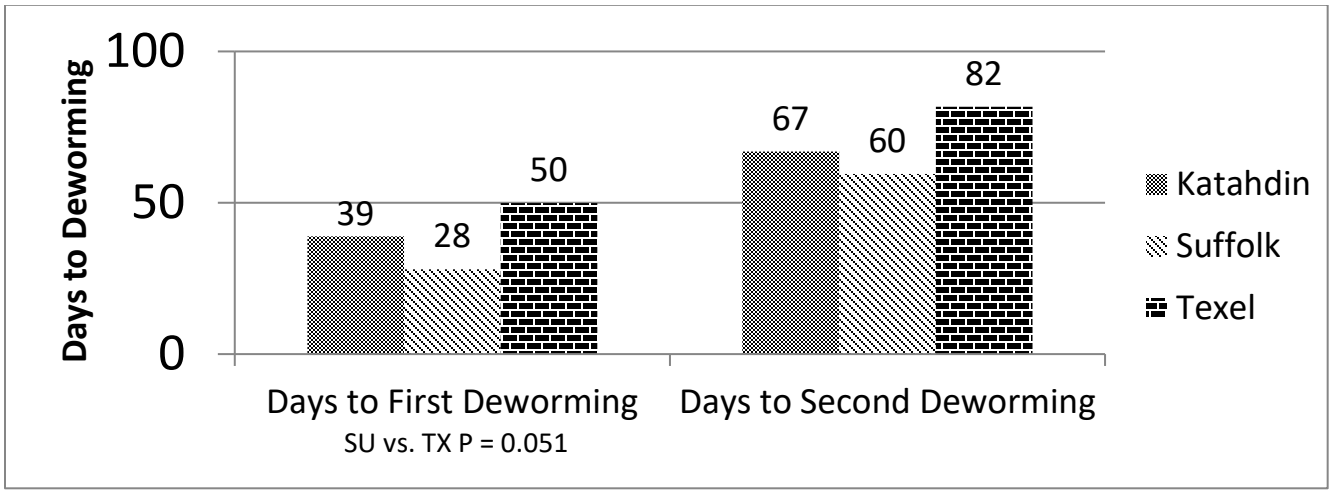


FEC varied over time ($P < 0.05$)



FAMACHA score varied over time ($P < 0.05$) Tendency for sire breed effect on FAMACHA ($P = 0.06$)



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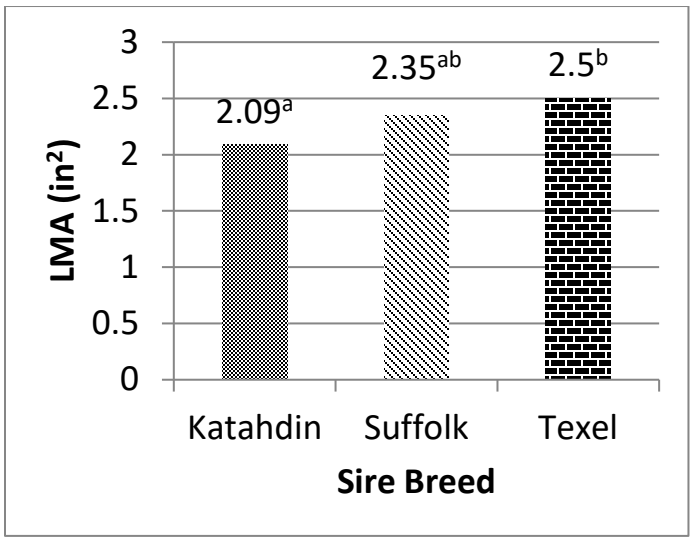

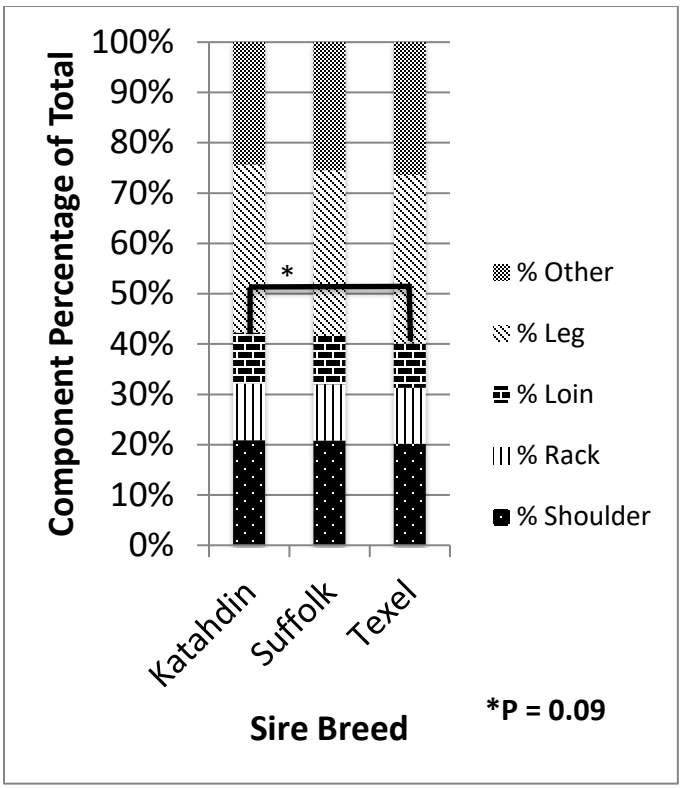

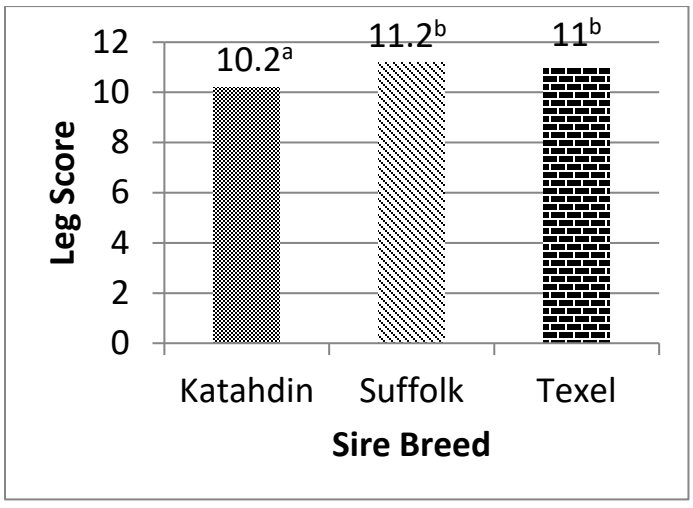

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Summary

Pre-weaning

Similar ewe genetics resulted in no sire breed effects for number of lambs born or number of lambs weaned per ewe. While the Suffolk-sired lambs were the heaviest at birth, there were no observed differences in lambing difficulty. In both years, the Katahdin-sired lambs were the lightest at weaning. There were no differences for average daily gain (ADG) prior to weaning.

Post weaning growth

In year one, the Texel-sired lambs were the heaviest at the end of the summer grazing season (Aug. 31) while also having the greatest ADG during this time period. In year two, there was a tendency for a sire breed effect on weight over the grazing season. While the Suffolk-sired lambs were the heaviest over the entire time period, there were no sire breed differences in weight at the conclusion of the grazing season. There were also no sire breed effects for ADG.

Parasite Resistance

Fecal egg count (FEC), packed cell volume (PCV), and FAMACHA scored varied over the summer grazing season with no sire breed effects. However, a greater percentage of Suffolk-sired lambs in both years required deworming at some point. In year one, the Katahdin-sired lambs took the greatest number of days before requiring deworming. In year two, there was a tendency for the Texel-sired lambs to take a greater number of days before deworming than the Suffolk-sired lambs. In addition, the Suffolk-sired lambs had the lowest FEC at deworming.

Carcass Merit

The Suffolk-sired lambs were the heaviest at harvest in both years while also having the greatest hot carcass weights (HCW). There were no differences in dressing percentage. The Texel-sired lambs had the greatest loin muscle area (LMA) in both years as well as leg scores in year one. The Katahdin-sired lambs had the greatest internal fat in year one with no differences in year two. There were also no sire breed differences for USDA Yield or Quality Grades. There was a tendency for the Katahdin-sired lambs to have a greater percentage loin than the Texel-sired lambs; however, there were no further sire breed differences in component percentages. There were no differences in carcass value between the sire breeds resulting from composition.

Conclusions

The Texel breed as terminal sires in hair sheep production systems has shown potential for increasing growth and enhancing carcass merit while maintaining parasite tolerance similar to the Katahdin. The Texel-sired lambs had the greatest grazing growth in year one while having the greatest LMA and greater leg scores than the Katahdin-sired lambs in both years. Deworming rates were similar for Katahdin- and Texel-sired lambs in both years.