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### Meat and Muscle Biology™



### Effects of Maternal Lines and Mating Systems on Lamb Carcass Merit

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### Objectives

The objective of this study was to analyze the carcass composition of lambs produced from different mating systems.

### Materials and methods

Lambs ( $n = 1237$ ) were produced by a multi-sire mating of 3 maternal lines [Katahdin (KN), Polypay (PP), and Easycare (EZ)] in 2 mating systems: a purebred mating system, in which each maternal line was mated with rams of the same genetic line, and a terminal mating system, in which ewes were mated with Texel (TL) rams. Lambs were born (late May/Early June) in a pasture-lambing, low-input production system. Lambs were weaned at about 9 wk of age, moved to feedlot pens, weighed, and transitioned to finishing rations using feedstuffs high in fermentable fiber. When lambs were about 24 wk of age, they were weighed and assigned to 1 of 4 slaughter groups with an equal number of lambs in each slaughter group and with the goal of maximizing the number of lambs that produced carcasses with acceptable carcass weights. The 4 groups of lambs (308 to 310 head per group), ranked from heaviest to lightest, were fed an additional 21, 49, 77, and 103 d, weighed, transported 645 km to a commercial packing plant, held overnight, and harvested. The commercial packing plant uses the VSS 2000 lamb carcass imaging system to evaluate each carcass as the hot carcasses move from the harvest floor to the chiller. Valid VSS data was obtained for 1108 of the carcasses. Data were analyzed with PROC GLIMIX using dam line, mating system, and sex as fixed effects with hot carcass weight included in the model as a covariate.

### Results

Lambs born from EZ ewes had a lighter ( $P < 0.05$ ) body weight than those from PP ewes, and a greater proportion of EZ lambs were assigned to later marketing groups. Consequently, lambs from EZ ewes were older ( $P < 0.05$ ) at time of slaughter, had a lower ( $P < 0.05$ ) dressing percentage and had a lower ( $P < 0.05$ ) HCW. Relative to the purebred mating system, terminal crossing improved ( $P < 0.0001$ ) the yield grade (i.e., reduced fat thickness) of lambs produced from EZ (2.99 vs. 3.20) and KN (2.79 vs. 3.11) ewes. However, terminal crossing did not ( $P > 0.05$ ) affect the yield grade (2.83 vs. 2.87) of lambs produced from PP ewes, which had lower yield grade than purebred KN, purebred EZ and TL × EZ lambs. Indicative of greater muscularity, terminal crossing with TL rams increased ( $P < 0.0001$ ) conformation scores of lambs produced from all maternal lines and conformation scores differed ( $P < 0.05$ ) among each breed combination (TL × EZ = 388 > TL × KN = 385 > TL × PP = 382 > EZ = 377 > KN = 373 > PP = 360). The increased prolificacy of EZ ewes relative to PP and KH, in the low-input production system, offset the reduction in growthiness and leanness of EZ as more ( $P < 0.01$ ) pounds of carcass was produced per ewe exposed for breeding for EZ (38.7 kg/ewe exposed) than PP (30.9 kg) and KN (28.5 kg).

### Conclusion

Use of TL rams in a terminal mating system improved growthiness, carcass leanness and carcass conformation of lambs from EZ ewes; however, complementarity of sire breed for other growth and carcass traits should be investigated further.