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Evaluating Texel-, Suffolk-, and Columbia-Sired Offspring: II. Postweaning Growth and Carcass Traits Under Feedlot and Pasture-Feedlot Finishing Systems[1]

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Abstract

*A terminal sire study was conducted to evaluate postweaning growth and carcass traits of Texel-sired offspring compared with Suffolk- and Columbia-sired offspring. The lambs were weaned at an average age of 70 and 94 d during the 2-yr study, respectively. After weaning, lambs from each sire breed were allocated to one of two finishing programs. Finishing programs were 1) direct to feedlot (**FP1**) and 2) pasture followed by feedlot (**FP2**). In the feedlot, lambs were fed ad libitum shelled corn (74.86% TDN and 7.18% CP, as fed) and pelleted protein supplement (43.20% CP) in a ratio of 85:15, respectively. Lambs were harvested at a BW of 58.5 kg (±7.2 kg). The ADG was greatest for Suffolk-sired offspring, followed by Columbia- and Texel-sired offspring (318, 286, and 262 g, respectively; P<0.01). Mean ADG was greater (P<0.01) for FP1 lambs than for FP2 lambs (333 vs 244 g, respectively). Feed efficiency (FE) in drylot was similar for offspring of each sire breed; however, FE was greater for FP1 than for FP2 (4.4 vs 5.1 kg of DMI/kg of BW gain, respectively; P<0.05). Texel-sired carcasses had greater (P<0.01) longissimus area (**LA**) than Suffolk- and Columbia-sired carcasses (17.3, 16.1, and 16.1 cm^2, respectively). Texel- and Suffolk-crossbred lambs were similar to Columbia-crossbred lambs in backfat (**BF**) thickness (0.79, 0.61, and 0.70 cm, respectively), although BF thickness was greater (P<0.05) in Texel- than Suffolk-crossbred lambs. Body wall thickness (**BWT**) was less (P<0.10) in Texel- and Suffolk-sired carcasses than in Columbia-sired carcasses (2.95, 2.99, and 3.21 cm, respectively). Dressing percentage (**DP**) and quality grades were similar for lambs from the 3 sire breeds. Lambs finished on FP2 had more LA (P=0.05) and less BF (P=0.10) than lambs finished on FP1 (16.4 vs 15.5 cm^2 and 0.54 vs 0.64 cm, respectively). The BWT was also less in carcasses of lambs finished on FP2 vs FP1 (2.57 vs 2.85 cm, respectively; P<0.01). The interactions between sire breeds and finishing programs were nonsignificant for all growth and carcass traits except DP. These data indicate that Texel-sired crossbred lambs may have some potential for increasing muscle mass. However, increased lean mass of Texel-crossbred lambs is counterbalanced by lesser postweaning growth rate than Suffolk- and Columbia-sired crossbred lambs. Grazing lambs following weaning and prior to finishing in drylot improved leanness and muscling without influencing quality grade.*

(Key Words: Texel, Suffolk, Columbia, Postweaning Growth, Carcass Traits.)

Introduction

Production of lean lamb to meet the consumer demand for less fat is a major challenge for the sheep industry. At present, <30% of market lambs processed into meat in the US meet requirements for leanness and muscling as specified in the Certified Lean American Lamb program established in 1990 by the American Sheep Industry Association (Beermann et al., 1995). To achieve the goal of meeting the demand of the consumer for leaner lamb, new sheep breeds have been introduced into terminal-sire breeding programs. Infor-

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mation on growth and carcass traits of progeny from different terminal-sire breeds is required by lamb producers to facilitate choices in relation to production systems and changes in market requirements. Croston et al. (1987), Latif and Owen (1980), Leymaster and Jenkins (1993), and Ellis et al. (1997) compared several terminal sire breeds, including the imported Texel breed that has been noted for an unusually high lean composition. Murphy et al. (1994) and McClure et al. (1995) compared all-concentrate and different forage-based finishing systems for achieving desirable carcasses and found that daily accretion of lean and fat tissues was greater for lambs placed directly in the feedlot than for lambs that consumed forage at some time during the feeding period. However, information is scanty about the overall effect of different finishing systems on growth performance and carcass characteristics of Texel-sired lambs as compared with the offspring of Suffolk and Columbia sires. Therefore, the objectives of this study were to evaluate Texel-sired crossbred lambs placed directly into the feedlot at weaning or left on pasture following weaning and later placed in the feedlot for finishing. Growth performance and carcass characteristics were compared with Suffolk- and Columbia-crossbred offspring.

TABLE 1. Chemical and nutrient analysis of shelled corn and protein supplement[a].

	Shelled corn		Protein supplement	
Item	As fed	Anhydrous	As fed	Anhydrous
DM, %	86.00	100.00	88.50	100.00
N, %	1.15	1.34	6.91	7.81
Protein, %	7.18	8.35	43.20	48.81
ADF, %	2.9	3.37	4.20	4.75
Ca, %	0.03	0.03	4.32	4.88
P, %	0.24	0.28	0.80	0.90
K, %	0.33	0.38	2.04	2.31
Mg, %	0.10	0.12	0.30	0.34
S, %	0.08	0.09	0.47	0.53
Na, %	0.01	0.012	0.10	0.11
Zn, ppm	19.0	22.0	322.0	364.0
Mn, ppm	6.0	7.0	234.0	264.0
Cu, ppm	4.0	5.0	8.0	9.0
Fe, ppm	30.0	6.0	374.0	423.0
Co, ppm	1.0	1.2	2.0	2.3
Al, ppm	1.0	1.0	50.0	56.0
TDN (estimated), %	74.86	87.04	—	—
Digestible protein (estimated), %	3.68	4.28	—	—
ME, kcal/kg	2704	3144	—	—
NE_m, kcal/kg	1797	2092	—	—
NE_g, kcal/kg	1221	1421	—	—

[a]Analysis at Iowa Testing Laboratories, Inc. (Eagle Grove).

Materials and Methods

Experimental Animals. This study used lambs resulting from the study described previously (Ali et al., 2005). Lambs were sired by Texel, Suffolk, or Columbia rams and born to Polypay × Dorset crossbred whiteface ewes in south central Iowa at the McNay Research Farm (Chariton) during a 2-yr period.

Lamb Management. Lambs were weaned on Jul. 28 (70 ± 9 d) for the first year and on Aug. 22 (94 ± 17 d) for the second year. All lambs were vaccinated against enterotoxemia prior to weaning. After weaning, lambs were allocated within sire breeds to one of two finishing programs. The finishing programs were 1) direct to feedlot (FP1) and 2) backgrounding on pasture followed by feedlot (FP2). The lambs were given an 8- and 9-d postweaning adaptation period in the 2 yr, respectively, to adjust to their finishing program prior to the start of the experiment. Lambs on FP1 were grouped and penned by sire breed in the barn and were fed ad libitum a high-concentrate diet consisting of shelled corn (74.86% TDN and 7.18% CP, as fed) and pelleted protein supplement (43.20% CP) in a ratio of 85:15, respectively (Table 1). Lambs on FP2 were backgrounded on pasture (Phase 1) for 63 and 56 d during the 2 yr, respectively. They were raised as a single group on pasture and were supplemented with 455 g of concentrate per head daily. The composition of concentrates fed to lambs in Phase 1 of FP2 is given in Table 2.

TABLE 2. Composition of concentrate fed to lambs during Phase 1.

Item[a]	(%)
Corn	73.5
Soybean meal, 49% CP	18.5
Molasses	5.0
Limestone	2.0
Trace-mineralized salt[b]	0.5
Ammonium sulfate	0.5

[a]Plus 50 g of chlortetracycline, 1,000,000 IU of vitamin A, 100,000 IU of vitamin D, 35,000 IU of vitamin E, and 0.3 g of Se/0.907 metric ton of concentrate.

[b]No Cu in trace-mineralized salt.

During the last weigh period (**WP**) of Phase 1 of FP2 (Table 3), lambs were gradually brought up to the