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Breeding Suffolk Rams to Western White Face Ewes on New Mexico Rangelands Increases Weaning Weight of Lambs

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ABSTRACT: The objective of the two-year study at the New Mexico State University Corona Range and Livestock Research Center was to determine the efficacy of breeding Suffolk rams to Western whiteface ewes while under range conditions. Approximately 120 ewes in 2003 and 2004, respectively, were divided among four similar pastures. Pastures were randomly assigned to receive either Suffolk rams or Rambouillet rams. Three rams were assigned to each pasture for a 34 d breeding season. One week before expected lambing approximately half of the ewes from each pasture were randomly selected to be shed lambed in order to estimate lambs born per ewe and birth weight of lambs. Birth weights (d 0 is the onset of lambing) were collected from only the shed lambs and within 24 h of parturition ewes and lambs were returned to their respective pastures. Body weights at marking (ear tagging and docking; approx. d 55) and weaning (approx. d 150) were recorded and analyzed from the entire lamb crop. Birth weights were similar ($P<0.05$) between sire groups (measured only on the shed lambed lambs) for both years. Suffolk sired lambs were heavier at d 55 in 2003 and 2004 ($P<0.10$ and $P<0.05$, respectively). The crossbred lambs were also heavier at weaning ($P<0.05$) in 2004 but no difference was detected between breeds in 2003 ($P>0.10$). In both years, the increased weight gain of crossbreds compared to straightbreds occurred between birth and marking, and the weight advantage was maintained through weaning. No differences were detected in lamb survivability between sire groups in either year. In conclusion, sheep producers that decide to use Suffolk rams on western white face ewes can expect crossbred lambs to be 8.5 % heavier at weaning than straight bred lambs.

Keywords: sheep, Suffolk, western white face, crossbreeding

Introduction

Many sheep producers in the Western United States use a terminal sire on Western white face (Rambouillet base) ewes to increase lamb productivity. This production system was developed by ranchers to utilize sheep breeds specialized to produce desirable lambs and yet maintain highly marketable fleeces of finewool flocks while grazing range pasture. The two year study at the New Mexico State University Corona Range and Livestock Research Center was conducted to mimic the production system which has been used New Mexico for many years. Even though terminal crossbreeding is widely accepted as a common practice within the sheep community, little research has been reported to support the specific crossbreeding system. A dated report by Neville et al. (1958) showed 2.32 and 1.3 kg improvements of Suffolk sired crossbred lambs 120 day weights over Hampshire, Oxford, and Shropshire sired crosses, which were all bred to Western whiteface ewes in 1955 and 1956, respectively. Suffolk rams have, more recently, been proven to be an optimum terminal sire because of their superiority to increase gain in crossbred lambs, which results in the production of larger leaner carcasses (Makarechian et al., 1978; Neville et al., 1958; Sidwell and Miller, 1971).

The US lamb industry is in need of lambs that possess larger leaner carcasses, both qualities in which the Suffolk breed excels. Purcell (1998) reported that the US lamb industry has not provided enough incentives to the sheep breeders to promote improvements in slaughter lamb carcass traits. Waldron (2002) stated sheep breeders/raisers need to take it upon themselves to genetically improve lamb as a marketable product in order to increase consumption of American lamb. Therefore, this study was conducted to prove that crossbred lambs from Western white face ewes and Suffolk rams will grow faster, increase herd productivity, and provide sheep producers with information regarding this management strategy.

Material and Methods

In 2003 and 2004, approximately 120 Western white face ewes (each year) were divided equally into four pastures. Each pasture consists of approximately 550 acres and was comparable in forage production. Suffolk or Rambouillet sires were randomly assigned to each pasture (three rams per pasture). Each pasture contained approximately 30 ewes and was exposed to the rams for 34 days.

One week prior to the onset of lambing (day 0 is onset of lambing) half the ewes from each pasture were randomly selected to be penned and lambed in confinement. Birth weights were recorded and lambs were ear tagged for identification purposes. Within 24 h post parturition, these ewes and lambs were returned to their original pastures. Birth weights and type of birth were recorded from the confinement lambed group. On day 55, all the lambs were ear tagged, docked, males castrated, and body weights recorded. On day 150, all lambs were weaned and body weights were recorded. Sire influence on lamb survivability was measured by the presence or absence of shed lambs at marking and weaning.

Data were analyzed as a completely random design and pasture within sire group was used to test the effect or sire group (PROC GLM of SAS; SAS Inst., Inc. Cary, NC). Survivability data were analyzed using Chi Square (SAS Inst., Inc. Cary, NC).

Results and Discussion

Birth weight of lambs that were lambed in confinement (n=69 and n=67 in 2003 and 2004, respectively) was similar between sire groups (P=0.12 and *P=0.31* for 2003 and 2004, respectively; Table 1 and 2).

Body weights taken on day 55 for all lambs (n=136 and n=133 for 2003 and 2004, respectively) were heavier for Suffolk sired lambs over Rambouillet sired lambs in 2003 and 2004 (*P=0.06* and *P=0.08*, respectively). The Suffolk sires markedly improved growth rate at a time when maternal influence is thought to be the greatest. However, weaning weight of lambs (n=128) taken on day 150 was similar (*P=0.17*) between breeds for in 2003 (Table 1). Although, in 2004, lambs (n=122) were heavier (*P=0.05*) at day 150 for the Suffolk sired lambs compared to Rambouillet sired lambs. The difference in 2003 and 2004 may be attributed to the quality and quantity of forage available since moisture totals for the years varied widely. Recorded rainfall for the years of 2003 and 2004 was 16.2 and 43.4 cm, respectively. The straight bred lambs would have been expected to gain better in the dryer environment than the crossbred lambs because of the Rambouillet breed influence known for its hardiness in western range land conditions. Neale (1943) mated Hampshire rams to Rambouillet ewes while under range conditions and the crossbred lambs marked heavier weights than the straight bred Rambouillet lambs. But in contrast to our current study, Neale's straight bred Rambouillet lambs weaned the largest lambs in poor range conditions and were comparable to the crossbred lambs on fair range conditions.

No difference of survivability between breeds at day 55 (*P=0.91* and *P=0.95* for 2003 and 2004, respectively) was detected between sire on the survivability of the lambs. At day 150, survivability of the two sired groups was also similar (*P=0.63* and *P=0.44* for 2003 and 2004, respectively). No difference (*P>0.10*) was found between shed and pasture born lambs for marking and weaning weights, or lamb survivability when compared to in both 2003 and 2004.

In conclusion, Suffolk sired lambs were similar at birth to the straight bred lambs, gained weight faster than straight bred lambs from birth to day 55, and maintained a heavier body weight for another 95 days to weaning. This study has shown an 8.5% advantage in weaning weights when breeding Suffolk sires to Western white face ewes under New Mexico range conditions. This is useful to the New Mexico sheep producers considering use of a terminal cross on their Western white face flock.

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TABLE 1. Body weights (kg) of lambs born in spring 2003 to Western white face ewes grazing native rangelands and sired by Suffolk or Rambouillet rams[ab]

	Sire Group			
Age of lambs	Rambouillet	Suffolk	SE[e]	p-value
Birth[c]	4.7	5.1	0.16	0.12
Day 55[d]	14.0	16.0	0.67	0.06
Day 150[d]	37.0	40.2	1.42	0.17

[a] 120 ewes were divided into four equal pastures and each pasture was randomly assigned a treatment (breed of sire). Pasture was used as the experimental unit.
[b] Three rams were allotted to each pasture for 34 days.
[c] Birth weights (day 0) were only taken from the shed born lambs, and half of each pasture was shed lambed.
[d] On day 55 lambs were ear tagged, docked, and males castrated. Lambs were weaned on day 150.
[e] Standard error (n=33, n=68, and n=63, respectively)

TABLE 2. Body weights (kg) of lambs born in spring 2004 to Western white face ewes grazing native rangelands and sired by Suffolk or Rambouillet rams[ab]

	Sire Group			
Age of lambs	Rambouillet	Suffolk	SE[e]	p-value
Birth[c]	5.1	5.4	0.22	0.31
Day 55[d]	22.6	26.3	1.12	0.08
Day 150[d]	41.0	45.9	1.24	0.05

[a] 120 ewes were divided into four equal pastures and each pasture was randomly assigned a treatment (breed of sire). Pasture was used as the experimental unit.
[b] Three rams were allotted to each pasture for 34 days.
[c] Birth weights (day 0) were only taken from the shed born lambs, and half of each pasture was shed lambed.
[d] On day 55 lambs were ear tagged, docked, and males castrated. Lambs were weaned on day 150.
[e] Standard error (n=27, n=66, and n=60, respectively)

TABLE 3. Sire effect on percent lamb survival from birth to day 55 and from birth to day 150 in 2003 and 2004[ab]

	Sire Group		
2003 Survivability	Rambouillet	Suffolk	p-values
Birth to day 55	90.9	91.6	0.91
Birth to day 150	81.8	86.1	0.63
2004 Survivability			
Birth to day 55	81.8	82.4	0.95
Birth to day 150	78.8	70.6	0.44

[a] Lamb survivability was measured only on the lambs born in confinement.
[b] Survivability was measured by the presence or absence of lambs at marking and weaning.

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