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REPRODUCTIVE PERFORMANCE OF CROSSBRED EWES SELECTED FOR FALL VS SPRING LAMBING UNDER RANGE OR FARM FLOCK MANAGEMENT SYSTEMS (PROGRESS REPORT)

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SHEEP 99-1

SUMMARY

Reproductive performance is reported for fall and spring lambing flocks under both range (Antelope Range Livestock Station, Buffalo, SD) and farm flock (SDSU Sheep Unit, Brookings, SD) management systems. Significant improvement was seen for fall lambing in the range system. The percent of ewe lambs that were exposed to lamb in the fall at 12-13 months of age that lambed was higher in 1998 than 1997 in the farm flock system. Selection for fall lambing traits will continue. In addition, blood samples have been collected for analyses of genetic markers that may speed selection progress.

INTRODUCTION

Many products and procedures have been attempted over a period of years aimed at producing lambs out of the normal (spring) lambing season. The reasons for the desire to have out of season lambs are as varied as the sheep industry. Some prefer non-traditional lambing time for show/sale purposes, some for convenience (better weather, labor schedules, etc.) and most importantly, some to provide a more continuous supply of fresh lambs on the market. Extending the lambing season provides opportunity for better use of facilities, more efficient use of labor, more consistent lamb numbers to the packer and a more consistent, high quality product for the consumer.

Genetic selection offers the only tool for permanent improvement for out of season lambing compared to the many products/procedures that have been attempted in the past or that are currently being used.

This study was initiated to evaluate the results of selecting for fall lambing under two management systems, farm vs range.

EXPERIMENTAL PROCEDURES

Finn-Dorset x Targhee (FDT, n=524) and Hampshire x FDT (n=80) ewe lambs produced at the Antelope Range Livestock Station (Buffalo, SD) in 1992, 1993, and 1994 are the base flock of this study. These April-born ewe lambs were weaned in August-September and transported to the Brookings Station where they were managed until exposure at approximately 12 months of age for September lambing. Each year the pregnant ewes from this initial exposure were randomly assigned to either the range or farm flock fall lambing group. The remaining open ewes were randomly split between the four lambing groups to balance the numbers per group, i.e., approximately 50 ewes entering the fall and spring groups in the range and farm flock systems each year. Starting with the fall 1994 born group of lambs, subsequent replacement ewes were selected from multiple birth, early lambing ewes and remained with their birth group (fall born ewe lambs remain with the fall group and spring born ewe lambs remain with the spring group). Rams were selected for the fall lambing groups at both locations and were used as yearlings for one year (both fall and spring) at their respective locations. Rams were replaced annually and the ewes were turned over as rapidly as possible while maintaining base flock numbers. The spring group served as the control.

The spring farm flock ewes were exposed starting approximately September 10 at Brookings and the spring range flock ewes

starting approximately November 15 at the Antelope Range Livestock Station. Ewes in both fall flocks were exposed beginning approximately April 15.

Common practices to all groups included the use of teaser rams for 15 days prior to exposure to fertile rams, flushing, a 35 day breeding season and routine vaccinations. Ewes remained with their lambing group unless they missed two consecutive lambings, were culled for unsoundness (i.e. lameness, bad udders, prolapse), death, or age. After the flock size was established, ewe turnover was as rapid as possible with approximately one-third of the ewes being replaced each year. Each flock was maintained at approximately 150 head at each lambing opportunity.

At lambing, number of lambs born (live and dead), lamb sex, and individual lamb weight

were recorded. Ewes were allowed to raise no more than two lambs. Extra lambs were either grafted onto another ewe or were sold as orphan lambs if no graft dam was available. In both spring flocks, all male lambs were castrated, while in the fall flocks 10 to 12 male lambs were left intact as possible ram replacements. Other data collected were numbers of ewes exposed, lambing, and weaning a lamb. Pre-breeding weight and condition score of ewes were also recorded.

RESULTS AND DISCUSSION

Lambing performance for mature ewes is shown in Table 1. The percentage of ewes lambing in the fall of 1998 at Brookings was 60%, considerably lower than the previous three fall groups. A management error resulted in the loss of 107 ewes from the fall 1998 Brookings group.

Table 1. Lambing performance of crossbred ewes^a – fall vs spring

Breed of ewe ^b /yr	No. exposed	Pre-breeding wt., lb (C.S. ^c)	Percent Lambing	Lambs born per ewe lambing	No. exposed	Pre-breeding wt., lb (C.S.)	Percent lambing	Lambs born per ewe lambing
Brookings (farm)								
Fall (Sept-Oct)					Spring (Feb-Mar)			
1994-95	47	160 (2.8)	55.3	1.35	83	157 (2.7)	90.3	2.12
1995-96	82	182 (2.7)	72.0	1.45	99	165 (2.9)	97.0	2.16
1996-97	167	167 (1.8)	82.6	1.53	104	164 (3.2)	97.1	2.30
1997-98	122	174 (3.3)	91.8	1.64	85	151 (3.0)	92.9	1.95
1998-99	35	176 (3.3)	60.0	1.62	95	134 (2.8)	92.6	2.01
Antelope (range)								
Fall (Sept-Oct)					Spring (April-May)			
1994-95	40	NA ^d	7.5	1.67	91	142 (2.9)	92.3	1.79
1995-96	59	NA	15.3	1.44	83	164 (2.5)	92.8	1.97
1996-97	132	127 (2.5)	12.9	1.47	150	155 (2.6)	94.7	1.89
1997-98	122	143 (3.4)	33.6	1.68	154	148 (2.5)	93.5	1.77
1998-99	131	152 (3.4)	64.1	1.30	199	143 (2.6)	NA	NA

^aEwes were ¼ Finn, ¼ Dorset, ½ Targhee (FDT) or Hampshire X FDT (HFDT). Approximately one-fourth of the 1992 and 1993 ewes entering the study were HFDT.

^bEwes 24 months of age or older at lambing time.

^cC.S. = condition score; 1 = very thin, 5 = very fat.

^dNA = not available.

Most of the ewes that inadvertently lambled in the wrong season were the older/more productive ewes. This may explain the lower lambing percentage for this group. Sixty-four percent of the fall ewes lambled in the range group which was almost double that reported for the previous year. Little difference was noted for the spring lambing groups between locations in either the percent lambing or number of lambs born per ewe lambing. The number of lambs born per ewe lambing in the fall range group was 1.30, which was the lowest reported to date. This lower number of lambs may be because there were more first time lambing ewes in this group.

Lambing performance for crossbred ewe lambs at Brookings is shown in Table 2. The percentage lambing in the fall of 1998 was higher than for the fall of 1997, although still not as high as reported for fall 1994 - fall 1996. Closer attention to lighting protocol details may account for the improvement seen in fall 1998 compared to fall 1997. Every effort was made to monitor the lights daily and to make sure all outside yard lights, etc were disconnected so the lighting and dark periods were as outlined in the protocol.

Significantly fewer ewes lambled at 12-13 months of age when comparing fall 1998 to spring 1999, although the number of lambs per ewe lambing slightly favored the fall group. No ewes are exposed for lambing at 12-13 months of age in the range system.

Data presented has not been adjusted for age of ewe. Based on Tim Lundeen's earlier report (SHEEP 97-3) age is extremely important. By design, our older ewes (4 years) move out of this study which no doubt lowers the reproductive rate compared to a flock with a normal age distribution. These older ewes are part of a cooperative project with the University of Minnesota, Morris.

Results presented are preliminary and have not been statistically analyzed yet. However, with the exceptions mentioned earlier they are encouraging, indicating that we can make selection progress for fall lambing traits. Selection for out of season traits will be continued in this study. In addition, samples have been collected for analysis of possible genetic markers that may speed progress.

Table 2. Lambing performance of crossbred ewe lambs^a - Brookings

Breed of ewe ^b /yr	Sept-Oct				Feb-Mar			
	No. Exposed	Pre-breeding wt., lb (C.S. ^c)	Percent lambing	Lambs born per ewe lambing	No. exposed	Pre-breeding wt., lb (C.S.)	Percent lambing	Lambs born per ewe lambing
1993-94 ^d	96	137	9.9	1.38				
1994-95 ^d	104	147	57.5	1.11				
1995-96 ^d	105	147	83.8	1.36				
1995-96 ^e	32	126 (3.3)	50.0	1.19	49	115 (3.1)	95.9	1.19
1996-97 ^e	71	135 (3.3)	65.7	1.19	50	91 (2.8)	90.9	1.42
1997-98 ^e	85	121 (3.1)	5.0	1.00	82	89 (2.7)	78.0	1.51
1998-99 ^e	65	140 (3.8)	44.8	1.40	66	109 (3.2)	83.3	1.29

^a Ewes were ¼ Finn, ¼ Dorset, ½ Targhee (FDT) or Hampshire X FDT (HFDT). Approximately one-fourth of the 1992 and 1993 ewes entering the study were HFDT.

^b All fall lambing animals were light treated; either 16 h light:8 h dark January 4 to February 9 (1993) or 18 h light:6 h dark December 1 to February 10 for subsequent years.

^c C.S. = condition score; 1 = very thin, 5 = very fat.

^d April born; \geq 12 months old at mating.

^e Fall born; September-October