

ACCELERATED LAMBING: ITS ROLE IN THE SHEEP INDUSTRY

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INTRODUCTION

The cost of maintaining a ewe for a year is often quite high, and unless the returns from lamb and wool exceed these costs by a reasonable amount, a sheep enterprise will not be profitable. Thus, increasing the frequency of lambing or the number of lambs born per lambing, or both, without a comparable increase in maintenance and labor costs, should increase net return. Any increase in the number of lambings in relationship to the age of the ewe is referred to as accelerated lambing and includes: 1) starting lamb production at a younger age, and 2) breeding and lambing at intervals more frequent than 12 months.

With few exceptions, ewe lambs should be bred, selected, and managed to lamb first at 1 year of age. When an appropriate breed or carefully selected strain is used, the income realized from yearling production will far surpass the extra cost of adequate nutrition and management required to achieve production the first year. Ewes managed and selected for production at 1 year of age will be more productive throughout their life than are ewes managed to lamb first at 2 years of age (table 1).

Of the several accelerated lambing systems now being used, an 8-month-interval lambing appears to be generally the most popular. However, success appears to be limited to those using light control in the northern United States or breeds or breed crosses with long breeding seasons in the southern states.

Another system using Polypay sheep in Idaho is essentially twice-a-year (6-month-interval) lambing on a flock basis, and variable intervals of 10-7-7-months. This results in approximately three lambing opportunities every two years on a ewe basis--yet does not limit exceptional ewes. A ewe, in fact, does have the opportunity to lamb every 6 months. A few exceptional Polypay ewes have lambed at 6-month intervals over extended periods of time--this system also offers important advantages over the 8-month-interval system (detailed discussion of this system follows.)

TABLE 1. LAMB PRODUCTION OF TARGHEE RANGE EWES BRED AND SELECTED ON PREGNANCY AS COMPARED TO EWES LAMBING FOR THE FIRST TIME AS 2-YEAR-OLDS

Management practice	Age of ewe	Ewes lambing	Lambs born	Lambs weaned ^a	Total lambs weaned
	Years	%	%	%	lb
Lambled 1st as yearlings	1	100 ^b	111	83	56
	2	98	143	115	84
	3 or over	97	158	134	107
Lambled 1st as 2-year-olds	1	0	0	0	0
	2	88	102	82	58
	3 or over	89	141	115	87

^a Percent lambs born or weaned of ewes bred.

^b Only those ewe lambs diagnosed pregnant were saved.

Accelerated lambing systems should be used only after one has gained considerable experience and competence at once-per-year lambing. Other important considerations include: a good local source of economical feed or pasture available when the demands for feed are high such as during lactation and when finishing lambs for market; early puberty and high prolificacy to enhance the possibility of satisfactory economic returns; starting relatively small and testing the system.

Accelerated lambing will facilitate the distribution of quality lamb throughout the year and should be a positive factor in promoting the increased consumption of lamb.

Accelerated lambing can lead to the more efficient use of lambing facilities and can possibly justify, under certain conditions, semi-confinement or total-confinement, lamb-production systems.

The use of hormones to facilitate accelerated lambing during the nonbreeding season will not be discussed because it seems unlikely that these hormones will be approved by the Food and Drug Administration for use in food animals, the lack of commercial availability of the hormones, and the technical problems in using the hormones in commercial operations.

IMPORTANT FACTORS THAT AFFECT SUCCESS OF ACCELERATED LAMBING PROGRAMS

- Day length is the primary factor controlling breeding season in sheep.

- Ewes breed naturally only during their normal breeding season.
- Length of breeding season varies with breed and individuals within breeds.
- The sudden introduction of a ram during the transition period between the nonbreeding season and the breeding season stimulates earlier breeding and conception in the ewes.
- Lactation inhibits the occurrence of heat near the end of the breeding season but not during early or midseason.
- Breeds and individuals appear to vary in the interval of time required for them to return to breeding condition and to exhibit fertile heat following lambing.
- The length of the breeding season appears to be moderately heritable and, therefore, may be changed by selection.

ACCELERATED LAMBING SCHEMES

Eight-Month-Interval Lambing

In order for the fixed 8-month lambing interval to be successful, one must either (1) have a breed of sheep that will consistently breed naturally at the fixed breeding dates that are established, such as that used by Outhouse (1974) in Indiana (table 2), or (2) use light control to induce fertile estrus at the planned breeding periods. In most 8-month-interval lambing schemes, ewes are bred every 4 months. This permits those that fail to conceive at the 8-month interval an opportunity to breed 4 months later (12-month interval) and improve the overall efficiency of production.

TABLE 2. BREEDING AND LAMBING SCHEDULE FOR 8-MONTH INTERVAL ACCELERATED LAMBING

Bred	Lambled
December 1972	May 1973
August 1973	January 1974
April 1974	September 1974

Source: Outhouse, J. B. (1974).

Rambouillet, Dorset, and Rambouillet x Dorset breeds and crosses have been used most successfully in this program. Outhouse of Indiana and a few commercial Dorset flock owners claim satisfactory results using the 8-month accelerated program without light treatment (table 3) (Outhouse, 1968). However, some have attempted this program but have found that the occurrence of estrus and fertility have not

been satisfactory during the spring breeding period. If the spring breeding fails, the entire program fails.

TABLE 3. PRODUCTIVITY OF RAMBOUILLET EWES FOR 8 YEARS AND 12 LACTATIONS, INDIANA AGRICULTURAL EXPERIMENT STATION, SEPTEMBER, 1964

Item	Winter (1966-72)	Fall (1964-70)	Spring (1965-71)	Total (1964-72)
No. ewes exposed	197	189	192	578
% ewes lambing	83.2	84.1	91.7	86.3
% born of ewes exposed	133.0	124.3	128.6	128.7
% born of ewes lambing	159.8	147.8	140.3	149.1
% raised of ewes exposed	105.1	101.1	109.4	105.2
% raised of ewes lambing	126.2	120.1	119.3	121.8
% lamb loss	21.0	18.7	15.0	18.3

Because of the difficulty many have experienced getting their ewes to breed out of season, some have established a light-control system to permit fertile estrus at the prescribed times. Leslie and David Chalmers of Choteau, Montana, (personal communication) are working with Polypay ewes in total confinement, using a system developed by the Rowett Institute, Buckland, Scotland, which seems to work well for them. Beginning 40 days before the start of breeding they change from 16 hours light and 8 hours dark to 8 hours light and 16 hours dark. This treatment is continued until breeding is completed; the treatment is then reversed again. During this past year, they reported that of 27 ewes exposed between June 10 and July 10 using the above light treatment, 22 lambed between November 15 and December 20. The Chalmers also practice early weaning (25 to 35 days of age), which may facilitate accelerated breeding. They report marketing a 341% lamb crop in 1980 using this system. In 1981 they plan to bred 250 ewes in this accelerated program.

Russ Beattie of Rexburg, Idaho, also working with Polypay ewes in a semi-confinement system, uses an accelerated lambing schedule, but has no light treatments to control breeding. Lamb production of this system is shown in table 4. Beattie early weans his lambs at 31 to 45 days of age. He then fasts his ewes for 3 days. This is followed by 10 days of average-level feeding while isolated from rams. He then introduces sterile rams and flushes the ewes with alfalfa hay and barley for 5 days. The sterilized rams are then removed and the fertile rams put in.

Beattie claims that farm operating costs, especially fuel and fertilizer costs, have been reduced dramatically and profits have increased greatly since he has started raising sheep on his farm.

TABLE 4. ACCELERATED LAMB PRODUCTION ON THE RUSS BEATTIE RANCH

Year	No. of ewes	No. ewes lambing	Lambs raised to market age	
			No.	%
1979	64			
Winter		64	112	175
Fall		43	70	163
Annual			182	284*
1980				
Winter	103	101	207	205
Fall		47	131	196
Annual			349	339*

* Percentage lambs raised to market weight per year of ewes in the flock.

Six-Month-Interval Lambing

The 6-month-interval lambing permits two breedings and lambings at the same time each year. Table 5 illustrates the system. This system can be adapted to range operations and fits in better with most farm operations. It also requires fewer breedings and lambing per year than most 8-month-lambing schemes while permitting an opportunity for shorter lambing intervals in exceptionally fertile ewes. This provides an opportunity to select for twice-a-year lambing on a ewe basis.

We have found that the average lambing interval in ewes lambing at two consecutive breedings to be about 200 days or slightly less than 7 months.

Ewes that lamb in the period from July to September breed readily while lactating (95% in 1981)--provided that they are fed well or are on good pasture. However, we have found that ewes lambing in the period from January to March must have their lambs weaned from them or they fail to conceive in significant numbers.

Table 6 clearly indicates that fertile estrus occurs much more readily following early lambing (January) rather than later lambing (February - March).

Thus it is clear that given a 200-day lambing interval and a declining breeding response with the advance of the breeding season, most ewes will not lamb at each lambing time for more than three consecutive times before they skip. When they skip, they will usually lamb early at the subsequent lambing period resulting in a lambing interval of

TABLE 5. SIX-MONTH INTERVAL BREEDING AND LAMBING SYSTEM

Bred	Lambled	Weaned
Aug. 10 - Oct. 25 ^a	Jan. 5 - Mar. 30	31 days of age ^b
Feb. 10 - Apr. 10	July 5 - Sept. 14 ^a	50-70 days of age

^a Ewes lambing late in the fall and ewe lambs are permitted to stay in breeding until Nov. 20 to maximize winter lambing.

^b Lambs are weaned at weekly intervals when they average 31 days of age.

TABLE 6. EFFECT OF 1980 WINTER LAMBING DATE ON PERCENTAGE OF EWES LAMBING THE FOLLOWING AUGUST-SEPTEMBER

Lambing day of year	No. of ewes	Percent ewes lambing the following fall
12-30	199	30.7
31-45	46	21.7
46-60	32	9.4
61-90	34	0.0

about 10 months. Thus good-performance ewes lamb two or three consecutive times at 7 month intervals and then skip one period for a 9 or 10 month lambing interval.

One important advantage of this system is that ewes are always being bred during the normal breeding season. This enhances good estrous response and increases the probability of a good lamb crop.

To facilitate early breeding and early lambing, which enhances rebreeding following winter lambing, we put sterilized rams with the ewes on about July 25 (15 to 18 days before desired breeding time) and put the fertile rams in about August 10. More ewes bred early following this procedure--72% vs 37% for controls.

We have elected to use Polypay ewes in this accelerated program after several years of testing Rambouillet, Targhee, Columbia, Finn x Rambouillet, Dorset x Targhee, and Polypay ewes in accelerated lambing. The Polypays consistently outperformed the other breeds. We believe that some of the factors accounting for their better adaptability, (supported by some data) include: short gestation, short postpartum interval, long breeding season, and high fertility. An additional advantage of the Polypay over most of the above breeds is early puberty and high prolificacy.

Light treatments also can be used if desired to enhance the late winter breeding performance of ewes on a twice-a-year lambing program. Conventional light treatments require light-tight barns. We have been experimenting with a new system that can probably be achieved with yard lights and a time switch.

When the ewes are taken out of fall breeding on about October 25, they are placed each night before dark under lights controlled by a timer. The lights go off for about 4 hours during the middle of the night. This treatment is continued until December 21 (the shortest day of the year). At this time ewes are again subject to the natural short day length. Ewes commence lambing in January. For night lambing low lighting (1 foot candle) is used without apparent detrimental effects. Starting February 10 when lambs are on average 31 days of age, they are weaned at weekly intervals onto their high-protein, high-energy creep diet. The ewes are put with fertile rams the next day. The ewes remain in breeding until about April 10. A higher percentage of treated ewes lambed when compared to the untreated group (44% vs 27%).

RAM FERTILITY

In any accelerated system, good ram fertility is critically important. If ewes are treated with light to enhance fertility, rams also should be treated with light. Precautions should be taken to ensure that rams are kept cool and healthy. They should not be overly fat nor too thin. Shearing can be helpful 3 weeks before breeding in hot or warm seasons.

Semen testing is highly recommended. If this is not possible, one should, as a minimum, carefully palpate testes and use only those rams with large, firm testes that are free from any lesions or abnormalities.

CONCLUSIONS

The role of accelerated lambing is two-fold: 1) to provide a more uniform supply of lamb throughout the year; 2) to increase lambs born and raised in relation to the number of ewes in the flock.

- Accelerated lambing can only be justified if it increases the net return over conventional once-a-year lambing systems.
- Low-cost local feeds available at the time of high feed demands are important to the success of an accelerated system.
- Successful accelerated lambing requires dedication and technical expertise above that required for once-a-year lambing. Time and experience usually improve the success of accelerate lambing systems.

- Very efficient, fertile, prolific sheep that have shown adaptability to accelerated lambing will greatly contribute to the success of an accelerated system.

REFERENCES

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