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Welcome to the July issue of *News to Ewes*

In this month's issue of *News to Ewes – A Newsletter for Kentucky Sheep Producers*, Dr. Don Ely and Dr. Debra Aaron of the University of Kentucky discuss the management practice of lambing ewes first at a year of age.

Lambing at a Year of Age

The 1960s and 70s can be described as the “years of commercialization” in the history of the U.S. sheep industry. Before these years, producers fed common feedstuffs like pasture forage, grain, soybean or cottonseed meal, alfalfa hay, steamed bone meal, ground limestone, and/or white salt. They drenched sheep with either cunic (a mixture of copper sulfate and nicotine sulfate) or phenothiazine + lead arsenate every 28 days to try and control stomach and tape worms. Then came the feeding of urea (a byproduct of the petroleum industry) to sheep so they could make some of their own protein and ammonium chloride to prevent urinary calculi in intact males and castrates. Concurrently, commercially-developed implants (stilbesterol and Ralgro®) were found to increase gain and improve feed efficiency as antibiotics improved overall health of sheep raised in confinement. Progesterone impregnated vaginal sponges were discovered to synchronize estrus. Attempts to get seasonal ewes to breed aseasonally, so three lamb crops could be obtained in two years, were the focus of many research studies throughout the U.S. The lack of success in these attempts led to the importation of the Finnish Landrace (Finn) into this country.

Ewe Lambs

Up until the introduction of the Finn, producers traditionally had bred ewes first at 17 to 19 months to lamb at 22 to 24 months of age. Even though the Finn ewe was notoriously seasonal in her estrous activity, ewe lambs reached sexual maturity at younger ages and became more prolific than ewes of firmly established U.S. breeds (Rambouillet, Hampshire, Suffolk, Southdown, Horned and Polled Dorset). Mating rams of traditional breeds to Finn ewes produced crossbred

ewe lambs with younger sexual activity and higher prolificacy than the traditional purebred dam. This showed that ewe lambs, with specific genetic makeups, could be bred at 7 to 9 months to lamb at 12 to 14 months of age. Today, breeding ewe lambs is most practical with maternal pure breeds, or crossbreds, that are white-faced and lamb in April/May. They may be either hair or wool breeds or crosses among those breeds. On the other hand, ewes of terminal sire breeds, like the Hampshire and Suffolk, still lamb first at 22 to 24 months of age (2-year-olds) in January/February. Their inherent later initial estrus activity results in less than optimum conception rates if they are exposed to rams as ewe lambs in August/September. The subsequent lambing percentage of these yearling ewes has been shown to be unacceptable when compared with those lambing first as 2-year-olds.

Continuing, ewes that lamb first at a year of age are usually restricted to white-faced, maternal purebreds or white-face × white-face crossbreds. In addition, these females need to be born in April, mated with rams from mid-November to mid-December, and lamb the next April (average lambing date: April 13) if at least 95% conception rate is desired. Breeding at 7 to 9 months will prevent reaching 95% conception rates for these same white-faced ewes if they are born in January/February and exposed to rams in August/September. Similarly, if these ewe lambs are born in September/October and exposed to rams the next May, conception rates will be too low to be economically efficient. The interaction between season and ewe lamb age can drive conception rates down to as low as 50 to 80% if they are expected to lamb in any season other than April. This is the same reproductive principle (seasonal effects on estrus activity) that prevents January/February-born ewe lambs of terminal sire breeds from having high enough conception rates to be economical if first exposed to rams in August/September.

Management

Based on the discussion above, we have to assume the crop from which replacement ewe lambs are selected are born in April. A complete set of lambing records (lamb, sire, and ewe ID numbers, birth date, birth weight, type birth, way raised, and comments about ewe performance) will be generated. Ewes nurse these lambs while grazing cool season pasture until all lambs are weaned at 60 to 90 days of age. Concurrently, all lambs should be creep-fed from 7 days of age through weaning in mid to late June. Lambs are weighed individually at weaning. Lambing records should be available at the scales so actual weaning weights can be preliminarily compared with the lambing records. Ewe lambs should weigh 50 to 60 lb.

As all lambs are individually weighed, evaluate the phenotype (structural correctness, breed character, disposition) of each ewe lamb. Make notes that can supplement weight records. Separate ewe lambs from rams and wethers so they can be managed in separate groups post-weaning. The ewe lamb group will include those that will eventually be selected for replacements along with those that will be destined for market. Allow these females to graze the highest quality pasture of alfalfa, cool season grass mixed with white clover or alfalfa, or summer annuals.

Supplement once daily (early am) with shelled/cracked corn or a grain mix (14% crude protein) at 2% of the average weight of all the ewe lambs at weaning.

Not all lambs are born on the same day! But, they may be weaned on the same day! And, they will not all weigh the same on the same day! One lamb may weigh more than another just because it may be older when both are weighed on the same day. To correct for this difference, and others, actual weaning weights have to be adjusted for lamb age. An example of the differences in weaning age, actual weaning weight, birth weight, ewe age, and type of birth/way raised for two lambs is shown in **Table 1**.

Table 1. Lamb Data

	Ewe Lamb 3	Ewe Lamb 10
Actual weaning weight (WWT), lb	63	52
Birth weight (BWT), lb	14	8
Weaning age, days	68	55
Ewe age, years	2	4
Type of birth/rearing (TBR)	S/S	Tw/Tw

The first step in adjusting weaning weights to allow meaningful comparisons is to adjust to a common age. Calculate the age-corrected weaning weight (ACWWT) at a common weaning age for Lambs 3 and 10 using the following formula:

$$\text{ACWWT} = \frac{(\text{Actual WWT} - \text{BWT}) \times 60 \text{ Days} + \text{BWT}}{\text{Weaning age in days}}$$

$$\text{Lamb 3} = \frac{(63 - 14) \times 60 + 14}{68} = 57 \text{ lb}$$

$$\text{Lamb 10} = \frac{(52 - 8) \times 60 + 8}{55} = 56 \text{ lb}$$

Note how the difference between the actual weaning weights disappears when weights are adjusted to a common age.

FACWWT's have to be further adjusted for age of the ewe that produced the lamb (2-year-old vs 4-year-old), sex of the lamb (ewe, wether, or ram), and type birth/way raised (single/single vs

twin/twin vs twin/single) in order to make legitimate comparisons. **Table 2** shows the factors and numerical values used to calculate adjusted weaning weights.

Table 2. Lamb Weaning Weight Adjustment Factors (National Sheep Improvement Program)

Factor	Class	Adjustment
Ewe age	1	1.14
	2	1.08
	3 – 6	1.00
	> 6	1.05
Sex	Ram	0.91
	Wether	0.97
	Ewe	1.00
Type of birth/way raised	S/S	1.00
	S/Tw	1.17
	Tw/S	1.11
	Tw/Tw	1.21
	Tr/S	1.19
	Tr/Tw	1.29
	Tr/Tr	1.36

Use these factors and numbers to adjust the actual weaning weights of Lambs 3 and 10 so their performance data can be compared fairly:

Adjusted WWT = ACWWT × ewe age adjustment factor

× sex adjustment factor

× type birth/way raised adjustment

Lamb 3 (ewe lamb born as a single to a 2-year-old ewe and raised as a single):

Adjusted WWT = 57 × 1.08 × 1.00 × 1.00 = 61.6 lb

Lamb 10 (ewe lamb born as a twin to a 4-year-old ewe and raised as a twin):

Adjusted WWT = 56 × 1.00 × 1.00 × 1.21 = 67.8 lb

Strange isn't it that Lamb 3's actual weaning weight was 11.0 lb more than Lamb 10's but 6.2 lb less when adjusted for lamb age, ewe age, and type birth/way raised.

Weigh all ewe lambs at 2- to 3-week intervals until late September and simultaneously increase daily concentrate intakes to 2% of the new average body weight of the entire group. Calculate daily gains after each weighing. They should gain a minimum of 0.5 lb/head/day for the 90 to 120 days from weaning to late September. The late September weights of individuals will likely range from 75 to 110 lb. Some of the differences in these weights can still be a function of pre-weaning variation (lamb age, age of ewe that produced the lamb(s), type birth/way raised, milk production and mothering ability of ewe). The inherent genetic growth potential, stomach worm susceptibility, phenotypic structure, and disposition are variables that may affect weights taken at 90 to 120 days post-weaning.

Selection

Use all the data you have generated to select your replacement ewe lambs. Supplement with phenotype observation (notes). Select 10% more lambs than you will eventually need in case something out of the ordinary happens from late September until initially exposing to rams in mid-November. These extras could also substitute for those originals that may not become pregnant.

A few selection tips follow. First, individual records are required on all lambs because single born and single raised lambs will typically weigh more and will be taller within a group than multiple birthed lambs. Don't select singles if you want a high flock prolificacy. Second, select lambs born early in the lambing season because if their mothers were early lambers, they will, in turn, likely be early lambers themselves. Third, even though triplets or quads may be selected, at least select twin borns that are in the top two-thirds of the total twin crop for adjusted weaning weight and post-weaning average daily gain from weaning to 90 to 120 days. Fourth, ewe lambs exposed to rams for the first time must weigh at least two-thirds of their expected mature weight (Example: 100-lb ewe lamb expected to weigh 150 lb at maturity). Ewe lambs that are smaller at initial ram exposure may not come into heat during the breeding season. Even if these light weights do become pregnant, it will be difficult to promote enough growth during the winter to keep them from having lambing problems in April. Furthermore, if they do lamb in April, their body condition will likely deteriorate during lactation, milk production will be minimal, stomach worms may be encountered during lactation, and overall performance will be suboptimal.

Advantages/Disadvantages

Ewes that lamb first at 12 to 14 months of age may have some growth retardation during pregnancy and lactation even if they were adequate size at breeding. However, this appears to be only a temporary malady. They will reach normal mature weights—it just may take longer than if they lambed first as 2-year-olds. Wool growth does not appear to be affected by early lambing. By lambing first at 12 to 14 months of age, producers can cull poor performers (or opens) prior to breeding as yearlings and thereby save significant feed costs. Maintenance feed costs, before receiving the first income, are less for lambs than for 2-year-olds. In addition, through current technology in pregnancy checking, open ewe lambs can be identified and sold

for harvest before they become yearlings and will, therefore, command high lamb prices. ***A significant advantage for lambing at 12 to 14 months of age, compared with 2 years, is that ewe lambs have been shown to produce 50 to 80 lb more marketable lamb per lifetime.***

Even with the numerous advantages associated with lambing ewes first at 12 to 14 months of age, some disadvantages may be encountered. Conception rates will likely be lower and birth weights will be smaller than for older ewes. More attention will be required at lambing, an extra shearing may be required before first lambing, and ewe lambs must be fed, bred, and managed separately from older ewes until the beginning of their second breeding season.

Summary

The early estrous activity of ewe lambs and subsequent high prolificacy of the Finnish Landrace stimulated the practice of breeding ewe lambs to lamb first at 12 to 14 months of age. Today, this practice seems to be more prevalent in maternal breeds and crosses that lamb in the spring (April). Efficient selection of ewe lambs requires a complete set of lambing records, weaning weights adjusted for lamb age, ewe age, sex, and type birth/way raised, and a phenotypic evaluation. A preliminary selection at weaning, when lambs weigh 50 to 60 lb, is followed by a management scheme that promotes daily gains equaling 0.5 lb/head/day for the next 90 to 120 days. Adding post-weaning gain comparisons to lambing records, adjusted weaning weights, and phenotypic evaluation will allow selection of a flock of replacements from the top two-thirds of the twin lamb crop. The advantages of lambing these ewes at 12 to 14 months, instead of 2 years, will override the disadvantages—the main advantage being production of 50 to 80 lb more marketable product per lifetime.

Questions?

If you have questions, contact Dr. Don Ely (dely@uky.edu) or Dr. Debra Aaron (daaron@uky.edu) at the University of Kentucky.

