CR-3802
1189

OSU Current Report

Cooperative Extension Service • Division of Agriculture • Oklahoma State University

Flock Improvement through Ram Selection

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In a purebred or commercial flock where replacement females are produced, ram selection is critical and can account for 80 percent to 90 percent or more of the flock improvement. In a commercial operation where terminal sires are utilized, the ram contributes 50 percent of the genetics to his offspring. Therefore, ram selection - even in a terminal sire program - is extremely important to an operation's profitability. We have long since passed the era of the utilization of rams as "ewe fresheners".

Performance Records

Performance recording is a way for producers to monitor the progress of their flocks through selection of genetically superior individuals.

Performance evaluation programs are utilized to obtain fair comparisons among all animals being considered for replacements within a flock. Fair comparisons are possible only when environmental differences are taken into account, such as creep fed versus non-creep fed. Those lambs which are creep fed are going to have heavier weaning weights than the non-creep fed lambs. Normally, a producer will creep feed all or none of the lambs which rules out this problem. If a producer does creep feed only part of the lamb crop, the use of ratios can be utilized to make the comparisons fair. Other environmental differences which must be taken into account include age, sex, age of dam, type of birth and rearing.

In adjusting lamb weights, we are removing the environmental influences that may cause lambs to differ in weight. For example, single born ram lambs are known to gain much faster than twin born ewe lambs. The dam's age has a great deal to do with lamb growth. Research has shown that the peak of milk production comes when a ewe is between three and six years of age. Ewes that are younger than three or older than six produce less milk and lambs gain less weight. Therefore, research has shown that adjusting weights to a constant age, sex, age of dam, and type of birth and rearing will allow producers to compare weights due to genetics rather than differences in environment.

Example: Calculating a 90 day adjusted weaning weight

Ram Lamb	Six-Year-Old Ewe
Born: Twin	Birth Weight: 11 lbs.
Raised: Twin	Age at Weaning: 98 days

Actual Weaning Weight: 101 lbs.

$$\frac{\text{Actual Weaning Weight - Birth Weight}}{\text{Weaning Age}} = \text{Average Daily Gain (Birth to Weaning)}$$

(A.D.G. * 90) + Birth Weight = 90 Day Weaning Weight

$$\frac{(101 \text{ lbs.} - 11 \text{ lbs.})}{98 \text{ days}} = (.918 \text{ lbs./d} * 90 \text{ d}) + 11 \text{ lbs.} = 93.6$$

The 90 day weaning weight adjusted only for age is 93.6 pounds. To adjust for sex, age of dam and type of birth and method of rearing we use a "multiplicative" factor. In this case, a twin born ram lamb raised as a twin out of a six year-old ewe has an adjustment factor of 1.09. These multiplicative adjustment factors can be found in the SID sheep production handbook. To complete the 90 day adjusted weaning weight, the 93.6 pounds is multiplied by 1.09 to yield and adjusted 90 day weaning weight of 102 pounds.

When all of the 90 day adjusted weaning weights have been completed within a flock, a producer can now make accurate and fair comparisons among his lambs. Since the environmental effects of sex, age, age

of dam, type of birth and method of rearing have been adjusted for, the adjusted weaning weight is a much better indication of growth due to genetics.

When looking for replacement rams to utilize in your breeding program, make sure you use all available information to make your selection. Visual appraisal is necessary to look for differences in structure, muscling, etc. Performance records are necessary to detect differences in growth.

Central Ram Testing

Selection within a single small flock will yield slow progress for most traits, and inbreeding depression may result in a loss of productivity. The central ram test station provides a program to compare performance among different flocks. The central ram test can be effective for those traits that are moderate to highly heritable and can be measured in the young ram. The OK Ram Test is a good example of this type of central ram test. This ram performance test measures post-weaning gain from late April through late June. The test is about 60 days in length.

The OK Ram Test compares rams from different flocks, all brought together and treated alike. This allows a ram buyer to purchase a breeding ram that has been compared to rams of the same breed under the same environmental conditions. Buyers should realize that just because a ram has been performance tested, does not mean he is a genetically superior individual. It is important to select performance tested rams that are above the average in post-weaning gain as they are superior rams.

Economics of Performance Testing

The following is a very simplified example of the additional value to a commercial producer of utilizing rams that are superior in growth. If a commercial producer can buy breeding rams for $200 per head based upon visual appraisal, is there any advantage in buying performance tested rams at probably a higher price? **YES!!!**

If 10 rams are purchased based solely on visual appearance, the average genetic growth that those individuals will pass down to their offspring will be simply average. Why? Some rams will produce offspring that will growth faster than the average; however, others will produce lambs that will gain slower than the average. Therefore, on all 10 rams, only average gains can be expected. Performance testing is simply identifying which rams will probably produce the faster gaining lambs based upon their own performance. Once we can identify superior individuals, how much value are they to an operation?

Example:

Taking a ram from the 1988 OK Ram Test that is 20 percent above the average. The average gain for the first 30 days of the test is 1.00 lb/day for the spring born ram lambs. This ram would be 1.20 lb/day and would have a .20 lb/day selection differential. The selection differential is the deviation from the average of the flock. In this case, this ram is .20 lb/day superior for growth. To calculate a genetic value on this ram with a heritability of 40 percent of .40 post-weaning gain. Calculation of an expected progeny difference would use the following equation:

(Heritability * Selection Differential) = Estimated Breeding Value (EBV)

EBV * .5 = Expected Progeny Difference (EPD)

(.40 * .20 lb/day) = .08 * .5 = .04 lb/day = EPT

.04 lb/day * 90 days = 3.6 lbs increase in weaning weight of progeny

Therefore, if a ram breeds 30 ewes with a 150 percent lamb crop, 45 lambs will gain an average of 3.6 lbs more than the average lamb. This is a yearly increase in pounds of lamb sold of 162 lbs. At $70/cwt, this is an additional profit of $113.40 per year. With an average ram's useful life being three years or more, this ram is worth $340.20 more than the average ram to the commercial producer.

Granted, this is a very simplified example. However, it does point out that rams with superior growth are a valuable commodity to the purebred producer and the commercial producer.

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