Ram Selection
Scott P. Greiner
Extension Sheep Specialist, Virginia Tech

From a genetic standpoint, ram selection is the most important decision a sheep producer makes. The vast majority of genetic improvement in the flock is the direct result of ram selection. For flocks with small numbers of ewes, the importance of an individual ram is even further exaggerated- as one ram alone accounts for a large proportion of the genetics represented in each lamb crop. Relative to other production and management decisions, ram selection is an infrequent occurrence. However, these decisions have long-term impact relative to the productivity and profitability of the sheep enterprise.

Genetic progress in economically important traits is dependent on several factors, including:

Accuracy of Selection- The true breeding value of the animal must be estimated accurately. This is best accomplished through the use of Estimated Breeding Values since EBVs account for nongenetic factors and are expressed on an across-flock basis. With EBVs not widely available, it is important that performance traits be compared between animals only within contemporary group (group of animals provided the same opportunity to perform (same flock, age, diet, management, etc.). Performance records also need to be properly adjusted for nongenetic factors such as age of ewe, type of birth and rearing, and sex of lamb for growth traits such as weaning weight.

Intensity of Selection and Variation- Since fewer rams are selected than replacement ewe lambs, rams can be more intensely selected for traits (more can be culled). It is also important that there be variation within the flock for the traits being selected, as more variation allows for more difference between genetically superior vs. inferior individuals to be made. Lack of variation makes genetic change very slow, as even superior animals are more similar to the average of the flock.

Heritability- Variation in traits between animals is due to combination of genetics and environment. The portion of the variation that is due to genetics is termed heritability. Traits with higher heritabilities respond faster to selection as a higher percentage of the differences between animals is due to genetics which will be passed to the next generation. In general, reproductive traits are lower in heritability and respond slower to selection (number of lambs born for example). Growth traits such as weaning weight and post-weaning weight are moderate in heritability, and carcass and fleece traits are generally high in heritability. Consequently, more rapid genetic progress is generally achieved in carcasss and growth traits compared to reproduction.

The first step in ram selection includes thoughtful determination of the role of the ram in contributing to the existing flock genetics. The breeding system utilized, marketing system, management level, and feed/environmental resources are important considerations for determining this role along with flock records to benchmark the flock performance and establish strengths and weaknesses. What traits do I need to improve (or maintain) in my flock, and how will the new ram contribute to these goals? For

example, traits of importance in rams will vary greatly if the ram will be used to sire replacement females vs. a ram that will be used strictly as a terminal sire.

The following major criteria are considerations for ram selection:

1.   Performance Record: Ideally ram selection would include evaluation of a complete performance record on potential rams. This performance record would include adjusted records (or EPDs generated through the National Sheep Improvement Program) for birth type, weights, fleece attributes, carcass merit, and dam lifetime production. Unfortunately, many times these records are not widely available. Although the heritability of condition of birth is low (single vs. twin vs. triplet), lambing percentage can be increased by selecting for multiple births over time. Of particular importance is the lifetime production of the dam, including number of lambs born per lambing and total weaning weight. Growth traits are typically expressed as weights measured at weaning (60-90 days), 120-days, and at a year of age. In the absence of formal weights being available, growth can be measured as a function of weight per day of age. Many purebred breeders commonly measure post-weaning performance on a structured gain test. Selection for growth needs to be in concert with selection for appropriate mature size.

2.   Conformation/Soundness: Visual appraisal is generally a poor method of selection for the traits just discussed. However, conformation as it relates to soundness is critically important to the function of the ram. Rams that stand and travel squarely and freely on their feet and legs are most desirable. Mouth soundness is particularly imperative, and rams exhibiting parrot mouth or monkey jaw conditions should be avoided. In most cases, muscling is assessed by visual appraisal as is body capacity. A breeding soundness exam that includes semen evaluation should be performed.

3.   Source: A variety of sources are available to purchase rams. Seedstock suppliers who are able to furnish extensive performance records offer the best opportunity to make informed selection decisions. Select breeding stock from flocks with compatible goals and selection strategies relative to the intended role of the ram to be purchased. Ram testing stations exist in the region, and allow for the comparison of rams from different flocks in addition to providing performance information and verification of a health and management program. Select rams from a reputable source, and from a breeder who stands behind their genetics. Remember that in addition to the new genetics you are purchasing in the form of the ram, you are also acquiring the health program of the source flock.

In summary, ram selection is critical to genetic improvement of the flock. Establishing the goals and priorities of your program and how the new ram will contribute to these objectives prior to the purchase of the new ram is key.