SHEEP SELECTION 101

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Animal selection has been described as part art and part science. The “perfect” animal for one may not fit the ideal described by the next person. Even though the ideal animal may be different for all of us, there are several considerations we should all be looking at to assess differences. As an overview, breeding sheep should be structurally and reproductively sound, highly productive and gain rapidly and efficiently. Additional traits to evaluate in selection of quality animals are frame, muscle, length, and capacity through their middle. Often, skeletal correctness and width of skeleton are overlooked but are still important evaluation points. Generally, sheep that walk and stand with additional width at the ground are going to have more muscle than narrow based sheep. Additional capacity is also gained when sheep have more curvature and depth to their middle.

Structural Correctness

Skeletally correct sheep that take a long and relaxed stride when in motion have a greater adaptability to adverse or varied range conditions. Sheep with a poor design through their joints, poor feet setting and placement tend to be less productive than those that do not incur this additional strain. Flexibility in joints is desired but can become too weak and cause as much strain as joints that have little to none. To account for this, selection should be placed on joints with correct angulations and strength. One does this by evaluating the skeletal system or bone structure of the individual. When doing this I like looking at animals from the ground up. Feet and legs should be set at the corners of the animal and at the ground should point forward. The two joints that cushion most of the animal’s weight are the pasterns and hock. Thus, they are very important in maintaining the soundness of the animal for the duration of production. Strength of the pastern depends on the length between the top of hoof and the base of the dewclaw. Typically, if the joint looks longer than normal it will also have more “set” to it. In badly set pasterns the dewclaws can be seen touching the ground. Eventually this can cause the animal to become lame. Sheep that have correct angulation to their hock will show flex when they travel. “Sickle hocked” and “cow hocked” are widely known as incorrect sets to the rear leg because it decreases the leg’s stability. The knee of the sheep should be set vertically above the hoof when viewed the front and side. Knees that point forward “bucked over” or to the inside are undesirable due to instability that this causes. The angle of the scapula or shoulder can dictate the length of stride by the front legs. If the shoulder blade is set forward or more perpendicular than ideal the sheep has more difficulty reaching forward when moving. Another sign that indicates a steep set to the shoulder is the way the sheep carries its head. When the shoulder is laid back, ideally to around a forty-five degree angle, the sheep’s neck will tie high into the top of the shoulder and allow it to carry its head high and appear alert. Sheep that are “down-headed” generally are set more perpendicular at their shoulder blade. The top of the sheep should be straight when you view it from the profile and carry this squareness through the dock area of the hip. Heavily boned, big-footed animals are more desired in order to give more stability and a more powerful look.
Frame

This is a direct indication of the growth potential of the individual and their offspring. Since breeding sheep produce market lambs, which are widely sold by the pound, one should always consider frame and growth as a genetic factor. Different production situations allow for different size ewes. Thus, large and small-framed ewes can produce profitable offspring when bred to a ram of exceptional complimentary and then marketed correctly. Large framed sheep produce lambs that grow fast and weigh heavier and thus are worth more money at the point in which they are marketed. With this mind-set, many times sheep are selected primarily on frame size because it correlates well with profit. However, if structure, muscle and capacity are neglected, over time, the production efficiency of the flock that retains replacements can decrease. Frame also correlates with the time of maturity of the individual and can be estimated by studying the length of the cannon and overall skeletal extension.

Capacity

This is evaluated by judging the overall volume that the animal posses throughout the rib cage or middle section. Sheep with more capacity have more area for gestation and holding more lambs as well as giving them a more productive and a more maternal look. Capacity starts at the chest floor with more width in this area being more desirable. Additional curvature in the lower fore rib and upper part of the rib cage is selected for. “Counterfeit” sheep are overly conditioned which creates the illusion of having more capacity than what is really there. A trained eye and experience allows one to see through this additional fat to find the true capacity. As an additional note, many times it is overlooked that sheep with more volume and capacity also weigh much heavier than those of the same frame size that lack in rib depth and shape.

Muscle

Muscle is evaluated in three primary sections on sheep being the rack, loin and leg. An experienced shepherd can make a good estimation of the amount of muscle that an individual has. However, to accurately judge the muscle that sheep have, they should be handled until one is comfortable with their visual estimation. Length, width and depth of muscle should be taken into consideration at all points. The forearm and shoulder should blend smooth but not lack muscle dimension. The rack is ideally wide and expressive. When measuring the loin, more length from the last rib to the hook bones is desired while additional width and depth create more total area of muscle. Finally, the hip and leg of the lamb should be measured by the length from hooks to pins and depth and circumference of muscle through the inner and outer portions of the leg. When handling the sheep, one should expect to find a hard and expressive muscle pattern.

Balance and Quality

This evaluation point is most effectively studied from the profile of the sheep. In female breeding sheep, the ewe should posses a broody and maternal look that is created by selection for capacity. Ideally, one should strive to find ewes that combine this with power, size and structural correctness. Femininity is found by selecting for refinement of the shape of the ewe’s
face, head and neck. When the ewe is viewed from the side, she should transition through her neck, shoulder, middle rib section and hip with a smooth pattern and additional length. The topline of the ewe is desired to be straight and the hip set squarely into it. Ewes that are short sided, weak in their top or steep in their hip are less attractive and thus should be selected against.

Rams should be stouter than the ewes. A powerful ram will be heavier structured, have more muscle and more masculine about his features. Rams can be coarser through their shoulder and head and still be desirable. Along with this, rams should be selected for added testicular size and be firm when handled.

**Mouth Soundness**

Breeding sheep should have a sound mouth and jaw design. The jaw should meet squarely and the front teeth in the lower jaw should be centered on the dental pad in the upper jaw. Jaw defects are highly heritable and can prevent sheep from gathering adequate forage. “Parrot-mouth” sheep have an over shot jaw while conversely a “Monkey-mouth” sheep has an undershot jaw.

**Performance Records & Selection**

**Ram Selection:** 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.

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. 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 criteria should be considered:

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. Weaning weights are a function of both growth genetics of the lamb and milk production of the dam, whereas post-weaning weights are
primarily a function of differences in individual growth genetics. Selection for growth needs to be in concert with selection for appropriate mature size.

**Ewe Selection:** In most breeding systems, replacement ewe lambs will be generated from within the flock. Therefore, attention to maternal traits in the rams siring potential replacements is critical. From the existing pool of potential replacements, the following are important considerations for selection:

Ewe lambs should be retained from highly productive dams. Identifying these dams through a record-keeping system is therefore the first step in identifying potential replacements. Dams that lamb early in the lambing season, produce multiple births, and excel in pounds of lamb weaned (reflective of milking ability) are the best candidates to produce replacements. In the absence of such records, identifying maternal potential in ewe lambs based solely on visual appraisal is difficult.

Preference should be given to ewe lambs born early in the lambing season (first 50 days). These ewe lambs are more likely to reach puberty earlier, breed, and lamb early as yearlings—thus keeping the subsequent lambing season short. Older ewe lambs are also more likely to reach target body weight by their first breeding season than young ewe lambs, and this coupled with age enhance their ability to breed as ewe lambs.

**Production Records:** Production records are important not only for selection, but also as a management tool. Basic performance records start with individual animal identification at birth. Simple records would include birth date, type of birth, and type of rearing. In many instances, individual lambs could be identified as to their dam as well as sire (or perhaps breed of sire in multiple sire breeding groups). These basic records can be very useful to the shepherd in terms of monitoring overall prolificacy of the flock, breed types and crosses within the flock, and individual reproductive performance of ewes. Additionally, the ability to identify an individual ewe and her lambs is an excellent management tool during lactation. More extensive performance records including individual birth and weaning weights of lambs as well as post-weaning growth measures would also be advantageous to commercial flocks. Addition of these records allows for calculation of ewe productivity (total pounds of lamb weaned), and provides the opportunity for more accurate selection for growth traits. To be used properly in selection, all records need to be adjusted to a common basis. Growth measures such as weaning weight need to be adjusted for sex, type of birth/rearing, lamb age, and age of dam. These adjustment factors are readily attainable from several sources, and rather simple to apply.

Finally, collection of performance records enables the shepherd to monitor the rate of progress in the flock. By doing so, proper emphasis can be placed on individual traits with selection and areas can be identified that may be responsive to management changes.