Understanding EBVs

Provided by the Katahdin NSIP (kNSIP) Steering Committee

So! Just what ARE these "EBVs"? They're called "Estimated Breeding Values" and they're tools that can help you fine-tune your flock. More accurately, they're mathematical predictions of the genetic merit of an animal for economically important traits. Do you have too much post-weaning growth for your production system? Need more resistance to parasites? Need to improve production in general? Or just need to maintain the traits you have? EBVs can help you do all of this and more.

Most (75-90%) of the differences we see between animals are the result of environment, management or chance. The remaining differences are the result of genetics. While this may seem like a small amount, genetic improvement is permanent and can be compounded. In other words, environmental influences fluctuate, whereas genetic effects remain constant. The value of EBVs is that they help us identify the portion due to genetics.

Very simply, EBVs are based on comparisons of animals with common genetics and allow us to predict future performance for specific traits. For Katahdins, these traits include: growth, milk, prolificacy, mothering, and parasite resistance. In order to make the most of EBVs, it helps to understand a little about how they work. The strength of EBVs is highly dependent on three concepts: contemporary group structure, genetic connections and accuracy.

A contemporary group is a group of lambs that are born within roughly 45 days and managed the same way. A well structured contemporary group needs at least two sires and enough lambs from each sire (generally 20) to tell if the differences observed between animals are due to genetics or due to environmental effects.

Genetic connections provide a way to compare performance between flocks. This is best done by using the same breeding ram in two or more participating flocks. These are called "across flock" EBVs because the common genetic connections allow us to compare performance between flocks. If a flock is not linked to other NSIP flocks, the EBVs obtained can only be compared to the animals in that individual flock. These are called "within flock" EBVs.

Accuracy has to do with reliability, which is the expectation that an animal and his progeny will perform the same way time and time again. Accuracy increases with good contemporary group structure, better genetic connections and greater numbers of offspring. With "across flock" EBVs, there are usually a greater number of progeny, and comparing those progeny in different management systems helps improve accuracy.

Since rams have the most influence on the rate of genetic change from year to year, we often talk about "proving" rams. This simply means that we want our rams' EBVs to be as accurate as possible. We do this by "testing" their progeny in well structured contemporary groups on multiple farms so that fair comparisons can be made. The sooner these rams are identified, the sooner we are able to use them to our best advantage. Likewise, it is just as important to identify those rams that don't live up to their promise, before they take our flock too far backwards.

Now that you know what EBVs are, let's review what you need to get started. For a well structured contemporary group, you'll need at least 2 or more rams for breeding. After the lambs are born, they need to be managed together as one group under the same conditions: same feed, same pasture. The data you'll need to collect is what most producers already collect: birth weight, weaning weight, and post weaning weight. These measurements, along with information on sire, dam, birth type and rear type are entered into Pedigree Wizard, a database software program used by LambPlan to manage data. LambPlan is a computerized sheep performance program in Australia that the National Sheep Improvement Program (NSIP) in the US utilizes to calculate the genetic evaluations from the data you have supplied and returns them to you in the form of EBVs.

EBVs are a tool, nothing more, and nothing less. They can be used to make culling decisions, select ewe replacements, rams, and set value for sales and purchases. They will not tell you whether an animal is structurally correct or has good conformation, and are not meant to replace visual appraisal or subjective observations of animal behavior. Rather, they are performance-based, objective measurements of an animal's genetic potential.

In the next issue of the Hairald we'll discuss how to use EBVs to select replacement ewes and your next herd sire.

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