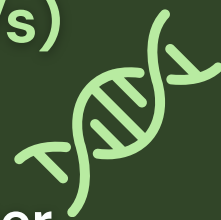




# ESTIMATED BREEDING VALUES (EBVs)

Science-based measures of heritable traits that can be tracked.



## How They're Calculated & Why They Matter

### THE BASICS

- **Sheep possess valuable traits** such as reproduction, growth, parasite resistance, carcass quality, and wool
  - These traits are observable characteristics (phenotypes) and can be measured.
  - Expression of these traits is influenced by both genetics and environmental factors.
- **Genetics:** Refers to an animal's inherited DNA and genetic potential, which remain constant regardless of environment.
- **Environment:** Includes all external factors affecting the animal, such as nutrition, weather, health challenges, management practices, and lambing rank (single or twin).

### THE CHALLENGE - Is it Environment or Genetics?

When two lambs are weaned and one weighs more, it's not always clear if the difference is due to genetics or to environmental factors—like being a single lamb or having a dam that produced more milk that year.

### THE SOLUTION

EBVs remove the environmental “noise,” revealing genetic traits that will reliably pass to the next generation.

### WHY DOES IT MATTER?

Choosing breeding animals only by appearance can lead to keeping ones that may not pass their desirable traits to their offspring.

### How EBVs are Calculated

#### 1. Individual Performance Measurements

- Adjustment factors are applied for age, dam's age, birth/rearing type so sheep can be compared fairly.
- Sheep of similar age, feed, and care are put into contemporary groups to reduce environmental effects.

#### 2. Heritability

- How much of a trait comes from genetics instead of the environment.

#### 3. Relationships Between Animals

- Parents, offspring, siblings, and even first cousins share portions of their genes. Even the most distant relatives share genes.
- Recognizing these relationships helps predict the genetic potential of future lambs.

#### 4. Genetic Linkage Across Flocks

- Shared ancestry across flocks strengthens genetic analysis and makes evaluations more reliable.

#### 5. Genetic Correlations

- Some traits are genetically linked, meaning selection for one trait can affect another.
- For example, birth weight and weaning weight have a positive link of 0.3—when one goes up, the other often goes up too.

#### 6. Integrating the Data

- By combining the above information together, Estimated Breeding Values (EBVs) are calculated.

### What This Means For You

- EBVs reveal an animal's genetic potential, cutting through environmental effects therefore reducing risk when purchasing sheep.
- Speeds genetic progress, improves flock productivity, and boosts profitability.

**Invest in your flock's future—use EBVs to build genetics that work in any environment.**

Learn more: [www.nsip.org](http://www.nsip.org)