Glossary of NSIP Terms

Accuracy – A measure of how close an animal's Estimated Breeding Value (EBV) for a trait is to its "true" breeding value. Accuracy is a function of the amount of data behind an animal's EBVs. As additional data are collected and accuracy increases, the EBV becomes a closer approximation of its true breeding value. If all the data needed to measure an animal's true breeding value were included in the analysis, accuracy would be 100%. Increasing accuracy together with adequate genetic linkages, will lead to EBVs that are less prone to fluctuation.

Balanced EBVs – all the EBVs for each measured trait for that animal, are at or better than the average for the breed.

Birth Weight – the weight of the lamb, recorded in pounds, taken within 24 hours of birth.

Connectedness – see Genetic Connections.

Contemporary Group – a group of animals, usually lambs, of approximately the same age (born within a 35-day window), managed together as one group so that all individuals receive the same environmental influences (i.e., same feed, shelter, de-worming application, etc.). Good contemporary group structure increases the accuracy of the EBVs, permits comparisons between progeny of different sires, and allows for the separation of genetics from environment. Ideally a contemporary group of lambs should include the progeny of more than one sire with each sire being adequately represented (at least 10 lambs per sire).

Estimated Breeding Value (EBV) - A numeric representation of an animal's genetic potential for a given economically important production trait. An animal's EBVs become more accurate over time as more data are accumulated on the individual animal, its progeny, and its relatives in their own and other genetically connected flocks. The EBVs reported by LAMBPLAN for Katahdins include:

BWT – Birth Weight EBV – estimates direct genetic effects on weight at birth. Higher values can be an indicator of larger lambs at birth. Both extremely large and extremely low birth weights can cause problems at lambing.

MWWT – Maternal Weaning Weight EBV – estimates the genetic merit for mothering ability. This EBV mainly reflects genetic differences in ewe milk production, but other aspects of maternal behavior are also involved. A higher number generally indicates more milk production and/or higher quality milk.

WWT – Weaning Weight EBV – provides an estimate of pre-weaning growth potential and will likely receive positive selection emphasis in most flocks. Target selling weight and length of time lambs are kept prior to marketing could impact the desired weaning growth rate in a flock.

PWWT – Post-weaning Weight EBV – combines information on pre-weaning and post-weaning growth to

predict genetic merit for post-weaning lamb weight. The target weight at which lambs are sold should strongly influence the desired level of post weaning gain.

PFAT – Post-weaning Back Fat Thickness EBV – evaluates the degree of fat cover on an animal's carcass and is measured and expressed in millimeters above or below the average for the breed.

PEMD – Post-weaning Eye Muscle Depth EBV – evaluates the genetic merit for muscling. Measurement of muscle depth of the ribeye muscle is expressed in millimeters above or below the average for the breed.

WFEC – Weaning Fecal Egg Count EBV – evaluates the genetic merit for innate parasite resistance based on worm egg counts recorded at weaning or at early post-weaning ages. The lower the number, the fewer parasite eggs and less vulnerable the animal will be to parasites. The WFEC EBV is especially important for lambs exposed to worms while still dependent on their dam.

PFEC – Post-weaning Fecal Egg Count EBV – can be reported at either the early (90- 150 days of age) or late post-weaning age (150-210 days). As with the preceding measure, low numbers indicate fewer parasite eggs and less loss due to parasites. The PFEC EBV is important for everyone with sheep grazing in areas where internal parasites are a problem.

PSC – Post-weaning Scrotal Circumference EBV – correlates with both fertility and sexual maturity. Selection for this trait is expected to increase reproductive performance in rams and their female relatives. Use of scrotal circumference measurements should emphasize "adequacy" and is not intended to be a "bigger is better" measure. The goal is to avoid rams with poor testicular development. This trait does not identify or correct for testicular deformities or abnormalities in semen.

NLB – Number of Lambs Born EBV – evaluates the genetic potential for prolificacy. This EBV is expressed as numbers of lambs born per ewe lambing. A higher value will increase litter size whereas a value near zero will reduce litter sizes in adult Katahdin ewes.

NLW – Number of Lambs Weaned EBV – evaluates the combined ewe effects of prolificacy and lamb survival to weaning. The NLW EBV is expressed as numbers of lambs weaned per ewe lambing. An NLW EBV equal to or higher than the number born EBV indicates that the ewe is able to raise all her lambs to weaning.

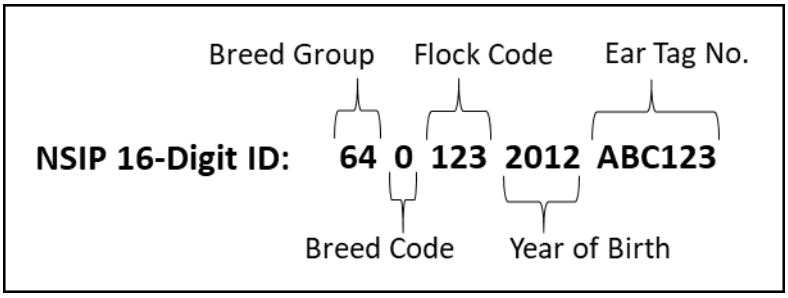
USA HAIR Index – also called the Katahdin Index, Ewe Productivity Index, or Ewe Productivity Trait (EPT) – combines EBVs for various production traits into a single value designed to maximize pounds of lambs weaned per ewe lambing. The USA Hair Index gives substantial positive weight to Number of Lambs Weaned, Maternal Weaning Weight, and Weaning Weight EBVs. This index does not include parasite resistance (FEC), post-weaning weight (PWWT), scrotal measurements, or carcass traits.

Genetic Connections or linkages – also referred to as "connectedness". Genetic connections occur when two or more flocks share common genetics. Genetic connections increase the accuracy and reliability of EBVs and allow the EBVs of one flock to be compared with confidence to those in another flock, independent of environment and management. There are several ways to achieve connectedness; sharing a proven sire or a son of a proven sire is one of the easiest.

Heritability – refers to the degree to which the differences observed between animals are due to genetic

influences versus the effects of management or environment. Depending on the trait in question, it is commonly assumed that only 10% to 30% of the differences seen in performance between animals is due to genetics. Heritability is generally highest for traits requiring direct individual animal measurement such as weights, parasite resistance, and carcass characteristics. The trait measured by performance in future generations, such as reproductive traits, tend to have lower heritability.

ID Number – each animal in LAMBPLAN is identified with a 16-digit ID. An example is given below. It is essential that once assigned, this number does not change. An animal purchased from an NSIP flock must maintain the exact ID number he/she was assigned in its flock of origin or the valuable genetic connections between flocks will be lost.



Individual Listings Report – this report, returned from LAMBPLAN following analysis, shows the EBVs for every animal in your flock on which data were submitted for the most recent analysis. This report includes four sections: sires, dams, male progeny, and female progeny. Only ewes and rams with progeny in the current year will be included on the report. This report is updated and returned every time data is analyzed by LAMBPLAN.

LAMBPLAN - the sheep performance program provided by Sheep Genetics Australia. North America's NSIP has partnered with LAMBPLAN of Australia to provide the service of performing the EBV calculations for NSIP members. The data calculation runs are performed every two weeks.

Management Group – see Contemporary Group.

NSIP – National Sheep Improvement Program, an organization developed in the U.S. that provides genetic evaluation for a variety of production traits. This organization delivers EBVs for the various US sheep breeds. It contracted with LAMBPLAN in 2010 for the service of providing the EBV analysis and generation of reports.

Pedigree EBV – an EBV that is estimated and based only on the average of the sire's EBV and the dam's EBV for each trait, with no actual performance data collected on the lamb in question. This is often used when planning matings and until the initial data submitted to LAMBPLAN is returned as actual EBVs for that animal.

Pedigree Master – the software application provided by LAMBPLAN for use by NSIP participants to enter, store, and submit their data to LAMBPLAN.

Percentile Ranking – a report that shows the distribution of EBVs by trait of all animals submitted for the breed for the previous two years. Percentiles are values that give the percentage of the population that are at or below the given value. For example, a lamb with an EBV at the 95th percentile means that 95% of its peers across the breed have EBV's for that trait equivalent to or below that value. In this case the animal could be said to be in the "top 5% for the breed". Percentiles allow the user to see how a lamb compares for each trait to its peers in the

breed. Percentile rankings are updated at least twice per year to reflect the current EBVs of the animals submitted.

Performance Interval – the period between one performance measurement and another, i.e., birth to weaning; weaning to post weaning; post weaning to yearling, etc. This usually refers to performance traits that involve collecting and submitting successive measurements such as weights and fecal egg counts.

Progeny – offspring of a ram or ewe. The more progeny with data submitted, the greater the accuracy of the parents' EBVs, as well siblings and other relatives.

Proven Sire – a ram with progeny and genetic connections in NSIP. A proven sire is more desirable than an unproven one with the same EBVs because his genetic merit for a particular trait is more predictable and reliable based on the performance data submitted from his progeny. The more progeny a ram has, the more accurate his EBVs become. There is no greater measure of a sire's breeding value than the performance of his own progeny.

Trait – a genetically-determined characteristic of an animal believed to be of economic importance across multiple member flocks. Traits are the focus of data collection and development of specific EBVs for an animal. See "Estimated Breeding Value" above for list of traits currently tracked by most Katahdin NSIP member flocks.

Weaning Weight – "weaning weight" is a term used by LAMBPLAN to designate a body weight taken at a standard 60 days of age for a contemporary group. Lambs do not need to be physically weaned at this time.