

Understanding Sheep Expected Progeny Differences (EPDs)

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Expected Progeny Differences (EPDs) provide estimates of the genetic value of an animal as a parent. Specifically, differences in EPDs between two individuals of the same breed predict differences in performance between their future offspring when each is mated to animals of the same average genetic merit. Sheep EPDs are calculated for growth and maternal traits and are reported in the same units of measurement as the trait (normally pounds).

EPDs are reported for the sheep industry through performance recording in the National Sheep Improvement Program. Complex statistical equations and models use all known information on a particular animal to calculate its EPD. This information includes performance data (i.e., weight records) on the animal itself, information from its ancestors (sire and dam, grandsire, great grandsire, maternal grandsire, etc.), collateral relatives (brothers and sisters), and progeny (including progeny that are parents themselves). In short, virtually all performance data that relates to the animal of interest is used to calculate its EPD. These performance records are adjusted for such factors as age and sex of the animal, and age of the dam prior to inclusion in EPD databases. These adjustment factors allow performance records to be fairly compared in the analysis. Additionally, genetic merit of mates is accounted in evaluating progeny information. Therefore, progeny records are not influenced by superior or inferior mates. The statistical analysis used for EPD calculation also accounts for the effects of environment (nutrition, climate, geographical location, etc.) that exist between flocks. Consequently, EPDs generated through the across-flock NSIP analysis allows EPDs to be compared on sheep from different flocks of the same breed.

EPDs are most useful to directly compare individuals for traits of interest. An example set of growth and maternal EPDs for two rams is shown below.

	60-day Wean Wt. EPD	120-day Wt. EPD	Maternal Milk EPD	Maternal Milk + Growth EPD	Maternal % Lamb Crop EPD
Ram A	+1.0	+2.5	+0.5	+1.0	+10.0
Ram B	+0.0	+0.5	+0.0	+0.0	+5.0

60-day Weaning Wt. EPD: EPD predicts genetic merit for weaning growth potential. The difference in the 60-day Weaning Wt. EPD value between Ram A and Ram B is 1.0 pound. Therefore, Ram A would be expected to sire lambs that average 1.0 pound heavier at 60 days of age than lambs sired by Ram B.

120-day Wt. EPD: Provides indication of post-weaning growth potential, and reflects differences in progeny weight at 120 days of age.

Maternal Milk EPD: Estimate of genetic merit for maternal ability, primarily due to differences in ewe milk production as realized in her lambs. Milk EPDs reflect the milking ability of an animal's daughters, as measured by additional pounds of lamb weaned. Considering the milk EPDs for Rams A and B, we would expect daughters of Ram A to wean lambs that are 0.5 pounds heavier at weaning than lambs weaned by daughters of Ram B. This difference is due to the superior milk production of daughters sired by Ram A.

Maternal Milk + Growth EPD: EPD combines information on 60-day weaning weight and maternal milk EPDs to provide a total estimate of the genetic merit of an animal's daughters for weaning weight. It recognizes that the genetic contribution of a ewe to the weaning weight of her lambs combines the effects of her milk production and growth potential. EPD is expressed in pounds of lamb weaned by an animal's daughters.

Maternal % Lamb Crop EPD: This EPD indicates genetic potential for prolificacy, and is expressed as number of lambs born per 100 ewes lambing (or %). In the above example, the difference in % Lamb Crop EPDs suggests daughters of Ram A should drop an average of 5.0 more lambs per 100 ewes lambing than daughters of Ram B (or 5% more lambs).