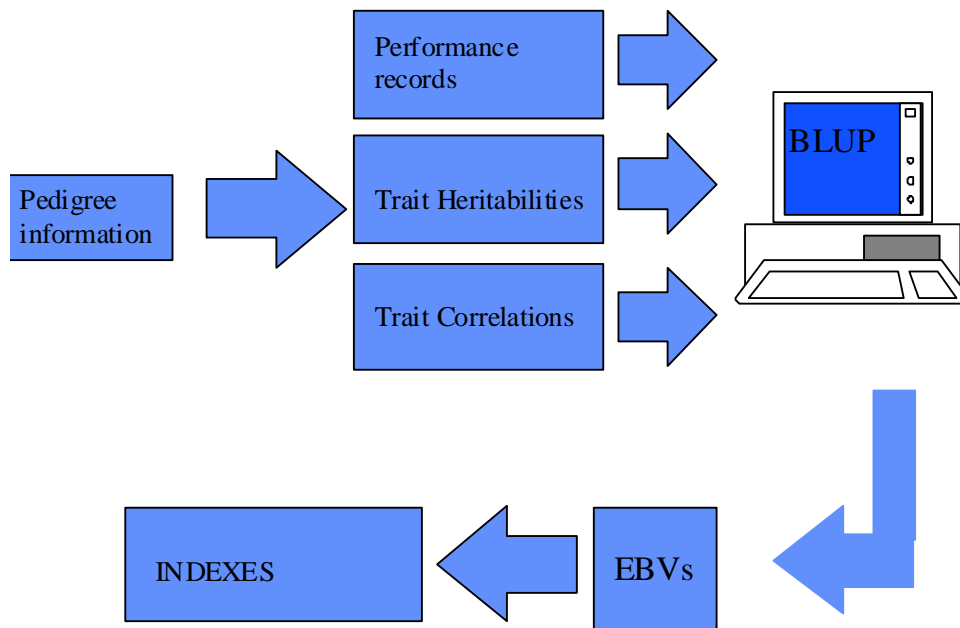




### Estimated Breeding Values (EBVs)

The pedigree and performance data collected and stored on the Sheepbreeder database is analysed using a procedure called BLUP (Best Linear Unbiased Predictor).

The BLUP system calculates how much of each animal's performance is due to its breeding merit and how much is due to the environment in which it has been raised. This assessment of breeding potential is expressed in units known as Estimated Breeding Values, or EBVs.



EBVs provide a measure of the breeding potential of an animal for a specific trait. They take into account performance data collected on known relatives, the relationships between performance traits (correlations) and the degree to which traits are inherited from one generation to the next (heritabilities).

The standard set of EBVs is shown in Table 1.

EBVs are expressed in the same units as the recorded trait (e.g. kg for eight week weight) and they relate to a common baseline. This baseline of zero relates to the average breeding value of lambs born in the year when the within flock or across flock analysis was first produced.



EBVs are easy to interpret, for example:

*A ram with an EBV of +6 for scan weight is estimated to have the genetic potential to be 6kg heavier at 20/21 weeks compared to the average of the animals from the same flock born in 1990.*

A recorded ram will only pass on half of its genes to its lambs so its EBVs must be halved in order to estimate the average genetic worth of its progeny.

Table 1. Standard performance traits

EBV	Trait	Raw data
Litter Size	Prolificacy	This trait is defined as the total number of lambs born alive and dead when pregnancy reaches full term.
Maternal Ability (kg)	Maternal ability of ewe, relates to milk production	The component of a lamb's growth to eight weeks of age that is influenced by the ewes breeding potential for milk production.
Eight Week Weight (kg)	Growth rate to 8 weeks of age Maternal ability of ewe	Weight at 8 weeks of age. To achieve an adjusted 8-week weight lambs must be weighed between 42 and 84 days of age.
Scan Weight (kg)	Growth rate to 21 weeks of age	Weight at scanning time, when lambs are 21 weeks of age.
Muscle Depth (mm)	Carcase muscling	Measured at 21 weeks of age by a Signet-approved technician. Ultrasound measurements at the third lumbar vertebra.
Fat Depth (mm)	Leanness	Measured at 21 weeks of age by a Signet-approved technician. Three ultrasound measurements taken at the third lumbar vertebra.
Mature size (kg)	Ewe efficiency	Ewe liveweight at first mating.
Carcase Lean Weight (kg)	Muscle yield	Quantity of muscle tissue in the carcase assessed using Computed Tomography (CT) image analysis of breeding stock at 21 weeks of age.
Carcase Fat Weight (kg)	Leanness	Quantity of fat in the carcase assessed using Computed Tomography (CT) image analysis of breeding stock at 21 weeks of age.
Gigot Muscularity (mm)	Carcase shape	Thickness of the muscle tissue in the gigot assessed using Computed Tomography (CT) standardised to a fixed femur length.
Faecal Egg Count (FEC)	Worm resistance	Faecal samples are taken from lambs at 21 weeks of age and submitted for laboratory analysis to measure the worm egg count in the sample.