

# Deer Select

## The importance of genetic improvement

Genetic improvement is one of the main ways farmers can improve the profitability of their deer operation.

With growth rate, for example, genetically improved animals are more likely to earn an extra \$1 a kg by hitting the spring peak in the venison schedule.

Genetic improvement is:

- **Permanent:** Unlike improved feeding or health, improved genetics influences the performance of an animal for its lifetime
- **Cumulative:** Improvements made in this generation are added to those made in previous generations and then passed on to the next
- **Sustainable:** Improvements can continue to be made so long as there is genetic variation as a basis for selection.

The challenge is to identify those animals which, when used for breeding in a herd, will give birth to progeny that perform better than progeny born on the farm in the past. You can't identify these animals just by looking at them. Nor can you rely on what the person selling them is telling you.

That is why the deer industry has Deer Select: To provide farmers with an accurate, unbiased way of identifying superior breeding animals (normally sires) for use in their herd.

## What is Deer Select?

Deer Select is a database based on pedigree records and performance data collected from performance-recorded animals in participating stud herds.

Deer Select uses the SIL (Sheep Improvement Limited) genetic engine to calculate how much of the performance variation between individual animals is genetic. It then ranks these animals in order of their genetic merit for particular traits.

Animals can be ranked across multiple herds when the stud herds are genetically linked through common sires, mainly through bought-in stags or semen. This allows the effects of farm/climate & management to be excluded from the estimation of genetic merit.

### No free lunch

Genetic improvement is not a free lunch – for animals to express their genetic potential they will require improved feeding and animal health management.

The genetic linkages between herds were strengthened by the Deer Progeny Test project carried out by AgResearch from 2012-2015. This project involved the use of a range of sires in Deer Select herds, in other stud herds and several performance-recorded commercial herds.

## What is a Breeding Value?

A breeding value is an estimate of the genetic merit of a deer relative to the average of all deer in the base year – 1995. The performance of the animal itself, its relatives and its progeny are all taken into account.

Breeding values are always expressed in the same units they are measured in. For example, growth and velvet are expressed as kilograms and conception date is in days.

Estimated breeding values (eBVs) are based on pedigree and performance information.

To calculate an eBV, known environmental effects are corrected for – such as date of birth and age of dam.

## Key points

- Genetic improvement is one of the main ways farmers can improve the productivity and profitability of their deer operation.
- Deer Select is the genetic evaluation programme that enables farmers to accurately choose replacement sires, based on genetic merit.
- The main genetic traits Deer Select evaluates are those relating to growth, meat yield, velvet weight and some maternal qualities.
- Commercial farmers are encouraged to buy sires from stud breeders who provide Deer Select estimated breeding values (eBVs) for sale stags that match their breeding objectives
- Deer Select sire summaries are published each year on the [www.deernz.org](http://www.deernz.org) website.

Differences in feeding can be accounted for by the use of mob codes within a farm, providing there are genetic links between the mobs – such as by having the progeny of one sire in both mobs. Of course, some factors are unknown and can't be corrected for, for example, a disease challenge.

After accounting for known environmental effects, the performance of an individual, as well as the performance of its known relatives, are used to predict the individual's genetic merit for a trait. Where a trait is not expressed in both sexes, for example velvet weight in hinds, a breeding value can be estimated based on the performance of relatives of the opposite sex.

## Deer Select Deer Industry Genetics

### Deer Select breeding values (2015)

GROWTH	Breeding values (kg)
Weaning weight	WWTeBV
Weaning weight maternal (milking ability)	WWTMeBV
Autumn weight	AWTeBV
Weight at 12 months of age	W12eBV
Mature weight	MWTeBV
MEAT	(kg)
Carcass weight	CWeBV
Lean yield	LEANYeBV
Fat yield	FATYeBV
Shoulder lean yield	SHLYeBV
Loin lean yield	LNLYeBV
Hindquarter yield	HQLNLY
VELVET	Breeding values (kg)
2 year old velvet weight	VW2eBV
Mature velvet weight	MVWeBV
REPRODUCTION	Breeding values (days)
Conception date (early)	CDeBV

**What is an index?**

Few animals are top performers in all traits. Every animal has a different mix of genetic strengths and weaknesses. This can make it hard to work out which animal has the best combination of traits overall.

Economic indices are therefore provided by Deer Select to enable buyers to work out which stags will give them the best return on investment.

An index consists of a set of breeding values multiplied by an economic weighting reflecting the value of a one unit increase in the trait in a typical deer production system. By multiplying each eBV by its financial contribution, the individual with the best combination of eBVs will have the highest value. Indices are expressed in cents per hind calving

As prices change over time and production systems evolve, the economic weightings of each trait in each index are updated. However, the indices do not need to be changed every time the venison schedule price changes, as animals will still be identified in order of merit.

The deer industry uses two indices – one for a breeding/replacement/finishing system, the other for a straight finishing (terminal) system. In future more maternal traits will be added to the breeding/replacement index, better representing the overall merit of sires that breed replacements.



Deer Select enables commercial farmers to select herd sires based on genetic merit

**Deer Select indices**

**Replacement & early kill =**

Growth eBVs x economic weights +  
Meat eBVs x economic weights +  
Conception eBVs x economic weight

**Terminal =**

Growth eBVs x economic weights + Meat eBVs  
x economic weights

**The benefits to commercial farmers**

By investing in stags with high eBVs, commercial farmers can improve the genetic merit of their herd for traits that are important to them.

**Genetic gain is cumulative**

Genetic gain is permanent and cumulative, like compound interest. By retaining the daughters of superior sires, the rate of genetic gain and the merit of the hind herd increase.

**Genetic gain is valuable**

The average genetic merit for weaning weight (WWT) in all Deer Select herds in 2015 was +8 kg compared to the 1995 average. The genetic merit of the top individuals was 2 to 3 times this, a huge difference when it comes to selling weaners.

Average genetic merit for 12 month weights (LW12) across all Deer Select herds in the same period increased by +11.6 kg, or 6 kg/head carcass weight. Top sires have values greater than +20 kg.

Progeny receive half their merit from the sire and half from the dam. A +20 kg LW12 sire over 1995 average merit hinds would result in + 10 kg merit progeny. A +20 LW12 merit sire over improved hinds – say +10 kg LW12 – will result in progeny with +15 kg merit.

If you keep buying stags from a breeder who is making genetic gain every year, you will make the same rate of gain as them.

Deer Select sire summaries are published each year on the [www.deernz.org](http://www.deernz.org) website.

**More?**

[www.deernz.org/deerselect](http://www.deernz.org/deerselect)



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