

DEER FACTS

DEER SELECT

ACCURATE SIRE SELECTION FOR RAPID GENETIC GAIN

KEY POINTS

- Genetic improvement is one of the main ways farmers can improve the profitability of their deer operation.
- Deer Select is the genetic evaluation programme that allows you to accurately select replacement sires, based on genetic merit.
- Deer Select evaluates genetic traits for growth, meat yield, internal parasite resilience, velvet weight and some maternal reproduction traits. It also provides indices that put financial values on related traits.
- The financial benefits of using stags with high BVs for carcass growth have been proven in trials on commercial farms.
- Commercial farmers are encouraged to buy sire stags that have Deer Select breeding values (BVs) for the traits that match their breeding objectives.
- Deer Select sire summaries are published each year on www.deernz.org.

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 a premium schedule price in spring, or to achieve higher target weights in late summer.



Photo: Richard Hilson

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

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, 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's 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 and commercial 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 differences between farms, such as climate and management, to be excluded from the estimation of genetic merit.

What is a Breeding Value?

Estimated breeding values (BV's for short) are estimates of the genetic merit of a deer relative to the average of all deer in the base year of 1995. The performance of the animal itself, its relatives and progeny (if available) are taken into account and corrected for known environmental effects, such as age of dam, birth date, etc.

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.

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.

For most BVs, a higher number equals greater merit. For conception date, however, a negative number indicates days earlier conceiving.

Where a trait is not expressed in both sexes, such as velvet weight in hinds, a breeding value can be estimated based on the performance of relatives of the opposite sex.

Deer Select breeding values

Breeding values and indices available in 2026



Traits	Breeding values (kg)	Red Maternal (RM) sub-indices RMG-Growth	Red or Wapiti Terminal (RT or WT) sub-indices RTG or WTG
Growth			
Weaning weight	WWT BV	WWT BV	WWT BV
Weaning weight maternal (milking)	WWTM BV	WWTM BV	
Autumn weight	AWT BV		
Post weaning gain	PWG BV	PWG BV	PWG BV
Weight at 12 months	W12 BV		
Carcass weight predicted from liveweight	CWL BV	CWL BV	CWL BV
Hind Weight	Breeding values (kg)	RMH – Hind weight	
Mature weight	MWT BV	MWT BV	
MEAT	(kg /kg carcass wt)	RMM - Meat	RTM or WTM
Carcass weight yield	CWY BV	CWY BV	CWY BV
Lean yield	LEANY BV	LEANY BV	LEANY BV
Eye muscle area	EMAc BV		
Reproduction	Breeding values	RMR - Reproduction	
Conception date (days)	CD BV	CD BV	
Fertility at 2 years	FERT2 BV	FERT2 BV	
Fertility at mixed age	FERTMA BV	FERTMA BV	
Parasite Resistance	Breeding values	RMC - CARLA	RTC or WTC
CARLA	CARLA BV	CARLA BV	CARLA BV
VELVET	Breeding values (kg)		
2-year-old velvet weight	VW2 BV		
Mature velvet weight	MVW BV		

Early conception BV

Research has shown quite large differences between sires for conception date for their daughters, especially as first fawners. Daughters of sires with BVs for later-than-average conception dates have also been shown to have later and lower conception rates.

For these reasons, the early conception BV was developed. Many farmers in summer-dry areas select for this trait. Some of these herds now start fawning in mid-October.

Meat versus fertility

If selection in any species for traits such as growth and meat are strong and sustained over time, it can result in a reduction in the 'fitness' traits, such as fertility and survival. To mitigate this, BVs for fertility at 2 years of age and mixed age were introduced.

The fertility BVs are based on pregnancy scanning data from 2-year-old and mixed-age hinds. The BV relates to the proportion of hinds in fawn/calf. A higher BV number indicates a higher pregnancy scanning rate.

Managing hind size

As merit for growth in a herd increases, adult hind size will also increase. This means target weights for puberty also need to increase.

You can limit the size of your mature females by selecting for males that have a larger size relative to females. This is known as sexual dimorphism.

To do this, use the mature weight BV of hinds to find sires that have a lower-than-expected MWT BV relative to their W12 BV. To identify these animals, the breeder must record the liveweights of adult hinds.

Velvet

Few velvet herds are genetically connected for velvet traits. This means most BVs provided by breeders are within-herd rankings. Breeding values for females are available based on information from their male relatives.

Having BVs for both males and females enables farmers to make selection decisions earlier and more accurately, but should be combined with recorded information on style. Many velvet and antler traits – such as circumference, typical/non-typical, length, SCI score – can be recorded and reported in Deer Select.

No free lunch

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

What is a sub-index and overall index?

Few animals are top performers in all traits. Every animal has a different mix of genetic strengths and weaknesses.

As the number of available BVs increases, it can be harder to assess the merit of individual animals. To assist with this, BVs can be grouped into a sub-index summarising merit for an overall trait.

For example, for growth, the dollar value to a standardised venison production system is calculated for each additional unit for all relevant BVs. These are then added together to give an overall value for growth in dollars per fawn/calf born.

Basically, sub-indexes summarise the financial value of an animal for a trait such as Growth, Meat, Reproduction and CARLA. This makes it easier to compare the overall merit of animals for a trait. The sub-indexes can also be combined, depending on what traits you are interested in, to give an overall value for all traits.

Deer Select standard combined indexes

REDMATN (Red Maternal Index): This is designed for farmers choosing sires for breeding replacement females, as well as progeny for venison.

The traits in this index are: Maternal Growth (RMG), Meat Yield (RMM), Hind Weight (RMH) and Reproduction (RMR) sub-indexes.

REDTERM & WAPTERM (Red and Wapiti Terminal Indexes): These indexes are for sires that will be used to generate progeny for venison production only. They include the Growth and Meat sub-indexes only.

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.

More: See *Understanding Maternal and Terminal Indexes* in the Deer Hub on the www.deernz.org website.

High BVs reflected in farm profits

By using stags with higher BVs for growth and meat, commercial farmers can expect to see a boost in their venison incomes. The on-farm proof can be seen in the results of Deer Select "BV proof" trials on three farms in the 2019/2020 season.

Two sires with BVs about 10 kg apart for 12-month growth were used over some commercial venison hinds on each property. The hinds were wintered and fawned together, and their progeny were run together under typical commercial farming conditions.

Because there was a 10 kg difference between two sires for W12 and all of the hinds were of similar genetic merit, there should have been an average 5 kg difference in liveweight between the two groups of progeny (half of their genes come from the stag and half from the hind).

In fact, on two of the three farms, the actual difference in weight at 12 months between the two lines was about 8 kg, or 3 kg more than expected.

The results for the third farm (the Seiferts) were more complicated, as four sires were used across different hind age groups, but the benefits of using high-BV sires still shone through.

John and Tash Hamilton

Elk/wapiti venison | Winton, Southland



John Hamilton

The difference in BVs for W12 for the two Tikana elk sires used by the Hamiltons was 12.6 kg. When weighed on 5 November, the progeny of the higher BV sire were

8.5 kg heavier than those of the lower BV sire. This translates to a carcass weight advantage of 4.6 kg, or \$46/head on a \$10 schedule.

John Hamilton was not surprised by the results, since the science behind Deer Select BVs is "quite robust," but he was pleased to see the proof. He routinely looks at BVs when he's buying sires, not focusing on any one trait but looking for a good all-rounder. "It's really important to know what you want in a sire."

Hamilton says he now takes the CARLA BV for parasite resistance, as well as the W12 Growth BV, into account when selecting new sires.

Duncan and Lorna Humm

Red venison | Mt Somers, Mid Canterbury



Duncan and Lorna Humm

The Humms used Melior red sires, with BVs for weight at 12 months of +30.78 kg and +19.5 kg, a difference of about 11.3 kg.

Weights for progeny of the two stags were almost identical at weaning, then tracked closely with the expected difference in stag BVs. Daily growth rates continued strongly through winter, with some cracking 300 g/day on a mixed pasture/herb species diet. By early September, there was an average 8.4 kg liveweight advantage for the progeny of the higher-BV sire. This translates to an extra 4.6 kg carcass weight, also worth an additional \$46/head at a \$10 schedule.

Duncan Humm says the progeny of the two sires well

outperformed those of their homebred stags, which wasn't a surprise. He admits he's a bit old school when it comes to selecting sires.

"Breeding values, conformation and temperament – they're all important. There's no single thing. You want to be putting good stags over good hinds. If you're putting them across average hinds, then your progress will be that much slower."

David and Ali Seifert

Red venison | Raetihi, Manawātū-Whanganui

The Seiferts used four sires from Ruapehu Red Deer, with BVs ranging from +19.54 kg to +28.22 kg, resulting in nearly 100 progeny.

The highest-BV sire, #422, was put over more second and third calvers, while the others were mainly mated to mixed-age hinds. As a result, 422's



David Seifert

progeny were at the lighter end of the range at weaning. Over the next eight months, they caught up with and eventually overtook the other weaners, being about 2.4 kg heavier than the next group by November and about 7 kg heavier than the lightest group.

Overall, the progeny of three of the four stags performed as expected based on the BVs of their sire, but they took different paths getting there. Progeny of sire 422 stacked on 20 kg in the 60 days to their weighing in early November. Another group grew steadily to reach the target; the other tracked lower, followed by a spring growth spurt.

The progeny of a fourth sire grew slightly slower than expected based on the sire's W12 BV, but still significantly better than the progeny of home-bred stags.

David Seifert says "It's important that any stag you buy has good conformation and can handle the demands of mating and hill country. But a good breeder should have already taken care of those issues. It's the BVs that really matter. Those show up in their progeny and relatives. That's where the real value lies."

The benefits of Deer Select to commercial farmers

By investing in new sires with the desired mix of genetic merit for their production system and location, commercial farmers can improve the genetic merit of their herd for the traits that are important to them.

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 www.deernz.org.

Genetic gain is cumulative

Genetic gain is permanent over an animal's life and cumulative, like compound interest across time. 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 venison-focused Deer Select herds in 2025 was +12.5 kg compared to the 1995 average. The genetic merit of the top individuals was 2–3 times this, a huge difference when it comes to selling weaners on a per kg basis.

Average genetic merit for 12-month weight (W12) across venison-focused Deer Select herds in the same period increased by +20 kg, or 11 kg/head carcass weight. This means either killing earlier at potentially higher schedules or at higher carcass weights, both options returning more income.

Top growth sires now have values greater than +35–40 kg. These stags may be more suitable to use as terminal sires as their daughters will be very large.

nProve for commercial deer farms

nProve is an interactive platform used by sheep, beef and deer breeders to interact with their own data, pedigree, genetic merit information and raw data online.

An increasing number of commercial deer farmers – particularly velvet breeders – are recording on Deer Select to get genetic merit information and using nProve to manage, store and access their data easily. This is because managing pedigree and performance information about commercial deer can become unwieldy over time.

Deer Select also allows these farmers to select replacements more accurately, increasing genetic gain in their herds.

More >>

Deer Facts: www.deernz.org/deer-facts

Breeding

- Setting your breeding objectives
- Best practice pregnancy scanning
- Stag and hind replacements that will boost your bottom line
- The CARLA breeding value: *Using genes to combat internal parasites*

Management for profit

- Best practice mating management
- Best practice management of breeding hinds
- Setting reproduction targets
- Successful pregnancy: Preventing foetal losses

Deer Hub: www.deernz.org/deer-hub

- Deer Select: www.deernz.org/deerselect
- Mate allocation calculator: www.deernz.org/mate-allocation-calculator



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Deer Facts are produced by Deer Industry New Zealand (DINZ), supported by the Ministry for Primary Industries, to assist farmers to run profitable farm management systems that are recognised for their high standards of animal welfare and environmental performance.

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