

DEER FACTS

STAG AND HIND REPLACEMENTS THAT WILL BOOST YOUR BOTTOM LINE

KEY POINTS

- Stags can have a huge effect on overall herd genetics, because they can each contribute around 50 progeny per year in a naturally-mated system.
- It can be highly profitable buying stags or semen with breeding values (BVs) for traits that increase the performance of your whole herd.
- It's important to replace and upgrade stags after 3–4 years to ensure your herd's genetic progress is keeping pace with improvements in your stag breeder's herd. If you are using AI, sires can be upgraded every year.
- With hinds, the focus needs to be on lifting the genetic merit of the herd as a whole. Daughters of a new stag will directly impact herd productivity for up to 13–14 years.
- A rapid generation turn-over, along with objective culling and selection, are the best tools most farmers with commercial breeding herds have to improve the quality of their hind herd.

Where the rubber meets the road

Genetics are the motor that drives the profitability of a deer farm.

No matter how much fuel is available and how well the vehicle is tuned and maintained (health, welfare, stockmanship), the performance of a deer farm is limited by what's under the hood.

To improve that genetic engine, a commercial deer farmer needs to have clear breeding objectives and know how to identify them (see *Deer Fact*, 'Setting your breeding objectives').

Velvet or venison? That's an obvious difference in breeding objective, but what about parasite resistance (CARLA) or fertility in 2-year-old and mixed-age hinds or earlier conception – are these important to you and should they be included in your sire choice?

With this done, it's time to buy some stags with estimated breeding values (BVs) for the traits you want and to mate them with your best hinds. This is where the rubber hits the road.



Photo: Jamie Ward

Weaner stags in early spring: The only way to predict which ones have the potential to become great herd sires is through their Deer Select breeding values (BVs).

The sire influence

Because they have more progeny than hinds, stags have much greater influence on the rate of genetic progress in a herd.

Sires used in natural mating should be turned over regularly – say, every three or four years. Good breeders are constantly improving the BVs of their offerings, so breeding from a young stag puts you in the fast lane. If you want to make even faster progress and have identified hinds of high genetic merit in your herd, you might consider using AI.

Ideally, all sires or semen used in a herd should be bought from a stud breeder who offers BVs for the traits you want. Use the Deer Select sire summaries to find studs with stags with these BVs: www.deernz.org/deerselect.

See the *Deer Fact*, 'Deer Select' for more information on the BVs that are available and how they are calculated.

See the *Deer Fact* 'Setting your breeding objectives' for more about the importance of having clear objectives and how to make best use of BVs to maximise genetic gain.

Selecting stags for better venison production

Buyers of herd sires can look at the 2-year-old and 3-year-old stags on offer and make judgements about their temperament, size and muscling. This is important, but how the progeny of these stags perform at 10–15 months of age is what counts in a venison system. BVs will provide that information.

Selection for high growth will, over time, make deer taller and longer. This can be at the expense of muscling at slaughter. So select for meat as well as growth rate, to ensure your animals will be well muscled when they are processed.

BVs and indexes also enable you to choose sires with the right genetic merit for your property. On intensive finishing country with high-quality pastures, go for high-growth rate BVs. On harder or drier hill country, a more moderate merit stag may be better.

If you are looking for sires to breed your replacement hinds, you may put more emphasis on fertility or CARLA, as well as merit for growth and meat.

See the testimonial by Mike Salveson of Mt Somers in this *Deer Fact*. Also other testimonials, in the *Deer Fact*, 'Setting your breeding objectives'.

Selecting stags for better velvet production

Heritability for velvet weight in stags is typically around 50%. This high heritability has enabled breeders who don't record BVs to make good progress with their velvet production.

However, you need to decide which R2 hinds to retain for breeding at 12–15 months of age when the hinds' half-brothers have not yet cut their 2-year-old velvet.

By using BVs, the accuracy of selection on the female side is greatly improved. Information from all male relatives is used to estimate a hind's BVs for velvet production. When 3-year-old hinds with higher velvet BVs are sold by velvet studs, they usually get higher prices as there is more data to back up likely performance of progeny, rather than just assessing the pedigree.

Velvet versus venison objectives

Selection should aim for animals that produce high velvet yields while maintaining the body size, structure, and constitution required to support healthy antler development and overall productivity.

Most velvetting operations breed their own replacements. This means they slaughter female yearlings that aren't selected for breeding and young stags that don't make the cut as velvet herd replacements. If these animals have low 12-month carcass weight BVs, they will struggle to reach reasonable slaughter weights before their second winter.

For this reason, a number of stud breeders producing stags with good BVs for velvet have also been increasing the 12-month carcass weight BVs of their offerings.

Putting BVs to work in stag selection

In 2024, Deer Select introduced sub-indexes by trait. For example, in a standardised venison production system, Growth BVs are multiplied by the value of an extra unit of liveweight to give a dollar per fawn value for the sire's merit for growth. The same logic is applied to Meat Yield, Reproduction and Parasite Resistance, expressed as \$/fawn born. The sub-indexes can be combined to give an overall index.

Red maternal sub-indexes

Stag	W12BV	CDBV	RMATN	RMRepro	RMGrowth	RMHdWt	RMMeat	RMCarla
A	35.19	-9.41	\$154	\$5	\$124	-\$1	\$25	-\$3
B	33.06	-3.3	\$132	-\$7	\$114	-\$1	\$27	\$28
C	32.88	4.58	\$104	-\$17	\$115	-\$1	\$7	-\$3
D	31.64	-4.2	\$145	\$9	\$121	\$0	\$15	-\$5
E	30.07	-8.38	\$139	\$10	\$111	\$0	\$18	\$11
F	29.9	-8.21	\$167	\$28	\$106	-\$1	\$35	\$16
G	24.88	-7.43	\$141	\$21	\$91	-\$1	\$30	\$6
H	24.43	-8	\$147	\$32	\$92	\$0	\$23	-\$1
	kg	days	\$/Fwn	\$/Fwn	\$/Fwn	\$/Fwn	\$/Fwn	\$/Fwn

How to interpret the table

- The best overall stags for the combined Red Maternal venison and replacement index are stags F, A and H.
- The best stags for meat yield are stags F and G.
- Looking at reproduction, the highest overall values (conception and fertility) are stags F and G.
- If earlier fawning is important to you, stags A, E, F and G have the earliest fawning breeding value – also very good scores for the Red Maternal overall index.
- Stag B is good for Red Maternal, very good for growth and CARLA and not so good at reproduction.

There are two standard overall indexes:

- RedMaternal (RMATN):** This is designed for venison production and to breed replacement hinds
- Red or Wapiti terminal index (RTERM or WTERM):** This is based on Growth and Meat traits only. As all traits are in the same units \$/fawn, it makes it easier to see the relative strengths of individual sires than looking at a large range of breeding values. Breeding values are still available.

- If you want a stag with the best growth rates and indexes to produce finishing deer for yourself, or weaners for sale to a finisher, you may choose Stag B. He also has good venison yield figures, but does leave the heaviest daughters.

Red and wapiti terminal indexes

Please refer to the Deer Hub, search for 'Traits, BVs, Indexes'

Table legend

W12BV: Weaning weight at 12 months
 CNBV: Conception date (days)
 RMATN: Red maternal index (\$ per fawn born)
 RMRepro: Conception date/fertility @ 2 years/fertility at mixed age

RMGrowth: Red maternal growth
 RMHdWt: Red maternal hind weight
 RMMeat: Red maternal meat yield
 RMCarla: Parasite resistance

On a commercial farm, these stags strike a better balance between conflicting velvet and venison production objectives.

Heavier, faster, more profitable

Mt Somers, South Canterbury, farmer Mike Salvesen (pictured) is a big fan of using breeding values to help his selection of sires.

"BV's do work. If you have an average herd, you will see a big leap in performance," he says.

In an on-farm trial in his commercial herd, he compared two stags with different BVs for 12-month weight (W12eBV), assuming a schedule price of \$9/kg. The benefits were clear – the heavier, faster growing progeny of the higher BV stag would return an extra \$10,000 if the stag was used for four years.



Photo: Phil Stewart

Stag W12eBV	Progeny 1st June liveweight	Avg kill date
+15 kg	60 kg	1st Dec
+25 kg	75 kg	25th Oct

Keep things in balance

When selecting stags with strong BVs for the traits you want, take care to check they are not weak in other important traits.

For example, an earlier fawning date may not be one of your breeding objectives, but you probably don't want them fawning late. Stags on Deer Select with good BVs for venison have fawning date BVs (CDeBV) ranging from around 10 days earlier to 10 days later than the average.

The hind influence

In stud herds, breeders use DNA-based parentage tests to accurately identify which fawn belongs to which hind. This

information is then used for calculating BVs and culling.

Some commercial farmers see value in using DNA parentage testing for three or four years to identify which hinds, when mated to high-BV sires, are producing their best fawns. They then use these hinds and their female progeny to set up a nucleus herd for mating to sires with the traits they want their replacements to have.

For most farmers with commercial herds, the costs and hassles of doing this cannot be justified when selecting their home-bred female replacements. For them, the focus needs to be on lifting the genetic merit of the herd as a whole. A rapid generation turnover, culling and selection are the best tools they have for doing this.

Rapid generation turnover

Half a fawn's genetic package comes from each parent.

Rapid improvement in the genetic quality on the father's side results from buying in stags or semen with good BVs every year.

Rapid improvement in the genetic quality of the mother's side comes about by replacing mature hinds with the daughters of higher merit stags used in the herd 2–4 years before. The higher the replacement rate each year, the more rapid the rate of genetic progress.

If a herd has a weaning rate of 85%, of which 50% will be male, 2.5 hinds will need to be mated for each potential female replacement for the breeding herd. If you plan to replace 20% of your breeding herd each year, 50% of your hinds will be needed to produce enough progeny to do this. The maximum possible replacement rate in a herd with an 85% weaning rate is 40% ($100/2.5 = 40$).

In practice, there's a trade-off between the rate at which a farm aims to improve the genetics of their females and the need for cash income now – say, from fast growth rate venison animals from hinds that went to a terminal sire.

Clearly, a higher fawning rate provides more flexibility for hind replacement. Give priority to the progeny of high-BV stags and younger hinds when selecting herd replacements.



Photo: Richard Hilson

Rising 2-year-old hinds in spring: To maximise the rate of genetic progress, the progeny of high-merit stags and younger hinds should be given priority to enter the herd as replacements.

Try using the DINZ Mate Allocation Calculator (www.deernz.org/mate-allocation-calculator) to help you work out how many of your hinds need to be put to a maternal sire each year to breed replacement females. It tells you how many 'spare' hinds can be mated to a terminal sire.

If you plan to select your replacements from your younger hinds, you will need to be able to identify their progeny. That's because younger hinds tend to fawn later and don't milk as well as older hinds, so their fawns may well be smaller than the fawns of older hinds of less genetic merit. The easy answer is to keep your first and second fawning hinds in separate mobs until weaning.

Culling and selection

1. Choose the best females to mate with your best BV-selected stags. In a commercial herd, it can be hard to identify better producing hinds. If you haven't been using improved stags, selecting an even line of younger hinds may be a good starting point.
2. Mate these hinds to higher merit stags, fawn them separately, and preferentially keep replacements from this mob.
3. You may choose to mate older hinds to Red or Wapiti sires selected on the Terminal index (Growth + Meat Yield).
4. Longer-term, if your climate and property allow, preferentially select your replacements from the offspring of R2–R4 hinds as they should be your best genetics. Bear in mind that R2 hinds are themselves still growing. They need to be able to raise a fawn and gain 10–20 kg LW, so you need to be able to feed them well during pregnancy and lactation.
5. If earlier fawning is a priority, and you have used stags that leave earlier conceiving hinds, you can identify these hinds by foetal aging at pregnancy scanning.
6. Another advantage of foetal ageing at pregnancy scanning is being able to draft hinds into mobs with a similar fawning date. This means you can move and rotate them onto better feed sooner than you can a mob with a spread fawning. Late fawners can also be identified for culling.
7. When selecting replacement hinds, check temperament and that they are physically sound.
8. Within a herd, some hinds give birth to small or late fawns. Some farmers have devised systems to identify the mothers of these fawns for culling.
9. Cull hinds if they are not pregnant, unless they are first fawners, and there is a good reason for the lack of pregnancy – such as under-feeding in a drought or stag failure.
10. Make the most of high genetic merit through good feeding of young hinds at all times. If selecting for higher growth, hinds will get bigger and target mating weights for first fawners for mating will need to increase.

Identifying the tail-enders



Culling the hinds that produce 'fluffies' or tail-end fawns can do much to lift overall herd performance. The challenge is to identify these hinds.

Sheffield, Canterbury, farmer Stu Stokes does this at weaning. He separates out the fluffies and daubs their heads with blue food-grade dye mixed with something sticky. Emollient salve (used by dairy farmers) works well. After a few hours in the shed – when they're good and hungry – he lets them back into the paddock with the weaned hinds.

"They go straight to their mums for a feed, colouring their udders bright blue. The next day, the hinds are run into the yards, and the blue-bagged ones are tagged for future culling. It's been very effective at tidying up the tail-end," Stokes said.

"It's interesting, but when you look at the mothers of the fluffies, they are a mix of small and large hinds. You can't tell they're poor mothers just by looking at them."

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