

Wintering deer indoors

A win all-round?

A growing number of deer farmers are investing in indoor wintering systems.

A big driver has been the need to reduce the run-off, nutrient loss and soil damage that can be associated with intensive winter feeding. In addition, there can be significant animal welfare and management benefits.

Indoor wintering is a major investment, especially if there are no existing buildings that can be repurposed as wintering barns.

Whether this investment stacks up economically and environmentally will depend on the circumstances of an individual farm.

Key points

- Indoor wintering is a highly effective way to reduce the impact of winter feeding on water quality and soil health.
- Deer adapt well to being wintered indoors. There are no animal health issues, but bullying by dominant hinds needs careful management.
- Wintering barns are expensive to build and operate. New or upgraded farm machinery may also be needed.
- There's no real labour saving, but the work involved is not as physically demanding as wintering on crop.
- Whether indoor wintering stacks up economically and environmentally depends on the circumstances of an individual farm.

The evidence

AgResearch scientist David Stevens carried out a study of wintering in 32 South Island deer herds in 2020 and 2022.

The average indoor-wintered herd in the study was 115 deer, fed indoors for an average of 87 days.

The productivity equation

In the Stevens study, the deer wintered indoors had a 9% lower feed intake than deer intensively grazed on a forage crop.

In addition, deer wintered indoors waste less feed through trampling and contamination with dung, urine and mud. Deer farmers who outdoor wintered with baleage say they've cut their baleage use by 10-25% by moving their deer indoors.

Because pastures are not damaged by winter grazing, farmers report more rapid pasture growth with the onset



Trevor Walton



Tony Roberts

Southland deer farmers Tony and daughter Kate Roberts with their baleage feeder and feeding stags. Feed wastage in the clearspan barn is minimal – the Roberts report a 25% reduction in baleage fed since moving their red stags and hinds indoors. Tony recommends having pens of varying sizes so that smaller mobs can be catered for

of spring. Less cultivation means they have more pasture available for grazing in autumn when feed demand from all stock classes is high.

The environmental equation

Water quality

Stevens calculated that if the average herd in his study had been grazed outdoors, it would have needed 1.8 ha of winter forage crop. On some farms this will lead to the loss of sediment, N and P, along with other nutrients, and bacteria into groundwater and streams.

Such losses vary from farm to farm, depending on slope, soil-type and rainfall. Their impact on stream and groundwater quality also varies with the locality, the catchment and the region.

Also, winter-grazed pasture soils can become highly compacted. As a result, pastures become run-out and need to be replaced more frequently. This is costly and increases a farm's greenhouse gas (GHG) footprint.

In contrast, well-managed wintering barns produce no liquid effluent or run-off. Nutrients in the bedding are returned to the land during the warmer months where they contribute to pasture growth.

Greenhouse gas emissions

In simple terms, ruminants produce greenhouse gases (GHGs) in direct proportion to the quantity of feed they consume. This means a 9% reduction in feed eaten by deer wintered indoors translates into a 9% reduction in GHG output.

A reduced need for cultivation for forage cropping, or to replace winter-damaged pasture, will further reduce GHG emissions.

However, there has been little research into the GHG emissions of deer being fed different feeds during winter. In addition, individual farms vary greatly in terms of the energy (fossil fuels) used during winter feeding.

For these reasons, it is difficult to make a blanket statement about the impact of indoor wintering on the GHG emissions of deer.

One potential benefit may be the ability to reduce GHG emissions by manipulating diets, or by feeding GHG-reducing additives, if these become viable options in the future.

Managing the system

Good planning is essential

Well before winter, organise your feed and bedding supplies and have them stored in a dry place, close to your wintering barn.

Check your feed quality

Many farmers winter their deer on a diet made-up solely of baleage or silage. It therefore needs to be made from high quality, legume-rich pastures, harvested and baled at the right time.

If you have any doubt about its quality, get your conserved feed tested. If ME levels are low, they can be topped up with barley, maize or PKE. Protein levels can be boosted with DDG, peas or high-legume hay.

Mouldy feed cannot be fixed. As it can cause major animal health issues, replace it with bought-in quality feed.

Transition the deer

During late April and May prepare the mobs you are planning to winter indoors. Box them up and graze out their paddocks, progressively introducing them to the feed they will be eating over winter. After a fortnight they will have adjusted to their new diet and grazing in close proximity to paddock mates.

Meeting the needs of your deer

If deer have enough space, dry bedding, a balanced diet and protection from rain, sleet and snow, they tend to be very happy indoors. Even old hinds and stags will play and scamper around their pens – a clear indication that their needs are being met.



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Bruce Allan

Gore deer farmer Bruce Allan in his Redpath polytunnel which fitted better on the site and was more economic than a conventional clearspan barn. The tunnel is 72 m x 10.6 m, with 3 m²-plus allowed on average for each stag, which he says is "working well".

He has three sheds – two of them conventional clearspans – with a total of 1300 m² under cover. He buys 300 m³ of sawdust a year, which costs him \$20-plus per tonne landed.

Building design

Deer can be wintered effectively in converted buildings that were once haybarns or covered sheep yards, as well as in purpose-built barns and polytunnels.

Because deer wintering barns are dry bedding systems, it is crucial to keep water out. This means having a weather-proof roof and protection from wind-driven rain.

Minimum standards and recommended best practice are laid down under 'Holding Facilities' in the *Deer Code of Welfare*. Read this before getting into indoor wintering. Aside from it being a legal requirement to comply with the Code, it is a useful source of practical guidance.

Desirable features

- Choose a site that is not subject to flooding or landslides, or close to activities or noise that could stress your deer
- For animal welfare reasons, ceilings should be no lower than 3.2 m. In practice, they need to be higher than this, to enable easy access by machinery
- Plenty of natural light: with existing buildings, consider replacing some of the iron on the roof with polycarbonate panels
- Plenty of ventilation: good airflow is essential to prevent the build-up of ammonia and to reduce the risk of disease-spread. With existing buildings, consider removing the iron from one or more walls to aid airflow
- Slats on the tops of pen walls, so deer can see other deer and people elsewhere in the building. This makes them less likely to be startled by sudden noises or movement
- A range of pen sizes, so smaller groups can be segregated from larger mobs. Don't go smaller than 36 m²
- Square, or close-to-square pens, to allow deer room to move past each other and escape bullies. Don't build skinny pens (where the width is less than half the pen length)
- An interconnecting race and gates between pens for maximum management flexibility, along with easy access to a race or cradle for handling individual animals
- Where baleage is fed along the front of the shed, a concrete strip to reduce feed contamination/spoilage
- For adult red deer, a 300 mm deep feeding gap along feeding faces, 300 mm off the ground. Provide weaners with a 250 mm gap; any wider and they will escape.
- Enough space at feeding racks or along a feeding face for at least 50% of the mob to feed at once
- A maximum of 100 animals in a pen. Above this, there is a greater risk of pile-ups and injuries if the mob is spooked or if play gets out of hand
- Robust water troughs in each pen, about 1 metre above the ground
- Consider having a radio playing in the shed to accustom deer to a range of noises and voices

Space requirements

Deer need space for social distancing. This area is greater than the physical space they need to feed, move around and lie down.

Stocking density should be calculated based on the heaviest animals. The minimum space requirements are laid down in the *Deer Code of Welfare*. In summary:

Weaners: 1.2 m² per 50 kg weaner: increasing to 1.8 m² for deer up to 80 kg

Hinds: 2.1 m² per adult up to 120 kg

Stags: 2.8 m² per adult up to 200 kg. Experienced farmers say this is insufficient. Stags are more settled if they are provided with 3-4 m² of space.

Winton deer farmers Cam and Wally (pictured top right) Nelson converted a set of covered sheep yards for their first wintering barn, with repurposed power poles keeping the baleage where it belongs. This worked well, so they then built a new clearspan barn to enable all their stags to be wintered indoors.



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The Nelsons bale the stalky toppings from their fawning paddocks once the hinds and fawns move on. They use it as bedding, with pens topped up with dry toppings each week. It's cost-effective, but the bedding needs to be removed at the end of the season and left to rot for a year before it's ready to be spread back on the land.

Bedding

Bedding needs to be of a high standard. Warm, dry and comfortable deer eat less, fight less and are more settled. Options include sawdust, woodchips, straw and late summer pasture toppings.

Sawdust is much more absorbent than wood chips and less likely to cause hoof damage. Make sure it comes from untreated timber. Order supplies in the summer, when prices are often cheaper.

A layer of 125-150 mm of dry bedding is often enough for a season. Top-ups may be needed in pens or areas that become wet, but in well-managed sheds the base of the bedding stays relatively dry.

At the end of the season, remove the top 60%-70% of the bedding for composting or spreading.

Sawdust bedding can be spread onto pasture or cultivated ground straight out of the shed.

Bedding made from woodchips, straw and pasture toppings is best left to compost for a season. It will then be easier to spread and will contribute better to soil fertility.

Manage composting carefully, to avoid nutrient losses to the environment.

Bullying, aggression and shy feeders

The *Deer Code of Welfare* says deer in pens must be inspected at least twice a day. One of the main reasons for this is to identify bad bullies, aggressive stags and shy feeders. Segregate victims and/or aggressors, along with shy feeders, from the mob.

Boredom can aggravate bullying. Consider adding toys to pens, such as hanging chains, suspended tyres, large plastic balls or containers.

Stags

Stags normally have priority access to wintering barns because they produce the most valuable product. Also, as the heaviest animals, they cause the most pasture and soil damage.

Move younger stags indoors first – usually in early to mid-May – as they tend to stop roaring earlier than mature stags. The mature stags follow – typically in mid- to late-May. Some of them may still be roaring and niggly, so give them plenty of space and segregate any bullies.

By the end of the first week in June, all the stags should be quiet. If they each have around 4 m² of space, they should be happy until button-drop.

Hinds

Hinds need careful management, because of their strong pecking order.

Dominant hinds can 'pluck' the hair from hinds at the bottom of the hierarchy. While badly bullied deer or particularly aggressive hinds can (and should) be segregated from the mob, the dominant hinds may then pick on another victim.

Because of this, some farmers don't winter hinds indoors, or do so for only a short period in late winter, after the stags have moved out.

Deer health and safety

Farmers wintering deer indoors report no animal health issues.

The greatest health risks arise from vermin contamination of hay and mouldy feed. Control rodents and possums to reduce the risk of leptospirosis to deer and humans. Control feral cats to reduce the risk of toxoplasmosis to pregnant hinds and humans. Buy in replacement feed if

your home-grown feed is mouldy.

Fire: Housed deer cannot escape from fire. Design pens so animals can be released quickly in an emergency.

If your barn is attached to a machinery shed, or an area where there is a risk of fire, have suitable fire prevention/detection/control measures in place.

Ammonia: If the level of ammonia (from urine) in a shed is unpleasant for you, it will be compromising the health and welfare of your deer. Improve the ventilation.

Lighting

Deer must be provided with continuous light (minimum 50 lux) during normal seasonal daylight hours. 50 lux is sufficient light to read a newspaper at arm's length.

During the 1980s, some scientists and farmers experimented with the use of artificial lighting during winter to encourage deer to keep growing at summer growth rates.

This was not a good idea. Deer need natural seasonal changes in daylight to trigger breeding (oestrus) and velvet growth. It also conflicts with consumer expectations for deer to be raised as naturally as possible.

Time to get out

Move mature stags out of the barn and onto autumn-saved pasture from mid-August, or as soon as button-drop gets underway. This is likely to be a little earlier on stags wintered indoors.

Once stags have dropped their buttons, stags can damage their pedicles when feeding in a barn. Also protein-rich pasture is the perfect feed for maximising velvet production.

This move back to pasture should be made during a spell of settled weather, so the stags acclimatise to being outdoors.

If your hinds have been wintering on crop, consider moving them into the barn behind the stags. After 10-12 weeks on crop they will be ready for a change of diet.

What are the costs?

Wintering Barns and Forage Crops (June 2022) by AgResearch scientist David Stevens summarises the capital and operating costs of indoor wintering, based on the costs incurred by five Southland deer farmers (see link below).

More >>

Deer Hub

- Indoor wintering: the pros and cons
- *Wintering Barns and Forage Crops* (June 2022) by AgResearch scientist David Stevens

www.deernz.org.nz/indoor-wintering

Legal

Deer Code of Welfare, 2022 [search www.mpi.govt.nz for 'Deer Code of Welfare']