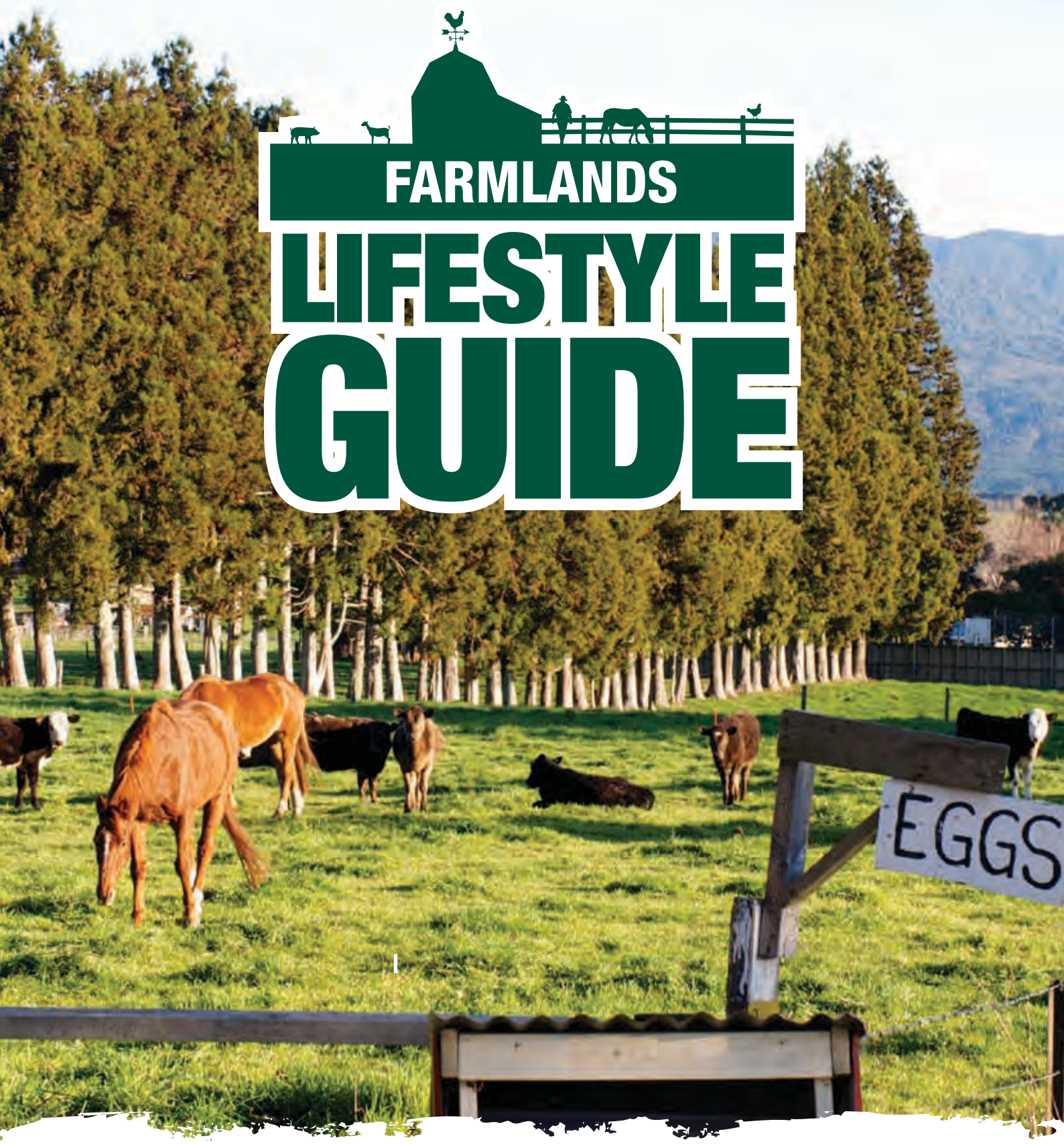
FARMLANDS LIFESTYLE GUIDE



An introduction to keeping animals on lifestyle farms in New Zealand, designed to optimise nutrition, wellbeing and inspire confidence to try new ventures.

Farmlands co-operative

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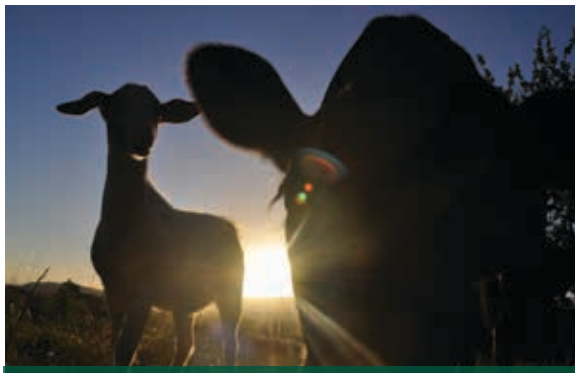
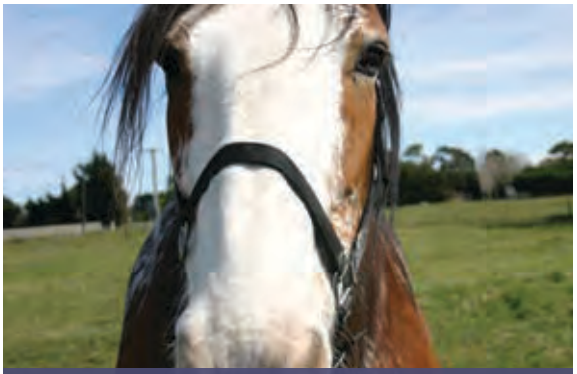




INTRODUCTION

Farmlands is committed to meeting the needs of New Zealand farmers and their operations, regardless of size and persuasion.

Whilst profitability may be a higher priority for commercial farmers whose livelihood may be totally dependent on farming, we understand that lifestyle and part-time commercial farmers may have many other criteria on which they judge the success of their farming activities. We are fortunate in New Zealand that small lifestyle blocks are still within the economic grasp of many, who can pursue their dreams of partial self-sufficiency by putting food on the table that has been raised and fed in a manner commensurate with their own standards and beliefs. The criticism that productive land is being lost to non-productive lifestyle farmers can be countered if they in-turn become recognised as productive stewards of the land, who are intertwining traditional and modern systems of food production. As custodians of the land for future generations, small block owners can do every bit as much to safeguard the health of the land as their commercial neighbours.

Sales of lifestyle blocks each year suggest that the lifestyle dream turns into a bit of a nightmare for too many people, who become tired by the need to be busy farmers at weekends, cope with cold mornings and dark evenings and become overwhelmed by the challenges of farming.

This guide is intended to help newcomers gain confidence and increase the rewards from their livestock activities. It may encourage more experienced lifestyle farmers to consider new species and systems on the route to a rewarding and possibly holistic experience. This guide has been written by commercial nutritionists, whose feed formulations effect the lives of tens of thousands of animals daily throughout New Zealand.

BENEFITS OF RAISING AND CARING FOR LIVESTOCK

As people lead increasingly hectic and busy lives, many of us crave returning to our agricultural or pastoral roots, which until only a few generations ago possibly would have been the norm.

Being able to produce your own food can be satisfying when as consumers, we are presented with packaged foods that seems far removed from the producer. Personal desires, which may seem like idiosyncrasies, can be catered for e.g. if you like well marbled beef, you can take beef to higher weights and if you want to wear a hand spun jumper from your own coloured sheep or alpaca, you can.

Lifestyle blocks offer many advantages, including distance from neighbours and room for the children to play. Also, those near urban areas especially can fetch a premium over properties with a smaller footprint. Evidence is suggesting that children raised with farm animals might be healthier and the honest manual labour that a lifestyle block often brings is likely to be beneficial for their toiling parents. Even small acreages can be attractive to contractors for silage or neighbours looking to lease land but farming the land for yourself offers the potential to generate income solely for yourself, which might help to offset the costs of a more expensive property.

Energy deficiency is a global issue. Pasture species have the ability to capture energy from sunlight throughout the year and generate organic matter provided they have sufficient water, minerals and are not too cold or hot. Ruminant animals (including cattle and sheep) have the ability to digest pasture species, which would otherwise be poorly utilised by mammals, to produce animal protein in meat and milk, in addition to wool, horn and hides, which are of value. Land allows lifestyle farmers to keep grazing animals in a potentially productive environment in smaller herds or flocks, which are more reminiscent of traditional farming practices. This allows for greater human interaction and personal care than might be possible on large commercial farms. Whilst high quality eggs can be produced in intensive systems, the ability for hens to free range might be expected to vary their diet and allow expression of behaviour that makes the consumer feel good, regardless of any changes to the flavour or nutritional value of the eggs. For those that are fortunate enough to be able to fulfil a lifestyle dream, small scale farming can be hard on the back but overall good for both body and soul.

HEALTH AND SAFETY

Farms rank as one of the most dangerous workplaces in New Zealand. Farm livestock can be big, strong and unpredictable, especially when being handled in confined spaces. Animals and their produce can be sources of disease and should be processed properly, especially with sensitive people including the very young, pregnant and elderly. Farm machinery can be dangerous and accidents happen even in the hands of experienced professionals. Courses are often available covering food preparation and storage, stock handling, quad bike riding, chainsaw use etc, which are a good opportunity for inexperienced farmers to gain some knowledge and meet like-minded individuals. Lifestyle farmers should consider the potential risk of any activity beforehand and make plans to mitigate the risks, if necessary opting to pay a professional when the task is beyond their expertise or experience.

ALPACA AND LLAMA

ALPACA AND LLAMA

Is there room on your lifestyle block for some exquisite New World Camelids?

Alpacas and llama are both members of the camelid animal family, originating from South America and domesticated for their wool (alpaca) and packing ability (llama). Alpaca and llama are friendly, intelligent, relatively low maintenance animals and are therefore a common choice for lifestyle farmers.

	Alpaca and llama
Temperament	Docile.
Mature weight	Alpaca 48-84kg. Llama 130-200kg.
Livestock unit equivalent	An adult alpaca would be equivalent to 2 LSU.
Life expectancy	15-20 years.
Gestation period	350 days (11-12 months) Can go a month over term if the weather is poor.
Stockmanship skills required	Average – limited experience required.
Profitability score/income streams	Potentially rewarding if selling high quality fibre/clothing or stud animals.

COMMONLY USED TERMS

Male alpaca/llama – Macho.

Female alpaca/llama – Hembra.

Baby alpaca/llama – Cria.

Castrated male – Wether.

Unpacking – giving birth.

SPECIES AVAILABLE.

There are two types of Alpaca – Huacayas and Suri. The difference is in their fleece structure – the Huacayas have a dense, short fleece while the Suri's fleece is a lot longer and silkier. In New Zealand the most commonly kept breed is the Huacayas, with the Suri breed making up only 10% of the total alpaca population. In total, New Zealand has approximately 20,000 registered alpacas according to the latest statistics.

There are two types of llamas, the Ccara and the Lanudas. The breed Ccara are favoured for work and Lanudas for fibre production. Llamas are not as popular in New Zealand compared to alpaca – with less than 2,000 registered llamas.

THE DIFFERENCE BETWEEN ALPACA AND LLAMA

Although closely related, llamas are physically bigger than alpaca and for this reason are better known for their use as pack animals (they can carry up to a third of their weight). Alpaca on the other hand are not physically suited for freight carriage and due to their high quality fleece they tend to be primarily kept for this property. The ears of llama are different in shape to that of an alpaca with llama having very distinctive banana shaped ears. Alpaca and llama are very similar in terms of behaviour, nutritional requirements and health and welfare needs.

Many owners enjoy showing their alpacas.

SYSTEM OPTIONS

Alpaca are well known for their lavish fleece, which is renowned for its softness and lustre as well as tensile strength. For this reason, it is in high demand for making luxury clothing items. Alpaca fibre is also very low in lanolin (natural grease), so therefore the fibre is believed to be hypoallergenic compared to other wool sources. Alpaca fibre is also very lightweight, non-itching and non-pilling. Alpaca fibre comes in a vast array of natural colours with 22 recognised colours available. Huacaya fibre has similar properties to Merino wool (but is even softer) and is ideal for knitted and woven products, while Suri fibre is straighter and smoother in structure and is ideal for high end fabrics. Alpaca fibre blends readily with other fibres e.g. silk, possum and sheep fibre however some of the special alpaca fibre traits may be lost if blending. Alpacas need to be shorn once a year and a single alpaca can produce between 3-5kg of fibre per year. Owners may choose to sell the fibre direct to wool buyers, or make the fibre into clothing items themselves. Raw fleece must be processed into yarn before it can be used to make clothing and other items. This can be done by an external spinning mill, or can be hand spun if you have the equipment and know how.

Llama still produce a fleece, however it is not as desirable as alpaca fibre due to its more variable and coarse nature.

However, llama do offer the versatility of also providing packing and guarding abilities. Interestingly enough, they are used as herd protectors for grazing animals in some countries around lambing or kidding time, as they protect the newly born animals from predators such as foxes, eagles and canines, attacking them with their front feet.

Although they have not traditionally made an appearance on the New Zealand dinner table, alpaca and llama meat is tasty and nutritious – as many South American herdsmen would agree. Alpaca and llama meat is low in fat, high in protein and iron and is believed to have the lowest cholesterol level of any meat, while still being tender and delicious. There is even a specialist alpaca processing abattoir in the North Island of New Zealand, or a home kill service could be used.

Breeding high genetic merit stud alpaca and llama to be sold or leased for breeding usage (stud services) can be financially rewarding. Selling excess stock bred on your farm can also be a good option.

Llamas and alpaca are often kept for their sought after products, however many alpaca and llama are kept purely as pets and they can offer a lot of pleasure for their owners. As very gentle, passive animals, they can be great animals to keep and are particularly favoured by children. Wethers (castrated males) make particularly good pets.

HUSBANDRY AND WELFARE

Alpaca and llama are low maintenance, stoic animals that do not seem to succumb to diseases as readily as other farmed species – however they do still have some specific environmental, health and nutritional needs to keep them as healthy and productive as possible.

Some tips for optimum animal health and welfare:

- As alpaca and llama are social animals, you will need to purchase at least two animals to start with. It is best not to keep two uncastrated males together as they can fight.
- Normal farm fencing is adequate. Electrified fences are not required.
- Originally from the colder climates of South America, alpacas and llamas can cope with dry cold but the rain and the wind chill factor can be a problem for them. Shelter trees to protect from wind and sun are required even in New Zealand's moderate climate. Areas that are prone to snowfall will also need shelter sheds.
- Alpacas and llama are ideal for people with small blocks of land – stocking rates can be higher compared to other farmed species. It is best to talk to an expert in terms of how many you can keep on your particular piece of land.
- Annual shearing is required – which is best done by an expert.
- Toenails require trimming 3-4 times annually.
- Some animals may require annual tooth trimming if they become overgrown (related to a genetic anomaly causing incorrect alignment of the teeth).
- Regular dung removal is recommended, to remove the risk of spreading disease and parasites. As they have one designated toilet area in a paddock, this is a relatively easy task.
- Although not as prone to intestinal worms compared to other livestock due to their tidy toilet habits, annual worming is still recommended. It is best to talk to your local vet, to work out the best plan for your animals.

Alpaca fibre comes in a huge range of colours. This Huacaya is a beautiful white colour.

Two Suri Alpaca's.

NUTRITIONAL REQUIREMENTS

Alpacas and llama are known as **'pseudo-ruminants'**, as they have a similar digestive system to traditional ruminants (cow, sheep, deer, goat) – however they have three stomach compartments rather than four, lacking the omasum compartment. Alpaca and llama are highly evolved to consume high fibre feeds and ruminate (chew the cud) in order to process it. In terms of mouth physiology, alpaca and llama have a split upper lip similar to a rabbit, which allows them to nibble and be more selective when grazing. Alpaca and llama also have a quite different mouth structure to the likes of sheep and cattle, with back teeth on the top of the mouth and an ability to chew in a 'figure eight' motion. Transit time of consumed feed through the gastrointestinal tract is slower in alpaca and llama compared with ruminants, which allows for a greater degree of fermentation of lower quality cell wall materials. This means that they tend to be good rough paddock feeders and can do well on poorer quality forage, compared to the likes of cattle and sheep. Alpaca and llama generally do not require a large amount of high quality supplementary feed and they can get by on lower quality pasture and some hay. Supplementation with feed such as pellets can become more important during pregnancy when energy and protein demands increase, if an animal is in poor condition and needs to gain weight, or if pasture supply is limited due to over-stocking or environmental conditions. There are some great alpaca/llama specific pelleted feeds available in New Zealand which help to satisfy their unique nutritional requirements.

UNIQUE NUTRITIONAL REQUIREMENTS

Alpaca and llama have some unique nutritional requirements that need to be taken into consideration when keeping them.

Vitamin D (the 'sunshine vitamin') deficiency is common, possibly due to their evolution in sunny South America. This deficiency becomes more of an issue in the winter months, due to decreased sunshine hours and thick fleeces. Vitamin D plays an important role in bone development and deficiency during pregnancy and lactation can cause rickets in young cria, due to low vitamin D in colostrum and milk. Symptoms of rickets include bowed legs, shifting leg lameness, joint enlargement, a humpback appearance and a slowed growth rate. Supplementing pregnant and lactating animals with vitamin D is a necessity – non-pregnant and male animals can also benefit from vitamin D supplementation. Many farmers treat all alpaca and llama with vitamin A, D and E injections as required – it's best to talk to a vet around how often these vitamin injections are required.

Thiamine (vitamin B1) deficiency causing Polioencephalomalacia (PEM) – inflammation of the brain – is a condition more commonly seen in alpaca compared to other animals. The gut flora of ruminants and pseudo-ruminants usually produce enough thiamine to satisfy animal requirements, however thiamine production can be reduced in certain circumstances, for example when there is too much sulphur in the diet, or if the rumen is not functioning optimally. Some weeds are also suspected to play a role in thiamine deficiency, due to the presence of an enzyme that breaks down thiamine. Symptoms of PEM include lethargy, low appetite or neurological impairment (head and ear twitching, drooling and staggering). Once an animal is showing signs of neurological impairment, injected thiamine is required quickly to avoid death. Regular supplementation of thiamine is the best way to prevent PEM cases arising.

Camelid nutrition experts have recorded that alpaca and llama do not show strong licking behaviours. This means that using feed/salt blocks may not be particularly effective. Animals may still take interest in the blocks and attempt to bite pieces off but they may not be able to consume sufficient amounts to meet their needs. For this reason, loose minerals or mineralised pelleted feeds are better options for supplementing alpaca.

Pelleted feed specifically designed for alpaca is readily available in New Zealand and can also be safely fed to llama as well. Pelleted feeds are a great way to ensure animals get all of the vitamins and minerals they require daily and in particular, it is good to purchase a feed that contains vitamin D and thiamine, as these are the most commonly limiting micronutrients. Feeding a pelleted feed can also help to maintain good daily interaction between you and your animals and a small handful of feed each day can be a nice treat for animals. Caution needs to be taken however to not over feed animals with pelleted feed, as this can result in overweight animals. Higher levels of high energy compound feeds should be directed into animals most in need, such as underweight or lactating animals.

Newly born cria should be up and suckling soon after birth.

BREEDING AND RAISING YOUNG

Alpaca and llama can be bred all year round and do not have regular oestrus cycles like other livestock species. They are classed as induced ovulators, with ovulation being stimulated by the male during the mating process. There are however more difficulties for the newborn cria to encounter in winter, or the heat of midday summer, so many breeders in New Zealand try to get their females to give birth in either autumn or late spring. Gestation is long compared to other livestock, at around 11½ months for alpaca and llama (which can be longer as they tend to extend their gestation if the weather is not ideal). Females are commonly mated at 12 months of age, although it's best to wait until 24 months of age, as females are more matured.

A stud service (where a male is leased for a short time) or an existing on-farm male can be used for breeding. Embryo transfer (ET) is another option that is becoming more common, but mainly for large herd managers. It is normal for a female to birth 1 cria per year hence the move to ET which can help to speed up the growth of a quality producing herd as the cria carries the genetics of the donor animal. Artificial insemination (AI) is not yet a viable option for alpaca and llama; however veterinary research into AI is underway.

Birthing of cria normally goes smoothly and it is rare that assistance is required. Generally birthing occurs during daylight hours, late morning to mid-afternoon. Animals that are still in labour as evening draws in may be in trouble, so it is recommended to call the vet in this circumstance or anytime during the birth process if a female appears to be having difficulties.

Young cria should be fairly active soon after birth and should be up on their feet within an hour and feeding not long after that. If a cria appears to be having problems and is not feeding within 4 hours of birth, intervention may need to occur to ensure survival and hand feeding with a suitable milk replacer may be required until you are confident the cria is feeding from its mother. It is important that cria get adequate colostrum in the first few days of life, to attain the passive immunity the immunoglobulins found in colostrum provide. A cria that does not receive adequate colostrum will be more at risk of succumbing to disease, particularly during the first few months of life, as their own immune system is still developing.

Crias at risk include:

- premature cria.
- cria that are slow to start feeding after birth.
- cria born during cold and wet weather that are slow and weaker.
- cria with mothers with health issues that may hamper good quality colostrum production.
- cria with mothers with poorer mothering abilities.

Bottle feeding or tubing cria with sourced good quality colostrum can be a solution. Some farmers also advocate injecting cria with plasma collected from adult animals as a way to get a guaranteed level of immunoglobulins into them. Contact an expert on this to find out more information on how this system may work for you. If hand rearing an orphan cria is required, products designed for lambs can be used, such as a lamb milk replacer and a lamb hard feed. Calf products should be avoided, as they often contain coccidiostats that should not be fed to alpaca or llama.

llama can be easily distinguished from alpaca by looking at their ears which are a banana shape.

COMMON HEALTH ISSUES

Alpaca and llama are animals that are not generally affected by health issues. However, there are some issues that are more commonly observed.

Facial eczema (FE)

FE is a disease that seems to be common in alpaca and llama. FE is a condition caused by spores produced by a fungus in the pasture, which increase in numbers during the summer and autumn months, predominantly in the North Island. These spores product a toxin that damages the liver and causes sensitivity to sunlight, which in turn causes inflammation of the skin and severe sunburn, particularly on the face and other unpigmented areas of the body. Other symptoms include general ill-thrift, reduced milk production, reproductive issues and even death. Once acquired, liver damage may be irreversible.

Prevention is the key to controlling FE. Mapping high and low risk areas of your property through spore counting can be helpful and keep in touch with local spore counts, which can often be found free of charge on the internet. This means that paddocks known to be risky can be avoided during peak periods. Pastures can be sprayed with fungicide to reduce the problematic fungi. Supplementation of animals with zinc can help to prevent FE – talk to your local vet for more information on an appropriate delivery method and dosage, as overdosing animals or dosing for a prolonged period of time can cause adverse health effects.

Ryegrass staggers

Ryegrass staggers are caused by animals ingesting endophyte toxins found in ryegrass and this becomes more of a problem in spring or autumn, when pastures are growing more rapidly. The symptoms include animals stumbling and falling due to muscle impairment. There is no cure and the condition is rarely lethal but effected animals must be taken off the problem pasture as soon as possible and fed alternative feed until the symptoms disappear. Some animals are more genetically susceptible to ryegrass staggers, so only a few animals may exhibit symptoms. The more long-term solution is to re-grass your property with endophyte resistant grasses or alternative forages.

Alpaca and llama can also be afflicted with flystrike and footrot, and its best to prevent these conditions from developing. See the sheep 'common health issues' section in this guide for more information on these two health issues.

See 'Unique nutritional requirements section' for more information in vitamin D deficiency/rickets and thiamine deficiency that are also commonly occurring health issues in alpaca and llama.

OTHER ISSUES

Ionophore toxicity

Alpaca and llama are sensitive to ionophores, which are sometimes included in feeds designed for other target animals. Ionophores (predominantly Bovatec®, Rumensin® and Avatec®) are often included in calf feeds for coccidiosis prevention (a debilitating parasite commonly seen in calves), in dairy feeds to improve milk production and reduce energy deficiency issues and even in some poultry and rabbit feeds. Ionophores are however not recommended for use in alpaca and llama and if fed can cause health issues and even death if enough is consumed. For this reason, ensure that alpaca and llama are never fed feeds that contain an ionophore and ensure that they cannot get access to any feeds stored or fed out to other animals on your property. Symptoms of ionophore toxicity include hypoactivity, weakness in the limbs, ataxia, dyspnoea, depression and diarrhoea.

If ionophore toxicity is suspected or if animals have consumed feed containing an ionophore, contact your vet as soon as possible.

There is nothing better than having a happy mother and cria in your paddock.

A beautiful fawn coloured Huacaya alpaca

BEEF

BEEF

Would you like to eat home-grown steak and not pay supermarket prices?

Cattle come in a wide variety of shapes and sizes, as both breeds and crosses, which reflect the selection pressure placed on their ancestors from both an environmental and production perspective. Whereas specialist dairy breeds like the Jersey and Friesian have been selected for milk production in favourable temperate conditions, beef breeds like the Hereford, Highland and Angus have been selected for meat production and survivability traits in a range of challenging environments. Large breeds like the Limousin and Charolais evolved in favourable climates and are used as bulls, to increase the growth potential of calves out of dairy cows and present an impressive profile for those that find muscular animals appealing.

In addition to the popular commercial breeds, rarer heritage breeds like the Dexter are finding favour on lifestyle farms and smaller strains are emerging such as the Lowline Belted Galloways, Angus and Herefords, which present a less imposing figure that suit smaller blocks and less experienced stock people. Small holdings probably make up the majority of farms with beef cattle in New Zealand, although collectively they have a relatively small proportion of the total beef herd. Small farms offer a lifeline for ancient rare breeds whose genetic diversity could be lost to future generations if they are not kept alive.

Whilst some cultures like to eat veal – pale beef from young animals which is very tender – prime beef is typically from animals that are physiologically mature and have laid down some fat through their muscles, which imparts taste to the meat when cooked. Beef feed-lotting is popular in some parts of the world, especially where grain prices are lower and grass growth less dependable but pasture-based beef production predominates here. Cull dairy cows are used in the processed beef sector to make lower grade meat products such as beef burger patties and pies and could be considered a lower cost alternative to prime beef animals.

Highland cattle are a hardy breed and are a great addition to the landscape.

	Beef cows	Finishing beef	Calves
Temperament	Generally good but can be protective after calving – aggressive cows should be culled.	Bulls can be more dangerous than steers, heifers can become restless when bulling.	Reared calves generally well associated with people, weaned suckled calves off the hill can be wilder.
Mature weight	Depends on breed.	At 50% killing out percentage, the carcass weight is half the animal liveweight.	Often bought and sold at around 100kg.
Livestock unit equivalent	3.7-6.3 (350kg cow-500kg cow breeding weight).	3.7 (slow growing) – 4.7 (rapid growing).	2.0 Jersey calf, 2.5 Friesian calf, 3.5 weaners (135-270kg).
Life expectancy	18-22 years.	18 months – 2.5 years.	NA.
Gestation period	On average 283 days but varies with breed, sire and nutrition.	NA.	NA.
Stockmanship skills required	Average most of the year, high around calving.	Average normally, good with bulls.	Good if rearing, average if buying weaned calves.
Profitability score/income streams	Cows are suited to less productive land, unless high value breeding stock can be produced they are typically not intensive enough for high value land.	Can put meat in the freezer and generate income if sold in sales yard or to meat works via an agent who will inspect cattle and agree best market for them.	Commercial calf rearers rely on large numbers and low losses, so buying in weaned calves can be attractive but rearing calves is personally rewarding.

COMMONLY USED TERMS

AI – artificial insemination, in which fresh or stored semen is deposited by a technician or trained farmer.

Endophyte – fungus found in many grass species that produces compounds that are toxic to some insects and pests but also can cause animal health problems including ryegrass staggers.

Cow – a mature bovine female.

Dry cow – mature female not producing milk.

Empty cow – mature cow that is not pregnant.

Bull – an adult uncastrated male bovine.

Heifer – a young female cow that has not had a calf.

Bullock/steer – a castrated bovine male of any age.

Ox – an adult bovine used for draught (usually a castrated male).

Calf – the young of a domestic cow.

Yearling – an animal that is one year old or has not completed its second year.

Prime beef – high quality beef usually from steers or heifers but some prime cuts are taken from bulls.

Processed beef – 'manufacturing beef' from bulls and cows and the forequarters of steers and heifers.

Beef schedule – beef prices that reflect current supply and demand, often reflect similar trends each year but global influences can affect the relative levels.

Charolais are a popular breed in Europe.

CLASSIFICATION OF CATTLE BREEDS

There are many different breeds of beef cattle to choose from to suit the beef farmer's tastes, topography and climate. Strains within different breeds can exhibit considerable variation, so the following classification is by no means rigid and is not comprehensive.

Beef Breeds		
Angus – hornless black breed that produces high quality beef, original Aberdeen Angus now a rare breed in NZ. Top meat cuts branded AngusPure.	**Belted Galloway** – characterised by a wide belt of white hair. Noted for hardiness and being good graziers on rough pasture.	**Charolais** – large breed with ability for rapid growth with less fat, which is popular in Europe, especially as a terminal sire on dairy cows.
Hereford – largely a grass-fed breed that has become popular for ranching in North and South America. Always leaves distinctive white face on offspring. Available in Miniature form.	**Highland** – extremely hardy, having originated in the western highlands of Scotland. Smallest of the traditional beef breeds, slow in maturing.	**Lincoln Red** – large, early-maturing breed with a red coat and docile nature. Was a dual purpose breed until the 1940s.
Limousin – considered a highly muscled breed, which tends to produce a lean carcase.	**Texas Longhorn Cattle** – a slow maturing breed, which thrives on herbage of low nutritional value.	**Welsh Black** – hardy breed, cows produce good levels of milk even in poor conditions.
Dexter – small breed originally from Ireland, suited to both meat and milk production. Considered quiet and easy to handle.	**Simmental** – large Swiss breed used as a terminal sire to produce heavier calves with high growth rates and muscling.	**British White** – ancient breed of white cattle that are very rare in New Zealand.

Beef calves start eating grass from an early age but benefit from milk for a long time.

SYSTEM OPTIONS

The New Zealand beef industry is supplied with calves from beef cows and as a by-product from the dairy industry. Purebred Friesian dairy bulls are kept entire (uncastrated) and raised by specialist operators but as they reach sexual maturity, have temperament and behaviour issues that make them dangerous and are best dealt with by specialists with expertise. Some people in the livestock industry will know experienced farmers who have been killed by bulls. Most Jersey and Jersey Cross bull calves go to the meat works as 4 day old bobby calves, because they are considered too extreme dairy types for beef finishing and produce yellow fat, which is not popular with some markets. Bulls are calmer and finish at lighter weights if castrated as calves, after which they are known as steers or bullocks. Most dairy cows are mated by artificial insemination (AI) but dairy heifers and late calving dairy cows are often mated naturally by a beef bull, because they tend to be safer to have running with the milking herd and produce smaller calves. Beef cross calves ideally possess meat traits from their father, which makes them better suited to beef production than purebred dairy types. Beef cows generate less income than dairy cows and have tended to populate more marginal land, where the topography or climate is not suitable for dairy cows.

Lifestyle farmers wishing to keep cattle have a multitude of options, from keeping a herd of beef cows, rearing calves, buying-in weaned calves at 100kg, grazing cattle owned by someone else or buying in store cattle or cull dairy cows for finishing. Beef cows may be pedigree stock for which a premium can be obtained for progeny suitable for breeding or dairy cows or crossbreds that may produce enough milk for more than one calf. Heavier cows are more likely to cause pasture damage and pugging on wet or steep hill country than light animals. Opportunistic individuals who have the time to attend sale yards or follow online auctions may be able to take advantage to buy stock when prices are low, in the hope that prices will have increased when they have to be resold, provided they have cattle yards (some stock haulage companies will loan ramps to clients but you need some way of funnelling stock into them).

Some calves love to run around more than others.

PROS AND CONS OF DIFFERENT CLASSES OF BEEF STOCK

Class of stock	Pros	Cons
Breeding herd of beef cows	Hardy and mostly self-reliant, long lived and steady. Opportunity to keep rare and interesting breeds alive. Can aim to sell breeding or commercial stock. Thrive on poor pasture compared to other stock types.	Good stockmanship skills required around calving. Relatively high cost of keeping cows fed relative to the value of progeny. Can become over-fat in the hands of a generous feeder. Generally have to keep or borrow a bull, can AI if yards available.
Finishing cull cows	Normally well used to people. Bloom in a low stress environment. May be relatively cheap.	May have health issues and can be lame or run-down. May be unexpectedly in-calf. May not be pretty to look at. Final value limited.
Rearing calves	Low initial cost per animal. Smaller and less dangerous than adult cattle, efficient feed converters that respond well to care and attention.	Initial investment in buildings and equipment. Losses can result from inexperience. High labour input whilst young. Calf rearing margins can be low so the premium for reared calves can be low and losses less likely.
Grazing cattle (short stay cattle 'Bed and Breakfast')	Known income provided growth targets are reached. Can match numbers to available feed.	Need access to yards, unless close enough to walk down the road. Responsible for someone else's stock.
Growing cattle	Avoid the stresses of calf rearing and sending cattle to the works.	Buyers and sellers react to the same feed shortages or surpluses in an area.
Finishing cattle	Get to see stock in prime condition. Maximise income from each animal.	Send stock you have cared for off to the works. Heavier cattle present more risk and weight on paddocks.

The author of this section is a serial over-feeder who enjoys keeping finishing stock rather than breeding cows, because he found controlling intakes difficult.

These soon to calf heifers were keen to check out the new calf.

Animals go through growth stages depending on their breeding, sex and level of nutrition. Bulls grow faster than steers, and heifers do not grow as rapidly as bulls or steers. Bulls are prone to behaviour problems as they get older. Well-fed animals and females tend to lay down fat sooner than poorer fed steers and the testosterone in bulls increases muscle growth and delays fattening.

Calves tend to grow lean muscle and frame and their carcass will be lean unless fed a very high energy diet – their meat is tender but lacks fat for most tastes. Yearlings start to accumulate fat and fat is very energy dense, so feed conversion efficiency drops as animals get fatter. Some breeds like Wagyu are favoured for the very marbled beef they produce but the commercial market does not want over-fat animals, so generally it becomes less profitable to put too much weight on animals.

If aesthetics are not your primary concern, putting some weight on cull dairy cows can generate income with flexibility. Free from the stresses of milk production and life on a commercial dairy farm, cows which are otherwise healthy but just failed to conceive in time can bloom when retired to a smaller unit. Timing when to buy and when to sell can be an important factor in the profitability of finishing operations, ideally taking advantage of when dairy farmers want to offload stock but meeting a rising beef schedule when finished.

When buying livestock look for active, healthy animals with good appetites that have done well relative to the system in which they have been kept. Try to avoid poor doers even if they are cheap, because they may have underlying genetic limitations or health issues that will impact on how well they do.

Beef cows can be kept with the aim of producing one calf per year from the age of two. Beef cows can be of a beef breed, in which case their offspring will be very beefy, a beef cross or dairy breed. Cows of a dairy type will generally produce more milk than a beef cow and can most likely generate more milk than one calf requires. Such cows can be milked to provide milk for calves and possibly some for the house, pigs or chickens. Alternatively, calves can be fostered onto cows – the nature of individual cows can determine how well they adopt extra calves but some people make it work using stalls if necessary, which restrain the cow whilst the calves suckle if she will not accept them readily.

Spring is a good time to calve beef cows, because increasing grass supply meets their increasing need for milk production. Cows must be fed well after calving to achieve high calf weaning weights and a high conception rate at re-breeding. Good quality pasture supplemented with minerals will normally suffice but in a hard spring, or if cows are in poor condition, baleage or compound feed could be offered. With a 9 month gestation and a 21 day breeding cycle cows are normally run with a bull from October or November, depending on the location and expected earliness of spring. Alternatively, cows can be artificially inseminated. This may give access to better quality bulls but handling facilities are required for the technician and application of spray paint or mounting indicators, which show when cows are being mounted by other cows, is needed. With only one calf to feed, excess weight gain can be a problem with beef cows but some condition can be useful to carry animals through a feed pinch. Calves are normally weaned from 5 to 7 months of age – later weaned calves will be heavier but cows may need better feeding if they are to enter the winter in good condition. Condition scoring is recommended, to identify when beef cows need more or less feed e.g. at calving time, thin cows can be given additional grazing or supplements.

Beef cows have a good fit on commercial farms if they utilise poor quality pasture, especially over the winter. Small blocks probably lack a less productive hill or river bed block – poor quality hay and straw can be filling and help keep dry cows content but if it makes up too much of the total diet, body condition can be lost. Conserved forage – baleage or hay – is useful if it can be fed out during an extreme weather event to help maintain energy intake. It also offers the benefit of generating heat during the fermentation process in the rumen, which helps keep cattle warmer.

Rearing calves is a popular and rewarding way for many people to get into beef cattle and allows experience to be gained whilst numbers are small.

Farmlands store staff are often well versed in the needs of calf rearers and the Farmlands Calf Rearing Guide is a comprehensive guide to the nutritional requirements of calves and is worth picking up from your local store.

In summary:

- Calves should be at least 4 days old before being purchased and should have received adequate levels of colostrum on the first day of life.
- Milk powder fed through milk feeders is typically fed twice per day, consistency and care is key to a successful outcome.
- Calves should be offered clean water and a source of long fibre from day one along with meal (molassed textured feed) or pellets, which aids rumen development prior to weaning off milk and prepares them for a grass based diet.
- Young calves should be housed.
- Pellets should be continued after weaning off-milk, to help maintain growth rates during the transition to an all pasture diet.

NUTRITIONAL REQUIREMENTS

Cattle are ruminant animals, which means they can digest high fibre feeds such as grass. See the 'Basics of ruminant nutrition' for more information on ruminant nutrition. Ruminants should always have access to sufficient long forage, to maintain good rumination and clean drinking water.

Once cattle are weaned from milk onto a pasture diet, it is more efficient to keep growing them at a steady rate than have periods of luxurious growth followed by periods of poor growth. Hay racks and troughs help to reduce feed-out wastage, which adds unnecessary cost to feeding forages. Compound feed or blends may be worthwhile if animals are dropping too far below targets. Nuts have the added convenience that they can be fed on the ground with very little waste, whereas blends need to be fed in troughs.

Pasture is most nutritious when it is young and leafy. Intensive high quality grazing systems, such as the TechnoGrazing™ system, require a high degree of pasture and stock management but it demonstrates the advantages of rotational controlled grazing for both the stock and pasture. During a period of summer dry or cold winter, offering some conserved forage should be considered to maintain growth rates. As grass matures, it becomes more fibrous. Fibre reduces the digestibility of the grass – even to ruminants – and also limits dry matter intake because it takes the rumen microbes longer to break down. When grass becomes reproductive it produces seed head on stalks that have to be strong and fibrous in order to be held up, so feed value drops rapidly. Grazing animals can be set-stocked (left in one area for a long period of time), rotationally grazed (moved from paddock to paddock) or strip grazed behind an electric fence. Strip grazing is a useful way to control the consumption of pasture and reduce selective grazing, which may necessitate topping (cutting of the long stalky grass stock have avoided, especially around dung and urine patches). If cattle can be prevented from re-grazing the paddock they are in by back-fencing, it helps the grass recover and reduces grazing close to dung patches, where parasite levels can be high. The pattern of grass growth through the year rarely matches the requirements of livestock, even when a mixture of animals are kept. Surplus grass growth can be conserved as hay or silage (called baleage if made into bales rather than a stack) for use during dry or cold periods when growth rates are reduced. Conservation adds cost, so some farmers build up covers (the amount of standing grass in a paddock) and accept that pasture growth and animal growth rates will be compromised because of increased dead matter in the pasture, shading and high fibre levels. Grass can be fed as standing hay in the summer or foggage in the winter. A variety of grazed forage crops – including kale, forage rape, maize and fodder beet offer the potential of filling summer or winter feed pinches for the more interactive lifestyle farmer with a well-equipped tractor shed or a good relationship with a local contractor.

If beef cattle are fed high quality pasture in sufficient quantity, the only supplementation they might need could be minerals or trace elements that can be lacking in pasture relative to the needs of stock, or made unavailable by the presence of antagonists. Trace minerals can be added to fertiliser and drinking water as a regular preventative, or in response to a recognised problem identified via issues with livestock or interpretation of herbage and soil tests. Most grazing animals have a desire for salt, so salt-rich molassed based blocks are a convenient way to supplement grazing livestock with minerals and trace elements that might be affecting their health or growth.

FUN FACT

Cattle are considered sacred in a number of world religions, including Hinduism.

The level of animal growth pasture at varying quality can support (if fed to appetite):

Pasture	150kg calf	350kg yearlings	500kg finishing stock
Spring leafy (11.5 ME, 25% CP)	1.1kg	1.2kg	1.25kg
Spring mature (10.5 ME, 18% CP)	0.9kg	1.0kg	1.05kg
Summer leafy (10.5 ME, 16% CP)	0.9kg	1.0	1.05kg
Summer Stalky (10.0 ME, 13% CP) Protein may be limiting	0.8kg	0.9kg	0.95kg
Autumn (10.8 ME, 17% CP)	0.95kg	1.05kg	1.1kg
Winter (10 ME, 17% CP)	0.8kg	0.9kg	0.95kg

NUTRITIONAL REQUIREMENTS CONTINUED

Supplementary feeding can be worthwhile whenever the quality or quantity of the forages available are insufficient relative to the class of animals and performance level required. Stock prepared for shows or pet days at school might benefit from supplementary feeding, which can be seen as a bloom and good body condition. Compound feed is increasingly being fed to beef calves prior to weaning to help the transition to an all grass diet. Controlled access feeders are available, which can allow calves to be fed whilst keeping cows away. Smaller animals have a higher maintenance cost relative to their weight than bigger animals but as animals lay down fat, their energy requirement increases. Higher protein calf feed can help calves reach growth targets through a dry summer, whereas in a wet autumn a lower protein compound feed might be a better complement to very lush grass. Winter time can put extra demands on stock when forage availability and supply may be lower than normal.

Specialist pre-calving pellets are available if cows need additional feed coming up to calving, especially if there has been a history of metabolic problems at calving. Extra feed over mating can help to increase activity and conception rates – especially in a cold, wet period – which can improve the timeliness of subsequent calvings. High energy compound feed can help body condition in the finishing stage and could be useful for short stay 'bed and breakfast' animals to help reach target weights sooner – especially if grass supply or market prices are expected to fall. Being able to do what others can't – such as carrying stock through a drought or finishing cattle – by stockpiling conserved forage or being prepared to buy in supplements can allow the smaller producer to buck trends and obtain extra income for their efforts.

COMMON HEALTH ISSUES

By and large, beef cattle are robust, hardy animals that live happy, productive lives with relatively simple needs. As herd animals they prefer being in a group and have social hierarchy that can determine access to the best feed if restricted. Although an amazing evolutionary development, the rumen has a couple of Achilles' heels:

- If the gases produced in the rumen become trapped they can form bloat – an expansion of the rumen volume that can impact on the organs and heart, causing death. Legumes such as clover and lucerne increase the risk of bloat, which can be reduced by adding bloat oil into drinking water, which prevents the formation of a frothy bloat.
- Some forage crops can be rich in nitrates, which reduce the animal's ability to transport oxygen around the body, which may cause death. Young crops such as rape and periods of dull, overcast weather are associated with an increased risk of nitrate poisoning, which can be lessened by offering conserved forage, which reduces the intake of the high nitrate feeds.
- Beef cows can succumb to milk fever and/or grass staggers (low blood magnesium or hypomagnesemia), especially around calving in the spring or during an autumn flush if still milking. Getting additional magnesium down the animal's throat – possibly via water troughs, magnesium bullets, dusting pasture, adding to silage or hay, feeding in compound feeds or mineralised blocks, can be very effective in preventing grass staggers in beef cattle. Over-fat cows may be more likely to have problems at calving time such as difficulty calving, milk fever and ketosis associated with poor appetite.

TOP TIPS

- Professional graziers pay a premium for early 100kg calves, so the price for 100kg calves normally drops as Christmas approaches – if you are less concerned about when your animals finish it may pay to wait.
- Do what makes you happy – if you like looking at hairy Highland Cattle, give them a try.
- The killing out percentage of prime beef is around 50%, so when you pick up your processed home kill from the butcher you will need freezer space for about half the weight of the animal. If you get too much made into mince, you can tire of spaghetti bolognese and beef patties long before the next animal yields some more steak.
- The shock level from modern electric fence units can be adjusted down so if you buy a unit with more capacity than your current block, you don't have to risk a huge shock and you will have future proofed yourself in case you buy a bigger block or want to subdivide more.
- Most four legged animals can run faster than most people, so try not to get in a situation where you have to outrun one.
- It can take twice the amount of energy to gain a kg of liveweight than is yielded when liveweight is mobilised, so stripping off weight can be costly to recover.
- There is no money in maintenance – unless the market rises by-and-large the value of beef animals only increases if they gain weight but they cost money to keep alive.
- Hay and silage sold off the property removes nutrients – grazing stock help to recirculate nutrients and represent less losses when they leave.

MILKING COWS

MILKING COWS

Would you like to convert your pasture into milk, cream and cheese?

Having a milking house cow or two might be considered the pinnacle of the small farmer's aspirations, since it puts them in the same realm as one of the most consistently profitable livestock farmers the world over, whilst putting food on the table without the need for a slaughterer or butcher. With niche markets developing for milk from boutique producers, milking cows even offer the potential of generating a liveable income from a small block. Practically, dairy cows require both agronomic and animal husbandry skills at a higher level than is required for less intensive enterprises but this is still well within the capability of committed small farmers.

One cow or two? A single dairy cow will keep up with the needs of most families, except for a couple of months of the year when it is dry, i.e. not milking. Having a spring calving cow and an autumn calving cow allows a more even spread of production but means at times you will have cows with different nutritional requirements and an over-abundance of milk. Surplus milk can be diverted into calf rearing, laying hens or pig growing and finishing operations.

Cows produce milk to meet demand and will produce more milk at peak production if they are milked three times rather than twice or once per day. Most cows are milked twice daily, although they can be milked once per day or every 16 hours for those that don't mind going to bed at odd times. Milking can be by hand or a milking machine in a milking bale, which can be inside a building or movable trailer.

	Dairy cows
Temperament	Generally good, Mostly hand reared, so accustomed to people. Individuals with a dominant personality can be avoided in the selection process during rearing.
Mature weight	Depends on breed. A Holstein Friesian female will weigh approx. 550kg while a Jersey female will weight approx. 450kg.
Livestock unit equivalent	6.1 (350kg Jersey) – 8.0 (450kg Friesian).
Life expectancy	5 lactations if milked commercially but if retired can live for 18-22 years. Cows will last longer if milked in a house cow situation, 10-12 lactations is not uncommon.
Gestation period	270 days (9 months).
Stockmanship skills required	Good skills required to look after productive milking animals, which need to calve each year. High level of commitment required if milked twice daily.
Profitability score/income streams	Good, as they produce high value milk that can be used in the place of bought in milk and surplus can be utilised in other operations, such as fattening pigs or laying hens. Criteria have to be met to sell milk from the farm-gate – current regulations should be checked if contemplating going commercial.

BREEDS AND TYPES AVAILABLE

Some of the popular beef breeds, such as the Charolais, were at one time milked and may keep up with the domestic needs of a household. But by-and-large cows of a dairy breed will require less feed for maintenance relative to the quantity of milk they can produce. Beef cross cows that potentially display some of the milkiness of their mother and the hardiness of their father, such as a Hereford x Friesian, could make dependable house cows with some hybrid vigour but could have a tendency to gain weight rather than produce milk. In reality they would probably be close to the type of cows kept before the agricultural revolution post World War II and would make robust options. Dairy crossbreed cows (generally Friesian x Jersey) are popular in New Zealand and also possess hybrid vigour but are more dairy orientated and lighter than beef cross cows. Dexters are considered a dual purpose breed that can be kept for milk or meat and are less intimating due to their small size. Smaller breeds, especially Jerseys, are favoured for wetter areas because they don't sink quite so deep into the mud. Calves and cows can be bought with a known BV or breeding value, which indicates the genetic merit of an animal – higher BV animals would be expected to produce more milk than lower BV animals. Some of the dairy breeds in New Zealand are listed below but prospective dairy farmers are advised to research what is available if they crave being different or have particular needs. Purchasing cull cows from a commercial farm can be an option – however, they may be getting culled for a number of reasons. Taking a cow from a commercial operation onto a lifestyle farm and giving them some care and attention may help a cull cow become a good producer for your family.

Dairy Breeds		
Ayrshire – A medium size, considered to have good hardiness, foraging ability and longevity that produces high protein milk in relation to fat content.	**Holstein Friesian (500-550kg) –** The dominant commercial breed in New Zealand, these black and white cows are popular for their prolific milk production.	**Brown Swiss –** A docile breed with quiet temperament, light brown coat and creamy white muzzle. Their milk is apparently favoured for cheese production.
Jersey (350-400kg) – A productive small cow with attractive eyes and thin skin and coat, which ensures better heat tolerance than some breeds.	**Crossbreed (JxF) –** Mid-way in size between the Friesian and the Jersey, crossbred are claimed to have good udders, longevity and calve easily.	**Dairy Shorthorn –** The first cattle to be introduced to New Zealand but now considered a rare breed. Considered high producing, easy care animals with good health traits.

SYSTEM OPTIONS

Milking cows can be used to turn vegetable protein in pasture into animal protein in milk, which can then be drunk as it is, separated to make cream or used to make cheese or butter. Provided it is carefully harvested and properly handled, the milk can be used for human consumption or can be fed to young calves, pigs or chickens. Cows produce milk after giving birth to a calf (calves can be hand reared – see Farmlands Calf Rearing Guide for more information). Peak milk production is normally about 5-6 weeks after calving and declines gradually thereafter, until it reaches a point which is not commercially viable to milk daily. The udder benefits from a dry period of about 2 months, to allow the regeneration of secretory tissues before the next lactation. If cows are poorly fed they will dry-off earlier or will need to be dried off earlier, to ensure they have sufficient time to regain condition before the next calving.

Spring calving dairy cows generally calve when they are about 2 years of age. Pasture only fed dairy cows in NZ typically milk for 230-250 days per lactation, so if calved at the same time each year, will be dry for about 115 -135 days per year. Cows fed supplements in the spring or autumn to extend their lactation may milk for 245-265 days per lactation, whereas cows fed supplements, in addition to pasture all year round, would be expected to milk for more than 275 days per year. A 305 day lactation and 60 day dry period is considered optimal if cows are well fed. Dairy farmers supplying towns have traditionally milked a proportion of their cows in the autumn, so it is possible to buy autumn born calves that might calf for the first time at 2.5 years in the spring, or raise spring born calves to calf down in the autumn at 2.5 years of age. Older calving heifers will have had more time to grow and will be under less pressure as first calvers – calving cows for the first time as 3 year olds is generally considered not worthwhile.

HUSBANDRY AND WELFARE

Well-handled cows should be familiar with the human touch and whilst not as co-operative as a horse, which lifts its foot for shoeing, should be calm and gentle around people. Adult cows are well suited to the temperate climate in New Zealand but may appreciate shelter in severe weather and shading in the summer heat. Milking cows are at most risk at calving time, when calving problems can threaten the life of both the cow and calf and when metabolic issues including milk fever, magnesium grass staggers and ketosis are most prevalent. More regular inspections may be required as calving approaches. Some cows can become protective after calving and extra care should be taken when handling them. At each milking the udder and milk should be inspected for signs of mastitis – an infection of the mammary glands that can be fatal if left untreated. Milking cows come into buildings and are exposed to more equipment than dry stock – care should be taken to ensure that facilities for milking cows will not cause harm or injury to animals.

Cows can be a delight to interact with at milking time.

BREEDING AND RAISING YOUNG

Foundation stock can be purchased as calves, yearlings, pregnant cows or in-milk. To ensure continued milk production (outside of the dry period), cows are normally mated with the intention of producing a calf approximately every 12 months. If breeding to replace or grow the existing milking herd, a milking breed sire may be chosen but if calves are to be sold or reared for beef a beef breed might be more appropriate. Breeds that tend to produce small calves are generally favoured for maiden heifers having a calf for the first time. Bulls can be dangerous, so artificial insemination may be preferable to hiring or keeping a bull. Cows will demonstrate oestrous with other cows, so it is easier if you have more than one to identify when cows are ready for mating. Tail paint or mounting markers can be applied to the area at the top of the cow's tail, which is rubbed off when a cow is mounted by another cow, showing that it is approaching the best time for mating. Mating markers can be also applied to check that cows are not returning to heat approximately 21 days later, which indicate they were not pregnant and needed serving again. Prospective breeders should contact artificial insemination technicians in their area to discuss the service available. Key factors that seem to influence fertility of milking cows are condition at calving (ideally Body Condition Score 5.5 for heifers and second calvers and 5.0 for older cows) and nutrition in early lactation.

Cows should be fed in late lactation so that they can be dried off at close to the ideal condition for calving – thin cows should be fed supplements or dried off early. It is difficult for cows to gain condition in the last month of pregnancy because demand from the growing fetus increases and also limits rumen capacity, so it is better not to try to gain too much condition during the dry period. The due calving date of cows can be calculated from the day of mating, visual inspections should be increased as the calving date approaches and attention given if difficulties arise. Calving can be the most rewarding or stressful experience in the farmer's year, commitment and planning will help to increase the chance of a positive outcome. Mal presentations are not common but if cows are seen to be straining for too long, veterinary intervention may be required and easily justifiable given the value of cows and calves. Checking stock in the middle of the night can be a wonderful time to view the stars and the milk will taste better after a run of interrupted sleeps.

It is important that calves receive colostrum for the first 4 days of their life, either directly from their dam or after their dam has been milked and the colostrum fed through a feeder. Calves can be reared as described in the beef section.

NUTRITIONAL REQUIREMENTS

Holstein Friesian's are the most commonly seen dairy cow in New Zealand.

Cows are classed as ruminant animals in terms of their digestive system – see the 'Basics of ruminant nutrition' section for more information on ruminant digestion. Ruminants should always have access to sufficient long forage, to maintain good rumination and clean drinking water. The primary aim with milking cows is generally to keep them fully fed to support milk production and body condition, so that the cost of maintaining an animal can be spread over a bigger output. Dry matter intake is normally the largest nutritional factor that determines milk production – you can't get more out than you put in – milk production is very demanding so the aim should be to keep cows fully fed when milking. Appetite is linked to milk production so dry matter intake will tend to fall as milk production drops anyway and intake will only have to be restricted if cows towards the end of their lactation get too fat.

The higher the level of production, the higher the quality of the diet fed. Energy is the first limiting factor for milk cows – it is the fuel in the tank that makes the journey possible. A 450kg Jersey cow typically needs 50 MJ ME/day for maintenance and 5 MJ ME per litre of milk produced, so a cow giving 20 litres of milk is working at 3x their maintenance level. Little wonder milking cows are compared to high performance athletes. Such a cow will struggle to produce 20 litres of milk per day without losing weight if the pasture is tall and mature and has an ME of 10.5 MJ ME/kg DM. A small lift in pasture quality to 11 MJ ME/kg DM means the animal can eat more dry matter per day and every kg delivers more energy, so the animal might be able to produce 22.5 litres per day. Pasture quality would need to be a high 12.0MJ ME/kg DM to produce 27.5 litres per day or balanced with high energy supplements – typically grain based because they are high in energy and low in fibre.

Commercial farmers with predominantly perennial ryegrass type pastures will aim to graze paddocks when the grass has between two and three leaves, to optimise production of high quality pasture. After the three leaf stage, older leaves die resulting in wastage and feed quality falls as dead material builds up, which has a low ME comparable to mature hard stems (6.5 MJ/kg DM). This is compared to green leaf (10.5-12.5 MJ ME/kg DM) and soft stem (10-11 MJ ME/kg DM). Commercial dairy farmers will aim to consistently graze ryegrass dominated pastures to leave a residual of 1,500-1,600kg DM/ha during spring and early summer – normally 3.5-4cm compressed height using a plate meter, which is used for measuring pasture covers. Grazing lower than this reduces pasture growth because the plants lack sufficient leaf area to intercept sunlight. Cows can be set-stocked but strip grazing behind an electric fence is a useful way of controlling access to pasture, to maximise the quality of the pasture consumed over as long a time as possible. Back-fencing grazing – to stop cows going back over recently grazed grass – helps the grass to recover more quickly after a single defoliation, rather than a series of cuts over a short period. At times of the year grass will become reproductive and feed quality drops as fibre levels rise. Topping after grazing can help to remove seed heads to encourage leafy re-growth, especially near dung and urine patches that cows tend to avoid.

Pasture management in a nutshell

Monitoring pasture height or 'pasture residuals' is a good way to manage pasture quality and to ensure that pasture is being grazed at the right stage. Pasture is best grazed at around 2,600-3,200 kilograms of dry matter per hectare (kg DM/ha), which is termed the 'pre-grazing residual'. With pre-grazing residuals increasing above 3,400kg DM/ha, the increasing fibre content of the grass begins to really limit pasture intake. Pasture should then be grazed and eaten down to a target pasture cover termed the 'post-grazing residual' and the target for this is 1,500-1,600kg DM/ha. Post-grazing residuals lower than 1,500 can impact on the pasture's ability to grow back following grazing and post-grazing residuals that are too high can impact on the quality of that pasture when it's grazed in the next round. There are some technologically advanced ways of monitoring pasture residuals very accurately, including using rising plate meters, however it can be simplified as well and using the Kiwi classic 'Red Band gumboot' as a reference can be a helpful tool. The simple rule of thumb here is that the pasture is ready to be grazed when it reaches 'Red Band gumboot height' or the top of the gumboot and should be grazed down to foot height. Obviously this rule of thumb is not as technical as working out the exact pasture residual but this simplification can work well, particularly if high production out of the house cow is not the goal.

As dairy cows are handled every day they can become very well trained and can make great pets.

Milking cows invariably lose weight in early lactation until they reach a point, depending on their genetics, at which milk production peaks. Provided they are fed well thereafter, peak production sets the lactation yield and appetite. Milk production will fall beyond expectations if cows are subsequently underfed after reaching peak production and can be increased if the quality of feeding is much improved but on average, peak production is well correlated to the total yield. If a calf is required roughly the same time each year, it is important to get milking cows pregnant again about 3 months after calving. Body Condition Score at calving is one of the dominant determinants of subsequent fertility. Cows in poor condition at calving will be slow to resume cycling and will have lower fertility than cows that calved down in good condition and were well fed thereafter.

Concentrated feed at milking time can be good way to reward cows during milking and help support milk production in the spring, when winter saved pasture is still being consumed. Although pasture quality can increase rapidly in the spring, it is not long before the grass itself becomes reproductive – putting up seed heads borne on stems that require extra fibre to give them strength. Increased fibre levels and falling protein levels in pasture can accentuate the fall in milk production that typically coincides with the end of mating. Higher daytime temperatures during the summer can further reduce intakes. Autumn typically sees a flush of leafy growth without going to seed – low fibre levels and high protein levels can see milk production lift or body condition increase as cows come to the end of their lactation. The aim through winter should be to gain up to 0.5 BCS – during the last month of pregnancy it tends to be difficult for cows to gain weight and grow a fetus at the late stage of pregnancy.

Dairy cows can produce milk on an all-pasture or forage diet but the quality of the pasture will determine the maximum amount of milk produced. Ultimately, there is a limit to how much a cow can harvest per day grazing. Higher level of milk production can be achieved when cows are fed supplements – sometimes as much as half the diet (on a dry matter basis) in early lactation. Supplements tend to be lower in fibre and less bulky than forage and are presented in a form that is easier to eat quickly compared to grazing pasture. For most pasture based milk production, 2 to 3kg per head per day of a grain based supplement is a typical level, unless farmers are aiming to achieve high levels of production or have a severe feed deficit. When above 4kg per head per day in the milking shed, a second supplementary feed based on a straight (e.g. soy hulls or palm kernel expeller meal) to replace forage is normally appropriate, although higher levels of compound feed are appropriate for high yielding herds.

Many people are wary of grain and grain based feed for cattle because they have been warned about acidosis. Acidosis – low rumen pH that may in extreme cases result in rumen stasis and death of the animal – can result by the rapid ingestion of excess amounts of starchy or sugary feeds. However, animals that have been accustomed to such diets are at less risk and in reality forages probably cause more deaths amongst grazing animals each year from grass staggers, bloat and nitrate poisoning, than grain consumption.

FUN FACT

Dairying has improved through the years. Today, one cow can produce the milk that it once took 10 cows to produce.

Jerseys are a smaller dairy breed but are still very productive.

Protein is often the second limiting factor for milk production. Leafy pasture generally contains more than enough protein for milking cows except for during the summer, when protein levels plummet. Protein can be considered as the accelerator that drives production – if pushed too hard, fuel consumption rises and feed efficiency drops. But if slackened off too much, you won't get to where you hope to be in terms of total milk production. Wholecrop forages such as maize silage are low in protein relative to the needs of the lactating cow so if feeding at more than 3-4kg DM, supplementary protein may be required.

Fibre is the third limiting factor for milking cows – often because the diet contains too much, which limits both dry matter intake and the digestibility of the feed and hence the amount of energy it delivers to the animal. Sometimes however the diet can lack long fibre, e.g. when grass grows very quickly after rain following a hot dry spell and cows can benefit from access to hay or baleage.

Pregnancy is a big risk for cows, so having gone to all the trouble of producing a calf they want to make sure the milk it receives will keep them growing strong and tall. Major minerals are important for cows because sometimes they will make sure the milk they produce is well balanced for their calf, even at the detriment to their own wellbeing. A calcium imbalance around calving time can cause cows to go down with milk fever, which if not treated quickly can cause casualties. Fatter cows, high yielding older cows and Jersey cows can be at more risk from milk fever, which can be treated with remedies injected into downer cows. Magnesium deficiency can also affect fresh calved cows in the spring, especially if the pasture is low in magnesium or high in potassium. Cows that are lacking magnesium can become nervous and jittery whilst cows that are over supplied with magnesium can become sedated and lethargic.

Trace minerals are required in minute amounts and generally if deficient impact health, fertility and production in subtle ways that are difficult to diagnose. A broad-brush but conservative approach to trace mineral supplementation often works well in practice and is preferential to waiting for a deficiency to reach clinic levels before being able to diagnose. **See the following page for more information on specific minerals in relation to dairy cows and calves.**

Milking a few house cows doesn't require extensive infrastructure however automatic milking machines can make life easier.

A cow tending to her newborn calf.

Mineral	Function	Symptom if deficient	Comments	Notes
Magnesium	In enzymes and nervous system (transmits nerve impulses) throughout the body.	Hypomagnesaemic tetany (staggers) – nervousness leading to convulsions and even death.	Causmag (magnesium oxide) on pasture, blocks, in feed or magnesium chloride in water. Bullets.	Not stored so needed daily. Poor weather, very lush growth and potassium can reduce intake.
Calcium	Found in bones and teeth but also enables nerves and muscles to function.	Milk fever post-calving and also when bulling if dry matter intake falls.	Limestone and dicalcium phosphate.	Milk fever more common in older dairy cows at calving than heifers.
Sodium	Maintains fluid and ion balance in body.	Abnormal licking of wood, soil and urine, reduced performance.	Salt in mineral supplements or rock salt. Salt both stimulates and regulates intake.	Always provide salt with adequate drinking water.
Copper	Involved in many different enzyme systems as a catalyst.	Anaemia, poor growth, scouring, 'spectacles' and poor coat condition, reduced fertility.	Copper sulphate fertiliser, injection, bullets and licks.	Interacts with sulphate, zinc, molybdenum and iron in the rumen, which reduces availability.
Selenium	Anti-oxidant system in all active body tissues.	Weak muscles (WMD), unthriftiness in young stock, poor conception rates and retained cleansings in cows.	Sodium selenate orally or by injection, mineral supplements or as fertiliser.	Excess selenium is toxic so avoid supplementing by several routes at the same time.
Zinc	Needed in enzyme systems throughout the body and keratinous tissues.	Dry skin, coarse hair, soft hooves.	Zinc oxide in drench or bolus, Zinc sulphate in mineral supplements.	May help good hoof growth.
Iodine	Essential for thyroxin production, which controls metabolism.	Cretins, reproductive problems and mummified calves.	Iodised salt or injection.	Requirement increased in presence of goitrogens (kale and other brassicas).
Cobalt	Required for vitamin B12 production in rumen.	Poor appetite, harsh coat and muscle wasting. Pining.	Cobalt sulphate in fertiliser, bullets, injection.	Cobalt levels in grass lowest in spring and summer.

COMMON HEALTH ISSUES

- Calving is the most dangerous time in the life of any cow. Risks can be reduced by calving cows in the best condition – not too fat and not too thin. Excellent Body Condition Score guides are available online that are well worth studying. Bulls or semen that produce smaller calves can be selected, especially for first calving heifers, sometimes with shorter gestation so that calving can be pulled forward.
- Mastitis or inflammation of the udder reduces the amount of milk a cow produces and adds undesirable bacteria that affect the keeping quality and appeal of the milk. The udder and milk should be examined at each milking for signs of mastitis and prompt treatment given, commensurate with the beliefs of the farmer who may favour a non-antibiotic approach.
- Lameness is a major reason for reduced production and culling on commercial farms. Cows are very good at avoiding objects that might damage the soles of their feet when walking at their own pace. Milking cows on small blocks are likely to be under less stress, walk less distances and be hurried along less than cows on large commercial farms.
- Facial eczema is a major threat in the North Island and some isolated areas on the upper West Coast of the South Island, which is generally treated with additional zinc daily. Mycotoxins can contaminate purchased feeds, conserved forages and pasture as endophytes, which can cause ryegrass staggers. Endophytes were introduced in some grasses to control harmful pests. They are especially concentrated in the base of the stem and can affect the health of grazing animals, especially when the grass is becoming reproductive or grazed down to a low level.

Ayrshire's are good milk producers and their red colouring is striking.

SUMMARY

Milking cows require a bit of commitment and are not for the faint-hearted – but they can be a great addition to a small farm with self-sufficiency ambitions.

For more information on calf rearing, see the Farmlands Calf Rearing Guide, which is available from Farmlands stores.

FUN FACT

A Holstein Friesian's spots are like a fingerprint. No two cows have exactly the same pattern of black and white spots.

DEER

DEER

Deer - a commercially viable option for the smaller block?

While deer are not a typical choice of stock to keep on a lifestyle block, deer can be rewarding animals to keep and can yield valuable products such as venison and velvet. Deer are fairly high maintenance animals and do require well designed yards and specialised equipment, so it's worth doing some research into deer farming before you take the plunge.

	Deer
Temperament	Nervous and flighty when stressed but manageable with careful handling.
Mature weight Males/Females	**Red** Female 100-150kg. Male 160-240kg. **Wapiti** Female 220-240kg. Male 320-330kg. **Fallow** Female 30-50kg. Male 60-100kg.
Life expectancy	18 years.
Gestation period	230 days.
Stockmanship skills required	From average to very good depending on the return required.
Profitability score/income streams	Velvet is currently showing excellent returns and big yielders are prized as trophy stags. Venison animals can put tasty meat on the freezer or be sold. Surplus high quality breeding stock can be sold.

SPECIES AND TYPES AVAILABLE

There are several different breeds of deer found in New Zealand well suited to farming including Red Deer, Wapiti (also known as Elk) and Fallow. Red Deer are the most commonly found breed on New Zealand farms and they are of a medium size. Wapiti are larger than Red Deer and for this reason they don't lend themselves well to smaller blocks, as handling them can be more difficult. Fallow deer are smaller than Red Deer and Wapiti and for this reason they may be a better option for smaller blocks. However, the Fallow do tend to be even more flighty than larger breeds. Crosses between Red Deer and Wapiti are common as well. Red Deer and Wapiti breeds are known to produce superior antlers, used to produce antler velvet and good quality meat. Fallow deer do not produce commercial antler velvet but do produce excellent quality meat.

COMMONLY USED TERMS

For deer there are a few different terms that are commonly used.

Stag/Buck/Bull – male deer (Bull generally used for Wapiti, Stag used for Red Deer and Buck used for Fallow deer).

Hind/Doe/Cow – female deer (Hind generally used for Red and Fallow Deer, Cow used for Wapiti).

Fawn/Calf – young deer (fawn generally used for Red and Fallow Deer, Calf used for Wapiti).

Spiker – 1 year old stag.

Cricket – 2 year old fallow spiker.

Weaner – 4-6 month old deer.

The rut – breeding season, also known as 'the roar'.

FUN FACT

All deer are classified as Artiodactyls because they have hooves and an even number of toes.

A male deers antlers can reach a very impressive size.

SYSTEM OPTIONS

There are three main commercial reasons why deer are farmed: meat, antler velvet and trophy stags. Meat from deer is called venison – it is very lean and is prized for its finer texture compared to beef. Velvet antler is the bony outgrowth of the skull in stags. Velvet antler grows annually at an extraordinarily rapid pace (up to 2cm per day at peak growth). There are two stages to the growth – first the 'velvet antler' growth period, which is fully intact skin with a covering of soft fine hair. The second growth stage is the hard antler phase – this is when the antler calcifies and loses blood supply. In early spring the antlers fall off and then regrow again the following year. In nature the antlers exist for some specific functions including defence, maintaining social order and attracting hinds. When cut at the velvet stage, deer velvet is thought to have medicinal properties when consumed and is in high demand for inclusion in supplements for health and vitality in humans. There is also a market for trophy stags in New Zealand – stags that have particularly impressive antlers. People pay to go hunting in enclosed territory where trophy stags inhabit, with the guarantee they will shoot an impressive stag. Lifestyle blocks do not tend to keep deer for commercial reasons however and you may want to keep a few deer purely for their attractive looks. Stags do not make great pets due to their unpredictable nature. Hinds and wethered stags can make good pets (wethered stags generally do not grow velvet). Hand reared deer can have little respect for humans and hand reared stags can be particularly dangerous during the rut stage, as they can become very aggressive. For this reason deer should always be handled with caution, even if kept as pets.

HUSBANDRY AND WELFARE

Deer have not been domesticated for as long as other livestock such as sheep and cattle. For this reason deer are not as behaviourally adapted to being farmed and tend to be very flighty and nervous when stressed. This can make regular animal health tasks such as drenching more problematic and also requires more specialist fencing, yards and sheds that can accommodate deer. Hand reared individuals can lose their respect for man and can be more dangerous – especially the stags.

Tips for handling deer on a property

- Good stockmanship is vital when handling deer. Patience is the key and it is best to always be calm and quiet when handling deer – if they become stressed, they can become a danger to you and themselves. It is best to not use dogs when controlling deer and it's a good idea to do some research into deer behaviour and how best to handle them.
- Adequate fencing for deer is important and fences should be at least 2 metres high. Deer can jump very high and normal fencing will not contain them. Specialist deer fencing is the best way to go.
- Adequate shelter is important, as deer cannot withstand cold/wet conditions as well as some breeds of cattle and sheep due to a relatively low fat cover. Ensure you have some paddocks available that have adequate natural shelter for use in bad weather conditions.
- Races and yards on the property should be as well suited to deer as possible. Deer are less stressed when handled in more low light facilities, so closed in yards are best. Deer can injure themselves during yarding if they become stressed, so it's best to remove as many risks as possible by ensuring any gates and doors sit flush to avoid catch points. There are some particular yard designs that are thought to improve deer handling, so it's best to contact an expert in the area for advice.
- A crush that accommodates deer is important to have, as deer do require regular animal health tasks such as drenching and vaccinating and a decent crush will make this easier.
- Remember to wear adequate protective clothing when dealing with deer, such as steel capped boots. Due to their flighty nature they are an unpredictable animal to work with.
- Velvetting stags can live a long and happy life compared to many farmed animals. Removing velvet is typically done by a veterinary surgeon, who will ensure the animal is properly anaesthetised during the operation. Cut velvet is typically frozen – potential producers are urged to speak with potential buyers in their area to determine what is required and when velvet is collected.
- Specialist freight companies are required when transporting deer.
- Deer like to wallow (roll in mud) and because of this, areas of a paddock they are kept in will become wallow sites (muddy depression in the ground). Wallowing is a natural behaviour thought to be linked to parasite and temperature control. Wallowing is normal and the only thing to be wary of is the wallowing holes themselves, which can be a risk to people driving through paddocks or when run off from the wallow is contaminating water ways. Fallow deer do not wallow.

UNIQUE NUTRITIONAL REQUIREMENTS

Deer are classed as ruminant animals, as are cattle and sheep. This means they are able to get nutritive value out of higher fibre plant matter due to their complex digestive system, consisting of four stomach compartments. Deer also ruminate or 'chew the cud', a process where they bring food previously consumed back into their mouth in order to break it down further (see ruminant nutrition section for more detailed information). Deer have some specialist eating behaviours compared to cattle and sheep. They are classed as concentrate selectors/browsers rather than grazers and they actively seek out feed of higher nutrient value from their environment. In their natural environment deer will select plants and plant parts high in easily digestible, less lignified, more nutrient dense substances such as plant starch, protein and fat (e.g. shrub leaves, fruit, herbs) and they can easily do this due to their small mouth size. In farming systems this behaviour is expressed by deer consuming red clover, chicory and white clover first when they enter a paddock (depending on what's available), as these feeds are higher in soluble sugars, starch and proteins. Hand in hand with this, concentrate selection behaviour deer also have adaptations in their digestive system that allows them to handle diets higher in sugar and starch than grazing ruminants.

Deer show marked seasonal changes in eating behaviour, related to the changing drive to grow in response to changing photoperiod and day length change, which has an impact on liveweight gain and subsequently feed intake. When the day length shortens deer have lowered feed intake and when the day length increases feed intake picks back up. It is therefore essential that deer go into winter in good condition and late winter/early spring is a good window of opportunity to increase

liveweight gain following condition loss over the winter, as feed intake starts to increase. The reproductive cycle can also have an impact on feed intake, with 'the rut' period over autumn causing a dramatic decrease in feed intake in stags, as they are preoccupied with looking for a mate and during this period they can lose up to 30% of their body weight. Going into the rut in good condition is therefore vital and offering high quality feed once the rut is over and appetite has picked up is important. Velvetting stags have additional nutritional requirements – growing velvet is a considerable energy and protein drain and offering stags a high quality supplement during this period can improve velvet yield. Lactating hinds also have higher nutrient requirements – good nutrition is vital for good milk production and fawn growth and a good quality supplement is beneficial to feed during this time.

FUN FACT

All male deer have antlers, with the exception of the Chinese Water Deer, which has tusks.

A common way of feeding deer supplement is in the paddock in a long line.

RECOMMENDED RATE OF FEEDING COMPOUND FEEDS

Compound/pelleted feeds can be a great way of ensuring deer are well fed and are receiving all of the micronutrients important for optimum health and productivity.

- **Hinds and fawns** – 0.5kg/head/day to 2kg/head/day.
- **Stags** – 1 to 2kg/head/day.

Feeding rates depend on pasture quality and quantity, size of the animal and season. Rates can be increased in feed deficit situations. Always ensure some long fibre is included in the diet, to promote rumen health. Transition onto pelleted feed by starting with 0.25kg/head/day for a week, before building up over the following 1 to 2 weeks to the desired level of supplementation.

Deer have higher copper requirements compared to other livestock and for this reason copper deficiency is one of the most common nutritional deficiencies seen in deer. Copper deficiency is characterised by general ill-thrift, poor conditioned coat, diarrhoea and more flighty/nervous behaviour than regularly. Copper is the most commonly deficient micronutrient, however others such as cobalt, iodine, B12 and selenium can also be deficient at times. Regular supplementation is a good preventative measure and there are a few ways of doing this. Feeding a mineralised Deer Nut can be an easy way to get micronutrients into stock, however injecting, salt blocks and slow release boluses are other options. Compound feeds designed for other livestock species, such as Sheep Nuts may not have a high enough level of copper included, so it's best to go for a feed designed for deer.

Fawns can be bottle fed.

BREEDING AND RAISING YOUNG

The deer reproductive cycle is linked to photoperiod and they are very seasonal breeders. The shortening of the day length signals the start of the mating season, so for New Zealand, when days shorten in late summer. Hinds reach puberty and can be mated from 16 months of age. Hinds start ovulation towards the end of March and most conception occurs in the first half of April. Hinds will come into oestrus and if they fail to mate with a stag will show signs of being on heat again 18-21 days later. Usually one stag will be used to mate a group of hinds on commercial farms. The breeding season is termed the rut and during this period stags become aggressive and protective of their territory, running fence lines and roaring. The rut can last 6-8 weeks and during this time people should avoid paddocks containing stags.

Gestation in deer is about 230 days and hinds give birth during November-December. A few days before a hind gives birth, she will separate herself from other animals and may appear to be more aggressive and pace the fence line. If a hind is struggling for a prolonged period of time once the birthing process starts, a vet may be required but the hind should not be disturbed unnecessarily, as this can cause birthing issues and increased risk of orphan fawns. The deer and her fawn are best left alone following birth. The fawn will begin to suckle soon after birth – the hind will then attempt to hide her fawn and return to feed the fawn several times each day, until the fawn is able to constantly follow the hind. In the circumstance of a fawn that has been rejected by its mother, hand rearing the fawn may be required. Hand rearing fawns can be very time consuming but can be done successfully. Fawns should be fed milk 4-5 times per day. Deer milk is best if this can be sourced, however cow's milk or lamb's milk replacer can work well too. Fawns should also be offered a hard feed to help rumen development and a feed designed for rearing lambs can work well. Rearing fawns has an added complication when it comes to defecating. This can be done by simply rubbing with a moist wet wipe and as fawns get older they will start to defecate without aid. Weaning of fawns usually occurs at around 4 months of age. Be aware that while cute and gentle at first, as they mature hand reared deer can be dangerous due to their lack of respect for humans, particularly stags who will eventually grow impressive antlers if not castrated. Hinds are unusually able to kick forward which can also catch people unaware.

COMMON HEALTH ISSUES

Deer don't generally have health issues but there are a few conditions that are more commonly seen in deer.

Lungworm

Lungworm is a parasitic disease that can be common in young deer that haven't yet developed immunity. Lungworm is one of the more serious parasitic issues, as the adult worms inhabit airways and heavy burden of the worm can cause blockages and death, or lung damage can cause pneumonia further down the track. Symptoms are those classic of parasitism, including general ill-thrift, poor production and scouring – however lungworm has the added symptom of a bronchial cough caused by the worms in airways. Regular parasite treatment is important for prevention of the parasite – it's best to contact your vet to work out the best parasite control programme for your farm.

Yersiniosis

Yersiniosis is a common disease in young deer. It is a bacterial disease and is spread in the faeces of carrier animals, which when consumed by deer pass on the bacteria. Symptoms include loss of appetite, ill-thrift and diarrhoea. The diarrhoea is generally very watery and green to start with and as the disease progresses, it can start to contain blood. Treatment includes antibiotics and a vet should be consulted as soon as possible if yersiniosis is suspected. There are vaccines available, so it's worth talking to your vet to see if vaccination could work for your animals.

Johne's Disease (pronounced 'yo-knees')

Johne's Disease is a bacterial infection that infects young animals by interuterine transmission, hind's milk or by animals consuming contaminated drinking water or feed. It is often brought onto a property when new deer are purchased. Symptoms include significant condition loss, muscle wasting and scouring. If Johne's Disease is suspected, contact your vet as soon as possible. Vaccination is available – talk to your vet about a Johne's prevention plan.

See the 'unique nutritional requirements' section for information on copper deficiency.

GOATS

GOATS

If the idea of milking a cow is daunting, how about a goat?

Goats are particularly inquisitive animals with bags of personality, which makes them very enjoyable animals to farm. As well as providing entertainment and companionship they can also provide milk, meat and even fibre, which make them a great choice for lifestyle farmers. Goats were one of the first animals to be domesticated more than 10,000 years ago, so they have been human companions for some time. An added plus is that being browsers, goats eat weeds that other grazing animals would not, so they can help you to control your garden. Just make sure you keep them well away from your vegetable patch and your favourite roses!

	Goats
Temperament	Intelligent and curious.
Mature weight Males/Females	45-300kg depending on breed.
Life expectancy	15-18 years.
Gestation period	144-155 days (5 months).
Stockmanship skills required	Good.
Livestock unit equivalent	2.
Profitability score/income streams	Good – opportunities in the goat milking area.

COMMONLY USED TERMS

Doe – Female goat.

Buck – Male goat.

Kid – Young goat.

Kidding – Giving birth.

Wether – Castrated male.

BREEDS AND TYPES AVAILABLE

While goats belong to the family 'bovidae' and they are classed as ruminants along with the like of cows and sheep, they also belong to the sub group capra, which only includes goats. There are many different breeds of goat available, grouped according to their main purpose (meat, milk or fibre), so the breed or mix of breeds selected may depend on what you want to get out of your goats. Breeds more suited for milk production include the Nubian, Sannen, French Alpine, British Alpine and Toggenburgs. Different breeds have different milk production characteristics, with the Nubian often compared to a Jersey cow – producing less milk but milk with a higher milksolid percentage and the Sannen compared to Friesian cows – producing more milk but milk with a lower milksolid percentage. If a good meat breed is required then the South African Boer or the New Zealand developed Kiko is a good choice, as they tend to put on weight quickly, instead of producing lots of milk. Some breeds are dual-purpose, meaning they produce plenty of milk as well as put on weight well and cross breeds can often be a good choice and easier to get your hands on. The Angora and Cashmeres are well known for their high quality fibre, which is sought after for use in luxury clothing items. If a pet is what you are after, any goat breed will do!

There is a myth out there that all goats smell – this is half true. Bucks have scent glands located just to the rear of their horns and in a few other locations. These emit an odour, with the smell becoming stronger during the breeding season, with the hope of attracting a mate. Does on the other hand do not smell any more than other livestock such as sheep or cattle. Bucks can be easily avoided on your farm, in order to evade their smell. Castrated bucks (wethers) do not smell, so a wether can be kept as a pet.

SYSTEM OPTIONS

The product goats are most well-known for is their milk. Goat milk is preferable to cow milk for people with allergies, as it contains less allergenic proteins and less lactose. The fat in goat milk is also thought to be easier on the digestive system due to its fat globules, which are naturally much smaller in size compared to cow's milk. Goat milk is also reported to alleviate the symptoms of eczema and other skin irritation, so is often included in skin products for sufferers of these skin conditions. Goat milk is actually used more regularly by people in the world as a whole compared to cow's milk, with goats being a popular stock choice in under developed countries due to their high efficiency to convert feed to milk and the fact that cows produce more milk daily than what a family can practically make good use of. A good dairy doe will produce at least 2.7 litres per day over a 300 day lactation, whereas a dairy cow can produce five times this amount – it's easy to see how a goat's milk production matches a family's milk consumption more closely than a cow. Demand for goat's milk has encouraged many smaller farmers into larger scale commercial production. Surveys of commercial goat farmers in the North Island suggest lactation length from around 200 days in outdoor herds to closer to 320 days in indoor herds. There is an added time commitment required when keeping milking goats as they require daily milking, or even twice daily milking if milk production is desired to be optimised. If milkings are skipped this can cause health issues in does, such as uncomfortably full udders and even mastitis, so it does require some serious commitment. Hand milking can be time consuming, however more automated milking machines can increase ease of milking. The kids produced by does in order to stimulate the lactation will require hand rearing, which can be time consuming. Goat milk fetches a high price per kilogram of milksolid and makes particularly tasty cheese.

Goat meat, otherwise known as 'chevon', is a staple meat in many cultures around the world including Africa, Asia and South America. Goat meat is very similar in characteristics and taste to beef and lamb but lower in fat and is often described as delicious, sweet and mild. Farming goats for meat can be viable commercially and goat meat is growing in popularity in the Western world due to its desirable taste. Goat meat is also a useful by-product of keeping goats for fibre or milk. Goats can be slaughtered for the table at 3-6 months of age. Unneeded bucks can also be slaughtered at a few days old for consumption.

Farming goats for fibre is a specialist operation and Angora/Cashmeres do have increased maintenance requirements (such as shearing) and can be more susceptible to animal health issues such as skin irritations, lice and fly strike. Their fibre however is much sought after for luxury clothing items and can fetch a high price, so they can be profitable animals.

Goats can also of course be kept simply as pets and they can be just as entertaining and interactive as the family dog, as they are very intelligent and trainable animals. They can even be taught to do agility courses and tricks like dogs!

HUSBANDRY AND WELFARE

Goats do have some special requirements, in order to keep them as healthy and productive as possible. They do require extra attention in terms of fencing and housing.

Some tips for optimum goat health and wellbeing

- Housing is important to consider when keeping goats. Goats do not withstand the wet and cold very well and are susceptible to pneumonia, so robust weatherproof shelter of some kind is vital. Shelter should be light and airy but not too draughty.
- Adequate fencing is important when keeping goats, as they tend to be very good at escaping if given half the chance and can slip through openings and holes in fences you may think they wouldn't have a chance of getting through. Electrified fences are recommended.
- Hoofs require regular trimming. Goats without access to rocks and concrete may require more frequent hoof trimming than those that do. Only the dead hoof should be trimmed and once or twice a year is usually sufficient. Get some advice on the best way to do this and the best equipment to use. Over-trimming can cause bleeding, pain and subsequent infection.
- Goats are particularly susceptible to internal parasites (worms) and should be on a regular drenching programme. It's best to talk to your vet around parasite control, in order to ensure you are using the correct drenches at appropriate times during the season.
- Shearing fibre goats requires special care by experienced shearers.
- Kid goats may need to be de-budded if the growth of horns is to be avoided. It is better to de-bud animals at a young age rather than de-horn at an older age (the de-horning procedure can be distressing for both the goat and human). Some goats are of the polled variety and horns will not grow due to their genetic makeup. Talk to your vet for more information.
- There are some health and welfare issues associated with tethered goats, as they can often not express their normal social behaviour and can sometimes not be given the care they require. It is recommended that goats are not tethered, however if they are, it is recommended that the MPI 'Code of Welfare for Goats' is consulted and adhered to.

Goats have excellent co-ordination and love climbing things.

UNIQUE NUTRITIONAL REQUIREMENTS

Goats are classed as ruminant animals, as are cattle and sheep. This means they are able to get nutritive value out of higher fibre plant matter due to their complex digestive system consisting of four stomach compartments. Goats also ruminate or 'chew the cud', a process where they bring food previously consumed back into their mouth in order to break it down further (see ruminant nutrition section for more detailed information). Very lush pasture in the spring may contain insufficient fibre to support rumination and goats may benefit from access to some hay or mature baleage. Although goats are in the same animal group as cattle and sheep, they do have different feeding behaviours. They are classed as browsers rather than grazers, which means they actively seek out feed in trees, bushes and shrubs, rather than just grazing the pasture that is directly in front of them. They also like to eat weeds and woody parts of plants that other livestock would not eat, so they are very thrifty animals when they need to be. For this reason goats tend to prefer a diet with more variety and simply offering them a typical ryegrass/clover pasture may not cut it and it may be worth exploring alternative forage mixes. Supplements such as a compound feed are likely to be required, as the diet on offer to a contained goat is likely to be different compared to a goat that is naturally browsing and simply grazing pasture may cause deficiency. Goats do have a reputation for consuming things they shouldn't, which can be frustrating for the owner and also not good for the goat if they consume something that may be poisonous. For this reason, make sure that fencing is adequate and that goats are not given access to plant matter that could cause health issues. Do your own research into what may be available to goats in your paddocks and if they are safe to consume or not. Although goats are curious by nature and like to consume woody plants and weeds, if higher production is desired out of them, such as in the case of milking goats or growing kids, a better quality diet will be required in order to support the higher energy and protein requirements associated with a higher physiological state such as lactating or growing. For this reason supplementation with a grain based feed may be beneficial, particularly if pasture quality is not as good as it should be.

Although goats are known to eat things they shouldn't, they can actually be fussy at times. Goats will decrease feed intake if offered spoiled feed. They don't even like to eat feed that other goats have nuzzled. For this reason hygiene is important and feed troughs should be cleaned out regularly and new feed should not be out on top of old feed.

Pregnant goats need more energy and protein in late pregnancy – the energy requirement may be double normal maintenance requirements, compared to three times maintenance requirements at peak milk production. Supplementary feeding may be necessary in late pregnancy if the condition of does is slipping, because the feed value of winter pasture may be insufficient to meet the increasing demand from the growing foetuses – especially if animals are grazing outside in cold, wet conditions when there is a wind chill factor.

Iodine deficiency seems to be more common in goats compared to other livestock. Iodine deficiency is characterised by goitre (an enlarged thyroid gland), rough, brittle hair and reduced growth rate/condition loss. Kids from iodine deficient does may be born weak or dead – if born alive, they can often grow in a stunted manner with shortened leg bones. Ensuring that goats are kept topped up with iodine is important, particularly in New Zealand, as our soils are typically low in iodine. Other micronutrients may be deficient at times, including but not restricted to selenium, copper and cobalt. For milking goats, macronutrients such as calcium, phosphorus and magnesium may require additional supplementation in order to support milk production and remove risk of metabolic issues such as milk fever and grass staggers. Mineralised compound feed or mineral blocks can be a good way of ensuring that goats are always topped up on the mineral side. There are some compound feeds available specifically for goats, however if these are not easily accessible, multi feed options can be a good option too. Beware of Sheep Nuts, as for high producing goats the copper level may not be adequate (sheep have a lower copper requirement).

FEEDING LACTATING GOATS

Lactating is a demanding physiological state that requires a good quality diet in order to support optimum production. Peak milk production occurs at around 6-9 weeks after kidding but feed intake does not peak until around 12 weeks after kidding. In dairy goats that are milking well (especially those with high milk production), this can mean that the herd is in a negative energy balance, as they are not physically able to consume enough energy until peak dry matter intake is reached. Negative energy balance means that the doe uses her body reserves to produce milk and this results in a loss of body condition. The lower the Body Condition Score at mating, the harder it will be for the doe to fall pregnant and the higher the chance the doe will return to service. Feeding a high energy compound feed, particularly in early lactation, can help to support the demands of milk production and minimise condition loss. Feeding a compound feed throughout the lactation can also help to increase peak milk production and lengthen the lactation. A compound feed should be fed at a daily rate of 0.5kg/head/day. Depending on the level of milk production and pasture quality and/or quantity, this recommended daily feeding rate may be increased.

It is important to keep in mind that feeds designed for other animals may not contain all the nutrients goats need. For example, sheep feed generally contains very low levels of copper, as this trace element is only needed in very small amounts by this species. Goats on the other hand have a much higher requirement for copper, so if lactating goats are fed a sheep or multi-purpose feed, they will not be meeting all their nutritional requirements.

Lactating animals require higher levels of micro nutrients in the diet compared to dry animals (e.g. calcium and magnesium just to name a few). For this reason it is important that a mineral supplement of some sort is included in the diet as standard. Feeding a mineralised compound feed can be a great way of ensuring levels of minerals and vitamins in the diet are optimum.

If wishing to supply specialist goat milk processors in New Zealand with your goat milk, there are some nutritional guidelines that must be met in order to do so. For example, feeds containing genetically modified source ingredients may be prohibited by some milk processors. It is worth doing research into these guidelines to ensure they are followed.

Many dairy goat farmers feed supplement in the dairy shed.

BREEDING AND RAISING YOUNG

Does reach maturity as early as 3-4 months of age but mating should be held off until 5-6 months, to avoid adversely effecting growth and production. Goats are classed as seasonal breeders, with oestrus cycles linked to day length. Does tend to come into heat as the day length shortens and autumn approaches. Does must be put to the buck when displaying signs of being on heat and it may only be on heat for 24 hours at a time. If an oestrus cycle is missed, or does not result in a pregnancy, the doe will come back onto heat in 17-20 days (this varies between goats). Signs of heat can be more difficult to detect if only a few goats are kept on the property but there are some tell-tale signs that a doe is on heat:

- swollen vulva sometimes accompanied by a discharge.
- riding other goats or being ridden by them.
- increased tail-wagging.
- bleating.
- increased urination.

If a buck is present on the property, the signs will be more obvious.

Once heat is detected the doe must be put up to the buck. This is more difficult if there is no buck on the property, however there are other options such as bringing the doe to an off-site buck or artificially inseminating the doe. Artificial insemination is growing in popularity and is a good way to avoid travelling to bucks and possible inbreeding issues. If artificial insemination is preferred, it is best to do more research into how it can best work for your system.

CAUTION – *bucks do smell particularly strongly around the breeding season. They have some habits that although may impress a doe in heat, may not impress your friends, family and neighbours – urinating on their beard, belly and chest in an attempt to attract a mate. Before committing yourself to keeping bucks on your property, ensure you do your research.*

The gestation period in goats is 144-155 days (about 5 months). When a doe is approaching parturition she will have a swollen vulva with discharge, her udder may start bagging up and she will separate herself away from other animals to prepare for the birth. Kidding normally goes smoothly, however if a doe has been struggling for some time it's worth contacting a vet.

Soon after birth the kids should be standing and suckling from the doe's teat. It is important that kids receive adequate colostrum soon after birth. Colostrum contains immunoglobulins, which are important for supporting the immune system of young animals while their own immunity develops in the months ahead. Kids that are suspected not to have received adequate colostrum should be fed colostrum via bottle or tube. Goat colostrum is best, however purchased colostrum can work as well. If the kids are to be taken away from the doe in order to milk the doe, this should be done as soon as possible following birth to minimise distress and the kid should be given its first drink of colostrum as soon as possible.

Raising dairy kids can be done in a similar way to calves in the dairy industry and much of their practices and tips can be translated to rearing kids. How dairy kids are raised can impact on how productive they will be in the years to come, so attention to detail is important. Goat milk replacers can be used successfully as a fresh goat milk alternative and it is best to use purpose made bottles or feeders, which are more widely available for goats in recent times. Calf milk replacer is not recommended, as it doesn't contain enough fat for kids. A hard feed should be offered to kids in order to aid in the development of the rumen. A specialised kid feed is best, however calf feed can be a good alternative as this often contains a coccidiostat – and young goats can be susceptible to coccidiosis if more intensive kid rearing is occurring on a property (see common health issues section for more information). Lamb feed is another option for kids, however this does not contain a coccidiostat.

A doe tending to her two kids.

COMMON HEALTH ISSUES

Johne's Disease (pronounced 'yo-kness')

Goats seem to be more susceptible to Johne's disease than other livestock. Johne's disease in an incurable disease that infects young animals via interuterine transmission, colostrum/milk, or by mouth (via contaminated feed or water). Animals may not show signs of the disease until 1-2 years old. Symptoms include significant condition loss, scouring and eventually death. If Johne's Disease is suspected, contact your vet as soon as possible.

CAE (Caprine arthritis encephalitis)

CAE is a viral disease passed from does to their offspring through colostrum and milk. Symptoms are not apparent for some time following infection and symptoms can be set off when an animal goes through a period of stress. Some animals will never show signs but will continue to pass on the virus to offspring. CAE can take two forms in terms of symptoms. Inflammation of the brain in young kids can cause problems with walking, developing into paralysis of the back legs. In older goats CAE can cause chronic arthritis, with goats developing inflammation of joints, severe problems grazing due to the swelling and therefore condition loss due to decreased feed intake. There is no current cure for CAE. If an animal is suspected to have CAE, it should be tested and if found to be infected should be culled. Prevention of the disease entering your herd is important, so goats introduced to your herd should be guaranteed CAE free by the seller, or tested for CAE before they join your animals. On the other hand, goats can live comfortably for years infected with CAE if not put under stress, so CAE infected goats can make good pets. However, they should not be allowed to pass the disease onto other goats. Talk to your vet if you suspect CAE may be apparent in your goats.

Parasites

All livestock are subjected to parasite exposure when grazing pasture, however goats are particularly susceptible as they don't seem to build up immunity with age. For this reason parasite control is extremely important when keeping goats and a parasite control programme is essential to discuss with your vet. There are some steps you can take to decrease parasite burden in your animals (along with a drenching programme).

- Have a low stocking rate to decrease parasite load in the pasture
- Add more variety into the diet to decrease the amount of pasture consumed (pasture is the main source of parasites). In more extreme situations, limit access to pasture to reduce parasite exposure.
- Practise good pasture management practices such as not grazing too low (parasites reside in higher proportions in the base of the sward).
- Goats share some parasites with sheep, so sheep cannot be used to reduce parasite burden in pasture for goats. Cattle however can be used for controlling parasite burden in pastures by either co-grazing (grazing together at the same time) or if this is not preferred, cattle and goats can be grazing alternately on the same pastures.
- Take a cutting of hay from the pasture every so often – this reduces parasite load in the pasture for the next time it is grazed.
- Ensure animals are well fed – when feed is restricted immunity can become compromised and parasite burden can increase. For animals under more pressure, such as pregnant and lactating goats, high quality supplements may help to support immunity.
- Make hygiene a priority and ensure housing, troughs and water sources are kept clean.

Goats are natural browsers and love to seek out other sources of feed from their environment.

Coccidiosis

Coccidiosis is classed as a parasite and is common in young goats – it is more commonly seen when large numbers of kids are reared in the same facilities year on year. The parasite affects the intestine of animals, laying eggs in the intestinal lining and when the eggs hatch some time later, the intestinal lining is damaged, causing a bloody scour. Immunity increases as the immune system develops, however young goats are susceptible. Coccidiosis is particularly debilitating and it can be difficult for animals to recover after a severe case. If coccidiosis is suspected, contact your vet as soon as possible. Preventative measures can be taken if the coccidiosis burden on a property may be high due to more intense kid rearing. A calf feed containing a coccidiostat may be a good option in this case but it is best to discuss this with your vet. The level of coccidiostat in calf feed should be fine for kids, as total intake of the hard feed will be lower due to their smaller size compared to calves. Feed that contains Bovatec cannot be fed to goats producing milk for human consumption. If this occurs then milk should be discarded for 35 days following the last time that goats consumed feed that contains Bovatec. Beware – feeds containing a coccidiostat are poisonous if consumed by dogs, horses or alpaca, so it must be kept away from these animals.

See 'unique nutritional requirement section' for more information on mineral deficiencies.

HORSES, MULES AND DONKEYS

HORSES, MULES AND DONKEYS

The ideal complement to any lifestyle block

Common NZ Horse Breeds	Thoroughbred, Standardbred, Warmblood, Arab, Quarter Horse, Gisborne Bred, Appaloosa, Palamino, Cleveland Bay, Gypsy Cob, Clydesdale, Shire, Miniature.
Common NZ Pony Breeds	Welsh, Shetland, Connemara.
Native New Zealand Breed	Kaimanawa.
Temperament	Varies from docile to very highly strung, according to age and level of training.
Mature Weight	Variation between 80kg for miniature horses and up to 900kg for Draft breeds. Average Thoroughbred matures to 500kg.
Life Expectancy	30 years.
Gestation Period	11 months (320-370 days).
Stockmanship Skills Required	Huge variation – from moderate to advanced according to horse temperament. Moderate for mild mannered pets and leisure horses and advanced for training and handling young, inexperienced stock.

COMMONLY USED TERMS

Broodmare – mare used for breeding.

Colic – pain in the abdomen.

Colt – young male up to 4 years old.

Condition scoring – a method of estimating the condition of a horse.

Dam – female parent of a horse.

Equine – horses are part of the family Equidae, which also includes donkeys, mules and zebras.

Farrier – person who fits horseshoes.

Filly – young female up to 4 years old.

Float – (teeth) filing of the sharp molars.

Float – (transport) a special trailer for transporting one or more horses.

Foal – young horse up to the age of 12 months.

Foetus – developing foal from day 40 of pregnancy to parturition.

Gelding – castrated male horse.

Gestation – the period between conception and birth.

Good doer – horse that gains weight or stays fat on minimal feed.

Hinny – the outcome of a cross between a male horse and a female donkey.

Jack – male donkey.

Jenny – female donkey.

Lactating – a term describing a mare that is producing milk to feed a foal.

Manure – faeces, also called droppings.

Mare – female horse that is 4 years or older.

Mule – the outcome of a cross between a female horse and a male donkey**.**

Lameness – limping, unevenness of the horse's stride when moving**.**

Laminitis – inflammation of the sensitive layers (laminae) of the hoof, characterised by heat and pain.

Palomino – gold yellow or dark cream colour with white mane and tail.

Parasite – an organism that lives on or inside the horse

Performance horse – competes in events such as racing, dressage and jumping.

Pony – a horse of any breed up to 14 hands.

Poor doer – a horse that loses or fails to gain weight with normal feed supply.

Roughage – high-fibre feed such as pasture, hay or chaff.

Stallion – **a**n uncastrated male horse aged four years or over.

Tack – saddlery.

Tying-up syndrome – stiffness and soreness of muscles

Vaccinate – to inject vaccine to stimulate immunity, e.g. for tetanus.

Weanling – young horse that no longer suckles milk from its mother.

Yearling – horse between 1 and 2 years old.

BREEDS AND DISCIPLINES COMMON TO NEW ZEALAND

New Zealand is home to a vast array of equine breeds, suitable for a range of different purposes. Aside from the racing industry, the largest proportion of horses in New Zealand are owned, cared for and ridden for performance and leisure purposes.

Thoroughbred and Standardbred breeding and racing are prosperous industries in New Zealand and New Zealand race horses are highly regarded on a world scale. As race horse careers generally conclude in the earlier stages of the horse's life, it is common for these horses to move into alternative careers as performance horses or pleasure horses as they retire from racing.

New Zealand Thoroughbreds and Thoroughbred crosses are also commonly seen on the performance horse circuit. The speed and agility common to the breed means that they thrive at eventing, show jumping, dressage, polo, hunting and are even occasionally seen in the show ring.

The Thoroughbred is considered a founding breed and has been influential in the creation of numerous other breeds specific to performance and leisure. These include Quarter Horse, Standardbred, Anglo-Arabian, and various Warmblood breeds.

The slightly heavier Warmblood breeds are common in performance, especially dressage and show jumping. Most are descendants of European stallions, however many New Zealand crosses are beginning to emerge.

While Quarter Horses were specifically bred for western riding and competing, which is not as common in New Zealand as Australia or America, pure and crossed Quarter Horses can also be successful at many other performance disciplines. The quiet nature of Quarter Horses makes them ideal leisure horses and pets.

Arabian horses are another descendant of Thoroughbreds that were specifically bred for endurance riding. Anglo-Arabians consist of an Arabian and Thoroughbred cross. Both breeds can be known for their highly strung nature, however their speed and athleticism means they are suitable for many disciplines and also make appropriate leisure horses.

The two most common pony breeds in New Zealand are Welsh and Shetland. While ponies can make good pets and mounts for children through pony club, mounted games and performance disciplines, many ponies require high levels of maintenance to avoid health conditions associated with dietary management. Larger ponies are commonly Thoroughbred crosses, which are often successful mounts for older

children at pony club as well as pony performance classes in dressage, show jumping and showing.

Originally used for agriculture and haulage, the size and strength of Clydesdales and other Draft breeds make them great for many purposes. Their generally quiet and sensible demeanour means they make great riding and pleasure horses and are often used for pulling carts and carriages today. The Budweiser Clydesdales are some of the most famous Clydesdales still used for draught purposes.

Other breeds common as pets, leisure and performance horses in New Zealand include Appaloosas, known for their interesting spotted colouring, Palominos with their creamy coats, Australian Stock Horses, Miniature Horses and the New Zealand native Kaimanawa.

Donkeys can make great pets.

DONKEYS AND MULES

While uncommon compared to the various horse and pony breeds, donkeys and mules are also kept as pets in New Zealand. Donkeys are a descendant of the African wild ass, where Mules are a cross between a female horse and a male donkey or a 'jack'. In contrast, a male horse and a female donkey, known as a 'jenny', bred together produces what's known as a 'hinny'.

Clydesdales are impressive animals, well know for their size and strength.

HUSBANDRY

Housing

The digestive tract structure and resulting grazing nature of horses means that the most ideal environment to house them in is a paddock, with constant access to a wide variety of forages. Depending on pasture quality, the average paddock size required is one to two acres per horse. Alternative housing arrangements include yards or stables, however this situation requires an alternative forage such as hay. Where the extreme weather conditions in parts of Europe mean many performance horses are housed constantly in stables, this is rare for New Zealand given the mild climate. Paddocks are the most common housing arrangement in New Zealand, or horses are managed between paddocks and stables or yards if pasture availability is limited. Overgrazing of paddocks should be avoided and in order to maintain optimum pasture growth year round, horses should be moved when there is still 1/3 pasture remaining in the paddock.

Parasite control

Manure management is an important part of parasite control and ideally manure should be removed from the paddock often. Alternatively, paddocks can be harrowed and left to recover once horses have been moved. Parasite management programmes are necessary in all domestic horses to protect against a range of parasites. Worming programmes will range from treating all horses every 6 weeks with a broad spectrum wormer on properties with multiple horses, to treating as little as twice yearly on properties containing minimal horses that are cross grazed with other species. Care must be taken when designing worming programmes to avoid tolerances to specific worming ingredients developing.

Hoof care

Hooves grow continuously and require trimming every 4 to 6 weeks to avoid excessive growth, manage cracks and prevent damage. Steel shoes can be used if required and are especially useful for working horses or horses with poor hoof quality. Leisure horses with strong hooves that are only required to work lightly on grass will be unlikely to require shoes. Horse owners should seek advice from an experienced farrier regarding the need for shoes, types and ongoing hoof management.

Dental care

Teeth should be checked by a qualified equine dentist or veterinarian at least once a year and may need to be floated because of uneven wear while eating. Older horses or horses with any dental issues may need more frequent dental check-ups.

Vaccinations

Vaccination programmes are determined by age, use and overall health of the horse. The time of year affects the risk of infectious diseases, so be sure to consult the veterinarian for recommendations.

Grooming

While grooming is common in performance horses for improving appearance for showing and competing, grooming has numerous benefits for leisure horses despite them not requiring to be impeccably turned out. Removing dirt and dust prior to tacking up is important to prevent gear rubbing and causing sores and removing hair during seasonal changes improves comfort for the horse. Grooming also helps to improve circulation, remove sweat as well as dry and dead skin, identify skin conditions or injuries and improve general satisfaction for both horse and rider. Hosing off the horse or applying water with a damp sponge is also an effective way of removing sweat after a ride. Bathing with shampoo is ideal for a thorough clean, however is not appropriate for colder weather. Frequent baths with shampoo should be avoided, as this can be detrimental to coat quality due to removing the natural oils of the coat.

Equipment and tack

For ridden leisure horses, the saddle is often the largest investment aside from the horse itself. It is essential that the correct saddle is selected, both for the rider as well as the horse, as ill-fitting saddles can result in numerous problems. It is wise to seek help from an experienced professional when choosing and fitting a saddle. Various saddle pads and blankets are available for use under the saddle to increase comfort for the horse and a comfortable girth that is easy for the rider to adjust when on the horse and from the ground is also necessary. Bridles and bits come in various types and styles and advice from an experienced professional is recommended to find the style that suits the individual horse and rider. Numerous other equipment and accessories are available for a variety of purposes, from boots and bandages to breastplates and martingales. While these can be useful, many will be unnecessary for leisure horses and are more specific to performance disciplines.

While most horses in New Zealand can easily be left uncovered outside, many people chose to provide blankets either just for the colder winter months or all year round with lighter sheet style rugs or fly sheets for the summer. Covers will be necessary for warmth in older horses or horses requiring weight gain and protection from the sun may be required in horses with pale skin that is prone to sunburn.

NUTRITION

The equine digestive tract is comprised of a simple stomach designed for small frequent meals and a large sacculated hindgut dedicated to fibre digestion. Taken together, horses were born to graze with quality fibre a critical element to digestive health. This means that forage in the form of pasture, hay, chaff and various other fibre products should always be considered first when designing a diet. Recommended forage intake is at least 1.5% of body weight, however left to graze ample pasture horses will typically ingest between 1.8% and 2.2%. Where pasture is limited, alternative forage in the form of hay is essential to ensure horses are consuming adequate amounts of forage to maintain digestive health. Alternative fibre products such as chaff, beet pulp or soy hulls can also be included in the horse's diet to increase fibre if required.

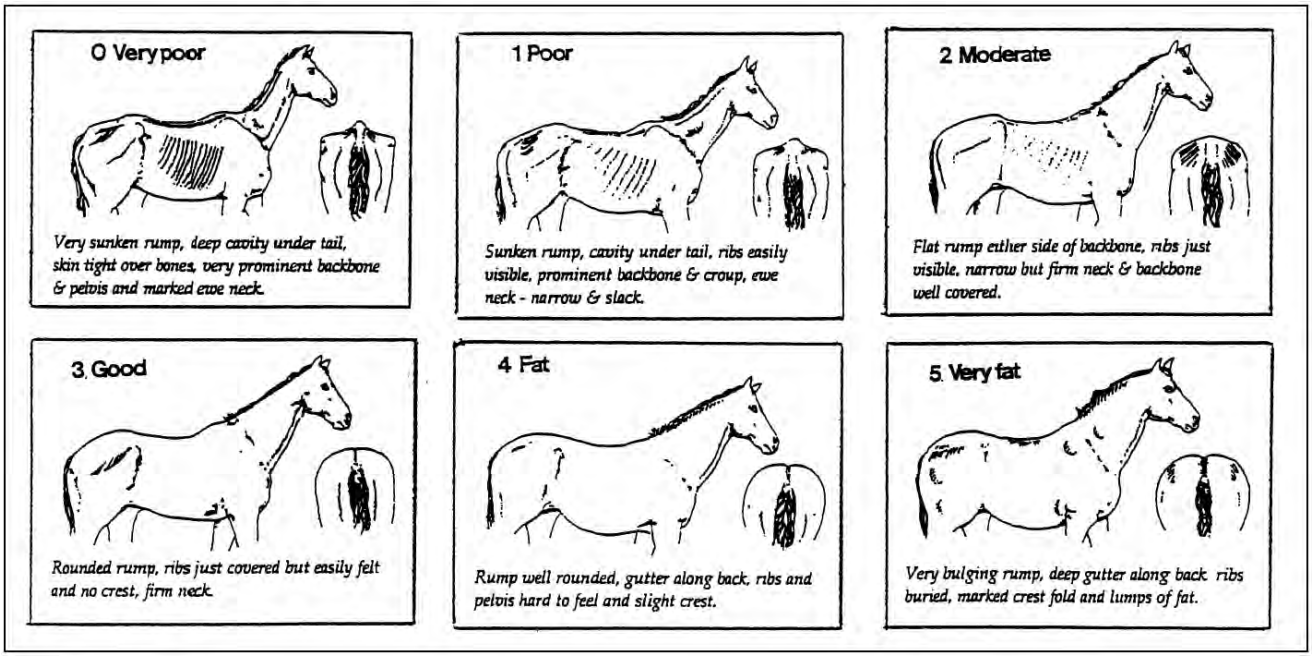
While forage is the most important part of the equine diet, horses will often require more energy than forage can provide, especially if working or breeding. Energy requirements will depend on work and metabolic rate and estimating energy requirements for a horse is best carried out using body condition scoring as detailed in the diagram below. Horses' body conditions should be assessed on a regular basis and energy intake altered to achieve a Body Condition Score of 3. There are numerous health conditions and problems associated with Body Condition Scores at either ends of the spectrum and excessive or poor body conditions should be avoided.

While most leisure horses do not have high workloads they may still require additional energy. Like people, horses' metabolism varies between individuals and some require more energy than others to maintain an acceptable body condition. Metabolic rates can be specific to certain breeds also and while there are exceptions, higher metabolisms are often seen in horses with more highly strung natures, such as Thoroughbreds and Arabians. These breeds may therefore require more energy than a more docile, quiet natured Quarter Horse or Draft breed, which are usually classified as 'good doers' and can gain weight easily.

When additional energy is required above that which forage can provide, typically, this energy deficit is made up through the use of grains. Grains such as oats, barley, maize and local mill mixes are great sources of energy and can be fed on their own or through selecting a complete manufactured feed. Where straight grains provide energy alone, manufactured feeds will contain a blend of grains, as well as added protein and a formulated vitamin and mineral mix. The formulation of ingredients and nutrients will depend on the type of horse the feed is designed for and most reputable feed companies will have feeds formulated for every type of horse, from horses in light work, to racing and performance horses, growing horses, stallions and broodmares.

With the exception of oats, all grains require some amount of processing, using heat and pressure prior to being included in an equine ration. Suitable types of processing include steam flaking, pelletising, extrusion and micronising, which all work to increase the ability of enzymes in the small intestine to access the starch within the grain and digest the starch more effectively, making the grain safer and more beneficial for the horse.

The huge array of feeds and supplements available can make creating the correct diet for an individual horse confusing and it is important to contact a qualified equine nutrition advisor for assistance.



*BCS Chart by Kentucky Equine Research

BREEDING AND YOUNG STOCK

Gestation period for horses is 11 months and most foals, regardless of breed, are planned to be born between August and January in New Zealand. Thoroughbred breeding season begins on 1st September and goes through until the end of December. Artificial insemination is common in most breeds, however in Thoroughbreds only live service is permitted.

Trace mineral requirements increases significantly in broodmares in third trimester and most will require supplementary feeding to provide adequate levels. Once the foal is born, energy and protein levels also increase to provide for lactation. Nutritional value of milk begins to decline from when the foal is 3 months of age and nutrition is required to be provided through forage and possibly other feedstuffs. Most breeding establishments will wean foals from 6 months onwards.

The biggest consideration for young horses is to prevent the development of orthopaedic diseases. There are various diseases that fall under this umbrella term and most are caused through excessive body condition in young horses and rapid growth. Achieving steady growth through altering feed and energy levels to avoid these problems is one of the major goals of horse producers.

COMMON HEALTH ISSUES

Digestive conditions

The delicate and complicated design of the equine gastrointestinal tract can predispose horses to specific digestive conditions. Both gastric ulcers and hindgut acidosis are common in all horses, however they are particularly high in performance horses. In racehorses, for example, ulcers are believed to occur in an estimated 50-90% of horses. While there are many contributing factors, both conditions generally occur as a result of incorrect feeding practices and stress. Both conditions can be subclinical and exhibit no signs, however common signs include inappetance, grumpy behaviour, loose manure, mild colic (see below) and underperformance.

Gastric ulcers mainly occur through prolonged exposure of the non-glandular, upper part of the horse's stomach to gastric acid. Unlike the lower, glandular portion of the stomach, the upper portion does not have a mucous layer or secrete bicarbonate for protection. Horses produce gastric acid at a constant rate and stomach pH can decrease quickly if the horse does not eat frequently. Meal feeding and prolonged periods without access to forage is the number one cause of ulcers, as consumption of forage stimulates saliva production, which contains bicarbonate to buffer gastric acid and protect the non-glandular section of the stomach. Diets higher in grain also contribute to the risk of ulcers as grain and concentrate feeds have less of a buffering effect on the stomach and increase gastrin production, the hormone that stimulates gastric acid production.

Where gastric ulcers occur in the stomach, hindgut acidosis occurs in the caecum and colon of the horse, known as the large intestine. This has two major causes – over-consumption of high starch concentrates or pastures rich in sugars known as fructans. The delicate array of microbes that reside in the hindgut are dedicated to fibre digestion and fermentation and microbial disturbance and a drop in pH occurs when undigested starch and sugars escape digestion in the small intestine and overflow into the hindgut. The limited capacity of the stomach and small intestine means that this can happen easily and keeping grain meals small is highly important in preventing this condition occurring. Recommendations are to feed no more than 2.5kg of grain or concentrate feed per meal to an average 500kg horse. If hindgut acidosis is occurring due to pasture exposure, the best mode of action is to restrict grazing and offer low sugar forage alternatives such as hay, to ensure adequate forage is being consumed daily. Pasture induced hindgut acidosis is one of the most common causes of laminitis (see below).

Colic

Colic is one of the most common equine ailments and is a general term used to describe abdominal discomfort from any cause. Signs of colic include pawing, kicking at the belly, looking at or nipping the flanks, rolling, sweating, or straining as if to pass urine or faeces and general signs of discomfort. Pain may be mild or severe, constant or intermittent.

If these signs are noticed, the best plan is to keep the horse from eating and to call a veterinarian immediately.

Distention, obstruction, or malfunction in any part of the digestive tract may cause the discomfort we know as colic. Problems in the stomach account for about 12% of colic cases, the small intestine is the culprit in about 33% and hindgut malfunction causes the remainder, about 55%.

While it can result from a number of factors, feeding practices are among the most common causes of colic and are probably the easiest for an owner to control. Feeding spoilt or mouldy forages and grains, providing inadequate forage, feeding too much grain in one meal and making feed changes too rapidly are all contributing factors. Colic caused as a result of these factors occurs due to a disruption in hindgut microbes, causing gas production to rise and pH levels to swing away from normal.

Tying up

Tying up is a generic term commonly used to describe muscle disease in performance horses. Horses experiencing a bout of tying up show signs of a stiff gait, reluctance to move; firm, painful, cramping muscles; profuse sweating, increased heart rate and increased respiratory rate. Diagnosis is confirmed by a blood sample displaying high levels of muscle enzymes CK and AST. Two specific causes of tying up have been identified in the horse. These include a muscle contraction disorder called Recurrent Exertional Rhabdomyolysis (RER) and a disorder in carbohydrate storage and utilisation called Equine Polysaccharide Storage Myopathy (PSSM or EPSM). RER mainly occurs as a result of exercise in lighter, more highly strung breeds such as Thoroughbreds, Standardbreds and Arabians. PSSM primarily affects breeds that are characteristically calmer, well-muscled and often 'good doers', compared with RER horses, such as Quarter Horses, Paints, Appaloosas, Warmbloods, Draft Horses and crossbreds of these breeds.

Management of horses that tie up include adopting a diet low in starch and sugars, while ensuring high levels of electrolytes and antioxidants such as vitamin E and selenium are provided daily. Reducing grains and replacing with alternative energy sources such as fibre and fat sources is ideal and pasture restriction to avoid sugar consumption may also be necessary in extreme cases. Most horses are required to be housed in a large yard or paddock to provide more room to move around. Exercise management is also important and adequate warming up and cooling down is essential.

Laminitis

This is a painful, life threatening condition involving inflammation of the sensitive layers of tissue (laminae) between the hoof wall and pedal bone. While there are multiple factors that can cause laminitis including injuries, toxicity and even retained placenta in broodmares, the most common causes are equine metabolic syndrome (EMS) and the ingestion of high sugar forages causing hindgut disturbances (see hindgut acidosis above). EMS is also known as insulin resistance, due to the effect the condition has on glucose levels and therefore insulin levels in the body and is comparable to type two diabetes in humans. It is most common in ponies and heavier breeds that gain weight easily. Management of EMS and therefore prevention of laminitis caused as a result involves managing body condition and avoiding starch and sugar in the diet. Most horses will require pasture restriction, especially during spring and low sugar hay as an alternative forage source. Balancer pellets and concentrated vitamin and mineral supplements are ideal for ensuring nutrient requirements are met without adding calories to the diet.

Ryegrass staggers

Horse owners in areas with predominantly ryegrass pastures need to be aware of the dangers of ryegrass staggers. Mycotoxins produced by the endophytes living within ryegrass cells can affect the muscle and nervous systems and cause symptoms from behavioural changes and reactiveness, to trembling and loss of co-ordination. Horses need to be removed from the pasture and given alternative forage at the first indication of staggers and symptoms should reduce within 2 weeks. Long-term strategies to prevent ryegrass staggers include sowing low endophyte grasses and rotating horses before they graze too close to the base of the grass, while also avoiding grazing on ryegrass where seed heads have formed.

POULTRY

POULTRY

CHICKENS

A productive addition to even the smallest lifestyle block

Chickens are the most popular animal to keep on a lifestyle block and are no longer only limited to the country these days either, with city slicker chickens on the rise if back garden space allows them. Chickens are great because they are relatively low maintenance animals that don't take up a lot of space, however they can supply a steady stream of delicious eggs and meat plus can also make great pets.

	Chickens
Temperament	Variable within different breeds but generally docile.
Mature weight Males/Females	0.65-3.9kg.
Life expectancy	6-10 years.
Incubation period	21 days.
Stockmanship skills required	Basic.
Profitability score/income streams	Good potential for non-cage eggs and meat.

COMMONLY USED TERMS

Hen – female chicken.

Cock/rooster – male chicken.

Chick – young chicken, generally under six weeks of age.

Pullet – young female chicken before the start of lay. Typically from 6 to 18 weeks of age.

Cockerel – young male chicken.

Broiler – meat type chicken.

Layer – egg laying type chicken.

BREEDS AND TYPES AVAILABLE

There are many different breeds of chicken available varying in size, colouring, personality and production capability and the breed you decide to go for may depend on personal preference, or you can keep a mixture of different breed to satisfy all of your requirements. Commercially developed breeds such as Shaver and Hy-Line are phenomenal egg producers and in a commercial setting can produce over 300 eggs in a year. Heritage breeds such as Plymouth Rock, Sussex, Wyandotte, Dorking, Rhode Island Red (just to name a few) are slower to mature and come into lay later than the commercial varieties but can still be great layers. If chickens that are more suitable for the table are desired, then commercial breeds such as Cobb or Ross are good choices. There are also many dual purpose breeds or crossbreed varieties that can be good options, as they can produce a good number of eggs while still having good meat properties for the table. Heavy breeds tend to be good for meat production, whereas lighter breeds tend to be better for egg production. Some breeds are kept for ornamental reasons due to their looks, such as the Chinese Silkie or the Pekin Bantams. **Do your research to find out what the best breed for your property and needs may be. Many breeds are available to purchase as day-old chicks and can get couriered right to your door – how convenient!**

Egg production is not the only criteria when deciding on your choice of poultry breed.

White silky cockerel.

FUN FACT

Chickens perform more than 30 types of vocalisation that we are aware of with meanings varying from calling youngsters, alarm calls, and alerting others to the whereabouts of food.

SYSTEM OPTIONS

The most popular reason for keeping chickens is for their eggs. Chicken eggs are one of the most complete, versatile foods available, containing a wide range of essential amino acids, minerals and vitamins. One of the benefits of keeping chickens is having access to fresh, home grown eggs. Good layers can produce an egg a day, so keeping even a few chickens can keep you well stocked up with eggs. Chicks can be hatched from fertilised eggs on your property if preferred, however most people buy in day old chicks, or pullets just prior to the onset of lay. Chickens can also be kept for meat. Chicken is an extremely popular meat all over the world. It is prized for being a healthy meat choice due to its low fat, high protein content. Most heritage chicken breeds are relatively dual purpose and can be kept for eggs, with excess hens and cocks slaughtered for the table. Commercial meat bird breeds can be ready for slaughter in as little as 6 weeks following hatching, however slower growing heritage type breeds will take longer. Male chickens grow more rapidly than female chickens so are a better choice if efficiency is a priority; however this difference is not as large with the commercial breeds.

Check with your local authority regulations before acquiring poultry – some areas may limit the number of laying hens or the keeping of a cockerel.

HUSBANDRY AND WELFARE

Chickens are relatively easy animals to keep and do not require as much attention as other livestock if managed well. However there are some species-specific things to consider.

SOME TIPS FOR CHICKEN HOUSING

- Housing is important and should provide adequate protection from rain, sunlight and predators. It should be well ventilated but free from draughts. There are many different chicken houses (coops) available, or you can even build your own. Do your research to find what the best option may be for you.
- Space in housing is important. As a rule of thumb every 10 average sized free ranging birds require a coop space of at least one square meter, however larger or smaller breeds may have different requirements. If birds are permanently housed with no access to outdoor areas they will require more space per bird, so seven birds per one square meter of coop space is required.
- Hens have a natural tendency to perch, so it's important to provide perches to avoid stress or overcrowding. Hens without perches may crowd in corners at night, which can cause hygiene problems and may also lead to smothering.
- It is important to have adequate nesting space for the number of birds kept. Provide one square metre of nesting space for six laying hens. Nest boxes should be approximately 30cm x 30cm x 35cm. Place straw, sawdust or another clean, soft material in the nest boxes at least 10cm deep. Hens should be trained not to sleep in the nests, as they excrete most of their manure at night and will dirty nest boxes. Training can be done by providing perches and closing the nest boxes at night. Reopen once birds are asleep and after a couple of weeks they should have formed a perching habit for sleeping.
- A chicken house that is designed for ease of cleaning is important, as regular cleaning out of the chicken house is vital.

OTHER INFORMATION ON HEALTH AND WELLBEING

- Wings of free ranging birds will require regular clipping to ensure they cannot escape over fences. Trimming the flight feathers of one wing without drawing blood makes the bird unbalanced and unable to fly. Wing clipping needs to be redone when the feathers start to grow back.
- Any new birds being brought into an existing flock should be quarantined, to make sure they are disease free before being introduced to other birds.
- Hygiene is important for preventing disease. Keep feed and water containers clean as well as the chicken coop. The coop should be thoroughly cleaned at least annually as a minimum requirement and preferably before every new flock is housed.
- Chickens do have a regular moult that occurs in autumn as day length decreases. During this moult hens will reduce egg production. This is normal and production will pick back up once moulting is complete and day length starts to increase.

Breeding and raising young

Commercial layer breeds can start to produce eggs from as early as 18 weeks of age, although heritage breeds will take longer to start exhibiting breeding behaviour or laying eggs. The age at which breeding behaviour occurs differs between breeds. Chickens are seasonal breeders and when left to breed as would occur in nature (and if a fertile cock is around), hens will lay on a 23 to 26 hour cycle and produce up to 10-15 eggs before incubating these until they hatch. However, this means that egg production stops while the hen is incubating her eggs and so these eggs are sometimes removed and hatched under a broody hen or in an incubator. Cocks can be problematic to keep due to their tendency to wake you and your neighbours up at the crack of dawn with their crow – however for those in rural areas this may not be a problem and keeping a cock with laying hens may even help to keep birds more settled, leading to less fighting and fewer injuries . If more than one cock is kept together they will fight. Fertile eggs can be purchased to avoid the requirement for a cock.

Rearing chicks and pullets

A chick is a young bird between hatching and 6 weeks. Young chicks need to be cared for in a suitable manner that will decrease mortality, as well as increase growth.

The following can be used as a guide for young chicks:

- Buy chicks from a reputable source such as a commercial hatchery or recognised breeder.
- Before chicks arrive ensure the enclosure is clean and all litter is removed from any previous batch. Clean with a detergent and spray with a sanitiser approved for use with poultry (such as Virkon). The goal is to minimise the presence of viruses, bacteria and parasites in the environment which the chicks will be housed in.
- Light the enclosure well so that chicks can easily find food and water when they first arrive.
- Provide a heat lamp suspended over the enclosure. Between day 1 and 3 keep chicks at around 35 to 36°C and gradually decrease down to 32°C by 1 week of age. At 3 weeks of age the temperature should be around 28°C. By 5 weeks of age when chicks are fully feathered they can handle lower temperatures around 21°C. Temperature requirements will be slightly lower for heavier commercial meat breeds.
- Always provide enough room so chicks can move further away or closer to the heat source as needed. This will allow them to regulate their body temperature. Panting and drowsiness indicates overheating while huddling and loud chirping indicates chilling.
- Avoid large fluctuations in temperature and extremely high temperatures.
- Ensure that the enclosure is dry and draught free.

FUN FACT

The chicken is the closest living relative to the great Tyrannosaurus-Rex.

- Use clean, dry litter (for example untreated wood shavings).
- Provide a good quality chick starter feed with high levels of energy and protein, as well as balanced amino acids and vitamins and minerals. This is important for good growth and bone and feather development. Feed should be crumbled for easy intake and offered in small amounts which are replaced regularly to maintain freshness.
- Monitor growth rates and compare these against recommended growth rates for the breed. This will ensure that good growth is maintained and pullets are the correct weight at point of lay.
- Provide an unlimited source of fresh, clean and cool water. This should be at the correct height for chicks to access the water. Ensure that water does not spill onto the litter.

If it is not feasible to rear chicks then point of lay pullets can be purchased. For maximum egg production, purchase these in spring.

At 6 to 8 weeks the chick technically becomes a pullet. They should be provided with a suitable feed, such as a pullet grower, to continue frame development and ensure that they do not become overweight. Pullets should not be fed a layer feed, as this can cause kidney damage due to the high levels of calcium in these feeds. If desired, a pre-lay diet can be fed from one week before the expected onset of lay. Provided the pullet has reached the proper body weight and has received sufficient light stimulation, then at 18 to 20 weeks they will commence lay. At this stage hens need to be fed a layer diet formulated to provide the nutrients required for egg production and good shell quality. Egg production increases after 18 to 20 weeks until production peaks at around 28 weeks (depending on breed of hen). At this stage production can be as high as 85 to 90% or even higher, provided the hens have proper nutrition, housing and disease management. This means that 85 to 90% of hens will produce an egg a day. Egg production occurs in clutches, with breaks in between clutches, so a hen's production will never be 100%. Production will decrease as birds' age and also as day-length decreases from summer into autumn and winter.

When to replace the flock

To get the highest production from the flock, it is best if the hens are replaced on a yearly basis. Hens in their second laying year will produce around 15 to 20% less than the first year. This will depend on the breed used.

SPECIAL NUTRIENT REQUIREMENTS

Chickens are part of the 'Aves' or 'bird' family, which are classed as monogastric animals (which means they only have one stomach compartment, unlike ruminants, which have four). Birds have a few special digestive features which makes them different from other monogastric animals such as pigs and humans. One is a compartment called a crop, an expandable storage compartment located at the base of the chicken's neck where consumed feed can remain for up to 12 hours. Ever heard the saying as rare as hen's teeth? Well chickens in fact have no teeth whatsoever. Instead they have a specialised compartment called a gizzard, which is a muscular part of the stomach that uses grit (small, hard particles of pebbles or sand) to grind consumed feed into smaller, more digestible, particles.

Chickens should be fed using proper poultry feeders. This will help ensure that hens do not spill and waste feed. Ensure that the feeder is big enough for the flock and there is enough feed for the flock every day. The average consumption of the free range flock is around 130g per bird, so for a 15 bird flock the total requirement would be around 2kg of feed per day.

FEEDING THE LAYING HEN

Feed is one of the most important factors in the success of a laying flock. The essential nutrients that they need from feed are energy, protein (amino acids), minerals and vitamins. This should be formulated in the correct ratios, to provide hens with their daily needs and to maximise egg production. Feeding a high quality feed designed with the laying hen in mind is therefore essential.

FUN FACT

Chickens have very sophisticated social behaviour with a dominance hierarchy where higher individuals dominate subordinate individuals. This is where the term pecking order comes from!

Hens will typically try to eat as much as possible in order to meet their requirements for any given nutrient. So it is important that the supply of energy and amino acids are balanced. Grains such as wheat contain high levels of energy but are low in protein and important amino acids that are needed for egg production and size. Flock production will not be as high on an unbalanced feed such as wheat and birds may stop laying if a poor quality feed is fed for a long time.

Vitamins and minerals are important for bird health, egg production and shell quality. In particular, calcium, phosphorus and vitamin D are needed for shell and bone strength. Other vitamins and trace minerals are needed to maintain the health of the flock and help birds cope with stress.

Oyster shell grit can be fed as an extra source of calcium. Providing this in self feeders will allow the hens to choose if they need additional calcium.

Green feed and scraps can be a good source of vitamins and carotenoids, however, they can also be low in nutrients. If the hen consumes too much poor quality scraps and forage then egg production is likely to suffer. Make sure that these sorts of feeds only make up a small percentage of the diet.

FEEDING THE BROILER

Broilers are best fed a diet specifically formulated for growing meat birds which is high in protein and energy with adequate minerals to support rapid growth rates. This can be fed to birds from day-old right up to point of slaughter.

COMMON HEALTH ISSUES

Coccidiosis

This parasitic infection can lead to gut damage and in severe cases it can cause death in young birds. In most cases a subclinical infection will mean that birds do not get as much out of feed and growth rates are affected. Such flocks may have uneven weight gain and be underweight at point of lay, meaning production can be affected. Beyond point of lay, hens will have generally developed immunity to coccidiosis. Most chick starters and some pullet feed will contain a coccidiostat to reduce the risk of coccidiosis challenge to birds. If it doesn't, or there is a greater than normal challenge to the flock then additional coccidiostat may need to be provided. In this case, please consult your local veterinarian as to which is the best product to use, the correct dosage rate and how best to treat the flock. A feed with a coccidiostat should not be given to laying hens, particularly if they are laying eggs for human consumption. This is due to residues in the eggs.

Worms

Birds become infected with worms by picking up worm eggs from litter, soil or faeces. Worms can cause reduced weight gain and/or production and a reduction in yolk colour and shell quality, depending on how severe the infection is. Effective control is aimed at breaking the lifecycle of the worm by limiting the stocking density on the land, using an anti-parasitic drug and removing contaminated soil and litter before chicks or pullets arrive. Worm burden can be identified by a veterinarian by examination of manure and they should be able to advise a suitable de-wormer for the flock.

External parasites

Red mites can irritate birds, leading to poor performance, reduced feed intake and lower production. Heavy infestations will make birds anaemic due to loss of blood. If red mites develop while birds are in the poultry house then talk to your local veterinarian about an insecticide that is safe to use with hens nearby.

Egg eating

Hens will naturally eat any broken egg shells but sometimes this can develop into a vice where hens peck and eat unbroken eggs. This is an issue as it can result in large losses of production and reduced annual egg production of the flock. Low calcium or low protein diets can start birds pecking eggs and once they learn the behaviour it can be difficult to stop it. Egg eating can be prevented by feeding a well-balanced layer feed along with removing any broken shells regularly, placing decoy eggs in nests and collecting eggs regularly.

Feather pecking and cannibalism

Feather pecking is where feathers are pulled from one hen by another hen and it is generally caused by overcrowding and boredom. To help stop feather pecking the birds should be kept occupied. This can be done by providing extra space for the hens to free range or scattering some wheat and pellets for hens to scratch around. Once feather pecking has started it is difficult to stop and can develop into cannibalism if the problem is ignored. If not too traumatised or injured, the victim should be removed from the flock and cared for separately. Any hens showing signs of severe cannibalism, feather pecking or poor health should be culled humanely.

Broodiness

This is a natural maternal instinct of hens and is needed to incubate eggs but it will also cause a reduction in production as the broody hen occupies a nest but does not produce eggs. If hens are allowed to sit on their entire clutch of eggs then they are more likely to go off the lay, so collect eggs frequently to prevent this. Broody hens should be moved to a separate wire coop without a nest box and given feed and water. Without physical comfort the hen should stop being broody and in a couple of days can be returned to the flock.

Signs of broody hens are:

- Refusing to leave the nest box even at night.
- Aggressiveness when approached.
- Ruffling of feathers.
- Making a clucking noise.

TROUBLE SHOOTING COMMON LAYING ISSUES

Below are common production issues that are experienced by free range flocks and some ways to remedy them.

NOT LAYING

Check:

- **Water intake –** ensure that hens have sufficient water and it is fresh and clean. Water intake will affect feed intake and therefore egg production.
- **Hen weight –** overweight or thin hens can stop producing eggs, or have a delay in production at point of lay. Ensure pullets are fed the correct feed so they are at the right weight at point of lay and make sure that layers have a quality layer feed while they are laying so they do not become thin or too fat.
- **Feed type and intake –** giving a poor quality feed that is low in energy and protein and that contains unbalanced amino acids can lead to hens going off the lay. Always provide a good quality layer feed and ensure that hens do not run out.
- **Stress level of hens –** stressing hens with loud noises, close proximity to dogs, rats and mice or overcrowding in the poultry house can cause them to go off the lay.
- **Parasites –** lice, mites or worms can stress hens and consume significant amounts of nutrients, meaning hens don't get the nutrients they need and stop laying. Check for these parasites and treat accordingly.
- **Weather –** extreme cold weather can stress birds. Provide a balanced feed that is higher in nutrients (in particular energy) under cold conditions and ensure that hens have suitable housing to keep them warm. Hot weather can also cause birds to reduce feed intake.
- **Time of the year –** If hens are in a moult or day length is decreasing birds will lay less. As day length starts to increase egg production will pick back up.

THIN SHELLS AND CRACKED EGGS

Check:

- **Feed intake –** Are birds getting sufficient access to feed to consume enough to meet their requirements?
- **Environmental temperatures –** high temperatures can reduce feed intake, so that the flock does not get their daily requirements of calcium and phosphorus for shell formation. Birds which are panting are less able form good quality egg shells. Ensure that birds have access to cool water and shade. It is important that they are kept below 25°C and are not heat stressed.
- **Disease status of the flock –** diseases such as infectious bronchitis (IB) and egg drop syndrome (EDS) can affect shell formation and cause eggs to be laid with thin shells that are more prone to cracking, or with no shell at all. IB can also cause reduction in egg production, watery albumens and pale shells. EDS can cause a dramatic drop in egg production and it takes some time for effected birds to recover. Neither disease is a threat to human health but your supplier of day-old chicks or veterinarian may be able to aid with diagnosis and limiting the negative effects on egg production.
- **Egg size –** the hen will deposit the same amount of shell for a small egg as a large egg. This means that there is less shell to go around a larger egg and thin shells can result. Older birds will naturally lay larger eggs and have thinner shelled eggs, so an older flock with large, thin-shelled eggs may need to be replaced. Overfat hens also tend to produce larger eggs with thin shells.
- **Handling –** take care with collection that the eggs are not handled roughly.
- **Calcium and phosphorus levels in feed –** ensure that feed contains enough calcium, phosphorus and vitamin D to meet the daily nutritional requirements of the laying hen. In particular, the calcium and phosphorus should be in the correct ratio for proper absorption. Calcium, phosphorus and vitamin D are needed for shell strength and quality, as these minerals are essential for shell formation.

PALE YOLKS

Check:

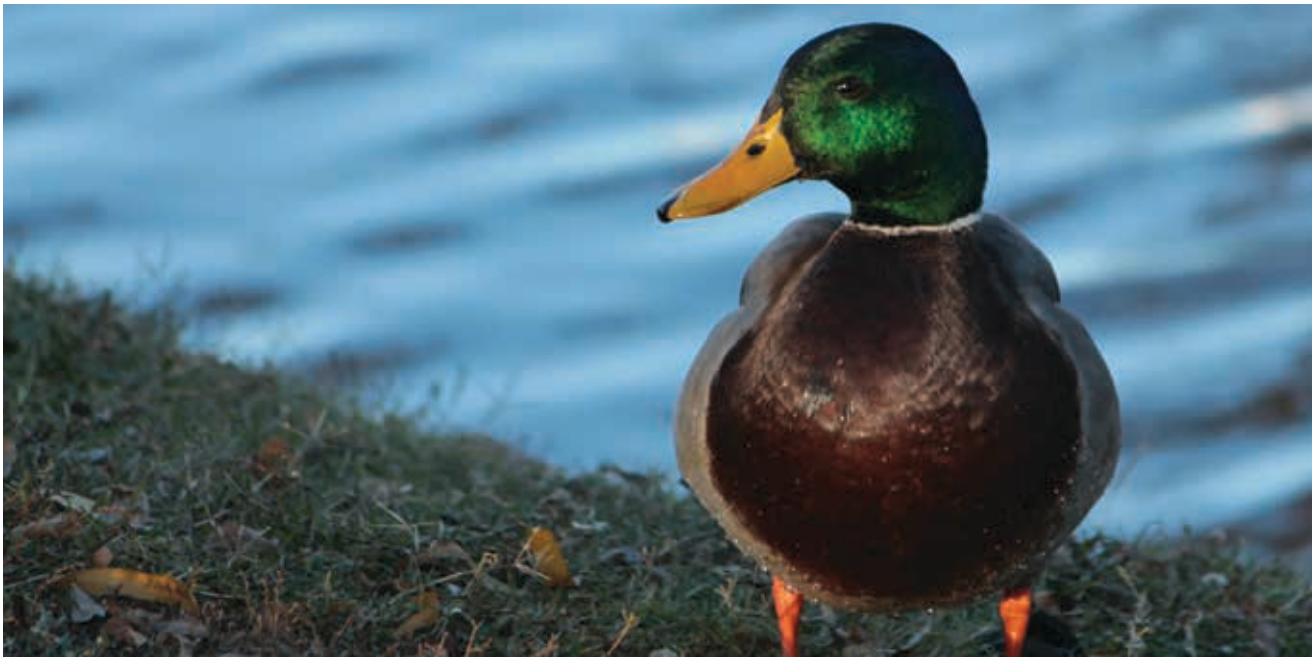
- **Internal parasites –** worms can cause a reduction in yolk colour so ensure that the flock is de-wormed before they start laying and regularly thereafter.
- **Feed intake –** ensure that birds are eating sufficient quantities of high quality layer feed and limit intake of forage/green feed. Forage is high in fibre so will reduce feed intake if fed in large quantities.
- **Carotenoid levels in the diet –** ensure that hens are receiving some green feed (but not too much as above point) and that there is yolk colourant in the layer feed. Low levels of carotenoids will cause pale yolks.

FUN FACT

Chicken eggs are highly nutritious as a food product, containing a vast array of vitamins and minerals – incredibly they contain every vitamin exept vitamin C!

OTHER POULTRY INCLUDING TURKEYS, DUCKS AND OTHER GAME BIRDS

Turkeys, ducks and other game birds including pheasants and quails can be enjoyable animals to keep on your lifestyle block. They are a treat to the eye with their vast array of feather colours and sizes but their uses are not limited to merely aesthetics and they can also provide a good supply of meat and eggs. While there are some similarities between keeping chickens and other species of poultry, there are some differences that will be looked at in this section. If the pleasure of consuming your home grown poultry is wanted but without the hassle of slaughtering and preparing the bird yourself, some home kill services include poultry, so it's worth researching what options are available in your area. Clipping wings to avoid escape can be important for free ranging poultry – this involves using sharp shears to cut off the first ten flight feathers of one wing, which causes a lack of balance and hence an inability to fly. It's worth talking to someone experienced in doing this or doing your own research to ensure you do this correctly.



TURKEYS

Turkeys are natives of South America and are popular birds to farm due to their generous size and good flesh. They are particularly popular to consume around the festive season. Turkeys are normally fattened for winter so, being in the southern hemisphere, this does not coincide with the festive season when turkey meat is most in demand. However, cold storage means that turkeys can be reared in their natural season and their meat still enjoyed at Christmas time and turkeys can still be reared for slaughter in December with a bit of forward planning. Common breeds of turkey include the Bronze, Beltsville White, New Zealand White and Broad-breasted Whites.

HUSBANDRY AND WELFARE

- Adult turkeys do not necessarily require sheds but do need adequate shelter from rain and wind. Turkeys are much larger than chickens and therefore require more space. If hen houses are used, it must be remembered that approximately four turkeys will take up the same space as 10 hens would.
- It is not recommended to keep turkeys alongside chickens or on land where chickens have previously been kept, as chickens can be silent carriers of diseases that can affect turkeys.
- The most common disease seen in turkeys is a condition called 'blackhead' and is the parasitic disease that has given turkeys their reputation as a more difficult poult to rear. Blackhead usually affects 3-18 week old poults and it can quickly cause death if not treated promptly. Despite its name, birds don't usually display the symptom of a blackened head until the condition is very advanced or sometimes not at all. Other symptoms to look out for include loss of appetite, depression, yellow droppings and diarrhoea. If black head is suspected the vet should be contacted as soon as possible. Prevention of this debilitating disease is the best course of action – there are specific medications available, contact your veterinarian for more information. Environmental risks such as other birds should be avoided and it's best to graze turkeys on fresh, longer pasture so that the burden of the parasite is reduced.
- Some free ranging turkeys may require their wings to be clipped, however this depends on breed as some turkeys cannot fly due to their size. Check in with breeders for more information.

COMMONLY USED TERMS

Tom – male turkey**.**

Hen – female turkey.

Poult – young turkey.

FUN FACT

The brightly coloured growths on the throat region of turkeys are called caruncles and they turn bright red when a turkey is upset or during courtship.

SPECIAL NUTRITIONAL REQUIREMENTS

Turkeys have a digestive system very similar to the chicken – only larger in scale (see chicken section for more in-depth information on the poultry digestive system). Although there are many similarities in techniques for rearing turkey poults and hen chicks, in terms of nutrition turkey poults do require a diet higher in protein. This means that chick starter feeds formulated for layer chicks are not appropriate for supporting growth in turkey poults. Feeds formulated for meat birds are widely available in New Zealand and these are a great choice for rearing turkey poults, because as well as providing adequate levels of protein they can also provide a range of vitamins and minerals for optimum health and growth. It is best to select a feed which does not contain a coccidiostat as these can be detrimental to turkeys. Young turkeys are particularly susceptible to a disease called blackhead, which can kill quickly once contracted – it's best to talk to your vet about how you can best prevent this disease in your birds.

The age that turkeys will be ready for the table varies between breed of turkey. Heritage breeds take longer and may be ready at about 18 months old, whereas faster growing breeds may be ready as early as 3 months old. Birds can be offered a meat bird feed up until they are ready for the table. Turkeys kept as pets that just require maintaining can be fed a chicken pullet, without a coccidiostat, feed once they have reached their mature size. This will ensure they get all the nutrients they require without becoming overfat or oversupplying calcium (feed designed for laying birds have high levels of calcium to support egg shell production).

DUCKS

Ducks are one of the lower maintenance and lower input poultries to keep but despite their simple needs, they can still provide eggs and meat very efficiently and rival chickens with how many eggs they can produce over a year. Duck eggs are prized for their richness compared to hen's eggs (they have higher fat and protein levels and are excellent used in baking) and duck meat is a delicacy in many countries. Popular duck breeds readily available in New Zealand include Indian Runners, Khaki Campbells for egg production, or Pekins and Muscovies for meat. If both eggs and meat are desired, mixed breed ducks may be the way to go. One important point to remember when keeping ducks is that their eggs don't seem to keep as well as chicken eggs due to their more porous shell. If collected promptly after lay and stored in a cool place duck eggs will keep for 7-10 days, so compared to chicken eggs, which can last for more than 3 weeks, duck eggs do have a much shorter shelf-life.

COMMONLY USED TERMS

Duck – female duck.

Drake – male duck.

Duckling – young duck**.**

HUSBANDRY AND WELFARE

- Ducks are hardy birds and do not require as robust housing as chickens do. They do however require some sort of covered shelter to be available to them to provide protection from rain, wind and sun.
- Free range laying ducks are required to remain in an enclosed area overnight, in order to ensure their eggs are easily collectable.
- Although ducks love water, you don't need a pond in order to keep ducks. A supply of clean water that is deep enough for ducks to dip their whole head in for grooming purposes is sufficient. Water that is deep enough for swimming is not a necessity.
- Ducks are social animals and it's best to keep at least three together.
- Ducklings are hardy and less predisposed to diseases that may affect chicks. One of the main issues resulting in deaths can be chill and exhaustion from mother ducks taking their brood through inappropriate terrain too early, such as long, wet grass. Confining a duck and her ducklings in an area for the first week or so can help to prevent this. Ducklings are also better without swimming water until they get their breast feather, so it's best to only offer them drinking water in containers they cannot get into until those feathers develop. A duck in the wild will take her ducklings swimming early on, however not being able to warm up ducklings quickly enough following a swim is one of the top reasons ducklings don't survive.
- Ducklings are affected badly by sunstroke if not given adequate shelter and can die quite quickly from it. Ensure some open shade is available to them at all times.
- Any area where ducks are regularly kept must be free of rocks, wood and other debris, as ducks have feet made for swimming rather than walking and they can be prone to lameness issues.
- Lice can be more of a problem in ducks that do not have access to swimming water, particularly during the summer months. A simple fix can be to give bird's access to troughs or tubs of water until the lice clear up.
- Some free ranging ducks may require their wings to be clipped, however this depends on breed as some ducks cannot fly due to their size.

Check in with breeders or your vet for more information.

SPECIAL NUTRITIONAL REQUIREMENTS

Ducks have a very similar digestive system to chickens – they are classed as monogastric animals and have specialised digestive compartments such as a crop and a gizzard like chickens (see chicken section for more in-depth information on the bird poultry digestive system). For simply maintaining adult ducks that are not growing or producing eggs, a chicken pullet feed without a coccidiostat is a good option as an all-round maintenance feed, as this will ensure they get all the nutrients they require without becoming overfat. Growing and laying ducks do require some more specific nutrition, as below.

Ducklings

Ducklings grow at a remarkable rate compared to chickens – although comparable in size at hatching, a duckling leaps ahead in growth in the first week and by 9 weeks the duckling will weigh more than 2kg, while an egg type chicken would only weight around 700 grams (depending on breed of course). For this reason ducklings require more feed, as well as a higher protein level than egg type chicks in order to support their rapid growth. Feeds designed for meat birds, which are free of coccidiostat, are the best option as these will provide higher levels of energy and protein. Ducklings are ready for the table by 9-11 weeks of ages – outdoor ducks take slightly longer. It is recommended that ducklings are not fed a feed designed for hen chicks, not only because of the lower protein content but also because of the coccidiostats that are often included in chick starter feeds, which are not recommended for ducklings.

Laying ducks

Egg laying for ducks begins at about 16 to 18 weeks of age. Laying ducks are extremely productive and generally lay more eggs over a season compared to heritage breeds of chickens. Ducks also have the added bonus of not dropping egg production as the days shorten like chickens do. For this reason laying ducks do require a diet higher in protein than laying chickens but do still have high requirements for calcium (as egg shells are predominantly made of calcium carbonate). A good way to ensure the unique nutritional requirements of a laying duck are met is to offer laying ducks both a good quality chicken layer feed as well as feed formulated for meat birds – this mix provides a good balance in terms of protein and calcium. Birds are very good at selecting a diet that meets their needs from the feeds on offer in their environment, so offering the two feeds in two separate feeders allows the ducks to select the appropriate combination to meet their requirements. Laying ducks may also benefit from being offered oyster shell grit, as this can help with calcium supply and gizzard function.

OTHER GAME BIRDS

Including pheasants, guinea fowl, pea fowl, quail, partridge.

More exotic game bird species can be a delight to keep and breed on a lifestyle property, particularly for children, as they can make good pets and can have very interesting and unique feathering. They can also provide delicious meat and eggs that are often difficult to source from elsewhere. Clipping the wings of these birds if free ranging can be important, to ensure they don't fly away!

Partridges are a delightful game bird to keep.

SPECIAL NUTRITIONAL REQUIREMENTS

As with ducks and turkeys, these game birds do have a similar digestive tract to chickens, however they do require a diet higher in protein than typical chicken feeds can offer. For larger game birds such as pheasants, a feed designed for meat birds is a good option while birds are still growing. Once the birds have reached their full adult weight they can be changed to a good quality chicken pullet diet, which will ensure they get all the nutrients they require without becoming overweight. For smaller game birds such as quail, again a feed formulated for meat birds is a good option – this can be offered alongside meat and bone meal to increase the protein in the diet. Birds are good at monitoring their intake and if the meat bird feed and the meat and bone meal are offered in separate containers, they will consume a combination that meets their requirements. This can be fed until birds reach their full adult weight and then, as with the large game birds, they can be transferred onto a chicken pullet feed. For breeding large or small game birds that are in lay, a diet higher in calcium will be required, in order to produce eggs with good quality shells. For this reason the combination of a good quality chicken layer feed and a meat bird feed work well – and again this can be offered in separate feeders to allow the birds to select the appropriate combination to meet their requirements. If preferred there are some more specialised small bird feed mixes available in smaller bag sizes, which could be more practical options if keeping low numbers of birds. Birds in lay should also be offered free access oyster shell grit.

PIGS

PIGS

Versatile omnivores that can provide light relief from work

Many small farmers will keep cattle or sheep but are wary of pigs, which are actually better suited to a small farm. They very are intelligent, normally gentle animals that appeal to many people as pets whilst being a highly productive meat producer and one of the most popular farmed species throughout the world. Pigs are thought to have been widely domesticated in China as early as about 5000 B.C. and in Europe by 1500 B.C. Heritage breeds that need the support of small farmers are well suited to free ranging, less intensive situations and the premium products they produce are just reward for the effort devoted to them. Common misconceptions "dirty as a pig" and "sweats like a pig" further suggest a poor level of appreciation and understanding of animals that will typically soil in one area and have limited sweat glands, which necessitates wallowing during hot weather to keep cool.

As opportunistic omnivores, pigs are flexible by nature and are amenable to changes in their circumstances whether they are kept in intensive commercial units, free range commercial or extensive farming systems that allow freedom to wander and dig. Whilst they might lack pig farming expertise and experience, lifestyle farmers are encouraged to welcome a pig into their lives. They will have the opportunity to interact with creatures that are very responsive to human interactions and offer them a less stressed existence than associated with being kept in larger herds.

Pigs are clever animals that can also provide entertainment.

COMMONLY USED TERMS

Baconer – a larger pig butchered at 6-7 months of age, about 90kg liveweight.

Barrow – a male pig castrated before puberty.

Boar – a male pig of breeding age.

Cutter – a pig butchered in between port and bacon weight to produce larger joints.

Gilt – young female not yet mated, or not yet farrowed.

Grower – a pig between weaning and sale or transfer to the breeding herd.

Piglet – un-weaned young pig.

Porker – normally 4-5 month old pig when ready with 40-45kg dressed weight (in the freezer), or about 60kg liveweight.

Sow – female pig.

Farrowing – when a sow gives birth to her piglets.

Runt – an unusually small and weak piglet, normally one per litter.

Weaners – weaned young pigs that are bought from breeders.

BRIEF DESCRIPTION OF BREEDS AND TYPES AVAILABLE

The commercial pig industry around the world is dominated by just six major pig breeding companies, committed to developing animals that are quick growing and healthy, to produce pigs at the optimum size for pork or bacon from large litters. Modern breeds have fast growth rates and minimal back fat, so are best suited to be housed and fed commercially prepared feed to do well. Heritage breeds may be slower growing, carry more fat and produce smaller litter sizes but are considered hardier and likely to have lower mortality in free range conditions. Possessing genes from the ultimate survivors – feral pigs – Captain Cookers are farmed on small blocks throughout New Zealand but arguably lack the aesthetic appeal of some breeds. The small farmer can play a role in maintaining genetic diversity by keeping alive old breeds that might otherwise be lost and that at some time in the future could be shown to offer as yet undiscovered advantages. Choosing the breed that appeals most in terms of temperament and looks and is best suited to your conditions and goals is an important first step in pig ownership.

FUN FACT

Pigs used to be kept on sailing ships because sea captains believed the pigs would swim towards the nearest land if they were ship wrecked.

Pigs are social animals and do better when they have a penmate.

BREEDS OF PIGS IN NEW ZEALAND		
Arapawa (not to be confused with the sheep) – a rare breed developed from wild pigs recovered from Arapawa Island in the Marlborough Sounds.	**Berkshire** – early-maturing black pig suited for making pork, with short legs and a dished face, which seem to do well when run on pasture.	**European Wild Boars** – a hardy breed of European origins that has a fearsome reputation but can be tamed.
Kunekune Pigs – small, placid breed with short legs and dumpy build. Come in range of colours and favoured as pets rather than for meat, thrive on more pasture than other breeds. Not good for eating in terms of meat quality.	**Large Black** – considered well suited to outdoor life being not susceptible to sunburn, docile breed ideal for bacon.	**Tamworth** – golden-red coloured pig with a long head, prick ears and long, narrow and leaner body, which is well suited to bacon production.
Wessex Saddleback – a lopped-eared black breed with a white belt around the body, which is considered both prolific and hardy.	**Large White** – a large breed with erect ears, well suited to intensive production systems but being replaced by commercial hybrids.	**Landrace** – long bodied, droopy eared white pig with 16 or 17 pairs of ribs and good mothering ability.
Large White/Landrace cross – the most popular commercial breed in New Zealand.	**Duroc** – popular terminal sire because of high feed efficiency.	**Hampshire** – large pig with prominent white belt and erect ears that produces a lean carcass.

PIG SYSTEM OPTIONS

Growing and then maintaining a pig as a pet is possibly the easiest route to pig keeping – better still start with two from the same litter so they keep each other company and warm (pigs grow better with a pen mate). Pigs can produce smells that may offend neighbours and tin shelters can look a bit untidy against some well-manicured lifestyle sections, so your neighbourhood may need to be considered.

Taking pigs through from weaning to finishing or market weights offers some commercial gain without the complexity of breeding. If starting out with two, one can be butchered slightly earlier for ham and pork and the other 6-8 weeks later for bacon. Much of the pig can be used to make food including sausages, bacon, gammon, ham, skin into pork scratchings and the blood into black pudding.

Farrow-to-wean operations focus on breeding and farrowing sows to produce weaners, which are sold to other breeders or finishers. This system can be attractive if you lack the facilities to finish a larger number of stock, or if conditions on your property limit the number of pigs you can keep. Sows are very responsive to good care and attention, especially at farrowing time, so this system will reward those with time, energy and natural if not learnt ability. Sows can be artificially inseminated but natural mating is typically favoured, which necessitates keeping or borrowing a boar. Boars can be aggressive and may require higher stock handling skills, especially if assisting during coupling.

Farrow-to-finish operations do not sell weaners but takes them through to finish or sale at 6 or 7 months of age. More pigs are fed over a longer period, so this system requires more commitment and management but avoids the risk of having to sell weaners into an over-supplied market when prices might be depressed.

PIG SYSTEM OPTIONS				
	Pet Pig	Farrow and sell weaners	Farrow and finish to pork or bacon weight	Buy in weaners
Temperament	Can be very friendly and akin to a dog.	Some sows can be protective at farrowing time but potential to establish long-term relationships. Boars can be more dangerous.	Weaners given freedom to express natural behaviour should be lively and inquisitive and less aggressive than those reared in sterile, intensive environments.	Boisterous adolescents that enjoy play and eating.
Weight	Kunekune 60-100kg. Other larger breeds range from 250-400kg mature weight.	Mature males 300-400kg, mature sows 250-350kg depending on breed.	Porkers around 60kg, baconers 80-100kg.	
Housing	Warm and dry.	Warm, dry and draught free for farrowing.	Deep litter bedding in open pens ideal.	
Life expectancy	15-20 years.	Commercial farms will replace sows with animals with higher genetic potential.	4-5 months for a porker. 6-7 months for a baconer.	
Gestation period	114 days.			
Stockmanship skills required	Low, comparable to owning a dog.	Good, especially if keeping own boar.	Excellent, if prolificacy and feed conversion are maximised.	Average, if healthy stock are purchased and reared in non-intensive conditions.
Profitability score/ income streams	NA.	Regular income.	Regular income, potential to market high quality meats directly to consumers and chefs.	Mass produced meat might be cheaper in the supermarket.
Special needs	Ventilated building or a pool or wallow during heat of summer.			

Piglets are particularly cute animals and are likely to capture your heart.

HUSBANDRY AND WELFARE

Pigs make exceptional pets, as they can be trained very easily and have a lot of personality. They can easily be whistle trained and do basic tricks very similarly to dogs. Pigs are animals that love company and they do pine if they lose a pen mate.

Pigs will reflect the nature of the people who look after them. The environment in which it lives has a significant impact on the pig's growth rate, general health and level of disease. Pigs can be kept in free range systems but need shelter from cold and wet and shade during the summer. They prefer to sleep in a dry, draught free environment and benefit from bedding during the winter. Commercial free-range farming is most viable where the weather, climate and soil type (free draining) are suitable, such as parts of the South Island. Pregnant sows can be kept in groups but normally when they farrow they are provided with individual huts that are warm, dry and draught free. Commercial free range pigs are generally weaned at around 4 weeks of age but if maximising the number of litters per year is less of a concern, piglets can be allowed to suckle for longer. At weaning commercial pigs are transferred to growing and finishing units, typically open fronted pole barns or hooped framed structures often with straw or sawdust bedding as deep litter systems.

Free range pigs can have a ring placed in their nose by a vet if it's preferred that they do not dig up your paddocks. Pigs have a natural drive to rut around in soil looking for food and if given the chance pigs can turn over a vast amount of area in a matter of hours. Sometimes it can be beneficial and seen as a positive for paddocks to be turned over by pigs as they aerate the soil very effectively, however it may be preferred that they do not. A pig with a ring in its nose will not root the ground but will still happily graze and fossick for other goodies in the paddocks such as worms.

Pigs need to be able to wallow in mud or cool water to cool off or they can become heat stressed. Most outdoor pigs can be controlled by an electric fence, about 30cm off the ground. For weaners, another wire at 15cm might be necessary to stop them running under it, however they will know when the power is off, particularly boars.

NUTRITIONAL REQUIREMENTS

Pigs are monogastric animals, which means that they have one stomach compartment – this is compared to ruminant animals that have four stomach compartments. Pigs digest food very similarly to us humans, with limited ability to extract nutrients from high fibre feeds such as pasture.

Pigs require 1-30 litres litres of drinking water per day depending on their age, climate and diet composition. Nipple drinkers are preferable to troughs as the water will always be clean. Good nutrition is fundamental to a pig's growth rate and reproductive success.

Dry pregnant sows need to be fed to meet the needs of their growing foetuses without getting too fat, so feeding will normally have to be controlled rather than ad-lib. The feed intake of pellets by dry sows ranges from 1.8-2.3kg/head/day depending on the need to gain condition.

Milking sows should be fed as much as they can eat, which will typically be up to 6kg/day fed in two meals to encourage intake. Sows should be continued to be fed well between weaning and mating to help increase the number of piglets produced in the next litter.

Piglets should be offered special creep feed from a few days of age. Demand for specialist creep feeds in New Zealand is small and they can deteriorate with storage, so adding dry pig milk replacer to weaner grower diets can be a useful way to transition piglets away from milk. Piglets are not normally weaned under 4 weeks of age, by which time they should be a minimum 5.5kg. Milk replacers are available for rearing orphan piglets, which need to be kept warm in a draught free environment.

FEEDING TABLE SCRAPS TO PIGS

The 2001 Foot and Mouth outbreak in the UK, during which more than 10 million sheep and cattle were killed to halt the disease, was thought to have originated on a pig farm where untreated, contaminated waste food had been fed to pigs. Feeding table scraps along with pelleted feed can be a cheap and economical way to raise pigs on a lifestyle block. However, it's important to be aware of the regulations that come with this practice, which is generally termed as swill feeding. Under the 2005 Biosecurity Regulations, it is a requirement that all meat, or food waste that has come into contact with meat, must be heated to 100°C for 1 hour to destroy any bacteria or viruses present. Failure to comply with this regulation can mean that an individual can be fined – but more importantly, the wider New Zealand livestock industry can be at great risk.

FEEDING GROWING PIGS FROM WEANING TO PLATE

Even though modern pig genotypes are considerably leaner than the genotypes of 20 years ago, the fundamental building blocks of nutrition remain unchanged. These are energy, protein (amino acids), vitamins and minerals and for optimum growth of any pig, it is important to ensure these are provided in balanced amounts.

Personal preference for different breeds of pigs and variation in objective when choosing pigs for your property means that across New Zealand there is considerable variation in pig genetics. As genetics play an important role in how a pig uses the nutrients contained in the feed it consumes, it is important to know what stock you have and how they should be fed.

The old adage of "eating like a pig" is no longer entirely true, since pigs are actually quite fussy. To provide some perspective, a modern (weaned) pig of 25kg is able to grow to 100kg in about 6 months and it takes a (large) human at least 20 years to get to that weight. Intensive producers are able to achieve a very efficient feed conversion of 3kg of feed to produce 1kg of liveweight. The nutritional demands of the pig are therefore enormous compared to humans and this poses unique challenges during growth from weaning to slaughter.

Let's handle the "easy" nutritional blocks first, namely vitamins and minerals. Balanced compound feeds contain all the vitamins and trace minerals required to support the growth of fattening pigs. Kitchen scraps and waste may be well received by the growing pig with great enthusiasm and, whilst they may be adequate for slow growing humans, they are generally woefully inadequate in supporting growth of the fattening pig. Any scraps one feeds should be regarded as equivalent to "lollies" for a young child – they are a treat and should not be regarded as "balanced" food. A balanced diet is essential for growing pigs and sufficient supply of vitamins, minerals and trace minerals will support skeletal growth, animal health and wellbeing. The more complex nutritional "blocks" are energy and protein and balancing these can be very tricky. Protein consists of combinations of amino acids and, for the growing pig, the most important function of these is their role in lean meat gain. Protein is a comparatively expensive component in a diet but it can be false economy to feed too little. If a diet that is deficient in protein or a specific amino acid is fed to growing pigs, these animals will eat extra feed to try and eat sufficient amounts of protein or the deficient amino acid to support weight gain. This means the pig will in all likelihood eat too much energy and consequently, become very fat. An overfat pig can be easy to produce if feed high fat feed such as waste milk. In contrast, if the diet is low in energy, the pig may not have sufficient energy to grow at its optimum rate. In such circumstances, feeding what appears to be a relatively cheap diet can turn out to be costly, as the amount of feed required per unit of body weight gain increases. Younger piglets require a higher protein diet (15-16%), whereas finishing pigs and maintenance diets for sows can be lower (13-14%). The faster a pig grows and reaches its required slaughter weight, the less money and time is needed to feed and care for it.

Giving weaners a ready-made ration will help get them off to a good start and they will be less susceptible to diarrhoea during the first weeks after weaning. If cheaper feeds are to be introduced, it should be after 3-4 weeks. If you largely only feed bought-in compound feed, the end-result may cost the same as the supermarket meat but you will know the animal has lived a happy life and you can dictate what cuts of meat you get and how they are processed. Collecting, preparing and feeding waste feeds can be time consuming and less rewarding than expected if they impact on feed conversion efficiency. Potatoes, carrots, apple pomace and citrus pulp are bulky and filling. Potatoes must be cooked and only fed to pigs over 12 weeks of age – they are low in protein, calcium and phosphorus. Cereals need to be ground or boiled to improve digestion and cereal based products such as biscuits, bread and breakfast cereals can be put through a garden shredder to produce a meal type feed. Milk is a good source of quality protein but needs to be introduced gradually and is normally fed diluted 50% with water. Many dairy farmers direct waste milk into pigs but ease back at the finishing stage, because too much is associated with soft fat in the carcass. Skim milk is a good source of protein but contains less energy, whey is an energy source and should be fed to older pigs (>14 weeks) as bloat is a common side effect.

The killing out percentage for commercial pigs is about 72-74%, with the percentage of usable meat around 64% of the animals liveweight, with prime cuts about 48% of the liveweight.

FUN FACT

Pigs have a tremendous sense of smell. The large round disk of cartilage at the tip of the snout is connected to muscle that gives it extra flexibility and strength for rooting in the ground.

Feeding a balanced diet to growing pigs from weaning through to slaughter not only ensures that pigs grow rapidly but helps to ensure that the carcass composition and meat quality is desirable, while the added vitamins and minerals contained in a balanced feed help to ensure that animals remain healthy throughout the growing phase. Sudden changes in the diet, too much undiluted milk or too much fat in the diet can cause diarrhoea.

Unlike cattle and sheep, pigs other than slow growing Kunekunes cannot be raised solely on pasture, because they have a single stomach that does not cope will with bulky fibrous food. Pasture can help to complement their diet and provide natural foraging behaviour, which is considered beneficial for their mental and physical welfare. Even good quality pasture delivers much less digestible energy to pigs than it does metabolisable energy to ruminants, whereas grains deliver more energy to pigs than they do ruminants. Grazing is normally restricted to non-lactating dry stock. Pigs can be used to break in scrub ground and are considered natural ploughs by some who use them as part of a rotation process.

Feeding recommendations for compound feeds

Feeding piglets

Creep feed piglets with a pig feed designed for young growing pigs while on the sow or providing milk replacer until 7 to 8 weeks of age. Wean gradually at 7 to 8 weeks of age and feed the young, growing pig feed until 15 to 17 weeks of age then transition onto a standard pig nut until slaughter. For fast growing, lean genetics, a pig grower feed can be fed until slaughter.

Growing pigs that are being grown for slaughter should have an unlimited intake of feed to maximise their growing potential. Feed intake should be between 0.5 to 3kg depending on age, weight and environmental temperature.

Kunekune and pigs kept as pets should be fed pig nuts and have a restricted intake to ensure that they do not become overweight. This will depend on the age and weight of the pig.

Feeding sows and boars

The recommended feeding rates for pelleted standard pig nuts are as follows:

- NON-PREGNANT SOWS – 2kg/sow/day depending on body weight and environmental temperature.
- PREGNANT SOWS AND BOARS – 2.5kg/sow/day depending on body weight and environmental temperature.
- LACTATING SOWS – start at 5kg after farrowing and gradually build up to 8-9kg, depending on body size and environmental temperature.

When feeding pregnant sows take care not to overfeed, as excessive weight gain causes overfat sows, which have a lower feed intake and therefore reduced milk production after farrowing.

Speciality breeds

Most pig nuts are suitable for smaller breeds such as Kunekune. However, due to size and the fact the Kunekune will also graze pasture, the feeding rates will be less than the above for growing pigs, sows and boars. For growing Kunekune pigs this will be around 0.5 to 0.75kg per pig per day depending on age and weight. Care needs to be taken that pigs don't become overweight.

BREEDING AND RAISING YOUNG

Sows normally assume a mating posture when they are in heat and will brace herself against a hand placed on her back. The swollen vulva in gilts can indicate oestrus, in commercial units they are often penned next to boars to encourage sexual behaviour. Sows normally stay in heat from 40 to 60 hours, while gilts will show oestrous for 24 to 28 hours. They are normally mated twice during the heat period. Sows that fail to conceive will typically come back on heat 21 days later. Reproductive performance can be measured in terms of the number of litters per sow per year, the number of piglets produced per litter and the survivability of those piglets. It is possible to achieve two farrowings per year from mature sows but it may be desirable to avoid farrowing during the winter and summer, due to weather extremes for both the animals and the people caring for them. A sow can produce more than 20 piglets in a litter but commercial breeders average 12-14 at 1-1.5kg each.

COMMON HEALTH ISSUES

New Zealand has one of the highest health status' for pigs in the world. The commercial pig industry fears that unregulated small scale pig owners could be the source of a pandemic disease that would devastate the industry, which places extra responsibility on small scale pig farmers to be attentive and vigilant when checking their stock daily and seeking advice from professionals when something unusual appears.

Sunlight and fresh air are two key components for raising healthy pigs, which are susceptible to diseases related to over-crowding. As a species, pigs are prone to a range of diseases including pneumonia, gastrointestinal tract infections and skin problems. Keeping a low stocking rate and moving to fresh ground may reduce the reliance on vaccinations (against Leptospirosis, Parvovirus, E coli, Mycoplasma, Haemophilus pneumonias and Erysipelothrix), wormers and the use of antibiotics. A range of viruses and bacteria can cause pneumonia, bronchitis and nasal cavity infections – rapid or laboured breathing usually indicates a serious illness that needs immediate treatment. Poor ventilation increases the risk of pneumonia and damp conditions can increase the risk of scours in piglets.

Piglets are born with low levels of iron in their blood and benefit from additional iron – often delivered as an injection soon after birth.

Pigs are more sensitive to mycotoxins than ruminants and can suffer poor growth and fertility. Mycotoxin binders can be added to feed if mycotoxosis is suspected.

Tamworths are a lovely heritage breed

SUMMARY

Pigs are well suited to small lifestyle blocks and offer potential to respond to the attention given to them.

RABBITS

RABBITS

Rabbits will probably find their way onto most farms in New Zealand, the caged variety make a delightful introduction to keeping live stock.

Raising rabbits can be one of the simplest things you can do on your lifestyle block, as they have a low start-up cost and a low time requirement to keep them healthy and content and are also easy to handle. Rabbits can be delightful animals to keep as companions and breeding and showing rabbits is a hobby enjoyed by many. With little required attention they can also provide a great amount of meat, as they are one of the most prolific mammals in the animal world.

	Rabbits
Temperament	Generally docile and friendly.
Mature weight Males/Females	0.5-2kg but larger for bigger breeds.
Life expectancy	8-12 years.
Gestation period	31 days.
Stockmanship skills required	Basic.
Profitability score/income streams	Low unless selling meat/fibre. Potential for selling rabbit to pet shops and/or for rabbit showing.

COMMONLY USED TERMS

Buck – male rabbit.

Doe – female rabbit.

Kitten/kit – baby rabbit.

Fryer – Young rabbit slaughtered between 2.0 and 2.3 kilograms and up to 9 weeks in age.

Roaster – Older rabbit slaughtered over 2.3 kilograms and up to 8 months in age.

BREEDS AND TYPES AVAILABLE

There are many different breeds of rabbit available to suit any owner's requirement. From fancy breeds such as the angora rabbits with a beautiful soft fleece, lop-eared for the cuteness factor, Flemish giants that can grow up to 8kg in size, right through to breeds such as the New Zealand Whites, which are favoured around the world for meat production. The breed decided on by an owner is really down to what they require out of the rabbits and any breed of rabbit can make good pets. Medium sized rabbits are preferred for meat production due to improved feed conversion efficiency and it's worth doing your research and finding a reputable breeder – a good foundation can make a huge difference in your meat production. On the other hand, if optimal meat production isn't your top priority and you'd rather have a diversity of different breeds, colours, fur textures and sizes then go for it! All domestic rabbit breeds are edible.

SYSTEM OPTIONS

Rabbits are well known for making great pets and being a low maintenance option, they are a low input starter pet for children. For rabbit enthusiasts, showing fancy rabbits at specialist shows can be very rewarding and can even provide a stream of income if excess stock can be sold to fellow rabbit enthusiasts or to pet shops.

Keeping rabbits does span to more commercial uses and rabbits can be farmed for their meat and fibre. Rabbit meat is prized as being a high quality, lean protein that can be used in most ways chicken meat is used. Rabbits are well known for being very prolific animals, so a small number of breeding animals can provide a vast amount of meat. Rabbit pelts are sometimes used for clothing and accessories, such as scarves or hats. Angora rabbits are bred for their long, fine hair, which can be sheared and harvested like sheep wool. This fibre can fetch high prices as it is desirable for making luxury clothing items.

New Zealand Whites are a breed favoured for meat production.

HUSBANDRY AND WELFARE

Rabbits are fairly low maintenance animals but do require a good quality level of housing and regular cleaning to maintain hygiene.

Some tips for rabbit housing

- A good roomy hutch with two connecting compartments is ideal. The more rabbits you have, the bigger the hutch/the more hutches you will need!
- One third of the hutch should be enclosed for draught-free sleeping quarters. The other two-thirds is for daytime and should have a strong wire-mesh front to admit light and air.
- The roof should be sloping and covered with roofing felt, tiles etc. for good weatherproofing and should overhang the hutch to keep its sides dry and to prevent driving rain from saturating the interior.
- Hutches should be in a non-draughty position, out of strong sunlight. Facing the morning sun is best.
- A warm, dry bed is important. Straw or shredded paper should be included to provide warmth, insulation and an opportunity for burrowing.
- A hutch/pen that is movable is a good idea so that rabbits can gain access to fresh grass, rather than staying in the same place for an extended period of time.
- A house that can be shut overnight is a good idea, to protect rabbits from predators.
- Regular cleaning of rabbit hutches is important and having a hutch with good accessibility for cleaning will help.
- Rabbits' toilet areas should be cleaned every day to avoid build up.
- Cleaning cages should be done on a regular basis. 'Deep cleanings' require the rabbit to be removed from the cage. Periodic sanitations can be done with the rabbit inside in between deep cleans and should be performed once a week. Only non-toxic cleaning products should be used and the housing should be dry before rabbits are replaced in it.

Tips for optimum rabbit health and wellbeing

- Rabbits are social animals, so it is best to keep more than one.
- Rabbits are fragile animals who must be handled carefully. If children are handling them, ensure they know the correct and safe way of doing so.
- Rabbits can catch deadly infectious diseases from wild rabbits, so you should prevent your rabbits from having contact with wild rabbits or areas where wild rabbits have been.
- Nails will require regular trimming – this is easy to do at home.
- Rabbits' teeth keep growing throughout their whole life (top front teeth grow at a rate of 3mm a week) so may require trimming at times – it's best to leave this to your vet.
- In warm weather urine or droppings that are stuck will attract flies, which can lay eggs and cause 'flystrike'. Keep an eye out for this, as it can cause major animal health issues and try and use preventative measures to keep flies at bay. Regularly removing manure will help (daily is the optimum).
- Vaccinations are recommended by some vets for certain diseases, so it's best to check in with your vet and discuss vaccination options.

FUN FACT

Despite their name, the 'New Zealand Whites' were actually developed in the United States and they have a genetic deviation called albinism, which gives them their white colouring.

UNIQUE NUTRITIONAL REQUIREMENTS

The rabbit's digestive tract is designed to digest a high fibre diet consisting mainly of grass. They are classified as vegetarians and are hind-gut fermenters, which means that a majority of digestion takes place in their large intestine and caecum. Despite being high fibre digesters, rabbits have a rapid gut transit time – in simple terms, they get as much as they can out of consumed feed then excrete it. They do not hold onto a large amount of feed in their gut for extended periods of time like ruminant species such as cows. This adaptation allows rabbits to maintain a relatively low bodyweight, which as small prey species is necessary to survive in the wild. Rabbits that are not fed a high fibre diet are prone to a potentially fatal health problem called "gut stasis". This is when their gut slows down completely to the point where they stop eating and defecating.

Rabbits consume their own faeces – a phenomenon that is a little more complex than it may sound. The unique muscles of a rabbit's caecum allows the intestinal tract to separate out fibrous material from more digestible material. The fibrous material is then passed as faeces, while the more nutritious material is encased in a mucous lining which is later passed as faeces that are re-consumed by the rabbit. These faeces are often referred to as 'night faeces' and are high in minerals, vitamins and protein. Night faeces are softer and appear darker in colour than normal faeces. This 'double digestion' allows rabbits to extract the necessary nutrients from their feed, with no need for a weighty digestive system.

Rabbits must always have constant access to either grass or hay in order to satisfy their fibre requirements and keep their teeth worn down. Rabbits with no access to hay or grass end up with teeth that overgrow, which can cause health issues such as mouth abscesses and incorrect jaw alignment.

Rabbits that are kept in captivity often get less exercise than wild rabbits and if their diet is not carefully regulated, they can become overweight. Overweight rabbits are unable to get their mouth around to their posterior and are therefore unable to consume their nutrient packed night faeces. The faecal matter can also stick to the rabbit's bottom and attract flies. It is therefore important that rabbits are offered a well-balanced diet and are not offered too many treat foods – stay away from treat feeds high in fat.

The best way to ensure rabbits are as healthy as possible is to offer them a feed specifically formulated for rabbits – this ensures that they get the right level of energy and protein, as well as important minerals and vitamins. This can be offered alongside hay or grass as well as a variety of safe, washed leafy greens or weeds every day. Safe plants include cabbage, kale, broccoli, parsley and mint. You can give apples or root vegetables like carrots, in small amounts as an occasional treat. Don't make any sudden changes to your rabbits' diet as this could make them very ill. Introduce new foods and make any necessary changes gradually, to avoid upsetting their digestive systems.

TIPS FOR FEEDING RABBITS

- Plenty of hay should be offered in hay racks, in addition to hay used as bedding.
- Rabbits can be given access to pasture for grazing and a moveable hutch or pen can make this easy. Be wary of introducing rabbits to lush pasture too fast – they must be introduced slowly to allow the digestive system to adapt.
- Never give rabbits grass cuttings.
- Vegetable food should be washed before being offered to rabbits.
- Frosted greens should be discarded.
- Lettuce contains traces of a poison (lactucarium) and should be avoided. Other feeds that should be avoided in the rabbit's diet include beans, cauliflower, parsnips, potato or potato peelings, rhubarb, spinach, swedes and tomato leaves.
- Remove uneaten vegetables and greenstuff from the hutch daily.
- It is a good idea to offer a mineral salt block to rabbits.
- Do some research into what plants are in your garden and whether they are safe to feed rabbits or not.

BREEDING AND RAISING YOUNG

Rabbits are very productive animals and can produce a vast number of offspring in a lifetime. A doe can be mated at 4-5 months of age. Does are fertile all year round and do not have an oestrus cycle with regular periods of heat like other mammals – however they are considered to be in oestrus more or less permanently. Ovulation occurs only after mating (about 12 hours after the act). A female rabbit is therefore considered to be in heat when she accepts service. Gestation is short at only 31 days. Ensure does have a nesting box, where they can create a nest for their impending offspring by pulling fur from their chest. Litters tend to be large, averaging five young. Kittens are born with no hair and with their eyes closed. In 5 or 6 days their fur will grow in and in 10 to 12 days they will open their eyes. The doe will spend most of her time outside of the nest box and only return to feed them twice or so a day. The young nurse for 5 or 6 weeks and begin to eat hard feed as they go. At 6 or 7 weeks the young fryers can be weaned and put in another hutch then slaughtered at 10-12 weeks of age. Does can be rebred again very rapidly following birth – some high producers rebred 2-3 weeks following birth while the doe is still nursing but this can be too hard on rabbits that are in poorer condition. The sooner you breed again following birth, the more litters you can produce a year.

COMMON HEALTH ISSUES

Coccidiosis

This is the most common disease in rabbits and is classified as a parasitic disease. Symptoms may include loss of appetite, pot belly, bloody diarrhoea and inability to gain weight, although in mild cases these symptoms may not be easily observed. Coccidiosis mainly affects youngsters from the age of 6 weeks to 5 months and is attributed to stress, noise, transport and/or poor immune function. It is mainly observed in young, newly weaned rabbits but is also found in older rabbits. A coccidiostat can be given to rabbits in order to prevent coccidiosis – it works by breaking the lifecycle of the parasite and prevents them building up in numbers (rabbit feed with coccidiostats included can be purchased). There is however a withholding period associated with coccidiostats, so if it is fed to meat rabbits intended for the table this withholding period should be observed before slaughter (usually around a 5-day withholding period but check for the particular coccidiostat used). Treatment options are available if a rabbit is suspected to have coccidiosis – animals showing symptoms should be taken to the vet as soon as possible.

Snuffles (Pasteurella Multocida)

'Snuffles' is caused by a bacterial infection and often results in sneezing, white milky nasal discharge, matted down front paws from wiping the nose and eyes and sometimes more serious breathing ailments. The disease can also travel to the eyes causing conjunctivitis, or it may travel to their ears causing ear infections. It is a very contagious condition and is easily spread from rabbit to rabbit. Some strains are commonly found in the nasal tract of rabbits but may not cause infections unless the animal is stressed or has a suppressed immune system. If detected early, snuffles can be treated but it can become chronic or fatal if left untreated. Treatment includes an extended period of antibiotics. As snuffles can be difficult to treat, prevention plays a very critical role in trying to control and eliminate this disease. Breeders need to take special precautions including strict sanitation/ hygiene and quarantine procedures when introducing new rabbits. If animals are suspected to have snuffles, the affected animal should be isolated from other rabbits and taken to the vet as soon as possible.

Mite

Ear mite can cause issues in rabbits. Symptoms include rabbits scratching their ears and shaking their head and brown powdery matter may be seen in the ear. If the condition deteriorates it can cause pain, inflammation and ulcerations. It's best to treat early so if ear mite is suspected, it's best to talk to your vet.

See 'Unique nutritional requirements section' for more information on overgrown teeth and being overweight, which can be commonly occurring health issues in rabbits.

SHEEP

SHEEP

Would you like to wear home-spun, natural coloured sweaters produced from your own flock?

Sheep are popular on lifestyle farms because they are small and relatively easy to handle and the barriers to entry are small – you can start with one or two bottle-fed orphan lambs and build up from there. They can make use of small areas not suitable for other stock, so you can even justify keeping a ram for a relatively small flock and their grazing habit and worm risk complements cattle well. Sheep are very versatile and will thrive in extensive dry, cold or wet environments but also respond well to lush lowland pastures. Whilst not as proficient at escaping as goats, they do need good fencing and most breeds need to be shorn at least once per year, so some form of yard is beneficial.

BREEDS AND TYPES AVAILABLE

Sheep come in many different breeds and sizes.

Farmers are spoilt for choice when it comes to choosing what breed or cross of sheep to buy, with breeds ranging from feral breeds that have survived being marooned on islands through to milking sheep selected for high milk production. Sheep breeds have been developed around the world in response to climate, feed constraints and in relation to the end-product required – meat, milk or wool. The golden hoof that brought prosperity and fertility in the early days of modern agriculture, the town halls of many affluent looking towns were probably built on the wealth generated by the wool trade and still today farmers will talk of paying off mortgage payments from a single wool crop some decades ago. The choice of sheep breeds available is too long to fully document here but they fall into a number of distinct groups.

The Merino and Corriedale dominate as the premium fine-wool breeds in New Zealand. Their ability to thrive in dry, harsh environments has allowed them to spread throughout many large South Island stations. By contrast, some small scale farmers aiming to produce the very finest micron fleece keep Merinos inside in pens so their diet can be very constant, to reduce the chance of changes in the fleece quality or breakages associated with dietary change.

Romney, Coopworth and Perendale are popular commercial breeds, producing both meat and wool, albeit not as valuable per kg as the low micron fibres produced by the fine-wool breeds.

Meat breeds such as the Suffolk and Texel were developed primarily for their meat qualities and are popular as terminal sires, i.e. used over ewes of other breeds to impart better meat qualities in the lambs produced.

Prolific breeds such as the Finn, with lambing rates frequently exceeding 200 percent, are sometimes used for crossing to increase the fertility in a flock.

The Wilshire Horn was very rare but is now growing in popularity because it sheds its fleece annually, which removes the need for shearing.

The East Friesian is the most common and productive breed of dairy sheep in the world, producing 450-500kg milk in a 220-240 day lactation – about 10 times the milk production from conventional breeds. Ewe's milk is considered highly nutritious, richer in short-chain fatty acids and conjugated linoleic acid and can be frozen without affecting the cheese-making qualities of the milk.

Primitive breeds such as the Gotland Pelt and Pitt Island Sheep were developed with minimal human selection pressure and are thought to retain survival characteristics that suit minimal human intervention systems. Some have coloured fleeces that are appealing to home spinners who like the natural colours to come through into their woollen garments.

Fat-tailed sheep store fat in their tail and rump area – they make up about 25% of the world's sheep population but are very rare in New Zealand.

COMMONLY USED TERMS

Ewe – mature female sheep, usually over 2 years of age.

Dagging – removal of wool covered in faeces – removed dags can be used for fertiliser.

Ram – male sheep of any age.

Lamb – up to 9 to 10 months old, have eight temporary incisors (milk teeth).

Hoggets – older lambs in which the central pair of permanent teeth have not yet appeared. Lambs become hoggets in their first winter.

Two-tooths – central permanent pair of teeth start to appear at about 12 months of age and are fully erupted before 18 months of age.

Four-tooths – second pair of permanent teeth appear at 21-24 months of age.

Six-tooths – the third pair erupt at 30-36 months of age.

Full mouth – sheep has a full mouth when the set of eight permanent teeth is complete – 42 to 48 months of age.

Cryptorchid – a male with undescended testicle or testicles. Can be used for lambs made infertile by applying a rubber band below the testicles, leaving the testes pushed up against the body (short scrotum technique).

Slink – lamb born dead or died soon after birth, processed for their skins.

Tupping – joining of male and females.

Flushing – putting stock on a rising plane of nutrition over mating.

Wether – a castrated male sheep.

Light prime lamb – 13.5-15.4kg carcass weight.

Prime lamb – 15.5-17.4kg carcass weight.

Heavy prime lamb – 17.5kg plus carcass weight.

SYSTEM OPTIONS

The lowest cost and gentlest way to get into sheep farming is to rear an orphan lamb or two. Some commercial farmers will remove the smallest lamb from ewes with triplets so that the remaining two lambs have a better chance of being finished whilst prices are high. The third lamb might be fostered onto a ewe whose lamb has died, reared by hand or sold off. In some areas, experienced calf rearers have moved into large scale lamb rearing because it utilises existing buildings with less pressure on cash flow. Hand reared lambs can form a nucleus breeding flock, which reflect how familiar the owner wishes them to become or can provide meat for the family.

When buying a lamb for a commercial enterprise or as a pet, the following guidelines can be used:

- Buy good quality stock from a reputable farmer
- Lambs should be 4 to 5 days old
- Check navels for swelling and spray with iodine to prevent navel infection
- Pick lambs that appear strong, bright and healthy
- Pick lambs that are not lame – check for sore/swollen joints
- Check if the ewes were vaccinated against clostridial diseases before lambing
- Make sure the lamb has been fed a sufficient amount of colostrum, either from its mum or in the case of orphans, from a bottle.

Where lambs can't be fostered to another ewe, they can be reared by-hand using lamb milk replacer, pelleted feed and hay. To minimise losses and get the best growth out of these lambs, it is important to use tried and tested rearing techniques and provide good quality, specialised feeds (see 'breeding and rearing young' section for more detailed information).

Sheep fertility has increased significantly in recent years, with the New Zealand average lambing percentage jumping from 100% in the 1980s to more than 130% these days, with top performing sheep farmers attaining in excess of 150%. This is due to a combination of genetics, along with improved animal health and better feeding. More prolific breeds of sheep are becoming increasingly popular, e.g. Wiltshires have an average lambing percentage of 190-210%. The trade off to increasing reproductive performance however is the concurrent issue of increasing orphan lamb mortality rate. For example, lamb survivability decreases to 77% for triplets, compared to singles and twins, which are 90% and 88% respectively, as demonstrated by a Poukawa trial. Genetic potential and economic gain is being lost if live lambs born are not reared. Rearing orphan lambs offers the opportunity to maximise productivity and Farmlands can provide you with all of the tools necessary to do so successfully.

Sheep are regularly bought and sold at any age, so the attentive lifestyle farmer can buy or sell sheep when they have feed available and think a profit can be made. Many dryland sheep farmers know they cannot finish lambs if spring pasture growth has been poor or summer dry conditions take hold early, so will sell store lambs for finishing by farmers with irrigated pasture or forage crops planted for the purpose.

Ewes can be kept for breeding to produce lambs. The lambs might be purebred or crossbred – often what is referred to as a terminal sire a meat breed such as a Suffolk – will be used to increase the size and growth potential of lambs out of lighter ewes that are prolific and milky but less muscular.

	Rearing lambs	Finishing store lambs	Breeding flock
Life expectancy	10-12 years.		
Gestation period	140-150 days (5 months).		
Mature weight	Males: 45-160kg. Females: 45-100kg.		
Temperament	Friendly, cute, demanding. Hand-raised rams can become dangerous if they assert dominance.	Depends on the breed and previous intensity of farming operation.	Relationships develop over the years.
Livestock unit equivalent	0.85-1.25 (ewe).		
Stockmanship skills required	Basic with one or two lambs, needs to increase with numbers.	Basic.	Average to good, depending on the lambing percentage and type of ewe.
Profitability score/ income streams?	Cute orphan lambs can fetch high prices – store lambs can be cheaper but other advantages in rearing lambs.	Like playing the stock market – small investors can make decent profits if they buy and sell well.	Can cater for niche markets, falling national flock may increase opportunities and margins going forward.

HUSBANDRY AND WELFARE

Sheep do require regular maintenance to ensure optimum health and production and avoid common health issues. Having a good set up for handling sheep can make these routine tasks easier.

- Sheep need regular treatment for worms and lice, so a drenching and dipping programme needs to be in place. Talk to your vet about the best products to use and how regularly to use them.
- Sheep are prone to foot rot and other foot issues. Foot trimming about once a year to remove overgrown horn can help to prevent issues. It is important that only the dead horn is removed when doing this, to avoid drawing blood.
- Sheep are particularly sensitive to the collection of faecal matter and urine around their rear end, particularly when grazing lush spring pasture. Flies can lay eggs in the warm, damp wool, which produce larvae that can grow and eat into the sheep – a serious condition known as fly strike. Dagging is normally carried out at the start of the fly season and may be repeated every 6-8 weeks in high fly risk conditions. Crutching similarly involves the removal of wool but is mainly intended to assist mating or clear the udder area prior to lambing.
- Vaccinating sheep against common disease is good practice. A '5 in 1' is recommended as standard procedure but it's best to talk to your vet, as there may be more vaccinations that are recommended for your area.
- Sheep need to be shorn at least once per year (apart from self-moulting sheep like the Wiltshire). Shearing before lambing is becoming more popular but some shelter may be required for a while after shearing and feed demand increases after shearing.

NUTRITIONAL REQUIREMENTS

Sheep are classed as ruminant animals. They are able to get nutritive value out of high fibre feeds such as grass due to their highly specialised gastrointestinal system. Sheep have four stomach compartments and 'chew the cud' as do cattle. **See the 'Basics of ruminant nutrition' section for more information.** Although sheep are classed as grazing animals like cattle, they do have different grazing behaviours and due to their split upper lip and small mouth relative to body size, they can graze closer to the base of the pasture sward and can handle shorter pastures better than cattle.

Ideally the stocking rate of grazing animals will match the feed availability while achieving maximum production. If the stocking rate is too low, there could be an opportunity to shut pasture up to make hay or silage, either for use later or for sale. Just as some people love animals, some people have a passion for machinery – especially big agricultural machinery – and inevitably there will be somebody not that far away who will help conserve surplus grass without breaking the bank. If the stocking rate is too high stock can be sold or supplements bought-in.

Feed budgeting can be very precise on the demand side because the needs of different classes of stock are well defined. The supply side can be harder to estimate, especially if you are new to a farm. In general it is relatively easy to move in and out of sheep even if you have some capital stock – breeding stock – whose retention is non-negotiable because they have names or particular genetic qualities you do not want to lose.

Beef and Lamb NZ have some very good information available online, linking the desired height of pasture to different classes of sheep at different times of the year. Winter is a time to ration pasture and supply supplements or crops to maintain liveweights. Spring is a time when flush of grass growth coincides with increased appetite and demand from lambed ewes. The summer and autumn is a time to maintain Body Condition in ewes and grow young stock well, being prepared to cope with a drought if necessary.

Ewes benefit from more pasture over mating and when feeding lambs but require less during mid-pregnancy and over the summer when dry. Weaned lambs can grow at 200g/head/day if given access to a sufficient quantity of young leafy pasture – autumn and winter grazing tends to support lower growth rates but can still be important times for animal growth. Sheep have an ability to select plants and plant parts in a mixed sward of higher nutritive value than the average on offer.

Supplements may be beneficial when pasture quality or quantity is sub-optimal for the class of animal being fed. Twin bearing ewes are especially under stress at the end of pregnancy because rumen capacity is restricted at a time when nutrient demand for the growing foetuses is rising. Triplet bearing ewes are under even more stress and may respond to supplementary feed, which delivers both energy and protein in addition to minerals and vitamins in higher amounts than twin bearing ewes require. Giving ewes a rising plane of nutrition over mating can help to improve conception rates (so they lamb earlier) and the number of lambs born. Where grass supply is inadequate over mating, a small amount of a cereal based concentrate may be offered (up to 0.25kg/day). Implantation takes place 14-28 days after mating, so it is important to avoid stress to maximise embryo survival.

Feeding ewes after lambing is difficult with large flocks because of mis-mothering. When ewes see feed being put in troughs they can forget they have just lambed and leave their

Free access feeders are now available which can make supplementation over lambing possible without increased mismothering.

newborn to perish. Such problems are less likely with small flocks and now there are restricted access feeders available, which provide the ewes with access to feed 24/7 and so remove the risk of ewes rushing for new feed.

Winter and the period coming up to lambing can be the most difficult time of the year in terms of both feed quality and quantity in relation to the needs of breeding ewes.

During the winter, it is important to ration pasture and supply supplements or crops to manage Body Condition Score, whilst ensuring that in the spring there is sufficient pasture cover for lambing, which can be managed to maximise animal performance. Given the unpredictability of pasture growth and the weather, grain and compound feeds present the opportunity to strategically supplement ewes for both lifestyle and commercial farmers.

Whilst mature ewes in good condition can lose some condition during mid-pregnancy (mild feed restriction may stimulate placental development and result in bigger lambs at birth), overall the priority should be to minimise condition loss in breeding ewes. This means an increase in liveweight of 8-10kg up to lambing, to allow for the weight of the foetus and body fluids – whilst avoiding overfeeding ewes having single lambs, as they can become overweight.

Shearing can increase the feed requirements of ewes by 10-30% for 2-4 weeks depending on the temperature, wind and rain, as they need extra energy to maintain body heat. Pre-shearing ewes can be introduced to grain or compound feed 7-10 days before shearing, so that feeding can be stepped up once shorn.

Fat reserves are put on the lamb in the last 60 days of pregnancy. Ewes that are underfed in late pregnancy produce lambs with low reserves of brown fat, which is used for protection against hypothermia. Pre-lambing feeding has a major impact on lamb birth weights, lamb survival, lamb growth rates, the ewe's mothering ability and even immunity to parasites and resistance to diseases including sleepy sickness and milk fever. The largest reward from feeding are in the last 4 weeks pre-lambing, when the energy demand increases. Supplements can be fed sooner if the expected lamb crop is high or the condition of the ewes is poor.

A hard winter caused a spike in cattle deaths in 2014 in Kentucky, USA. Older cattle in particular had apparently been stripped of fat reserves and had literally 'ran out of gas', despite having access to as much hay as they could eat. This limitation of ruminants to utilise poor quality forage is made worse with multiple bearing in-lamb ewes, because the uterus takes up a lot of abdominal space, which compresses the rumen and therefore reduces feed intake. It is important to know the nutritional quality of the pasture, silage and baleage that is being fed, so the best quality can be used closer to lambing and use can be made of supplements such as grain or pelleted feed if necessary.

Compound feeds can be fed with less waste than barley and offer nutritional benefits because they contain additional trace minerals, which are transferred via the placenta to the lambs in the last 4-8 weeks pre-lambing, which can help their survival and growth rates. For high performing ewes with triplets, a feed aimed at these animals containing a high level of quality protein can work well and can support the unborn lamb and its mother. It also results in more colostrum early on, which is crucial for the survival of triplet and twin lambs. The higher the lambing percentage, the earlier supplementary feeding should be started. If forage feed supplies are tight or if ewe condition is light, consider feeding grain based compound feed:

- Minimum 150g/day for Singles for last 2-3 weeks.
- Multiples – up to 300g for the last 3 weeks pre-lambing, longer if necessary.
- Introduce at 50g/head/day and increase by 50g/head/day every second day.
- Triplet bearing ewes benefit from additional protein and energy and can be fed at higher rates, provided it is introduced slowly. (A 70kg ewe might be expected to produce a 5.8kg single lamb, 2 x 4.7kg twin lambs or 3 x 3.9kg triplets, which would represent an impressive 16.7% of its body weight produced mostly in the last trimester of pregnancy).

Higher lambing percentages on-farm have been positive for productivity. However, with this increase in productivity there has also been an increase in surplus and orphaned lambs. This may be due to the inability of the ewe to produce enough milk for all lambs in a multiple birth, poor mothering ability or death of the ewe at lambing. Leaving poor ewes with a strong single lamb or good ewes with two strong lambs rather than triplets increases the chance of finishing lambs in a timely and profitable manner. Surplus lambs can be reared by-hand on-farm or sold to commercial lamb rearers or people looking for pet lambs.

Improving lambing percentage makes the biggest contribution to higher profits on sheep farms. Whilst commercial farmers may require easy lambing ewes because the sheer number they keep prevents individual attention, farmers with small flocks may have more potential to intervene. Lambing problems and starvation/exposure are thought to account for up to 75% of total lamb losses in high performance flocks.

Body Condition scoring is a good way to monitor the progress of ewes and lambs. See Beef and Lamb's resources on Body Condition scoring for more detailed information.

BREEDING AND REARING YOUNG

Sheep are ready to be mated at around 7-10 months of age. Sheep are seasonal breeders and ewes are stimulated to start cycling by the gradual shortening of days in autumn. Rams are also stimulated to come into the breeding season and they start to smell more strongly in an attempt to attract females. A ewe will come into heat every 17 days over the mating season with each heat lasting for about 24 hours. A ewe should be put to the ram during this 24 hours, however if she does not become pregnant she will come into heat again, which offers another chance for pregnancy. Signs of a ewe being on heat include seeking out and sniffing rams, tail fanning, standing to be sniffed and mounted, crouching and urinating if a ram approaches. If rams are being run with your flock of ewes, a ram harness can be used, which can help to identify what ewes have been mated (the harness leaves a mark on the ewe's rump when the ram mounts them). Ram health and fertility is important, so it's a good idea to do regular checks of your rams to make sure they are in a good condition to do their job. Ewes can be scanned to see if they are pregnant and if so how many lambs they are carrying (which can be important information to consider when planning late pregnancy feeding). This is best done at 100 days after the ewe has been mated. Pregnancy lasts for 140-150 days (about 5 months).

As lambing approaches, make sure you are well prepared. Ensure ewes close to lambing are put in paddocks with good shelter from adverse weather to ensure good lamb survivability. Ewes close to lambing will have enlarged udders, the vulva may swell and there may be some mucous discharge. The ewe will also separate itself from the rest of the flock and look for an appropriate birthing site. Leave ewes alone during lambing, unnecessary interference should be avoided. If the ewe does look likes it's struggling or is taking a prolonged period of time to lamb, the vet may need to be contacted. Don't shift a ewe from its birthing spot in the first few days after birth, as this can cause mis-mothering.

If mis-mothering does occur, or if ewes with triplets are struggling to keep up with all three lambs, rearing orphan lambs can be a good way to avoid the unnecessary death of lambs. Colostrum is the key to orphan lamb survivability and it is crucial to feed lambs 10% of their body weight in good quality colostrum with high levels of immunoglobulins within in the first 12 hours of life, with the first feed given as quickly as possible after birth. Colostrum intake should continue for 3 to 4 days following birth to ensure optimum lamb immunity and health. Lambs require milk feeds little and often (4-5 small feeds a day). A nutritionally balanced and highly digestible milk powder is essential for supporting good lamb growth rates. Abomasal bloat can be an issue when rearing lambs. Mixing a yoghurt culture in with milk can be helpful in preventing bloat as it contains probiotics (which helps to control the harmful bacteria that can cause bloating). Profitable lamb rearing is reliant on good rumen development that can support early weaning and minimise post-weaning growth checks. Hard feed stimulates papillae development in the rumen and should be offered to lambs ad-lib from day one, in order to prepare them for digesting high fibre pasture. It is best to choose a feed that is specifically designed for lambs, which have quite different requirements compared to other animals such as calves. Lambs start eating grass from around 2 weeks of age but lambs weaned before 6 weeks of age are likely to suffer, because they can't eat enough pasture to make up for the lost milk. Tail docking and castration are common tasks when rearing lambs – talk to your vet about the best way and best time to do these procedures.

COMMON HEALTH ISSUES

Parasites (internal and external)

Internal parasites are a major challenge, particularly for young lambs. High parasite burden can cause diarrhoea, ill-thrift and poor growth rate. Grazing lambs on paddocks with low levels of infestation, such as re-growth after a hay or silage crop or paddocks grazed by cattle for the previous 3 months can help. Drench resistance is a growing problem so it's best to talk to your vet about putting together a parasite prevention plan for your flock. External parasites such as lice can be a problem for sheep, so an external parasite prevention plan should also be in place.

Flystrike

Flystrike is a condition that develops from blowflies – they lay their eggs on the skin of animals and when the maggots hatch they begin to eat the flesh of the animal causing pain, irritation, infection and eventually death. Problems usually arise in late summer and autumn as blowfly populations increase in warm, humid conditions. Sheep are more prone to flystrike as their wool, particularly when dirty, is an attractant for flies. Prevention is the best course of action, as flystrike can be a horrible condition to deal with if treatment is required. Removing dags can help as flies will be less attracted to animals. Pour-on/spray treatments can work well (take note of withholding period for wool). Blowfly traps can help to decrease populations of flies and can be used to monitor the risk of flystrike. Good internal parasite control can also help, as this can prevent dags developing. Keep an eye on animals, particularly during risk periods. If animals seem restless, seek shade, or are swinging around to nibble at parts of their body, it may be worth checking them for flystrike. The most commonly struck areas are on the back end of the animal, in shearing wounds, or in the feet of an animal with footrot.

Foot rot

Foot rot is a condition that can cause severe lameness is sheep as well as other animals such as cattle, goats and alpacas. Foot rot is an anaerobic bacterial infection of the hoof, more specifically the area between the two toes of the affected animal and it has a distinctive foul smell associated with it. Foot rot is contagious and can spread across a flock if infected animals are not treated. Treatment includes antibiotics, it's best to talk to your vet if foot rot is suspected. Hot and wet weather increases the risk of foot rot as does poor sanitation and mud. Since the foot rot organism is anaerobic, the introduction of oxygen to its environment will help in eradicating it. Therefore it is important to keep sheep's hooves properly trimmed; although care must be taken not to cause bleeding. Elimination of overgrown hoof tissue will result in less mud and manure packing, which aids in environmental conditions conducive to foot rot development. After foot trimming, the use of regular soaking in a footbath of a zinc sulfate solution can greatly help in eradicating the disease. When purchasing new stock, ensure they do not have foot rot or do not come from a flock that has other animals affected with foot rot. A quarantine period is recommended before introducing an animal to your flock.

Ryegrass staggers

Ryegrass staggers is caused by a toxin produced by a fungus, which was deliberately introduced to some grasses to give them protection against insects. Affected stock can fall over and are best handled as little as possible. Animals showing symptoms should be taken off hazardous pasture and feed alternative feeds until symptoms are gone. Toxin binders are available that can be added to feed, which reduce the amount of toxins being absorbed into the animals. The best long-term solution to ryegrass staggers is to replace affected ryegrass pasture with species that are endophyte free or contain safe endophytes.

Pregnancy toxaemia

Pregnancy toxaemia (also known as twin lamb disease or sleepy sickness) affects ewes in late pregnancy and is seen as partial anorexia, depression and lethargy progressing to recumbency and death. Each foetus requires 30-40g glucose per day in late gestation, so twin bearing ewes have difficulty meeting their needs and may mobilise fat, which can clog up their liver. The main cause of pregnancy toxaemia is underfeeding or a decrease in feed intake. Ensuring ewes are well fed in late pregnancy is the key to prevention and high energy concentrates such as sheep nuts can be a good addition to the diet, as they provide energy without taking up much rumen space – and rumen space can be limited in late pregnancy as the growing foetus takes up a lot of room in the abdomen.

Bloat

Sheep can be killed by bloat following the consumption of legumes – clovers and lucerne – especially during damp periods when the plant is growing well. Bloat is caused by the formation of a stable foam in the rumen, which makes it impossible for the animal to belch out gases formed by rumen fermentation. The accumulating gases cause an increase in pressure, which exerts pressure on the heart and lungs and the animal can die from asphyxiation. Signs are swelling of the left hand side of the body and laboured breathing. Sheep being grazed on high risk pastures can be treated with antifoaming agent (oil/detergent) to prevent that stable foam forming in the rumen, or bloat oil can be added to the drinking water or sprayed onto the pasture before consuming. Carefully controlling the diet and rate of eating can prevent issues – for example, ensure that hungry sheep are not put onto risky pasture.

Facial eczema

Facial eczema is another debilitating disease in New Zealand caused by a fungus. Facial eczema is caused by a common fungus Pithomyces chartarum, which only produces spores containing a toxin called sporidesmin during special humid weather conditions, typically following a dry spell. If consumed, the spores release sporidesmin into the digestive tract, from where they are absorbed into the bloodstream and become concentrated in the bile ducts and cause severe damage to the liver. Initial signs include diarrhoea and sudden milk production drop, followed 10-14 days later by restless behaviour (as sheep seek shade) and reduced appetite. Skin damage occurs because photosensitive toxins build up under the skin, complications from which can be deadly or necessitate early culling. Sheep may become restless and rub their heads against post and gates, with reddened ears and swollen eyes. The effects of the toxin on the liver are cumulative. By the time symptoms are seen, the liver damage that causes the most economic losses has already occurred. There is no specific treatment for the liver damage, so the timing of treatment to prevent damage is critical.

There are a number of preventative options available to help manage facial eczema, including high doses of inorganic zinc, to substantially reduce the incidence and severity of liver damage suffered in an outbreak of facial eczema if delivered prior to or during outbreaks. When feeding zinc oxide in-feed or via oral drenches, or zinc sulphate via water troughs – at far above normal therapeutic levels – a product registered with ACVM and proven to be effective against facial eczema should be selected. Zinc consumed at high levels inhibits the production of superoxide radicals by the sporidesmin, which damages the tissue. Unfortunately, although zinc is relatively non-toxic to ruminants, the amount of zinc required to prevent facial eczema is close to the level likely to cause toxic effects, which may cause anorexia and reduced milk production. Care must also be taken if feeding supplementary copper, as copper seems to activate the toxin in the liver. Zinc dosing should be discontinued as soon as possible – in cattle and sheep the recommended maximum continuous zinc supplementation period is 100 days. Managing zinc supplementation at these higher levels requires co-operation between the farmer, advisor/veterinarian and the feed company to minimise the risks. Local knowledge about the degree of threat each season is invaluable and shareholders are urged to talk to their local Farmlands team.

Mineral deficiencies

To perform well animals need adequate levels of minerals. The most commonly limiting minerals for sheep include cobalt, selenium, copper, magnesium and iodine – although minerals may be deficient depending on soil fertility. It's worth always including a mineral supplementation source in the diet to prevent any issues developing. **See the sheep mineral and trace element table for more information on specific minerals.**

SUPPLEMENTARY FEEDING TIPS

- Watch out for shy feeders and draft out if necessary.
- Do not starve animals before feeding grain or nuts.
- Introducing hoggets to grain or nuts helps train the flock for supplementary feeding.
- Hoggets need to grow and develop lambs, so feeding them during pregnancy can improve lamb survival and the survival of the ewe to a second lambing.

Mineral	Function	Symptom if deficient	Supplementation (check with a vet or supplier)	Comments
Calcium	Found in bones and teeth but also enables nerves and muscles to function.	Severe growth stunting, gross dental abnormalities.	Limestone and dicalcium phosphate in mineral blocks or compound feeds.	Excess calcium can reduce the uptake of Mg, P, Zn, Fe, Cu and possibly other elements.
Magnesium	In enzymes and nervous system (transmits nerve impulses) throughout the body.	Grass staggers within 4-6 weeks of lambing, can be precipitated by bad weather or stress.	Causmag (magnesium oxide) on pasture, magnesium fertilisation of pastures, compound feed and blocks.	Not stored so needed daily. Poor weather, very lush growth and K can reduce intake. Natural water sources often preclude trough treatment.
Sodium	Maintains fluid and ion balance in body.	Depraved appetite, continual bleating.	Salt in mineral supplements or rock salt.	Always provide salt with adequate drinking water. Heat stress increases demand.
Cobalt	Required for vitamin B12 production in rumen, which is important for energy and protein metabolism.	Poor growth rates, loss of appetite (pining), watery eye discharge, increased lamb death rates at lambing time.	Cobalt sulphate in fertiliser, bullets at weaning, injection of vitamin B12.	Cobalt levels in grass lowest in spring and summer. Soil contamination can give a misleading assessment of pasture cobalt levels.
Copper	Involved in many different enzyme systems, bone growth and development, immune system and fleece and skin pigmentation.	Swayback (enzootic ataxia) in lambs, poorer growth rates when molybdenum levels exceeds 3mg/kg DM.	Copper sulphate in fertiliser, copper oxide needles (bolus), injection during early to mid-pregnancy.	Sheep are very sensitive to copper toxicity. Drenching with copper is not recommended, as it is only effective for 2 to 3 weeks.
Iodine	Essential for thyroxin production, which controls metabolism and important for foetal development.	Enlarged thyroid in lambs, increased mortality after birth, particularly in cold weather. Low birth weight and hairless lambs. Decreased fecundity.	Iodised salt, injection of iodised oil or drenching with potassium iodide or iodate, normally 4 to 8 weeks before lambing.	Requirement increased in presence of goitrogens (kale and other brassicas) but iodine deficiency can occur in sheep grazing only pasture.
Selenium	Anti-oxidant system in all active body tissues and helps maintain integrity of the immune system.	Embryonic mortality 3 to 4 weeks after conception increases barren rate and decreases lambing percentage. Poor sperm motility. White muscle disease in lambs and poor growth rates.	Sodium selenate orally or barium selenate by injection, mineral supplements or as fertiliser.	Excess selenium is toxic, so avoid supplementing by several routes at the same time. About 30% of the pastures in New Zealand will not provide adequate selenium for grazing livestock.
Zinc	Needed in enzyme systems throughout the body and keratinous tissues.	Breaks in the wool, hoof and horn weakened, reduced feed intake and growth rates.	Zinc oxide in drench or bolus, zinc sulphate in mineral supplements.	Essential for the development and functioning of reproductive organs.

GENERAL SECTION

GENERAL SECTION

DISCLAIMER

All information is provided in good faith and without prejudice. This guide is not intended as a comprehensive, definitive compendium. Health and happiness should be the norm for birds and animals farmed according to the principles contained within this guide. If stock are not thriving, are unwell or have died unexpectedly, people without previous experience of farm livestock are advised to seek the advice of a veterinary surgeon or experienced professional, so that a solution can be found to minimise the chance of a reoccurrence. Wth livestock comes dead stock, even on the best run farms.

Existing small block owners planning a new enterprise or those looking to purchase a property are recommended to check local authority regulations with regards to what stock can be farmed, especially if planning a commercial pig or poultry unit, which may be a restricted activity above a certain activity level.

FIVE BASICS FOR ETHICAL ANIMAL PRODUCTION

When keeping animals, whether as pets or for production purposes, there are five non-negotiable rules that need to be followed at all times, in order to ensure animal welfare is upheld. The following set of rules were developed in response to a 1965 UK Government report on livestock husbandry and were formalised in about 1979 by the UK Farm Animal Welfare Council.

Freedom from hunger or thirst

Animals should always have access to fresh drinking water and have an adequate diet on offer in order to maintain full health and vigour. Monogastric animals (pigs and poultry) have very different nutritional requirements compared to ruminant animals (cattle, sheep, goat, deer) – so the species of animal must be considered and the diet on offer must meet specific animal requirements as closely as possible.

Freedom from discomfort

Animals should be provided with an appropriate environment, including shelter and a comfortable resting area. This differs species to species – some animals require more robust shelter than others. Animal facilities should be kept as clean as possible.

Freedom from pain, injury or disease

Diseases and health conditions should be prevented whenever possible, or rapid diagnosis and treatment of conditions should occur so the animal has to experience as little discomfort as possible if suffering from a health condition. Each species have their own set of commonly experienced health conditions, so it's worth looking into these, setting up appropriate prevention plans and involving vets when required. Livestock condition should be regularly checked to ensure they are fit and healthy.

Freedom to express (most) normal behaviour

Animals should be provided sufficient space, proper facilities and company of the animal's own kind. Some animals are more social than others and this needs to be taken into consideration.

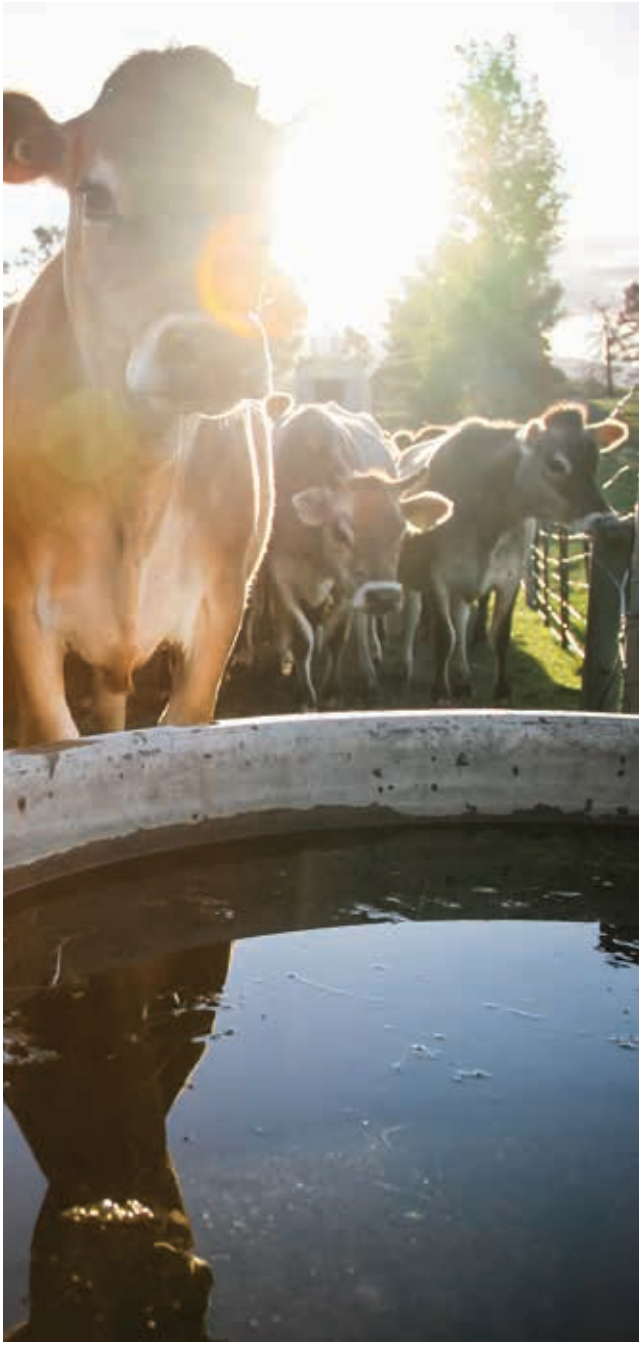
Freedom from fear and distress

Animal conditions and treatment towards animals should avoid mental suffering. Animals should be handled with care and respect at all times.

MANAGEMENT BY EXCEPTION

People who have an interest in livestock should not be deterred by the thought that animal numbers might grow as the productivity from their farm rises. Commercial farmers manage large groups of animals because they are good at spotting the small number of animals that need special attention at any time. As natural predators, we potentially all share the instinct of the wolf or lion to identify those animals that are sick, weak, lame or infirmed. Honing your ability to spot which of your animals is unusual – perhaps limping, standing alone, coughing, soiled back-end – allows you to tend to a larger number of animals in less time.

The MPI website is a great resource for information on the welfare standards required for keeping animals. Check out www.mpi.govt.nz/protection-and-response/animal-welfare for official codes of welfare for a vast array of animals.



Stock should always have ample access to clean water.

THE BASICS OF RUMINANT NUTRITION

Many livestock kept on farms are ruminant animals (apart from horses, pigs and poultry). Ruminants are a class of highly successful herbivores that have come to dominate the domesticated farmed animals of the world and include buffalo, cattle, deer, goats and sheep. They are superbly equipped to convert pasture into high value animal proteins in meat and milk and in some species wool and hair for spinning. A symbiotic relationship with microorganisms allows them to break down cellulose and generate nutrients that support life and production.

Ruminants must have evolved over an incredibly long period of time, because they are now equipped with very specialised anatomy and physiology, which allows them to make use of pasture species rich in structural fibre (including cellulose). Classed as foregut fermenters – unlike horses, which are hindgut fermenters – their stomach has developed into four distinct compartments to help foster a symbiotic relationship with microorganisms, which possess the ability to digest cellulose by fermentation, which mammals do not possess the enzyme to digest. Foregut fermentation gives ruminants the ability to regurgitate and re-chew feed, which increases the surface area exposed to the rumen microbes and increases the addition of sodium bicarbonate in saliva, which helps lift rumen pH – beneficial for fibre digesting bacteria. Amazingly the rumen of a mature cow contains 15-20 billion microorganisms – considering the population of humans in the world is 7 billion at the time of writing this, the population of microorganisms in the rumen is very impressive in comparison.

ANATOMY OF THE RUMINANT

Ruminants have four stomach compartments.

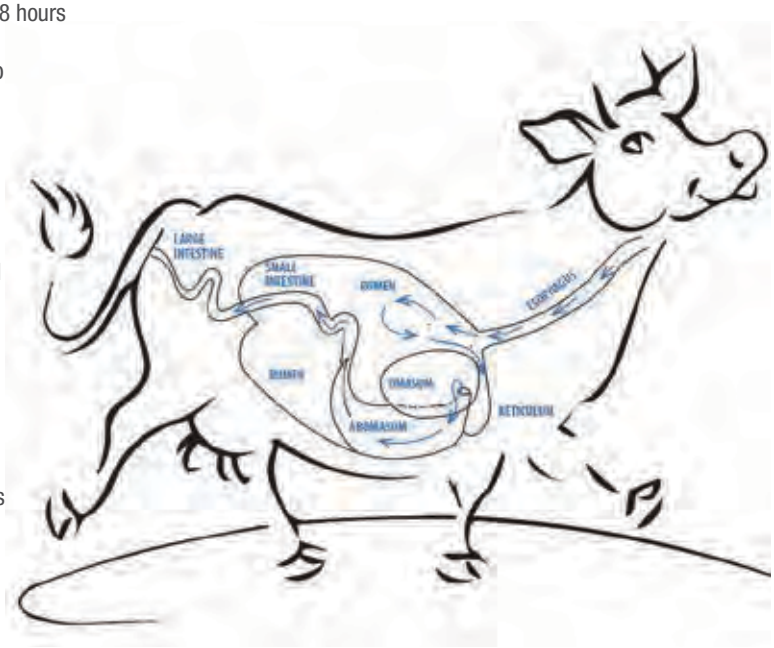
Rumen	The largest and most important stomach compartment. The rumen is where the feeds that are consumed are fermented by rumen microorganisms. It is a huge compartment that can be up to 200 litres in dairy cows. Absorption of nutrients also occurs here – the rumen wall is covered in finger like projections called villi, which increase the surface area to aid in absorption of nutrients.
Reticulum	Important for feed particle size sorting and propulsion of long feed particles into the mouth for rumination. The rumen and reticulum are sometimes referred to as the reticulorumen, as rumen digesta is constantly moving between them.
Omasum	Water and electrolytes are absorbed here through sheets that resemble the leaves of a book.
Abomasum	The 'true' stomach, with a lower pH than the rumen and acts similar to a monogastric's stomach. Material in the abomasum cannot be regurgitated and like the human stomach has a powerful sterilisation effect on the material leaving the omasum, which is very rich in bacteria.

The rumen of the newborn calf is small and undeveloped, grain based calf feed can help stimulate rumen development and the early transition to a forage based diet.

PHYSIOLOGY OF THE RUMINANT

Ruminants share a symbiotic relationship with the microorganisms that reside in their rumen, which includes bacteria, protozoa and fungi. The host animal provides the microorganisms an environment that favours their growth and reproduction because it is warm, dark, moist, anaerobic and around a pH of 6. Ruminants graze for up to 8 hours per day and ruminate for up to another 8 hours per day. In return for providing the microorganisms the perfect place to live, the microorganisms digest feed such as cellulose and hemi-cellulose, creating by-products that are absorbable by the host animal, including volatile fatty acids (acetate, propionate and butyrate). The microorganisms also provide the host animal with a protein source by incorporating amino acids and non-protein-nitrogen (which can be high in young leafy pasture) into their own body protein (referred to as microbial protein). As microorganisms can contain up to 70% protein when they are washed through the lower parts of the digestive tract, they provide the majority of the protein required by the animal. The microorganisms also synthesise vitamins B, K and H (biotin), which the host animal cannot synthesise and may be deficient in feeds.

During the fermentation process the rumen microorganisms produce methane, which must be belched out. If it becomes trapped in the rumen it can cause bloat, which can be deadly. The fermentation process also generates heat – higher fibre feeds generate more heat, which can be beneficial when dry cows are being wintered outside but can add to heat stress during hot weather. Rapidly fermented carbohydrates can drop the rumen pH too much and too quickly, creating acidosis that can reduce feed efficiency and in acute cases can be life threatening.



Cattle do not chew their feed when first consumed as much as sheep do.

Rather than feeding the ruminant directly, farmers must consider that primarily they are feeding the billions of microbes that reside in the rumen, from which the animal then derives it nutrients. Unless ruminants are just being fed to maintain their current liveweight, they should be fed to appetite. Other than when feed is not available to be consumed, cell wall digestion is the most limiting nutritional factor for ruminants, because cell walls determine dry matter intake and the energy available to the animal per kg consumed. As grass matures and especially as it moves from a vegetative to reproductive phase and puts up a seed head, cell wall content rises and digestibility falls, so high producing, pasture-based systems are dependent on presenting young leafy grass or low fibre forage crops to animals. Only when the rumen microorganisms are provided with the environment and nutrients they need to thrive and reproduce will the rumen be functioning optimally. As pasture forms the base of most ruminant livestock production in New Zealand, profitable and sustainable supplementary feeding requires the identification – and ideally the supply – of the limiting factor, whilst trying not to supply nutrients that are already over-supplied. The rumen microbes take time to adapt to changes in the diet, so to minimise risk and increase efficiency it is important to transition ruminants onto new feeds slowly whenever possible.

Pasture can be analysed and the nutritive requirements of different classes of stock have now been well defined. In practice however, herbage analyses can be relatively expensive and out of date by the time they are received and knowing how much dry matter stock are consuming is very difficult to determine in a grazing situation. A less technical approach based on keeping an eye on the condition of stock, how full they look and the consistency of their dung is recommended. Ruminant stock have billions of years of evolution behind them, so they are pretty well equipped to deal with many of the vagaries of temperate pasture.

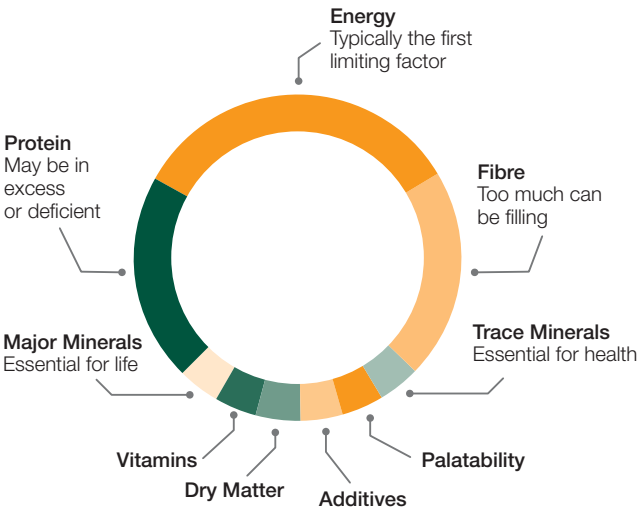
Given the bulky nature of their feed, dry matter intake is a key determinant of production. The first prerequisite to maximise production at a herd or individual level is to ensure ruminants are full. Where animals are not fed enough to meet their needs, e.g. a late spring, summer drought or just general overstocking, milk production or growth rates can be increased by the feeding of supplements. High fibre feeds are safe in that they will not cause a rapid drop in rumen pH after consumption but they are limiting because fibre limits both dry matter intake and the net energy recovered from each kg consumed. Grains have advantages over high fibre straights for production and fertility because they ferment faster in the rumen and can increase dry matter intakes. Protein can be considered as the accelerator that drives milk production and growth – if over-supplied when energy is limiting it can accentuate weight loss. Major minerals can affect both milk production and animal health to the extent that death can result quite rapidly from a mineral imbalance or deficiency. The effects of trace minerals are more subtle and are associated more with reproduction and high cell count issues than sudden death.

Cattle use their long tongue to grasp foliage.

Break fencing helps with pasture management and reduces selection.

RESPONSE TO SUPPLEMENTARY FEEDING

Supplements will be most effective when they supply the most limiting factor or factors and may be ineffective or even detrimental if they add to the supply of a nutrient that is already in excess. The typical limiting factors that might be considered when rationing cows are detailed in the diagram below.



Even when well fed, cattle will enjoy good, clean hay.

PASTURE AND FORAGE CROPS

Keeping some paddocks large helps with contractors' equipment and gives horses a chance to hoon around.

Pasture and forage crops can be an economical source of feed for livestock and can be high quality if managed correctly. There are many different pasture and forage species available. Perennial and annual grasses are the most popular – white and red clover is often also included in the pasture mix, as they improve soil fertility and pasture quality. Herbs such as chicory and plantain can also be grown and then of course there are the more specialist forage crops such as maize, kale and fodder beet. For more extensive information on pasture and crop species available in New Zealand and their best use, pick up a copy of the Farmlands 'Seed Buyer's Guide'.

Pasture quality and quantity will vary over the year due to environmental conditions such as soil temperature, rainfall, sunshine hours and soil fertility. The most common mix of pasture includes 70% ryegrass and 30% clover but different mixes suit different farms and it's worth consulting an expert for their advice. Pasture is a good feed for animals such as cattle, sheep, goats, deer and horses, however it is often not a perfectly balanced feed and other feeds need to be included in the diet to create a more suitable diet. Supplementary feed becomes even more important in times of pasture deficit or poor pasture quality. Different pasture heights suit different species of animals due to different grazing behaviours – for sheep, maintaining a sward height of 4cm will ensure grass quality is at its highest, whereas for cattle 6-8cm is considered ideal.

Pasture is not the only forage cattle and sheep can graze. Forage brassica crops are grown widely, both as a supplement and as an alternative to pasture on many commercial farms and could be grown on a small scale by lifestyle farmers. Brassicas are important for their potential to produce high quality and high yields of forage that can be fed 'in situ' from early summer through to late winter and for their role as break crops during pasture renewal. They produce high quality feed in periods of pasture feed deficit. They are a valuable feed substitute, to avoid pasture-related health problems such as facial eczema and ryegrass staggers. Brassica break crops provide advantages for pasture renovation by reducing weeds, pests and diseases and creating better soil conditions and cleaner seed beds for establishing new pastures. Greenfeed maize has been popular in some regions and fodder beet lifters now give the option of growing and conserving fodder beet for feeding out by hand, outside of the typical strip grazing periods. Contractors are prepared to service relatively small areas, so crops like maize silage and fodder beet are no longer the choice of only large commercial farms.

PASTURE MANAGEMENT

Strip grazing is a good strategy to aid in pasture management as it allows more refined control over pasture intake.

Maintaining pasture quality is the most important goal of pasture management. Pasture can typically range from 8-12 MJ ME per kg of dry matter (a measure of energy content) decreasing in energy as it matures, and quality is dependent on many factors, both environmental and management. Pasture can also change in protein, fat and micronutrient content throughout the season. Pasture increases in fibrous material for rigidity and structure as pasture ages, which decreases the energy of the feed. Also, as plant material ages it begins to deteriorate and eventually decays. Pasture with high energy content is vital for good production results and if pasture quality is too low, not enough can be eaten to satisfy animal requirements. Pasture quality therefore sets a limit on animal production. Seasonal environmental changes can have a huge impact on pasture quality – for example, during summer reproductive growth in plant matter increases stem content and seed heads begin to develop, which lowers the nutritive value of the pasture.

For high animal performance, pasture is best grazed at the three-leaf stage, as the leaf's area to trap light is at its optimum. When the fourth-leaf emerges the first leaf dies and pasture quality begins to decline, as there is dead matter present. This highlights the need to graze pasture while it is still young for best results. On the flip side, repeatedly having low post grazing residuals can be a problem, depleting plant reserves and jeopardising the plant's future growth. Striking a balance between not grazing pasture too long or too short is the key but is not always easy. Shorter rotation lengths when pasture is growing fast and longer rotation lengths when plants are growing slower will help to keep on top of pasture when it's at its highest quality. Stocking rate is also important. If stocking is too low, animals will not be able to keep on top of pasture and there may be a decrease in quality as pasture utilisation declines. If stocking rate is too high, this could cause over-grazing of pastures.

Grazing management must cater for the present and future needs of both the pasture and the animals and it must be remembered that pasture is a live feed with a short shelf life. The main objective of pasture management is to maintain a balance between the rate at which pasture is growing and the rate at which it is consumed and is a successful compromise between the requirements of the pasture and requirements of stock grazing it.

Note: Some animals such as horses and alpacas do better on poorer quality pastures, so for these species maintaining high quality pasture may not be a top priority.

WHAT WILL YOUR PASTURE SUPPORT?

Young leafy grass will support higher levels of growth or milk production than more mature and fibrous grass. Clover has a delicate leaf structure and will tend to lift the digestibility of pasture and animal performance it can support.

Description	ME	Animal production possible
Leafy, actively growing	11-12	High weight gain or milk production
Late vegetative	10-11	Good weight gain or milk production
Early flowering	9.5 -10	Moderate weight gain, milk production likely to be compromised
Mid flowering, green and dead	9-9.5	Young stock performance limited by lack of energy and protein
Late flowering, in-head	8-9	Maintain dry stock
Dry grass and stalks	7-8	Supplementation required to maintain growth and performance of stock
Dry stalks	5-7	Weight loss of dry stock

Leafy, less mature pasture is higher in energy and protein compared to mature pasture.

SOIL FERTILITY

Just as you need to feed your livestock, you also have to feed your soil. Applying fertiliser is important for optimum pasture and crop growth. Nitrogen, magnesium, phosphorus, sulphur and potassium are the key nutrients to consider for optimum soil fertility as well as soil pH. It's worth doing annual soil tests to see where your soils sit and what fertilisers you may need to apply. Contact an expert for more information on soil fertility and personalised consultations. Agronomy experts at Farmlands can help you with this.

OTHER FEED OPTIONS

Often on a lifestyle block you will need to offer your stock feed other than pasture in order to balance the diet, particularly during times of pasture deficit, or if improved production is desired. Below is a brief guide to some different supplement options.

Hay

Hay can be made on-farm and stored for when it's needed, or purchased in. Hay tends to be made from mature forage, which is cut, dried and baled. Hay can be a good source of fibre for grazing animals and complements lush pasture well. Hay can also be good to have on-hand in feed deficit situations and is a very palatable feed.

As hay is very high in fibre, too much hay in the diet can limit dry matter intake along with energy and protein intake.

Silage

Silage is essentially pickled grass and making silage is a great way of preserving grass in times of surplus and transferring it into times of pasture deficit. The fodder in silage is preserved via controlled anaerobic fermentation – bacteria present in the pasture produce acids, which lower the pH of the silage to a level where spoilage organisms can no longer survive. Silage can tend to be higher in energy and protein and lower in fibre when compared to hay, as silage is made out of less mature forage, although silage can vary in maturity depending on what stage it was harvested at. Be wary of buying in poorly ensiled silage that has not been fermented well. Good silage should smell sweet, with no ammonia or putrid type smells. Baleage is a common term, which is simply wrapped silage.

Grain (barley, wheat, maize, oats)

Grain is defined as 'small, hard, dry seeds, harvested for human or animal consumption'. Grains are produced by plants when they go reproductive and produce a seed head, which becomes a place to store starch in the form of the grains. The grains are then harvested from the crop, removing the fibrous component from the crop. Grain can be purchased in smaller bags, or in bulk and offers a high starch, high energy feed source that can be fed out to most animals. Grain can be a useful energy source to increase the energy density of the diet and support productive animals – however it tends to be low in micronutrients and protein, so a formulated compound feed is often the better, more balanced choice. Grain is often available to buy in different forms other than whole, which can make the grain more digestible to animals (e.g. crushed, steam-flaked or in pelleted feeds).

Compound feed/pelleted feed

A good species specific option that is easily accessible and convenient. A vast range of pelleted feeds are available in your local Farmlands store, carefully formulated for each animal type. Pelleted feed contains micro minerals such as trace elements and vitamins, which are often not present in adequate enough levels to meet animal requirements in pasture alone (for pasture grazing species). Often pelleted feeds are grain based feed, so are high in energy and can help to increase the productivity of animals by increasing the energy density of the diet and balance out nutrient deficiencies of other components of the diet. Pelleted feeds can also be higher in fibre for animals that require a higher fibre diet, such as rabbits. Pelleted feeds are low wastage when fed out and offer a no hassle feed choice for lifestylers.

Molasses

A viscous liquid feed made from the by-product of the refining of sugarcane or sugar beets into sugar. A high sugar feed that is very palatable and appealing to animals. Is best used as a treat food for animals and if fed on a daily basis, only a small amount should be included in the diet.

Palm Kernel Expeller (PKE)

Palm kernel is a high fibre feed, made from the by-product of the palm oil industry and is brown and powdery in appearance. A simple, safe feed for ruminant animals in times of pasture shortages. Very low starch levels mean that PKE can be fed free access in troughs in the paddock, without the concern of gorging. Commonly available in bulk or bulk bags, which are not as practical for lifestyle farmers.

Other feeds options are also available to purchase or grow on your farm, including different varieties of forage crops and different concentrate feed options. Head to your local Farmlands store for more information on what feed options may be the best for you and your animals.

CARING FOR ANIMALS IN EXTREME WEATHER

You must look after your livestock's welfare during extreme hot or cold weather, floods or drought as part of your responsibilities for farm animals.

You must take reasonable steps (such as preparing food and water) to plan for your animals' welfare in extreme weather and it should be part of your yearly planning to prepare for extreme weather situations. You should check on your animals often during extreme weather events and take necessary action if needed. You may need to co-operate with neighbours if supplies run short or access is difficult and extreme weather events can be a good time to get to know your neighbours in the first place!

FLOODS

If you keep animals outdoors in an area where there's a flood risk you should make a plan to protect them, which includes where you'll bring the animals during a flood and how you'll transport them there. During and after a flood, sewage, manure and chemicals can pollute water and this could infect any animals that drink it. You should monitor your animals closely (especially young ones) and get advice from a vet if they drink flood water.

EXTREME COLD WEATHER AND SNOW EVENTS

In extreme cold weather you must provide feed and water regularly. Keep any drinking water troughs free of ice for animals kept outside and take water to animals regularly if any pipes or other water supplies are blocked. Some animal species are more sensitive to cold conditions and require more robust shelter and housing than others during cold weather. Wind chill must be taken into consideration and it's worth remembering that animals that are wet and cold are much worse off than animals that are just cold. During cold weather animals use up energy keeping warm (e.g. by shivering), so energy requirements increase. Younger animals will be more at risk than older animals.

In the case of a major snow event, stock may need to be moved to a stand-off or sacrifice area if they are not already on one. Ensure stock have enough space to lie down and ensure stock are fed. They will be very hungry if they have not been able to graze for some time due to snow cover and will eat whatever is put in front of them, so take great care when introducing different feeds. Grain-based compound feeds should be gradually introduced if they have not been fed previous to the snow event. Ensure stock have access to ample clean water.

CARING FOR YOUR ANIMALS IN HOT WEATHER

We all expect temperatures to increase in the summer months but it is the combination of increased temperature and humidity that can make for "sticky" summer days. Some species and breeds of livestock can tolerate higher temperatures and humidity than others, particularly when these have evolved in warmer climates.

Horses (like humans) have the ability to sweat, allowing for the removal of heat by evaporation and if not required to perform intense physical activity, can usually handle hot humid days quite well. In contrast, many other species such as cattle, pigs, chickens and rabbits have limited ability to sweat and make use of alternate strategies such as panting to keep cool. Provision of adequate shade and ventilation is essential for cattle, chickens and rabbits, while providing a wallow can help to keep pigs cool.

Here are some tips to help you keep your animals cool over the hot summer months.

- Plant (or maintain) trees to provide natural shade, or if this is not possible use a constructed shelter to help create shade.
- Ensure that there is enough shelter provided for all the animals in the herd or flock and that constructed shelters do not limit air flow, as a breeze can be useful in keeping animals cool. Providing adequate shade not only helps animals stay cool but helps prevent sunburn and possible damage to eyes.
- Consider the design and position of animal housing such as chicken sheds. Sheds should be shaded from the sun and have wide overhangs at the eves to prevent the sun shining directly into them. For optimum egg quality and to limit floor eggs, ensure that nest boxes are designed to prevent them trapping heat.
- Provide plenty of clean, fresh water regardless of the weather, making sure that water troughs or containers hold sufficient volumes of water and are easy to access. In hot weather cool water can help cool the animals and help them regulate body temperature, so keeping water as cool as possible is important. Avoid the use of black pipes above ground for distributing water or dark tanks for storing water, as these heat up very rapidly. Providing clean water will help encourage water intake, so be sure to clean water troughs regularly.
- Use a low fibre compound feed to support energy intakes and weight gain in high producing animals when feed intake is reduced due to high temperatures. Feeding a higher protein compound feed is also a good way to overcome reduced pasture quality during the drier summer months.
- Feed little and often to help encourage intake by keeping feed fresh. Clean the feeding area regularly to remove stale feed.
- Feed fibrous supplements later in the day when temperatures are dropping, as these feeds generate more heat during digestion than grain based feeds and can contribute to reduced intake.
- Reduce activity during the hottest part of the day, as increased levels of activity raise body temperature. Moving cattle during hot weather can increase their body temperature between 0.5 and 3.5°C. This causes stress and impacts on their ability to maintain normal function.

Green pasture soon disappears in the summer without irrigation.

KEEPING ANIMALS FED IN A DROUGHT

Development of reproductive growth in summer can decrease feed quality significantly, as the stemmy growth has a lower nutritive value than green leafy material (the green leaf of the plant has an ME of ~12, whereas the stemmy proportion has an ME of ~10). In addition to falling supply, pasture protein and essential vitamin levels fall, which can impact on stock health and performance. During a drought it is important to identify what the limiting factors of your system are in order to choose the supplement that will work best for your system.

Top tips for farming through a drought

- Regularly monitor both the farm and the wider situation based on the most accurate information.
- Have a plan in place with defined trigger points, to ensure key decisions are actioned by certain dates (trigger points can vary farm to farm and within areas).
- Review your plan weekly by monitoring rainfall, feed cover, supplement and production and monitoring animal condition. Get a third party to give their opinion if possible.
- Set up for the next season and ask for help if you need it.
- Take action early. Early decisions are often less costly.

WHAT TO TAKE INTO CONSIDERATION WHEN BUYING SUPPLEMENTARY FEED IN A DROUGHT

The quality of the supplement

Be cautious when purchasing baleage and silage – there may be a lot of high priced yet poor quality conserved forage for sale. Even if a poor quality supplement seems cheaper on face value, in the long run it may be more efficient to purchase a higher quality supplement.

The energy content of the supplement

Often high energy supplements such as grain-based feeds are more cost effective than lower energy supplements such as baleage. Baleage can be expensive and hard to source during a drought. It can also have an unknown degree of fermentation losses and varying quality, depending on harvesting. Not all energy is created equal – starch based feeds are used with greater efficiency for weight gain and milk protein production than high fibre feeds.

The protein content of the supplement

Protein in supplements may be important when pasture has been stressed and is low in protein, or if there is minimal pasture available. Consideration of the different protein requirements of stock when buying in supplement may be beneficial.

The ability you have to store the supplement.

Ensuring feed remains fresh and mould free is important. Some supplements store better than others, e.g. feed with higher moisture such as vegetable waste may mould over time, where pelleted feed low in moisture would store well.

The ability you have to feed out the supplement.

Think about the type of supplement and how it needs to be fed out in order to minimise animal health issues. More readily fermentable supplements such as grain based feed needs to be fed out in a way that limits how much individual animals can consume. Feeding pellets in a long line that allows all animals access can also be a good option for all animal classes. There are many novel ways of doing this, with a 'chute on a ute' being one. Care must be taken, as if a few dominant animals eat more than their fair share, acidosis could be an issue. Low acidosis risk feeds such as palm kernel and soya hulls can be fed out in troughs in the paddock with free access. Even then, adequate trough space and trough numbers need to be considered, so that all animals have a chance to consume the supplement.

Potential wastage of a supplement.

Feed that makes it to the farm but doesn't make it down an animal's throat is costly. When feeding on the ground, you need to ensure the feed is in a form that is easy for an animal to pick up and eat, with little feed left behind. When feeding crushed grain on the ground, wastage will be much more significant when compared to feeding a pelleted nut. Silage can be associated with high wastage, so in some situations a more concentrated feed associated with less wastage may be better bang for your buck.

WHAT ACTIONS SHOULD YOU TAKE ONCE THE DROUGHT HAS BROKEN?

The drought is considered broken only when there has been enough rain to take the soil to within about 15% of the field capacity (generally > 50mm of rain).

Things to do:

- Slow the rotation, to ensure grass builds up and plants develop root mass.
- Continue to feed supplements. Half the grass available is lost after rain because it is dead and decays quickly. Even if there is plenty of fresh feed available, it may be of a low dry matter content due to its rapid growth.
- Apply nitrogen several weeks after rain to promote pasture growth.
- Plan pasture restoration. Burnt off patches of pasture will be filled with hardy but low feed value grass and weeds. Do this strategically by assessing what paddocks are most in need of attention. Using the 50% rule may help – test the pasture by doing a minimum of 20 observations in front of where you place your right boot. Are there live grass tillers present at the front of the boot? If the answer is no in more than 50% of cases, the paddock definitely requires renovation.

Other things to consider:

- Ensure animals always have adequate access to water.
- Watch out for drought related animal issues, such as tooth wear from grazing short pasture and nitrate poisoning when stock are grazing crops that come away well after the drought.

PARASITES AND PREVENTATIVE MEDICINES AND VACCINES

Parasitic worms, which inhabit the gastrointestinal tract, can be very debilitating to ruminant animals which can be parasitised by up to 20 different species of gastrointestinal nematodes. Bacteria, protozoa and gastrointestinal parasites can be the hidden threat that can suddenly proliferate with devastating effects on animal health and productivity, sometimes to the point of death. The level of damage depends on the nematode species, numbers present and susceptibility of the host. Also, all grazing animals can be affected by liver fluke, although it is less pathogenic in cattle compared to sheep. Stock on lifestyle farms can be at particular risk if they are set-stocked on the same land for long periods. Dung patches can be a reservoir of parasites, back-fencing grazing can help to keep animals away from contaminated areas until parasite levels have fallen. Most parasitic worm species are host specific – cattle and horses do not share many of the same parasitic worms as sheep – so alternate grazing with different species may help to reduce worm burdens. Worms can be controlled using drenches and pour-on treatments but there is growing concern about drench resistance building. Using products at the correct rate and alternating the type of worm drench is recommended, to lessen the risk of resistance developing on a property.

Veterinary surgeons are well versed in the prevention and treatment of these debilitating challenges and can provide appropriate remedies for even the smallest of stock owners. Smaller populations and a variety of stock types may reduce the risks compared to large single species units and actions can be commensurate with the desire to minimise inputs but should be considered carefully, to safeguard the welfare of the animals and birds. Younger animals and birds are especially at risk to parasites (which older animals develop resistance to) and can succumb very quickly. Even animals that survive can be permanently debilitated, which encourages many people to adopt preventative strategies.

Anthelmintics to help control intestinal parasites are available in a form that is drenched down the animal's throat – animals can be reluctant to take these and a cattle crush with a head lock might be necessary. Some treatments can be simply poured onto the animal's back in a measured dose, so are easier to administer. The FEC (faecal egg count) can be determined by vets (and kits are available from Farmlands stores), which quantifies the internal parasite infestation so that drenching programmes can be adjusted as necessary, in relation to the extent of the problem. Worm burdens are heaviest in dung patches (which animals instinctively avoid) but when tightly stocked, back-grazing can help keep them away from high parasite levels until their numbers have been naturally depleted by the sun.

HOW MANY GRAZING ANIMALS CAN YOUR BLOCK SUPPORT?

The feed requirements of stock on an annual basis is dependent on how big they are – which determines how much energy they need for maintenance – and how productive they are in terms of growth or milk production, which increases demand. Terms vary around the world but in New Zealand Livestock Units (LSU), or Ewe Equivalents are based on a 55kg ewe rearing one lamb. It is a value assigned to stock that makes it easier to predict what will be required and allows benchmarking between farms. One LSU is assumed to require 520kg dry matter of feed per year. For each 5kg change in ewe liveweight or a 20% change in lambing percentage, the LSU changes by 0.1. Sale details for large farms and stations will often state how many LU the farm has been carrying. It is calculated on June 30th each year and reflects what the farm can support when pasture growth is at its lowest.

The amount of LSU you can carry on your block will depend on many things including soil, rainfall, soil fertility, temperatures, topography, pasture species, crop and animal management etc. The weather seems to be increasingly unpredictable and extreme weather can affect regions at a localised level – whilst some people are constantly preparing for Armageddon, it can be restrictive to farm for the worst case scenario rather than the average.

The small farmer can have more options than large scale farmers to respond in difficult times, by having a contingency plan that might include:

- Having stocks of hay or wrapped baleage.
- Defer grazing by building-up areas of standing hay in the summer or winter foggage (heavy cover of pasture), which can be rationed through periods of poor or zero growth.
- Sell prime and non-breeding stock before the feed shortage.
- Lease an additional block or pay for graziers to carry stock through – especially breeding stock if genetics are important to you.

Grazing animals can be set stocked or rotationally grazed. Rotational grazing either with individual paddocks or strip grazing behind electric fencing allows grazing allocation to be controlled. Controlled grazing helps to ration pasture intake over a period and allows time for grass to recover growth after grazing – repeated defoliation in quick succession will weaken plants and reduce their ability to regrow and harness more sunlight to produce dry matter for future consumption.

Livestock units of different classes of stock taken from a variety of sources – International figures are not directly comparable:

SHEEP

	Weight at mating (kg) (lambs weaned)	Livestock Units
Ewe	45	0.85
Ewe	55	1.00
Ewe	65	1.25

BEEF CATTLE

	Weight Breeding (kg)	Calves Weaned	Livestock Units
Cow	340-400	68%	3.70
Cow	400	83%	4.40
Cow	450	88%	5.30
Cow	500	90%	6.30
Weaners	135-270	—	3.50
Heifers, steers, bulls	200-400	Slow growing	3.70
Heifers, steers, bulls	200-465	Rapid growing	4.60
Heifers, steers, bulls	350-500	Rapid growing	4.70
Heifers, steers, bulls	600		6.00

DAIRY CATTLE

	Weight (kg)	Fat yield (kg)	Milksolids	Livestock Units
Cow	350	140	244	6.10
Cow	400	160	278	6.80
Cow	400	180	313	7.30
Cow	450	200	348	8.00
Jersey yearling	180-320	—	—	3.50
Friesian yearling	225-430	—	—	4.50
Jersey calf	25-180	—	—	2.00
Friesian calf	35-225	—	—	2.50

HORSES - ON PASTURE-ONLY DIET

	Livestock Units
Pony in light work or turned out	6
Pony broodmare and foal	8
Small hack in light work (up to 15.2 hands)	8
Small hack broodmare and foal	10
Large hack in light work (500-600kg)	12
Yearling thoroughbreds	12
Large hack broodmare and foal	14

Goats are classed as 2 LSU but no production indication was given.

Commercial North Island hard hill country farms, with steep hill country or low fertility soils, are typically carrying 6 to 10 stock units per hectare, while some stock are finished and a significant proportion are sold in store condition. High fertility soils on easier North Island hill country can support between 7 and 13 stock units per hectare. South Island hill country commercial farms can carry between 2 and 7 stock units per hectare, with three quarters of the stock units wintered being sheep and one quarter beef cattle. Finishing-breeding farms dominate in the South Island, with carrying capacity from 6 to 11 LSU per hectare on dryland farms and more than 12 LSU per hectare on irrigated units. South Island intensive finishing farms are mainly found in Southland and South and West Otago and can carry 10 to 14 stock units per hectare.

HOMEKILL

One of the benefits of growing and finishing livestock is putting meat in the freezer and on the dinner table. A listed homekill slaughterer will come to the owner's premises and slaughter stock on-site. If also a butcher, they may offer a variety of services with respect to preparing the meat, from cutting into joints or steaks through to processing into sausages or patties and disposing of the unwanted parts, such as the offal and hide.

Animals are not transported or separated for a long period from their familiar surroundings, often being killed in a totally relaxed state, which is considered to have benefits in terms of animal welfare and the eating quality of the meat produced.

Homekill meat is for the owner's own consumption, including direct family or household and employed farm workers but cannot be sold or served to paying customers e.g, at B&Bs. It is illegal to select an animal from a farmer and immediately have it slaughtered before taking the meat away but you can buy an animal and have it sent to a registered abattoir for killing without owning it for 28 days prior to slaughter.

NAIT

The National Animal Identification and Tracing (NAIT) regulations apply to anyone in charge of cattle or deer. People who are in charge of animals must register their property, tag animals and record and confirm animal movements. The NAIT scheme aims to help reduce the spread of bovine tuberculosis. If you are planning on keeping deer or cattle on your property, make it a priority to look into the NAIT programme in New Zealand to ensure your obligations as a deer/cattle owner are met.

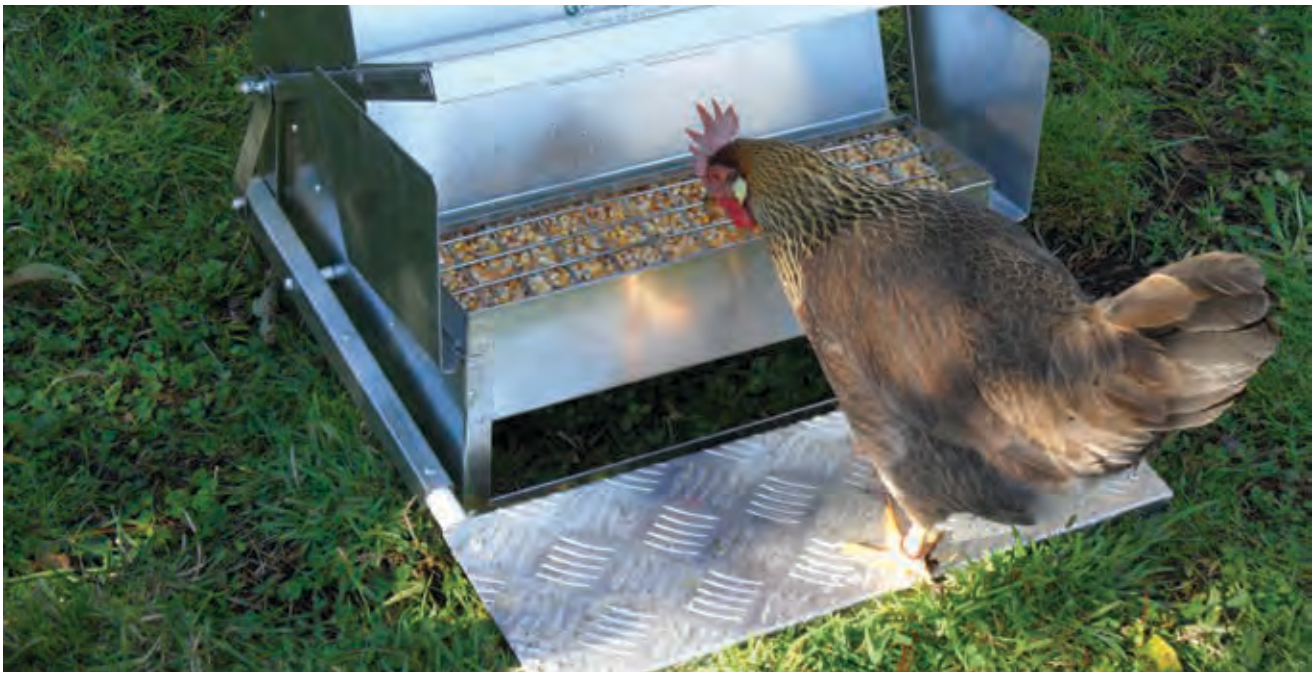
BOVINE TUBERCULOSIS (TB)

As mentioned in the 'NAIT' section, there is a scheme in place in New Zealand to reduce cases of Bovine Tuberculosis (TB), an infectious disease caused by the bacterium Mycobacterium bovis. It is one of the world's most serious animal health problems and, in many parts of the developing world, still a major killer. In New Zealand, cattle and deer are the species most at risk of contracting the disease. TBfree New Zealand is a nationwide programme of livestock testing and pest control that exists to eliminate the disease. If you are a deer or cattle owner, even if on a lifestyle block, you must comply with TBfree New Zealand's regulations by tagging all deer and cattle on your property with NAIT approved tags and by making sure that you complete animal status declaration forms if any of your animals leave the property.

For more information, visit www.tbfree.org.nz

HYGIENE AND DISEASE PREVENTION

Disinfectants that are widely used in commercial practice such as Virkon®S can also have a place on lifestyle farms wishing to limit the ingress and spread of diseases, which can affect both livestock and farmers. Housing for young animals such as calves, which can be particularly vulnerable, or continuously housed animals such as poultry and dog kennels can benefit in particular from regular disinfection. Farmers with particularly sensitive stock like high health status pigs or young calves might rely on foot dips at the entrances to their property, which can help to limit spread from contaminated units and help safeguard the health status of a farm. Including a disinfectant when cleaning out horse floats after a trip away may help to keep some diseases at bay. Many farms are serviced by a reticulated drinking water system, which may harbour viral and bacterial contamination, especially in header tanks where dust and debris can accumulate. Disinfection can help clean the system and eliminate viruses, bacteria and fungal growth. Some products can be misted in the presence of livestock or poultry to help control organisms that can build up through a season. Users are urged to read the instruction and capability of the product they are intending to use.



Grandpa Feeders are a good way to keep chicken feed as fresh as possible and avoid wild birds contaminating it.

STORING AND FEEDING OUT FEEDS

Purchased in feed can be an important component of a lifestyle farming system, whether it is to fill a feed deficit during a feed pinch with the use of high feeds such as palm kernel or silage, to optimise the production of stock, which cannot be achieved on pasture alone using carefully formulated compound feeds or simply for the satisfaction of seeing your animals happy and well fed.

Storage

Correctly storing supplementary feed helps to ensure that the quality of feed purchased is retained right up until the point of consumption by your animals, thereby ensuring palatability is optimal and nutritional value at its prime. Moulding of feed can be a common issue if feed is not stored correctly. Mouldy feed can adversely affect the production and health of animals and the digestibility of feed can be decreased by up to 5% for ruminants. Moulds produce mycotoxins as their own form of self-defence. Mycotoxins can have serious detrimental effects on animals, with immunosuppression, damage to vital organs and reproductive issues some of the effects. Mouldy feeds are also less appealing to animals, which can limit daily dry matter intake. If the animals smell musty feed they will try and avoid it and what might smell ok to us may smell differently to an animal. Moulds grow best in moist and warm conditions, so it is important to keep feed stored away from possible moisture contamination and in as cool conditions as possible. The higher the moisture content of feed, the more susceptible it will be to mould growth. Pelleted feed for example is generally 86-88% dry matter, leaving little opportunity for biological survival if stored correctly, while feeds higher in moisture content with a dry matter below 84% will more readily accommodate biological growth and will deteriorate faster over time. Keeping feed in airtight containers or in silos, along with keeping mould at bay, can also help to preserve the feed's nutritional value by preventing oxidation of fats and also the deterioration of nutrients that may occur on exposure to UV light.

Contamination by vermin and other pests such as birds is another common issue experienced on-farm. These aggravating pests love your stock feed as much as your own animals do. However, they are possible routes of entry for diseases such as salmonella and leptospirosis so they can be both an animal and human health risk. Pests also consume your feed in the process of introducing diseases, often eating a lot more than you might think. In fact, a rat can eat 10% of its body weight in a day and a colony of just 100 rats can consume a tonne of grain in a year. Pests can also decrease the palatability of feed due to contamination – astonishingly rodents can spoil up to 10 times the amount of feed they actually eat due to urination and droppings, which can quickly put stock off eating feed. Vermin can chew through feed bags easily, so it's best to keep feed in rodent proof containers such as plastic drums with snug fitting lids. Birds can also be a problem when storing feeds outside, introducing salmonella to feed via droppings. Visit your local Farmlands store for a selection of feed storage options to keep your feeds fresh and free of spoilage organisms.

Feeding out

Whatever supplementary feeds you decide to use, it's important to get the most out of it by avoiding excessive losses at the point of feeding out. Some feeds are particularly prone to high losses if not managed correctly, while others have higher utilisation rates by animals and little is left behind in troughs and paddocks. Silage can have wastage of up to 20% when fed out in paddocks, possibly even higher during inclement weather. This wastage on feeding out is on top of the inevitable fermentation losses occurring in the stack as a consequence of the preservation process, which can be anywhere between 3-8%, without taking into account factors such as effluent leakage from the stack and surface wastage. Palm kernel fed in trailers can have 10-20% wastage, climbing to 30% wastage when fed directly onto paddocks. Compound feed has relatively low wastage of below 5% when fed in troughs. Even when fed on the ground, by opting for a larger pellet size of 10-12mm users report very little feed is left behind by animals or trampled into the ground.

There are several options available that can help to lower losses at feeding out and there are many novel feeding systems out there that can help to make your life easier when it comes to feeding your stock. For example, poultry 'Grandpa Feeders' are a great choice, as they allow chickens to get access to feed via lifting a lid, which closes when they are not feeding in order to protect the feed from spoilage. Visit your local Farmlands store for a range of feed out options.

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