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Full hand feeding of beef cattle – management

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Introduction

When there is not enough pasture for livestock maintenance, or further grazing of pastures may be detrimental to pasture management or survival, the animals' nutritional requirements must be met by full hand feeding. When initiating a full feeding program, it is necessary to plan well before starting to feed.

Feed in a confined area

All stock in a full feeding situation should be confined to a small area or a small paddock for the following reasons.

- The extent of pasture and soil degradation will be limited.
- A close eye can be kept on stock for assessing their health.
- Stock do not have to expend energy walking around the paddock looking for food or water, reducing the amount of feed required.

Choose an area where the pasture can be regenerated without any inconvenience after the drought breaks and any soil erosion will be minimised.

Weeds

Weeds introduced in drought feed can become an ongoing liability for a farm. The following strategies will facilitate weed management:

- Try to find out about the source of grain or fodder so that potential problems can be anticipated.
- Restrict the area over which imported grain or fodder is fed out and keep a record of the area.
- After the drought breaks, observe the area periodically for the next few years. Note any new weed species and have them identified.
- Contamination of fodder and grain with herbicide-resistant weed seeds, mainly annual ryegrass, is the quickest means of introducing herbicide resistant weeds onto farms. Good farm hygiene and the controlled feeding of introduced fodder and grains are the best avoidance procedures.

Parasites

Parasite burdens can be greater when stock have lower resistance because of poor nutrition and when they are concentrated in small areas. Bulls are highly susceptible to ostertagia (small brown worm) infestations.

Do not overlook the need to treat for fluke in areas at risk from this parasite. Treat all stock for lice and worms.

Vaccinations

A 5-in-1 (or 7-in-1) vaccination given to all stock (including bulls) before grain feeding provides cheap insurance against losses from clostridial diseases.

Vitamin A, D, E injection (intramuscular) is essential for all classes of cattle.

Stock management

Heifers

If you decide not to sell maiden heifers, they are best withheld from joining. If joined then you must feed them to ensure they will develop adequately before calving.

Cows

Pregnancy-test all cows that have been joined and sell any that are not in calf. Cows that are in calf need close supervision.

Problems may develop during calving because drought conditions lead to a higher proportion of calving difficulties and retained afterbirths. Metabolic disorders (such as milk fever) are also more likely to occur. Cows will do better if fed separately from their calves. They need less feed and feed quality is less important.

Calves

It may be better to dispose of calves shortly after birth, particularly those from first and second-calvers. Those you keep should be weaned at as young an age as possible – see the later sections ‘Weaning management’ and ‘Calf feeding management’.

Dehorning

Ideally, stock should have been dehorned as part of normal management. In a drought, polled or dehorned cattle are less aggressive at the feed trough, so less troughing is required.

If beasts have not been dehorned by the start of the drought, they are better left alone than being subjected to the extra stress of dehorning.

Water

Beware of cattle bogging in dams, soaks and waterholes. Fence off these areas and provide water in troughs. The inflow to the trough is as important as trough capacity. Under drought conditions cattle will drink about 10 L of water per 100 kg of bodyweight per day, and more in hot weather. Cattle water intake doubles when the daily temperatures increase from 21°C to 32°C.

When water becomes a problem, sell stock to reduce the need to cart water.

Preparing for full feeding

Where necessary, draft stock into management groups based on weight and body condition. Stock are best confined to small paddocks close to feed supplies so that they can be better supervised and managed.

Grain feeding

Starting cattle on grain

Take care when introducing cattle to grain and pelleted diets as there is a risk of grain poisoning. The high starch content of most grains can cause grain poisoning. Lupin is the exception because it is low in starch.

Good security of grain stores and standing crops is essential in order to prevent accidental poisoning. If you intend to turn stock onto stubble, it may be a wise precaution to feed some grain beforehand, so that the rumen bacterial population becomes adapted to grain.

When stock are fed grain or any feed that has a high carbohydrate content, the feed must be introduced gradually so that the animal’s rumen has time to adapt to the increasing levels. There should also be a minimum of 10–20% roughage in any ration.

During the introductory phase to grain feeding, animals should be closely monitored. Diarrhoea is often the first sign of mild grain poisoning, and if this is seen in a number of animals, the proportion of hay in the ration should be further increased.

Some grains, for example lupins, are safer to feed than others. Similarly, it is safer to feed oats, which have a higher ratio of fibre to starch than does wheat.

When changing between different types, or even batches, of grains, and especially when changing between batches of pellets, the new feed should be introduced by ‘shandying’ it with the old and gradually increasing the proportion of the new feed over about 7 days.

Paddock situation

A typical introductory regime to grain feeding in a paddock situation for cattle is given in Table 1.

Complete grain and roughage ration

When animals are introduced to a high-grain diet, they should be started on a ration consisting primarily of hay, with the percentage of grain being gradually increased over 2–3 weeks.

A typical introductory regime for introducing sheep or cattle to a complete diet of grain and roughage is given in Table 2.

Including lupins in the ration

Alternatively, lupins may be used to introduce sheep or cattle to a complete ration with high levels of grain. The high fibre content and low starch levels in lupins make them extremely safe to feed to ruminants without the risk of acidosis. **The lupins must be fed whole or cracked, but not ground, as grinding will increase the risk of grain poisoning.** The high protein and energy levels in lupins also make them an ideal feed for inclusion in any ration. A typical introduction to a feedlot ration using lupins is given in Table 3.

Table 1. A typical introductory regime for increasing grain content in the rations of cattle in a paddock feeding situation

Day	Amount of hay	Cereal grain (kg/hd/day) for cattle
1–2	To requirements, then grain	1
3–4	Decrease hay fed	1.5
Day 5 onwards	Decrease hay fed	Increase by 500 g/day – until required feeding level is reached

Table 2. A typical introductory regime for increasing grain content in a complete ration for cattle

Day	% in ration	
	Cereal grain	Hay
1–5	20	80
6–10	40	60
11–15	60	40
16–20	70	30
Final ration	80	20

Table 3. A typical introductory regime for increasing grain content using lupins in a complete ration for cattle

Day	% in ration		
	Lupins	Cereal grain	Hay
1–5	80	0	20
6–10	60	20	20
11–15	40	40	20
16–20	20	60	20
Final ration	0	80	20

Frequency of feeding

When cattle are on full drought grain rations, it is safest to feed daily. If you can feed only two or three times a week because labour is scarce or needed elsewhere, be alert to the increased risk of grain poisoning.

Where possible, feed at a regular time of the day to reduce digestive upsets.

Digestibility of grains

Grains are more digestible if coarsely crushed, but the benefits of crushing the grain are questionable when drought feeding for survival as more digestive upsets occur due to gorging.

Most grains give satisfactory results if fed whole. Some whole grain will pass through in the dung, but the proportion lost will decrease the longer cattle are being fed whole grain. Grain that is processed too finely may cause digestive upsets and surges in intake.

Digestive losses will vary, depending on a number of factors, including the amount and type of grain fed and the length of time animals have been on that feed. The amount passed through by cattle eating whole grain compared with crushed grain varies from about 5% in oats up to about 25% in sorghum.

Addition of calcium

Grains are low in calcium, so feed finely ground limestone with the grain at the rate of 1.5 kg limestone per 100 kg grain. This will avoid the poor bone and teeth development that are the long-term effects of calcium deficiency.

Changing grains

Changing from one type of grain to another (e.g. from oats to wheat) increases the risk of grain poisoning and deaths. The approach here is to introduce the new grain slowly by mixing it with the original grain and, over 7–10 days, gradually increasing the proportion until the substitution is complete.

Depraved appetite

Bark chewing, hair licking and dung eating can occur when cattle are on grain survival rations. These habits are no real problem. However, bone chewing is more serious, and calcium-based supplements should be given to reduce this behaviour and avoid deaths from botulism.

Lactating cows

Cows have low milk yields on all-grain diets and calves suffer accordingly. To help calves survive, feed lactating cows 1–2 kg of hay or straw/stubble in addition to grain.

Shy feeders

About 10–15% of stock will not settle down to grain feeding. Such shy feeders are best removed from the mob and should either be fed diets containing some roughage or be sold.

Weaning management

Calves are the most difficult stock to feed in a drought. There is no point in feeding them for survival; they need a ration that allows them to grow. Calves need more protein than do older stock, thus adding to costs. They also take longer to finish.

If you decide to wean and feed calves, the guidelines below will help. See also Primefact 322 *Feeding calves in drought.*

Calves over 5 months

Wean and feed calves aged over 5 months according to the table in Primefact 295 *Full hand feeding of beef cattle – quantities*

Backward calves, and heifers intended for future breeding, will benefit from adding 75–100 g per head per day of a high-protein feed (such as a meal or legume grain) to normal rations.

Calves 2–5 months

Calves 2–5 months will wean satisfactorily as long as they are fed a balanced diet. Calf pellets available commercially are suitable, or one of the following feed mixes:

- **Mix 1:** 100 kg lucerne chaff with 100 kg crushed grain.
- **Mix 2:** 100 kg crushed grain, 15 kg protein meal and 10 kg roughage (optional: add 1 kg urea).

A ration of 1.5–2 kg per head per day is adequate for maintenance, but 2–2.5 kg per head per day is preferable as it will ensure some growth.

Treat these calves against coccidiosis.

Calves under 2 months

Leave calves under 2 months with the cows. They should be weaned only if the survival of the cow is at stake. If calves must be weaned earlier, feed them a milk replacer to minimise losses. Milk replacers are best fed in liquid form or as the manufacturer recommends. Observe strict hygiene to prevent scouring.

Calf feeding management

Provide fresh, clean water, preferably in troughs, at all times. Provide shelter from cold winds.

Inject the calves with one million international units of vitamin A at weaning, and thereafter at 3-monthly intervals.

Draft off strong calves and feed them away from weak ones. Remove sick and scouring calves from the group, and treat them immediately.

Treat calves regularly for lice and internal parasites.

Troughing

If possible, put grain in a trough to prevent wastage. Troughing does not need to be elaborate. Many cheap, temporary methods are satisfactory, for example:

- bush timber or railway sleepers placed on the ground 30 cm apart, along a fence line;
- 200-litre drums split down the middle;
- tractor tyres cut in half with a chainsaw.

Provide sufficient length of trough so that all stock can eat together. Allow 30 cm of trough length per head for weaners, 45 cm for yearlings and 60 cm for adult stock. To reduce bullying, several troughs spread apart are better than one long trough.

Where no troughing is available, place the grain in dumps of about 20 kg each, rather than trailing as for sheep. Dumps are not as efficient as troughs; a wastage of 6–8% can be expected, and there is a higher risk of sand impaction.

The best buy in feeds

Energy requirements for maintenance

Energy is needed by animals for all body functions. Energy is measured in megajoules (MJ). Animal requirements are assessed as megajoules of metabolisable energy (MJ.ME). Energy in feed is assessed as megajoules of metabolisable energy per kilogram of dry matter (MJ.ME/kg feed dry matter or simply M/D).

Table 4 gives a suggested method of comparing value for money in different types of feeds that may

be available for drought feeding. Read downwards to compare relative costs; figures in the same vertical column represent matching cost per unit of energy.

Table 4 is best used to work out value for money when purchasing your main feed source. The energy value is expressed on a weight basis and all cost calculations must be done on weight, not volume.

When calculating the cost of a feeding program, it is important to cost the feed in terms of units of energy provided, because feed that has the lowest price per tonne may not be the cheapest source of energy. To use Table 4, select a feed from the right-hand column (e.g. wheat). Then select the price per tonne you can buy it for (e.g. $140). Look down that column to see how much you must pay for other feeds and compare on a 'cost per unit of energy' basis. For example, if barley is more than $129 per tonne, then wheat at $140 is a better buy. The cost per unit of energy is the same where wheat is $140, barley $129, medium quality oats $118, and so on.

Remember to consider:

- wastage levels and the practicalities of handling and feeding out;
- the amount of hay needed for cold weather, for lactating stock, when introducing full grain rations, and for shy feeders;
- suitability of the feed – low-energy feeds (ME 7 or lower) may not be suitable for feeding to young stock over a prolonged period;
- grains fed whole are lower in feed value than the same grains cracked or rolled;
- supplements may be needed with some types of feed – this could mean the addition of extra protein or minerals such as limestone, salt, urea.

For assistance in calculating relative feed costs, see:

- the Feed Cost Calculator at www.dpi.nsw.gov.au/reader/4439, and.
- Primefact 356 *Feed cost calculator instructions*

This online tool can be used to select the best mix of feed for your situation.

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Table 4. Feed price equivalents for drought feeding, based on energy values of feed

ME* (MJ/kg DM)	$ per tonne									Examples of feeds
13	100	140	180	220	260	300	340	380	420	Maize, wheat, triticale, sorghum, lupins, peas.
12	92	129	166	203	240	277	314	351	388	Barley, good quality oats.
11	85	118	152	186	220	254	288	322	355	Medium quality oats, most nuts.
10	77	108	138	169	200	231	262	292	323	Poor quality oats, good legume hay.
9	69	97	125	152	180	208	235	263	291	Good pasture and cereal hay.
8	62	86	111	135	160	185	209	234	258	Medium quality hays.
7	54	75	97	118	140	162	183	205	226	Poor quality hay.
6	46	65	83	102	120	138	157	175	194	Stubbles, cottonseed hulls.
5	38	54	69	85	100	115	131	146	162	Rice hulls, sunflower hulls, rice straw.

* This is the energy value of feed (ME = metabolisable energy; MJ/kg DM= megajoules per kilogram of dry matter). Most grains and hays contain about 10% moisture, a component which has no feed value. When buying feeds with a higher moisture content than this, for example molasses, silage or turnips, try to ensure that the price is discounted to relate to dry matter content only.