CHAPTER 6

Feeding cattle

This chapter discusses the energy and protein needs of different classes of cattle and examples of feed budgets to assist in determining feed requirements.

Key Messages

- **A feed budget will help determine the amount of supplementary feed required.**
- **Feed budgets are best completed using the energy requirements of stock and the energy content of feeds, then converted back to kilograms of dry matter consumed.**
- **Completing feed budgets using kilograms of dry matter estimates for cattle intakes can lead to large errors due to highly variable energy contents of feed, particularly grasses – 1 kgDM grass in spring could have an energy value of 11 MJ ME/kgDM, whereas in summer 1 kgDM grass could have a value of 6 MJ ME/kgDM.**
- **Even if the energy of the diet is adequate, the desired level of production (maintenance, growth, etc) will not be achieved if there is not enough protein.**
- **Cattle have an upper limit to appetite that is influenced by the fibre level of the feed being offered.**

Nutritional requirements of beef cattle

Beef cattle production can be affected by a whole range of dietary mineral and vitamin deficiencies (or excesses), but by far the most important nutritional limitations are energy and/or protein.

It is important to know the approximate weight of each animal and the level of production (e.g. growth rate or stage of reproduction) that is expected for, say, a 300 kg steer to grow at 0.5 kg/day or a mature, dry cow that is seven months pregnant.

Explanation of the terms used in the following tables

Liveweight, growth rate

To precisely plan feeding management, you need to have some idea of liveweights and expected growth rates of cattle. This can only be achieved by weighing cattle.

Maximum intake

Cattle have an upper limit to their appetite. This can be defined either in terms of a percentage of their liveweight or as a weight of feed. One of the most common issues in a drought is that animals are physically not able to consume enough supplement to meet a required level of nutrition each day. Intake is influenced by the fibre level of the feed being consumed, the higher the fibre levels in the feed, the less the animal is able to consume. See Tables 6.1-6.4 for approximate maximum intake for different rations.

Metabolisable energy (ME) requirement

The ME value of a foodstuff is the amount of energy a ruminant animal (sheep or cattle) is able to use, per kilogram that it consumes. The units of ME are megajoules (MJ) per kilogram of dry matter (DM) of the particular foodstuff.

The ME requirement of an animal can be accurately estimated, as long as its weight and level of production (for example growth rate or stage of reproduction) are specified.

Minimum ME concentration of diet

The minimum ME concentration of the diet is calculated from the relevant values for maximum daily dry matter intake and metabolisable energy requirement.

To achieve the stated level of production, it is necessary to ensure that the cattle have access to a diet that has an energy level at least as high as the minimum value shown in the sixth column in Tables 6.1-6.4.

As an example of how these values could be used, a 300 kg steer requires a diet with a minimum of 10 MJ ME to grow at 1 kg/day. This is possible on young, growing green pasture (energy value of 11 MJ ME), but not on mature, dry pasture (energy value of 7 MJ ME). See Tables 5.1, 5.2 and 11.2 for the value of different feeds.

Crude protein percentage of dietary dry matter

Tables 6.1-6.4 show that the protein requirements of cattle vary according to the weight and type of animal, as well as the expected level of production.

Even when the ME concentration of the diet is adequate, if the protein percentage is inadequate, the desired level of production will not be achieved.

If protein is the limiting nutrient in a diet, cattle may not be able to eat enough to satisfy their maintenance requirements. In some situations, non-protein nitrogen (NPN) supplements, such as urea, can significantly stimulate appetite. See later in the chapter for further information on urea.

When pasture dries off, there can be plenty of dry-standing feed of low quality. Feeding animals NPN stimulates rumen microbes and increases feed intake, so cattle consume more dry feed than they otherwise would.

Animals can be fed a NPN source such as urea in the form of blocks, licks or urea fortified molasses. However, adequate dry-standing feed or fodder must be available or these supplements will simply be an extremely expensive source of energy.

Energy and protein requirements of various classes of cattle

Table 6.1: Steers and heifers (after weaning) (see Table 10.1 for early weaned, lighter calves).

Liveweight (kg)	Growth rate (kg/day)	Maximum daily dry matter (DM) intake		Metabolisable energy (ME) requirement (MJ ME/day)	Minimum ME concentration of diet (MJ ME/kgDM)	Crude protein % of dietary dry matter
		% of liveweight	(kg)			
150	0	2.9	4.3	22	5.2*	8
	0.5			37	8.7	12
	1			48	11.2	13
200	0	2.8	5.5	26	4.8*	8
	0.5			44	8.0	11
	1			57	10.4	13
300	0	2.5	7.6	35	4.6*	8
	0.5			56	7.4	10
	1			73.5	9.7	13
400	0	2.4	9.4	45	4.8*	8
	0.5			72	7.6	10
	1			94.5	10	13
500	0	2.1	10.7	55	5.1*	7
	0.5			82.5	7.7	10
	1			110	10.2	12

** Cattle on these diets may not eat to full appetite because of the very poor quality (low ME values) of these particular diets.*

Table 6.2: Cows dry, pregnant mature.*

Liveweight (kg)	Growth rate (kg/day)	Maximum daily dry matter (DM) intake		Metabolisable energy (ME) requirement (MJ ME/day)	Minimum ME concentration of diet (MJ ME/kgDM)	Crude protein % of dietary dry matter
		% of liveweight	(kg)			
350	0	2.4	8.5	49-85	5.7-10	6
400	0	2.3	9.4	54-90	5.7-9.6	6
450	0	2.2	10.1	59-95	5.8-9.4	6
500	0	2.1	10.7	64-100	5.9-9.3	6
550	0	2.0	11.2	69-105	6.2-9.4	6

** Range of values for cows that are 6 months pregnant to point of calving, assuming a 40 kg calf birthweight. When determining the energy requirement for your cows, if the cows are 6 months pregnant, use the lower figure in the column for MJ ME/kgDM. If cows are at the point of calving, use the upper range for energy requirements.*

Table 6.3: Cows with suckling calves 1-4 months old, assuming eventual calf weaning weight of 250 kg.

Liveweight (kg)	Growth rate (kg/day)	Maximum daily dry matter (DM) intake		Metabolisable energy (ME) requirement (MJ ME/day)	Minimum ME concentration of diet (MJ ME/kgDM)	Crude protein % of dietary dry matter
		% of liveweight	(kg)			
350*	0	2.4	8.5	90-117	10.6	10
	0.5			114-141	13.4	11
400*	0	2.3	9.4	95-122	10.1	10
	0.5			122-149	12.9	11
450	0	2.2	10.1	100-127	9.9	10
500	0	2.1	10.7	105-132	9.8	10
550	0	2.0	11.2	110-137	9.8	10

** Young cows at these weights need to put on some weight after calving (for example, 0.5kg/day) because they have not yet reached their adult weight and therefore need better feed than older cows. Note: When determining the cow/calf unit energy requirements, use the lower figure in the energy column if the calf is 1 month old. Use the higher figure in the energy column if the calf is 4 months old.*

Table 6.4: Bulls.

Liveweight (kg)	Growth rate (kg/day)	Maximum daily dry matter (DM) intake		Metabolisable energy (ME) requirement (MJ ME/day)	Minimum ME concentration of diet (MJ ME/kgDM)	Crude protein % of dietary dry matter
		% of liveweight	(kg)			
400	1	2.4	9.4	94	10	13
500	0.5	2.1	10.7	88	8.2	11
	1			115	10.7	12
600	0	2.0	11.7	65	5.5	10
	0.5			97	8.3	11
	1			130	11.1	12
800	0	1.8	14.4	85	5.9	10
	0.5			127	8.8	10

See Appendix II for calculations and equations used to derive the figures in Tables 6.1-6.4.

Note: These tables are a guide only. With natural variation between cattle, responses to feed levels will differ. It is important to monitor stock condition regularly and adjust the diet accordingly. If stock are losing condition, increase the energy on offer. Check they can eat enough of the diet on offer to satisfy their maintenance needs.

Table 6.5: Quantities for full hand feeding (kg/hd/day) for common classes of stock.

	Growth Rate kg/day	Metabolisable energy (ME) requirement MJ ME/day	Hay	Grain:Hay 50:50		Grain:Hay 70:30		Hay:Grain 70:30		Grass Silage
			kg hay	kg grain	kg hay	kg grain	kg hay	kg hay	kg grain	kg silage
Adult Dry Stock (450 kg)	Nil	59	8.2	3.3	3.3	4.3	1.9	5	2.1	12.6
Pregnant cow point of calving (450 kg)	Nil	95	13.2*	5.3	5.3	6.7	3.1	7.9	3.5	20.3
Pregnant heifer point of calving (400 kg)	0.5	106	14.7*	5.9	5.9	7.6*	3.4*	8.8	3.9	22.7*
Lactating cow (450 kg) plus calf (4 months)	Nil	127	17.6*#	7.1	7.1	9.1*	4*	10.6	4.6	27.2*#
Lactating heifer (400 kg) plus calf (4 months)	0.5	149	20.5*	8.3	8.3	10.7*	4.6*	12.3	5.5	31.8*#
Weaner steer/heifer (250 kg)	0	30	4.2	1.7	1.7	2.2	0.9	2.5	1.1	6.5
	0.5	51	7.1#	2.8	2.8	3.7	1.6	4.3	1.9	10.9#
	1	66	9.2*#	3.7#	3.7#	4.4#	1.8#	5.6*#	2.4*#	14.2#
Yearling steer/heifer (350 kg)	0	40	5.5	2.2	2.2	2.9	1.2	3.4	1.4	8.6
	0.5	64	8.9#	3.5	3.5	4.6	2	5.5	2.3	13.7#
	1	84	11.7*#	4.7#	4.7#	6.1#	2.6#	7.1*#	3*#	18#

The figures in this table are 'as fed' rather than on a dry matter basis.

Assumptions: Grain 12 MJ ME/kgDM, 90% DM; Hay 8.5 MJ ME/kgDM, 85% DM; Grass silage 10.4 MJ ME/kgDM, 45% DM. Heifers are assumed to be growing at 0.5 kg/day giving birth to a 30 kg calf

 # These rations will not meet the protein requirements to achieve the stated level of performance.

** Stock may not be able to physically consume this much feed in a day.*

Using the figures – feed budgeting

Feed budgets help manage risk and allow more accurate planning of the feed resources. They allow for a better estimation of the supplementary feed required and allow a comparison of feed costs. They are an essential tool for helping make good decisions in regards to feeding cattle.

The following pages contain two worked examples of feed budgets. There are blank versions in the appendix section of this book. The first, a tactical feed budget, is best used if there is still some pasture available for the cattle to consume. The second, Pearson's Square, is good for calculating a balanced diet where no pasture is available.

Tactical feed budget for use when some pasture is available

The tactical feed budget can also be used throughout the season to help respond to changes in pasture growth conditions and changes in feed demand.

The information needed to complete the tactical feed budget and where you can source it is:

- Number and class of cattle.
- Cattle liveweight – use the average liveweight the animals will be during the budget period. For mature cows, you wouldn't expect a change in weight over the budget period, but for young stock, you may. If you expected them to grow from 300 kg to 350 kg over the budget period, use the liveweight of 325 kg.
- Current Feed On Offer (FOO) – measured in kilograms of dry matter per hectare (kg DM/ha). For information on assessing FOO, see Chapter 3.
- Estimate of the quality of the pasture they have access to – young, green pasture in the growing season usually has an energy value of 10 MJ ME/kgDM. During late spring with seed heads visible, the pasture may have an energy value of 9 MJ ME/kgDM. During early summer, as the pasture starts to dry off, the pasture may have an energy value of 8 MJ ME/kgDM and in mid-late summer if pastures are completely dry, the energy value could be as low as 6 MJ ME/kgDM.
- Grazing area in the rotation – expressed in hectares.
- Time frame of the budget, in days – it can be as short as one month or as long as four months.
- Required performance of the cattle – is it just maintenance (0 kg/day growth) or are you looking at achieving a growth rate in young stock of 0.5 or 1 kg/day?
- Energy requirement of the stock you are including in the budget based on their liveweight and their expected performance. Energy requirements can be found on the previous pages in Tables 6.1, 6.2, 6.3 and 6.4.
- Minimum pasture cover – expressed as kg DM/ha. This is the feed level you don't want the cattle to graze below. Generally in drought conditions, 1,000 kg DM/ha is recommended for cattle. During dry, but not drought periods, 1,200 kg DM/ha is recommended to help protect the grass plants from damage. In normal pasture growth situations, it is recommended that cattle don't graze below 1,400 kg DM/ha for young growing stock to ensure good animal growth rates.
- Estimated growth rates of pasture for the budget period, expressed as kg DM/ha/day – it is better to underestimate pasture growth rates than over estimate. Annual pastures will generally have a zero growth rate over summer. Perennial pastures are influenced by summer rainfall events, so their growth rates may be 0-10 kg DM/ha.
  The website www.pasturesfromspace.csiro.au allows a more accurate prediction of growth rates for your own region:
  - on the website, click on the icon for "Eastern Australia PGR data"
  - click Accept for the disclaimer of liability
  - either register as a first time user or click icon for PGR data returning user
  - click on Chart Shire PGRs for 20xx (select most current year)
  - find your shire in the list – you can click on the state at the top to narrow the search
  - if you click on the name of the shire, it will graph all growth rates for all the years it has data for, which is great for seeing the variability across the years
  - if you click in the small box to the left of the shire name, and click Graph Shires, it will return a bar graph for the year you selected, with weekly averaged growth rates for that shire; if you hover your mouse over an individual bar in the graph, it will display the actual reading.

A blank copy of the tactical feed budget can be found in Appendix III.

TACTICAL FEED BUDGET				
Scenario:	200 (300 kg liveweight start weight) steers, want to grow at 0.5 kg/day. 80 cow/calf units (cow 500 kg liveweight, calves start age 3 months) on 200 ha , and what impact would grazing to 1,000 kg DM/ha have compared to grazing to 1,200 kg DM/ha			
Step 1 – Where are we now?				
No. of animals **(a)**	Liveweight (kg)	Current FOO (kg DM/ha) **(b)**	Pasture quality (MJ ME/kgDM) **(c)**	Grazing Area (ha) **(d)**
200 steers 80 cow/calves	325 500	1,400	8	200

Step 2 – Where do we want to get to?			
Time frame (days) **(e)**	Required liveweight gain (kg/day)		Energy Requirement (MJ ME/day) **(f)**
90	Steers 0.5 Cow/calf units 0		Steers 60 Cow/calf units 132
Animal feed requirement (kgDM/day) **(g)** g = f ÷c	Herd pasture intake (kgDM/day) **(h)** h = a x g		Total timeframe pasture intake (kgDM) **(i)** i = h x e
Steers 60 ÷ 8 = 7.5 c/c units 132 ÷ 8 = 16.5*	= 200 x 7.5 = 1,500 = 80 x 16.5 = 1,320	= 1,500 + 1,320 = 2,820	= 2,820 x 90 = 253,800

Step 3 – How do we get there?				
Future Growth				
Month	Days in month **(j)**	Pasture Growth rate (kg DM/ha/day)**(k)**	Area (ha) **(l)**	Total grown/month (kgDM) = j x k x l
January	31	5	200	= 31 x 5 x 200 = 31,000
February	28	5	200	= 28 x 5 x 200 = 28,000
March	31	10	200	= 31 x 10 x 200 = 62,000
			Total Growth **(m)**	121,000

Minimum pasture cover (kg DM/ha) **(n)**	Provision from current pasture (kgDM) **(o)** **o = (b – n) x d**
at 1,200 residual or 1,000 residual	@1,200 = (1,400 – 1,200) x 200 = 40,000 or @1,000 = (1,400 – 1,000) x 200 = 80,000
Provision from current pasture (kgDM) **(o)**	@1,200 = 40,000 @1,000 = 80,000
Provision from future growth (kgDM) **(m)**	121,000
Total pasture intake (kgDM) **(i)**	253,800
FEED BALANCE (kgDM) = (o + m)– i	@1,200 (40,000 + 121,000) – 253,800 = **– 92,800 (deficit) (92.8 tDM)**^ @1,000 (80,000 + 121,000) – 253,800 = **– 52,800 (deficit) (52.8 tDM)**^
Step 4 – Options for achieving feed balance	

** A quick check using Table 6.2 shows the cow/calf unit requirement of 16.5 kgDM pasture is in excess of maximum daily dry matter intake. Without supplementation, the cow will lose weight and may stop producing milk. The cow/calf units will need to be supplemented with a feed that has a higher energy value than the pasture, that is a supplementary feed with an energy value greater than 8 MJ ME/kgDM*

^ The deficit is the tonnage of feed short at the equivalent energy value of the pasture (8 MJ ME/kgDM). If purchasing supplementary feed of a higher energy value, this needs to be taken into consideration. See following form to convert pasture deficit into supplementary feed requirement.

Converting pasture deficit into supplementary feed requirement

Following on from the tactical feed budget, the option of grazing the pastures down to 1,000 kg DM/ha is selected in this case, resulting in an apparent deficit of 52,800 kgDM. It has been decided that pellets will be purchased to fill this feed gap. The pellets have an energy value of 12 MJ ME/kgDM and have a dry matter of 90%. How much pellet needs to be purchased?

Determine total energy shortage				
Energy in pasture* MJ ME/kgDM **(c)**	x	Feed Balance Deficit kgDM	=	Total energy shortage MJ ME
8		52,800		422,400
Determine kgDM of supplement required				
Total energy shortage MJ ME	÷	Energy value of supplement MJ ME/kgDM	=	Supplement required kgDM
422,400		12		35,200
Determine 'as bought' amount of supplement				
Supplement required kgDM	÷	Dry Matter % of supplement (expressed as a decimal)	=	'As Bought' supplement required kg
35,200		0.9		39,111

** This figure comes from box (c) on the Tactical Feed Budget*

So, if purchasing pellets that are 12 MJ ME/kgDM and 90% dry matter, 39.11 tonnes would be required to fill the deficit calculated on the tactical feed budget.

Pearson's Square – for use when no pasture is available

It is important to consider both the energy and protein levels of the feed on offer to stock. Buying in feed that doesn't meet the needs of the cattle or feeding at the wrong levels can quickly become a costly mistake.

A method called Pearson's Square allows two supplements being fed to be balanced in the diet in terms of both energy and protein.

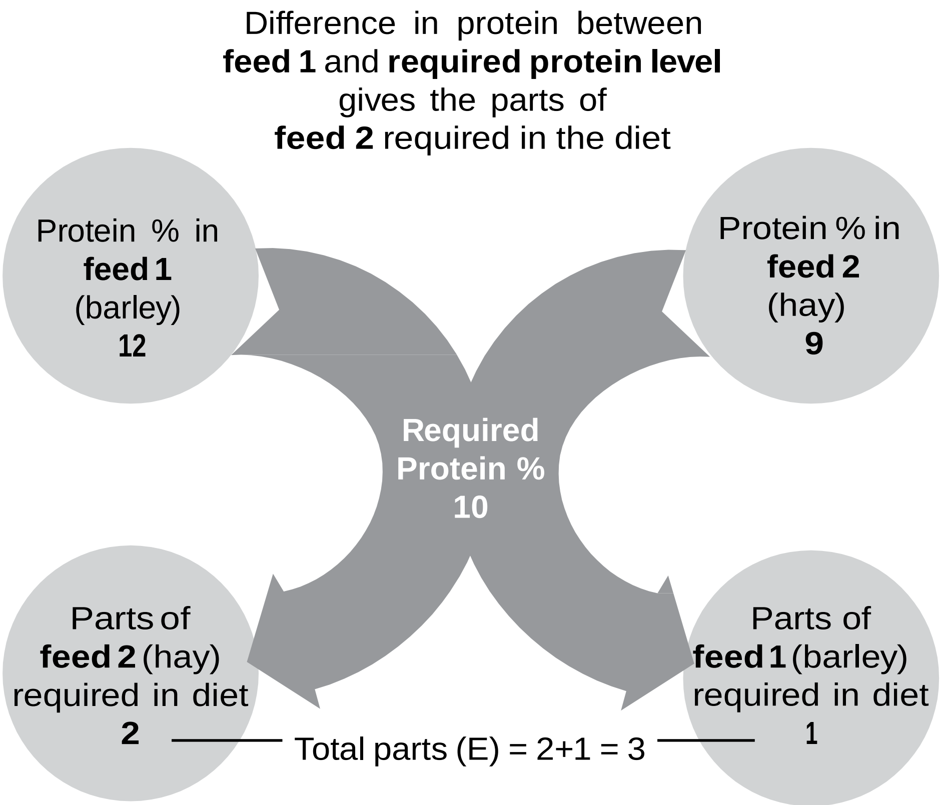
Pearson's Square – Balancing the diet for energy and protein

Example: 500 kg cows with 1-month-old calves at foot.

From Table 6.3, we can see that these cow/calf units require 105 MJ ME/day in energy and 10% crude protein and can eat a maximum 10.7 kgDM in a day.

The following feed is available:

Feed 1	Barley	13 MJ ME/kgDM	12% Crude Protein	85% dry matter
Feed 2	Hay	9 MJ ME/kgDM	9% Crude Protein	85% dry matter



Proportion (%) of **feed 1** (barley) in diet = (173) x 100 = 33% or 0.33
Proportion (%) of **feed 2** (hay) in diet = (273) x 100 = 67% or 0.67

Amount of energy needed from feed 1 (barley)				
Proportion of barley in diet	x	Animal requirements MJ ME/day	=	Amount of energy needed from barley MJ ME/day
0.33		105		35 MJ ME/day
kgDM required of feed 1 (barley)				
Amount of energy needed from barley MJ ME/day	÷	Energy value of feed 1 (barley) MJ ME/kgDM	=	Amount required of feed 1 (barley) kgDM
35		13		2.7
Amount of feed required on an as fed basis (barley)				
Amount required of feed 1 (barley) kgDM	÷	Dry matter of feed 1 (barley) (expressed as a decimal, i.e. 90% = 0.9)	=	Kg as fed per head per day of feed 1 (barley)
2.7		0.9		3.0

Amount of energy needed from feed 2 (hay)				
Proportion of hay in diet	x	Animal requirements MJ ME/day	=	Amount of energy needed from hay MJ ME/day
0.67		105		70 MJ ME/day
kgDM required of feed 2 (hay)				
Amount of energy needed from hay MJ ME/day	÷	Energy value of feed 2 (hay) MJ ME/kgDM	=	Amount required of feed 2 (hay) kgDM
70		9		7.8
Amount of feed required on an as fed basis (hay)				
Amount required of feed 2 (hay) kgDM	÷	Dry matter of feed 2 (hay) (expressed as a decimal, i.e. 85% = 0.85)	=	Kg as fed per head per day of feed 2 (hay)
7.8		0.85		9.2

Each cow calf unit requires 3.0 kg barley as fed (2.7 kgDM) and 9.2 kg hay as fed (7.8 kgDM) to meet the energy requirements of 105 MJ ME/head/day and to supply the required protein level.

It is important to check if the calculated diet can be consumed by the cow-calf unit. In this case, the cow-calf unit can consume 10.7 kgDM and the formulated diet will be providing 10.5 kgDM (2.7 kgDM from the barley and 7.8 kgDM from the hay).

This diet is balanced for protein and energy and will allow the cow to maintain body condition and the calf to grow.

Note: With natural variation between cattle, responses to feed levels will differ. It is important to monitor stock condition regularly and adjust the diet accordingly. If stock are losing condition, increase the energy on offer. Check they can eat enough of the diet on offer to satisfy their requirements.

See Appendix IV for a blank Pearson's Square worksheet.

Other considerations

Minerals

When animals are removed from pasture and rely solely on a drought ration, mineral supplementation may be required. Calcium (agricultural lime) and sodium (salt) are the most commonly required mineral supplements.

Calcium

Diets that have high grain percentages (greater than 50%) are generally calcium deficient.

To prevent calcium deficiency, add ground agricultural limestone to cereal grain at a ratio of 2 parts limestone per 100 parts grain (2%). If roughage represents 50% or more of the diet, calcium is generally not required.

Sodium

Diets that contain high grain percentages may require sodium (salt) to be added to the ration to prevent a sodium deficiency.

Add 1 parts of salt to 100 parts grain (1%).

If stock water contains high levels of salt then additional supplementation may not be required.

Buffers

As a precaution against grain poisoning (acidosis), buffers such as sodium bentonite or sodium bicarbonate can be mixed with the grain. Sodium bentonite or sodium bicarbonate should be mixed at a ratio of 2 parts of powder per 100 parts of grain (2% or 2 kg per 100kg grain). After the first 30 days of grain feeding, the amount of buffer can be reduced to 1% (see Chapter 7).

Vitamins

Vitamins A and E are the most common vitamin deficiencies that develop when there is no green feed. A single intramuscular injection of A, D and E will protect against both deficiencies.

Vitamin A

Cattle that have not had access to green pasture, green coloured hay or yellow maize for an extended period (3 months) will be deficient in Vitamin A. Cattle will develop a Vitamin A deficiency in a shorter time off green feed than sheep. An injection of A, D and E will correct a deficiency for around 3 months.

Vitamin E

The amount of Vitamin E in grain, hay and straw can vary significantly. A deficiency may develop in some drought rations. An injection of Vitamins A, D and E will correct any deficiency.

Improving the feed value of low-quality feeds

Treating straw with urea to improve the protein level of the diet

Straw can be a cheap and available source of roughage (fibre) during a drought, however, it is a poor quality feed for ruminants. Being very high in fibre, low in energy and very low in protein, makes straw slow to digest. Cattle physically can't eat enough to satisfy even their maintenance energy requirements.

Treating straw with urea can lift the feed value of the straw and, when fed in conjunction with low quantities of grain or pellets, can provide a low-cost maintenance diet for cattle.

Treating straw with urea provides the microbes in the rumen with a protein source resulting in improved rates of digestion of the straw.

As the straw is digested more rapidly, appetite is increased, allowing the animal to consume a volume of feed that more closely meets their needs.

As with any new feed, animals will take 3-7 days to adjust to eating the urea-treated straw, which will smell different to untreated straw.

Feed analysis results have shown that treating straw with urea can increase protein levels by 2-14%. However, the straw's metabolisable energy value is not improved. To provide the extra energy required it is important to continue a low level of grain feeding.

Figure 6.1: Urea-treated straw being fed out in hay racks.

How to treat the straw

Treated straw is obtained by the addition of 5% weight to weight (w/w) of urea plus 80-85% w/w water.

To treat 1 tonne of straw, dissolve 50 kg of urea fertiliser in 800-850 litres of water. The solution should be mixed in a large container, such as a drum or an old water tank and sprayed onto the straw using a pressure pump and hose.

A big square bale weighing 400 kg will need 20 kg of urea dissolved in 320-340 litres of water.

After spraying, it is critical that the treated straw is contained in a reasonably airtight condition (e.g. covered in polythene or old bunker tarpaulin) to facilitate the chemical reaction. The straw should be kept covered for 7-10 days in the summer months or 2-3 weeks in winter after treatment.

Figure 6.2: Urea-treated straw covered with tarp for 7-10 days in summer.

The urea on treated straw is non-toxic. Urea is only toxic to animals if they drink the urea solution or consume a mouthful of urea granules.

When urea is diluted with water at the rates recommended and sprayed over straw in the method described here, the risks are eliminated.

Urea poisoning can occur with malfunctioning of liquid urea feeders or with homemade urea blocks. After rain or heavy dew, the blocks may become soft and stock are able to eat them too quickly and consume too much.

Molasses as an energy source

Molasses has a good level of energy (11 MJ ME) but is very low in protein. It can be added to the urea-water mixes and sprayed on poor quality straw to improve both palatability and protein levels when straw is the main component of a diet.

When molasses is added in quantities, up to 12% of total DM, the sugars in the molasses assist with the digestion of fibre.

In feedlot rations, it is added at levels up to 12-14%. This level of molasses increases the palatability, binds fine dust particles and assists with rumen function.

The energy value of cane molasses decreases rapidly when it is added at levels above 30% of the total ration. Too much molasses causes digestive upsets and reduces animal performance.

Another use for molasses is as a carrier for feeding urea. Urea-molasses products come in block or liquid form and can be bought or homemade.

The nitrogen in urea assists animals to digest very fibrous feeds, such as standing dry paddock feed.

The sugars in the molasses can also assist in this digestion.

Economics of molasses feeding

Molasses can be an expensive form of energy. Animal performance would be higher and achieved more economically if grain or pellets were fed with poor quality roughage instead of molasses.