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Drought – buying feed at the right price

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Warning

Drought increases the risk of unacceptable residues in stock. Causes include contaminated feed, increased intake of contaminated soil, concentration of existing residues as animals lose condition, and many others. Refer to Primefact 312 *Drought increases residue risks* for details before purchasing stockfeed or making feeding decisions.

Introduction

The factor that most limits livestock performance during a drought is energy intake. Dry stock can be maintained on diets that have protein levels as low as 6%, provided the energy level of the feed is adequate.

The best feed to use is the feed that gives the best value for money. To determine this, we must calculate the cost of the feed per unit of nutrient provided. When full handfeeding for maintenance, we need to calculate the cost per unit of metabolisable energy (ME).

What does 'cheap' really mean?

When purchasing stock feed, the most obvious information affecting the decision to buy is 'dollars per tonne'. In actual fact, this figure is often misleading. To make sense of the price per tonne, we must take account of the moisture content of the feed, as well as its ME and protein concentration. The amount of moisture is accounted for by determining the dry matter percentage (DM%) of the feed, and ME concentration is expressed as megajoules per kilogram of dry matter (MJ/kg DM).

ME concentration is inversely proportional to the fibre content of the feed; for instance, a fibrous feed, such as poor-quality hay, has an ME value around 6.5 MJ/kg DM; whereas wheat, being low in fibre and high in starch, has an ME of approximately 13 MJ/kg DM.

Beware the so-called 'cheap alternative'!

We can use information on DM% and ME concentration to calculate the unit of cost of energy, and hence determine the true dollar value of a stock feed.

The following calculations show how to compare the cost-effectiveness of two typical feeds (in this case feed wheat and lucerne hay) as drought fodder:

Feed wheat

Cost per tonne = $200
DM = 90%
ME = 13 MJ/kg DM
First, determine the cost per kilogram of dry matter. We must multiply the cost per tonne by 10 and then divide by the dry matter percentage:
Cost per kg DM = $200 × 10 ÷ 90 = 22.2c/kg DM
Now, to determine the cost per energy unit we must divide the cost per kilogram of dry matter (determined above) by the energy concentration of the feed. Wheat has an average energy value of 13 MJ/kg. Therefore:
Energy cost = 22.2c/kg ÷ 13 MJ/kg = 1.7c/MJ

Lucerne hay

Cost per tonne = $300
DM = 90%
ME = 8.5 MJ/kg DM
Cost per kg DM = $300 × 10 ÷ 90 = 33.3c/kg DM
Lucerne hay has an average energy value of 8.5 MJ/kg. Therefore:
Energy cost = 33.3c/kg ÷ 8.5 MJ/kg = 3.9c/MJ

At these prices, lucerne hay is more than twice as expensive to feed as wheat, even though the cost per tonne is only 50% higher than wheat.

Many other feeds become available during drought, including many types of low-quality roughages, such as crop stubbles; for example, sorghum stubble is typically found as round bales weighing 250 kg and priced from $70 per bale. With an energy value of only 7 MJ/kg, this fodder is costing

around 4.4c/MJ and, although appearing to be good value, is in actual fact more expensive than lucerne hay.

An additional concern with some of these 'cheap' alternatives is that they are often so low in energy and protein that stock simply cannot eat enough to maintain their body weight; for example, soybean stubble provides only 5.5 MJ/kg DM, and could not provide a maintenance diet by itself. The sorghum stubble mentioned above, while being just adequate in provision of energy, is typically only around 3% crude protein, and so would also be inadequate as a complete feed.

While it is always best to calculate the energy cost of feed on the actual nutritive value of the sample for sale, this is not always possible. Table 4 in Primefact 339 *Full hand feeding of beef cattle – management* provides an alternative, where cost equivalence per tonne at different ME concentrations can be read simply from the table.

Buying feeds on a 'protein value' basis

Early in a drought, when there is an ample quantity of dry pasture available, a suitable feeding strategy may involve the feeding of a protein source, to balance the animals' diet and improve intake levels. This strategy is only suitable for dry stock, and will not be adequate for stock with higher demands (e.g. pregnancy, lactation or growth). To choose feeds in these circumstances, first determine the cost per kilogram of crude protein (CP) provided.

To determine protein costs, we first need to determine the cost per kilogram of dry matter as before, and then divide that value by the crude protein percentage (CP%) and multiply by 100. The following example shows the calculation for the cost of lupin protein – lupins are a popular choice as a protein-rich supplement.

Lupins

Cost per tonne = $450

DM = 90%

CP = 32%

Cost per kg DM = $450 × 10 ÷ 90 = 50c/kg DM

Lupins have an average crude protein percentage of 32%.

Therefore:

Protein cost = 50c/kg ÷ 32 ×100 = $1.56/kg CP

Another alternative often used to supplement crude protein is urea lick blocks. These supply a non-protein nitrogen source. A typical commercial 10% urea block with some additional mono ammonium phosphate (MAP) will supply the equivalent of around 40% CP.

Urea lick blocks

Cost per 20 kg block = $17

CP = 40%

Cost per kg = $17 ÷ 20 = 85c/kg

Therefore:

Protein cost = 85c/kg ÷ 40 × 100 = $2.12/kg CP

These calculations show that lupins are far cheaper than urea lick block in providing crude protein. Lupins also contain energy, which blocks do not provide.

There are many other possible alternatives to providing protein to stock. This method will determine the most cost-effective alternative.

Feed cost calculator

The feed cost calculator – www.dpi.nsw.gov.au/reader/choosing-feeds/dai201b – contains an interactive program that can be used to compare the values of feeds on an energy and crude protein basis. For instructions on its use, see Primefact 356 *Feed cost calculator – instructions*

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