# Fact sheet

North Coast Local Land Services

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# Understanding stock feed product labels

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## Introduction

There is an ever increasing range of stock feed supplements available to North Coast beef producers, from traditional feedlot meals and pellets, to loose licks, lick blocks, fortifiers and liquid supplements.

Identifying that cattle are in need of a supplement is often the easy part, deciding what product will offer the most economical response is often a lot harder when faced with a large range of options.

Knowing and understanding the key nutritional information to look for on the feed product label will ensure you choose the most economical option.

## Where is the nutritional information

Any manufactured stock feed product is required to provide a nutritional analysis.

Typically for products that can be handled manually the product labels are printed or attached to the back of the bag, carton, container or box.

For large bulk loads the nutritional analysis is available as its own document that can be handed or sent to you. It is recommended that you always ask for a copy if you are unsure.

Figure 1: Example stock feed product nutritional analysis

| | | | As Fed | Dry Matter |
|---|---|---|---|---|
| DRY MATTER | % | : | 60.00 | 100.00 |
| PROTEIN | % | MIN: | 23.50 | 39.00 |
| EQUIV. CP | % | MAX: | 22.00 | 36.50 |
| UREA | % | : | 6.00 | 10.00 |
| CALCIUM | % | MIN: | 1.20 | 2.00 |
| PHOSPHORUS | % | MIN: | 0.80 | 1.30 |
| SULPHUR | % | MIN: | 0.60 | 1.00 |
| SALT | % | : | 11.00 | 18.00 |
| VITAMIN A | iu/kg | : | 67,000.00 | 111,500.00 |
| VITAMIN D3 | iu/kg | : | 8,000.00 | 13,300.00 |
| VITAMIN E | mg/kg | : | 250.00 | 416.60 |
| IRON | mg/kg | : | 100.00 | 166.50 |
| IODINE | mg/kg | : | 5.00 | 8.30 |
| COBALT | mg/kg | : | 5.00 | 8.30 |
| COPPER | mg/kg | : | 30.00 | 50.00 |
| MANGANESE | mg/kg | : | 400.00 | 666.50 |
| SELENIUM | mg/kg | : | 1.00 | 1.65 |
| ZINC | mg/kg | : | 400.00 | 666.50 |

## Dry Matter percentage

The Dry Matter percentage (DM%) of a feed product is the amount of feed with all the water or moisture removed. The nutrients such as the energy, protein, vitamins and minerals are all contained in the dry matter portion of the feed.

For example, Manufactured Liquid Protein supplements are typically 60% dry matter. This means that for every 1kg of supplement, 0.6kg is dry matter and 0.4kg is water.

Water, whilst essential for livestock offers no nutritional benefit as far as nutrients, therefore when purchasing a feed consider the DM% to determine the amount of nutrients being purchased vs the amount of moisture (water). Just about every feed product will contain some moisture.

## ‘As Fed’ or ‘Dry Matter’ basis

The nutritional analysis of a stock feed product can be presented on the label as an ‘as fed’ (AF) or ‘dry matter’ (DM) basis.

‘As fed’ analysis is a measure of the nutrients contained in the entire feed product including the moisture component.

‘Dry matter’ analysis is a measure of the nutrients contained in the dry matter portion of the feed only.

An example using the liquid protein supplement from the previous page:

On an ‘as fed’ basis the analysis reads 23.5% Protein. This means that for each 1kg of supplement 23.5% (0.235kg) is protein.

On a ‘dry matter’ basis it reads 39% Protein.

This is because of the influence the water or moisture component is having on the feed. Remember it is 60% DM, so for every 1kg of supplement, 0.6kg is dry matter and 0.4kg is water.

The ‘as fed’ analysis for protein appears lower but that is because it is calculated including the water component (0.235kg protein / 1kg X 100 = 23.5%)

The ‘dry matter’ analysis for protein appears higher in this case because it is calculated as a percentage of the dry matter component of the feed (0.235kg protein / 0.6kg dry matter in the feed x 100 = 39%).

When selecting between different options ensure you are comparing both products on the same basis either an ‘as fed’ or ‘dry matter basis’.

When a product label has no wording to signify what basis the analysis has been recorded on, this usually means it’s on an ‘as fed’ basis.

## Energy

The measure of energy in a cattle supplement is usually presented as Energy ME with the ME referring to Metabolisable Energy.

The units of measure are MJ/kg (Megajoules per kilogram).

If the analysis is on a ‘dry matter’ basis the units will read MJ/kg/DM (Megajoules per kilogram of dry matter)

## Protein

Look for one of these terms first **Protein, Total Protein or Total Crude Protein** this is because depending on the product and the manufacturer one of these 3 terms will be used to show the total percentage (%) of protein in the feed. That is the sum of Crude Protein and Equivalent Crude Protein.

**Crude Protein** is the true protein that has been provided by plant sources such as grains or meals.

**Equivalent Crude Protein** is the amount of crude protein that has been provided to the feed from using a nitrogen source such as urea.

The amount of equivalent crude protein provided from urea or other nitrogen sources is calculated by multiplying the nitrogen percentage by 6.25. Urea is 46% nitrogen X 6.25 = 287.5% crude protein equivalent.

If a feed contains 2% urea its contribution to the equivalent crude protein is 5.75% (287.5 x 2%).

## Urea (%)

This is the percentage of urea contained in the feed.

## Fibre (%)

Fibre is usually only presented in the analysis for products that contain predominantly plant based materials. Fibre comes from the structural parts of a plant such as the lignin, cellulose and hemicellulose.

Fibre is important for rumen function. Depending on other components of a cow’s diet such as pasture conditions, you may require a supplement that increases or reduces fibre.

Beef cattle grazing tropical pastures usually have enough fibre in their diet which is provided from the pasture alone.

## Calcium (Ca) (%)

Measured as a percentage and is used to balance phosphorus (P) from 1Ca:1P for maintenance to 2Ca:1P for higher growth.

Calcium is required by cattle for bone formation, muscle action, milk production and general body processes.

There are low levels of calcium in grains and all grasses as they mature.

Depending on other components of the diet, class of animal and level of production you may require a supplement with additional calcium.

## Phosphorus (P) (%)

Measured as a percentage and is a very important ingredient if your country is P deficient.

Phosphorus is needed for bone formation, milk production, energy metabolism and general bodily processes.

## Sulphur (S) (%)

Sulphur is measured as a percentage and is required by rumen microbes to use with nitrogen to make protein. Rumen microbes require sulphur and nitrogen in the ratio of 1S:10N. Sulphur is NOT required when cattle are fed Molasses based products as Molasses is naturally high in sulphur.

## Salt (Sodium Na) (%)

Salt is measured as a percentage and will sometimes be listed on a label as sodium. Depending on the feed product salt can be added for two reasons:

- In high grain diets salt is added to prevent a salt deficiency from occurring, especially if cattle still have access to tropical pastures at the same time.
- In loose licks or lick blocks salt is generally added at much higher percentages than grain diets and this is to help control supplement intake. The higher the salt content the less cattle will eat, but only after any salt cravings have been addressed.

Some high urea based lick products suggest feeding plain salt prior to introducing the supplement to ensure salt cravings are satisfied as sodium deficient cattle will find the salt an attractant and may over eat the mixed supplement.

## Magnesium (Mg) (%)

Magnesium is measured as a percentage and is usually only listed on magnesium based supplements but on occasions some feed products will list it as part of the formulation.

Low levels of magnesium interferes with calcium absorption and can occur when cattle graze very lush pastures but this usually isn't very common on the North Coast.

## Potassium (K) (%)

Measured as a percentage of the feed and is seldom presented on most feed product labels with the exception of mineral supplement products.

A deficiency in potassium should not occur in grazing cattle as they obtain enough potassium from the pasture. Rather excessive potassium in the diet can cause milk fever.

Use of potassium fertilisers on pastures has removed much of the need for potassium supplements to grazing cattle. Avoid high potassium supplements when cattle are grazing pastures fertilised with potassium based products.

Cows only require 0.80% potassium in their daily dry matter intake.

## Microminerals

Microminerals are only needed by beef cattle in very small amounts hence the term 'micro'. On occasions these minerals may be required if there is a diagnosed deficiency and supplementation is likely to be cost effective. However because these minerals are needed in such low amounts it's very easy to provide excessive amounts which can be toxic.

Consult your herd veterinarian if you suspect a mineral deficiency prior to supplementing.

When presented on feed product labels the units of measurement are typically mg/kg (milligrams per kilogram)

Microminerals include:

**Copper** is needed for the enzymes that control energy metabolism, pigmentation and blood formation. Deficiency signs include weight loss, diarrhoea and a pale rough coat, and infertility. High molybdenum levels can cause a copper deficiency

**Selenium** has an enzyme function in protecting cell membranes from damage by oxidation. It is also important in maintaining an effective immune system. Selenium deficiency often occurs with vitamin E deficiency. Signs are poor reproduction, retained placenta, mastitis and general ill thrift.

**Cobalt** is needed by the rumen microbes to synthesise vitamin B12. It is essential for the production of propionic acid which is the precursor of glucose. Cattle do not store large amounts of cobalt, so vitamin B12 production relies on a steady supply of cobalt in the diet.

There is adequate cobalt present in just about all pasture grasses and legumes grazed in Australia.

**Iodine** is found in the thyroid hormones that control energy, metabolism, growth and development, and skin and hair formation.

**Iron** is an essential component of haemoglobin in the blood, and the immune system. Deficiencies are rare in grazing cattle as all feed sources are generally adequate.

**Manganese** is involved in fat and protein synthesis, brain metabolism and various enzyme systems. Manganese is adequate in all pastures even though there can be varying levels found between pasture species. Lower levels are common in grain diets with maize grain containing the lowest level of manganese.

**Molybdenum** is mainly required for the function of the enzyme xanthine oxidase, which is involved in excretion. Very high and very low levels of molybdenum affect the metabolism of copper. Cattle grazing high molybdenum pastures may show signs of copper deficiency such as weight loss, diarrhea or pale coat.

**Zinc** is involved in many body functions in the cow. It activates 30 different enzymes and enhances the action of the reproductive hormones. Deficiency symptoms include reduced feed intake, feed efficiency, stiff joints and cystic ovaries.

## Vitamins

Vitamins are most commonly presented on stock feed product labels using the units' iu/kg which stands for international units per kilogram.

For beef cattle grazing green pasture, vitamin supplements offer virtually no benefit because cattle can access these from the green feed.

When pasture is limited or unavailable e.g. feed lot situations, vitamins must be added to the diet.

The most common vitamins required in the diet of cattle are the Fat soluble vitamins A, D and E and the Water soluble vitamins B1, B3, B12.

**Vitamin A** has numerous functions, including maintenance of the skin and other tissues and prevention of night blindness.

**Vitamin D** helps calcium metabolism.

**Vitamin E** has a similar role to selenium and helps the immune system and muscle formation

**Vitamin B1** (thiamine) can be synthesised in the rumen and is important for cellular metabolism

**Vitamin B3**, (niacin), is a key part of the metabolism, helping process fats, carbohydrates, and amino acids.

**Vitamin B12,** interacts with cobalt and is essential for the production of propionic acid which is the precursor of glucose. B12 may be required when there is insufficient pasture present for cattle to graze.

Some feed products promote the inclusion of **Biotin** and **Folic Acid**, these are not required to be provided as part of the diet for cattle.

## Medication or Rumen Modifiers and Buffers

The most common terms you may see on cattle feed product labels that relate to either medications or rumen modifiers or buffers are:

**Monensin Sodium** e.g. Rumensin® this is a rumen modifier that improves the efficiency of fermentation within the rumen and can assist reducing acidosis and assist with coccidiosis control. It is toxic to horses and dogs.

**Flavophospholipol** e.g. Flaveco® or Flavomycin® also a rumen modifier that improves the efficiency of fermentation for feed within the rumen

**Sodium Bentonite**, high swelling natural clay to help buffer the rumen from some dietary toxins and pH. Common in pelletised rations as it has great binding capabilities.

**Sodium Bicarbonate** a rumen buffering agent to assist in control of rumen pH hence help prevent acidosis, can also be used to provide a source of salt to the diet.

Quantities of rumen modifiers or buffers are presented in milligrams per kilogram (mg/kg) on feed product labels.

## With Holding Period (WHP)

Some feed products depending on there ingredients, will have a WHP statement listed on the label. It is usually because the feed product contains a medication or an ingredient that may require a length of time to pass between the time the cattle were fed the feed before they can be milked or processed for human consumption.

## Restricted Animal Material (RAM)

Stock feed products manufactured for cattle and other ruminant animals will have written on the bag, container or label:

**This product does NOT contain restricted animal material.**

This means that there are no ingredients used in the making of the feed product that have come from animal tissues and therefore it is safe and can legally be fed to ruminants such as cattle.

Figure 2: Example RAM statement on a feed product that is safe to be fed to ruminants (photo source agric.wa.gov.au)


If a feed product indicates that a feed contains RAM you must prevent ruminant animals from eating it.

These products will clearly state on the bag, container or label:

**This product contains restricted animal material DO NOT FEED TO CATTLE, SHEEP, GOATS, DEER OR ANY OTHER RUMINANTS.**

Figure 3: Example RAM statement on a feed product that must NOT be fed ruminants (photo source agric.wa.gov.au)


Many poultry, pig and dog feeds are still manufactured with RAM products included which is allowable for these animal species.

It is worthwhile checking all poultry and pig feeds for RAM so you are aware and can ensure that no ruminant species can access any of these feed products. Especially on small farms which often feed multiple animal species in close proximity. In this instance it would be safer to exclude ruminant animals from areas where poultry or pig feeds are fed out, or ensure that poultry and pig feeds purchased also do not contain RAM.

## Directions for use

Depending on the feed product there will often be directions for how to safely feed it. Ensure you read and understand these directions prior to feeding any stock feed supplement and if you still aren't sure ask the supplier or your advisor.

Directions for use often state how to introduce the feed, feeding rates, protection required of the feed from weather particularly for urea based supplements and any possible health concerns to be aware of.

There can often be instructions that say that the product is only suitable to be fed to cattle. This can be presented in wording such as: **Feed only to cattle**

Or it can be presented as a picture such as photo 4.

Figure 4: Example of a label picture showing a feed product is only suitable for cattle

The reason for this is often to do with the formulation of the feed product. In particular the rates of minerals or medications included in the product are included at a level which is only suitable and safe for cattle. These rates or products can be toxic to animals of other species if they consume the feed.