FACT SHEET
Nutritional value of common pastoral grasses to livestock

# Nutritional value of common pastoral grasses to livestock

This factsheet brings together information allowing comparison of nutrition information for 10 common grasses growing in South Australia's rangelands and considers the extent to which they meet nutrient requirements for livestock.

## 10 COMMON PASTORAL GRASSES


▲ **Desert spear-grass**
*Austrostipa eremophila*
Native perennial grass; 0.4-1.0 m tall; Grows in a range of areas including damp clay flats, sand plains and dunes, and bluebush plains.

▲ **Barley Mitchell grass**
*Astrebla pectinata*
Native perennial rhizomatous[1] grass; 0.15-1.0 m tall; Grows in temporarily wet areas, but also on plains, rocky hillsides and on the clay soils of gibber plains.

▲ **Buffel grass**
*Cenchrus ciliaris*
Introduced perennial grass often with stolons[2]; 0.15-1.0 m tall; Grows in dry areas, especially on sandy soils, commonly along watercourses.

1. Rhizomatous – a plant that has stems that run (often horizontally) below the ground sending up new shoots

2 Stolons – stems that run (often horizontally) above the ground often producing roots and new shoots

**Spear-grass ▶**
*Austrostipa nodosa*
Native perennial grass; 0.2-0.9 m tall; Grows in a range of areas, often with mulga and chenopod shrubs.

*** Photos reproduced with permission from Foster et al. (2009) An Introduction to the Nutritional Composition of Australian Native Grasses: Forage and Seed. Adelaide, Rural Solutions SA.**

◀ **Small Flinders-grass**
*Iseilema membranaceum*
Native annual grass; 0.06-0.35 m tall; Grows on sand and gibber plains, flood plains and water courses.

▲ **White top**
*Rytidosperma caespitosum*[1]
Native perennial grass; 0.2-0.9 m tall; Grows in a wide range of areas.

1 Formerly known as *Austrodanthonia caespitosa*

▲ **Umbrella grass**
*Enteropogon acicularis*
Native perennial grass; 0.15-0.5 m tall; Grows on a range of soil types – sand, loam and clay; and on creek banks and flood plains.

▲ **Black-head grass**
*Enneapogon nigricans*
Native perennial grass; 0.1-0.5 m tall; Grows in a range of areas including gibber plains and creek beds; and on a range of soil types.

◀ **Kangaroo grass**
*Themeda triandra*
Native perennial grass; 0.4-1.5 m tall; Grows in a wide range of soils often near creek beds and waterholes or rocky gullies.

▲ **Silky blue-grass**
*Dichanthium sericeum* ssp. *sericeum*
Native perennial grass; 0.12-1.0 m tall; Grows in a range of areas including on clay soils and temporarily wet areas.

## NUTRITION RESULTS

Table 1 presents the results of nutrition analysis for 10 pastoral grasses.
The results are best considered in relation to the nutrient requirements for livestock (Table 2).

***Table 1. Results of nutritional analysis for 10 pastoral grasses.***

| PASTORAL GRASS | CP (% DM) | ME (MJ/kg day) | NDF (% DM) | COMMENT |
|---|---|---|---|---|
| Barley Mitchell grass *Astrebla pectinata* | 12.1 | 8.1 | 68 | Metabolisable energy (ME) and crude protein (CP) sufficient for ewes in early pregnancy, and dry sheep/cattle maintenance. The high neutral detergent fibre (NDF) would restrict intake to 1.8% of live weight. |
| Desert spear-grass *Austrostipa eremophila* | 11.7 | 8.5 | 66 | Energy and crude protein sufficient for ewes in early pregnancy, and dry sheep/cattle maintenance. The high NDF would restrict intake to 1.8% of live weight. |
| Spear-grass *Austrostipa nodosa* | 8.2 | 7.5 | 73 | Energy and crude protein sufficient for dry sheep/cattle maintenance only. The high NDF would restrict intake to 1.6% of live weight. |
| Buffel grass *Cenchrus ciliaris* | 7.4 | 6.8 | 75 | Inadequate protein and energy to maintain adult dry stock. The high NDF would restrict intake to 1.6% of live weight. |
| Silky blue-grass *Dichanthium sericeum* ssp. *sericeum* | 10.0 | 8.3 | 61 | Energy and crude protein sufficient for ewes in early pregnancy, and dry sheep/cattle maintenance. The NDF would restrict intake to 2.0% of live weight. |
| Black-head grass *Enneapogon nigricans* | 14.8 | 9.1 | 60 | Energy and crude protein sufficient for ewes and cows in early pregnancy, and dry sheep/cattle maintenance. The NDF would restrict intake to 2.0% of live weight. |
| Umbrella grass *Enteropogon acicularis* | 18.8 | 9.3 | 65 | Energy and crude protein sufficient for ewes and cows in early pregnancy, and dry sheep/cattle maintenance. Very high crude protein levels. The NDF would restrict intake to 1.9% of live weight. |
| Small Flinders-grass *Iseilema membranaceum* | 7.2 | 6.9 | 65 | Crude protein and energy levels are not sufficient for maintenance of dry sheep/cattle. The high NDF would restrict intake to 1.8% of live weight. |
| White top *Rytidosperma caespitosum* | 9.6 | 8.5 | 64 | Energy and crude protein sufficient for ewes in early pregnancy, and dry sheep/cattle maintenance. The high NDF would restrict intake to 1.9% of live weight. |
| Kangaroo grass *Themeda triandra* | 13.2 | 8.7 | 70 | Energy and crude protein sufficient for ewes and cows in early pregnancy, and dry sheep/cattle maintenance. High crude protein levels. The NDF would restrict intake to 1.7% of live weight. |

*Results reproduced from Upper North Farming Systems: Native Grass Nutrition Fact Sheet – spring samples, *Dichanthium* – summer sample, Outback Lakes Group Final Report – average for reproductive samples and nutrition testing undertaken by Natural Resources SA Arid Lands – reproductive sample.

## NUTRITION TERMS

**Understanding some nutrition terms will assist in interpreting the value of the different grasses to your livestock.**

### Crude Protein (CP)

Crude protein is calculated from the amount of nitrogen in the forage. Crude protein consists of the amount of true protein (composed of amino acids) plus non-protein nitrogen. Inadequate levels of protein can limit livestock production. Crude protein is expressed as a percentage of dry matter (% DM).

### Metabolisable Energy (ME)

Metabolisable energy is the measure of the forage's ability to maintain the function and productivity of the grazing animal. The higher the value of energy the better the quality of the forage. Energy requirements of an animal are determined by whether the animal is lactating, pregnant, growing, dry and also the level of activity. Metabolisable energy is measured as megajoules of metabolisable energy per kg of dry matter (MJ ME/kg DM) or megajoules of metabolisable energy per head (hd) per day (MJ ME/head/day).

### Fibre

Fibre in forage is the structural material in a plant, some of which is digestible. Fibre is measured in two ways; i) neutral detergent fibre (NDF) and ii) acid detergent fibre (ADF). NDF is the most useful measure of fibre content currently available. Fibre is usually measured as a percentage of dry matter (% DM).

NDF is a measure of all the fibre (both digestible and non-digestible) in the forage. NDF is related to voluntary feed intake and generally the lower the NDF, the more an animal will eat and conversely the higher the NDF the lower the intake. NDF values greater than 50% restrict voluntary feed intake. Very low NDF can result in rumen issues such as acidosis. NDF can be used to calculate the dry matter intake of the animal i.e. how much the animal can eat in a day. The amount of intake or feed that can be consumed is measured as the percentage of live weight of the grazing animal.

## NUTRIENT REQUIREMENTS FOR LIVESTOCK

***Table 2. Livestock nutrition requirements for sheep and cattle.***

| LIVESTOCK CLASS | CP (% DM) | ME (MJ ME/hd/day) | NDF (% DM) |
|---|---|---|---|
| Ewe/wether | 8 | 8.8 | 30 |
| Weaner lamb (25kg) | 14 | 6.0 | 30 |
| Ewe – mid pregnancy | 9 | 11.5 | 30 |
| Ewe – early lactation | 14 | 17 | 30 |
| Dry cow (450kg) | 8 | 64 | 30-60 |
| Cow – late pregnancy | 10 | 65 | 30-48 |
| Cow – lactating | 15 | 90 | 30-48 |
| Calf (8 months) | 13 | 50 | 30-40 |

Livestock nutrition requirements sourced from Making More From Sheep (2008), More Beef From Pastures (2013) and Hinton, D.G. (2007)

## OVERVIEW OF RESULTS

Nutritive value of forage may vary throughout the year and is largely dependent on the growth stage of the plant. Comparisons presented in this fact sheet are of grasses at a reproductive growth phase, where possible.

All plants tested with the exception of Buffel grass and Small Flinders-grass had sufficient crude protein and metabolisable energy to maintain dry sheep and cattle. Four grasses – Barley Mitchell grass, White top, Desert spear-grass and Silky blue-grass had sufficient crude protein and metabolisable energy to maintain ewes in early pregnancy, whilst Black-head grass and Umbrella grass could also maintain cows in early pregnancy.

However, all of the grasses tested had medium-high NDF values. NDF values >50% restrict voluntary feed intake (the higher the NDF the lower the intake, as the movement of feed through the animal slows).

▲ **FIGURE 1** ***A pasture colonised by Buffel grass, where the pasture composition has changed from a diverse pasture to generally a monoculture.***
*Location: Anangu Pitjantjatjara Yankunytjatjara Lands, north-west South Australia*

▲ **FIGURE 2** ***A diverse pasture of annual and perennial grasses, annual herbs and forbs, and shrubs.***
*Location: North Flinders Ranges*

## IMPLICATIONS FOR GRAZING MANAGEMENT

This fact sheet presents the nutrition analysis for individual species of pastoral grasses. In the pastoral area, however, monocultures are rare except where they have been planted or colonised by another species (Figure 1). Generally, no single species can provide a perfect, balanced diet and livestock must source their nutrition from a wide range of plants including grasses (annual and perennial), herbs, forbs (e.g. daisies), and shrubs (Figure 2). This diversity provides better nutrition for livestock as it offers a range of forage choices (each with their own nutritional composition) and livestock have a greater chance of meeting their nutritional requirements. Pastures with large amounts of herbage mass or biomass cannot necessarily maintain dry sheep and cattle or pregnant livestock, as the nutritional quality of the pasture may not meet the nutritional needs of grazing animals.

## FURTHER INFORMATION

**NUTRITIONAL INFORMATION**

*Upper North Farming Systems: Native Grass Nutrition Fact Sheet* (2014). Authors: Reseigh, J., Wurst, M., and Bennett, T; Rural Solutions SA, Adelaide.

*Outback Lakes Group Final Report: Best practice nutritional management of grazed pasture plants* (2009). Author: Productive Nutrition Pty Ltd, Kapunda.

**PLANT IDENTIFICATION**

*Plants of Western New South Wales* (2011). Authors: Cunningham, G. M., Mulham, W. E., Milthorpe, P. L., and Leigh, J. H; Inkata Press. Melbourne

*Grasses of South Australia* (2006). Authors: Jessop, J., Dashorst, G. R. M., and James, F. M.; Wakefield Press, Kent Town.

**BUFFEL GRASS**

Buffel Grass Identification (2016). Author: Primary Industries and Regions SA; Biosecurity SA, Adelaide

Buffel Grass Control (2016). Author: Primary Industries and Regions SA; Biosecurity SA, Adelaide



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