Increasing the value and marketability of feed grains

This trial is funded by the GRDC and SAGIT and conducted by Productive Nutrition Pty Ltd

Key findings

- Oats demonstrated the greatest variation in ME between samples, with values ranging from 12.8 to 13.9 MJ ME/ kg DM.
- Due to the greater variation in ME for oats than other cereal grains, testing to determine nutritive values is recommended.
- Average ME at 13.6 MJ ME/ kg DM and protein at 13.2% were high for cereal grains and appeared to be consistent across varieties and between sites.

Why do the trial?

The project aims to quantify and potentially exploit the variation in nutritive value of a range of cereal grains that come on to the feed market in South Australia to increase grain trading options for grain growers.

As growing seasons across southern Australia appear to be more variable, the ability to finish livestock to a saleable weight without grain supplementation is becoming an increasing challenge. The demand for feed grains is predicted to grow, with increasing interest from livestock producers in sourcing grain based on the predicted value to livestock, rather than purely on a $/t basis. Knowing the nutritive value of grain is important to livestock producers, as it allows the most cost effective feeding strategies to be implemented.

How was it done?

Grain samples from twelve sites across South Australia, including the Hart Field Site have been sourced for analysis to identify the variation in nutritive value across species, variety, replicate, rainfall region, site and season. The species and varieties sourced from Hart for the 2010 season are listed in Table 1.

Results

The nutritive value of cereal grains in the 2010 season varied across species, varieties and locations. There were however, distinct trends in the nutritive value of each species, especially in the metabolisable energy (ME) and protein levels of each grain. The results from the Hart site are shown in Table 1.

The relatively high fibre levels compared with other cereal grains (average NDF 30.6%) means they are a safer feed grain for livestock. This along with the high ME (average of 13.36 MJ ME/ kg DM), indicates that oats have the potential to become a preferred cereal grain to feed to livestock; this largely disproves a commonly held belief that oats should be provided at a price discount and are a feed of lesser quality than other grains.

Table 1 Average nutritive value of cereal grains sampled from the Hart Field Site in 2010

		Est Metabolisable Energy (MJ ME/ kg DM)	Crude Protein (CP %)
Oat Grain			
Milling varieties	Euro	12.9	9.5
	Mitika	13.6	11.7
	Possum	13.3	9.9
	SV97181-12	13.3	9.8
	SV98146-26	12.9	9.1
	SV98185-27	13.3	10.2
Feed varieties	Echidna	13.3	8.5
	Potoroo	13.4	9.2
	Wintaroo	13.5	10.4
	Yallara	13.2	10.4
Average values		**13.3**	**9.9**
Barley Grain			
Malting varieties	Baudin	13.5	9.6
	Buloke	13.5	8.9
	Commander	13.4	9.2
	Gairdner	13.4	9.9
	Schooner	13.5	10.0
Feed varieties	Fleet	13.5	9.8
	Hindmarsh	13.5	9.8
	Keel	13.4	9.6
	Maritime	13.4	10.3
Average values		**13.5**	**9.7**
Triticale Grain			
Triticale varieties	Bogong	13.5	11.1
	Hawkeye	13.5	11.8
	Jaywick	13.5	11.8
	Rufus	13.5	11.8
	Tahara	13.5	11.6
Average values		**13.5**	**11.6**
Wheat Grain			
Hard varieties	Axe	13.6	12.8
	Correll	13.6	11.8
	Gladius	13.6	12.8
	Mace	13.6	11.9
	Yitpi	13.6	11.7
APW varieties	Espada	13.6	12.1
	Scout	13.6	11.5
	Wyalkatchem	13.6	11.7
Average values		**13.6**	**12.0**

Oats demonstrated the greatest variation in ME between samples, with values ranging from 12.8 to 13.9 MJ ME/ kg DM (Figure 1). This variation in oat ME was replicated between all sites (Figure 2), with the ME of oats from the Hart site being relatively consistent with ME values of samples from Nunjikompita, Riverton and Crystal Brook. Oat samples from Waikerie showed higher ME values than all other sites at an average of 13.53 MJ ME/ kg DM. The variation in ME was greater for oats

than other cereal grains, therefore testing to determine nutritive value is recommended.

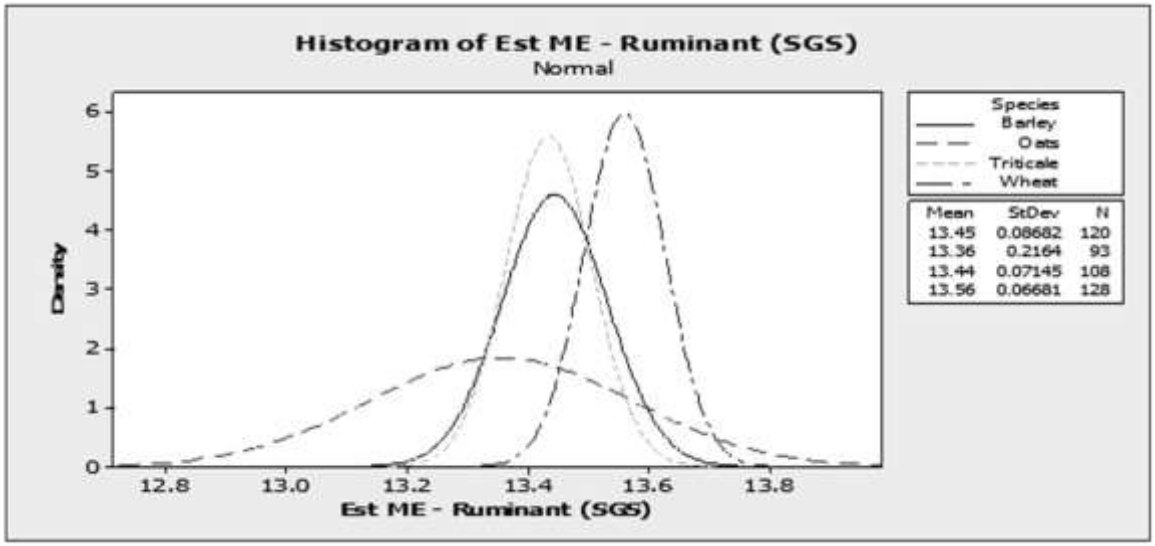

Figure 1 Variation in ME between cereal grains from 2010 season samples

75% of malt barley varieties in 2010 failed to meet market specification. Of these samples 30% were downgraded due to protein levels below 9%, with 11% downgraded for high protein (>12%).

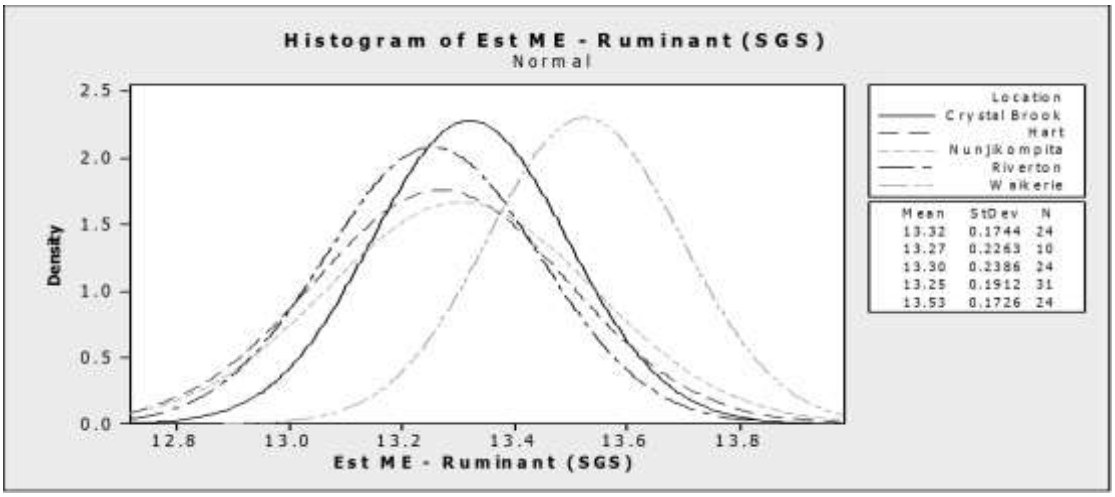

Figure 2 Variation in oat ME between sites from 2010 season samples

Although 93% of malting barley varieties at the Hart site were outside of Malt 1 specifications, only a small proportion (9%) were downgraded for low protein. Average protein values of samples from Hart were 9.6% (Figure 3). The majority of malting barley samples at Hart were downgraded due to low test weights at an average of 51.7kg/ hl, with only 6% above 65kg/ hl.

Hindmarsh barley, a feed variety which has the potential to be reclassified to Malt, has demonstrated promising nutritive values in the 2010 season. Average ME of Hindmarsh across all sites was 13.39 MJ ME/ kg DM and the grain displayed adequate levels of protein at 10.1%.

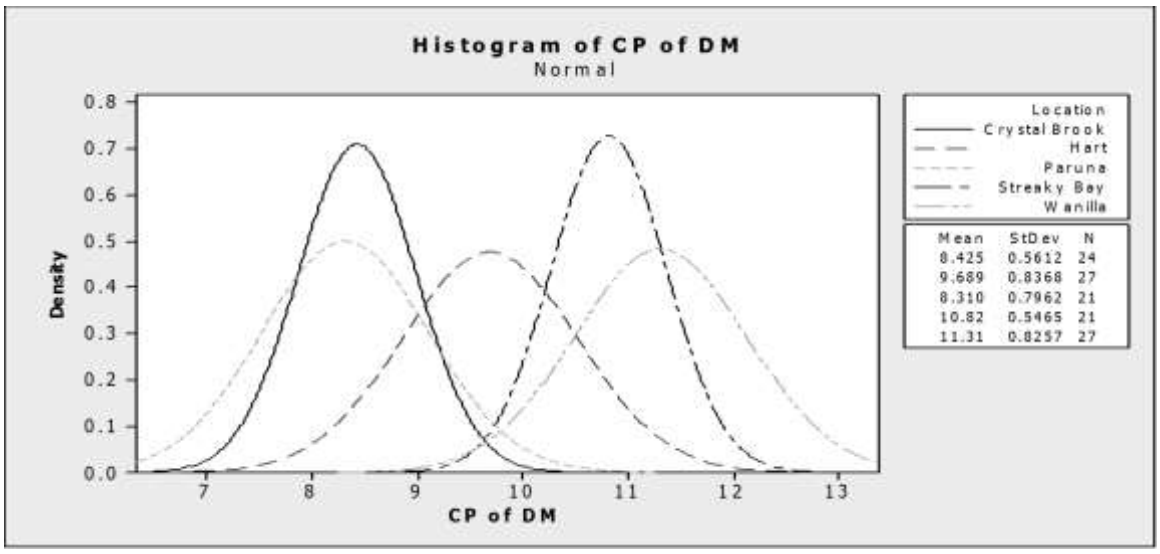

Figure 3 Variation in barley crude protein (%) between sites from 2010 season samples

While care should be taken when feeding triticale to livestock, due to its low fibre levels (average 12.5%) and therefore increased risk of acidosis, triticale analysed from the 2010 season has shown consistently high ME and protein levels. The average ME for triticale between all sites in 2010 was 13.4 MJ ME/ kg DM and average protein levels were 13.3%, with little variation shown between varieties. However the protein levels of triticale grain at the Hart site averaged 11.6%.

Similarly care needs to be taken when feeding wheat to livestock, with wheat samples analysed from the 2010 season showing low fibre values at an average of 11% NDF, significantly below oats at 30.8% NDF. Average ME at 13.6 MJ ME/ kg DM and protein at 13.2% were high for cereal grains and appeared to be consistent across varieties and between sites. Wheat samples analysed from the Hart site had the most consistent ME of all sites showing no variation at 13.6 MJ ME/ kg.

These results from the 2010 season indicate that there is potential to increase financial returns for each grain species, when it is marketed based on its nutritive value instead of via traditional marketing methods. For example, a discount of $50/ t for oats, against wheat when sold via traditional methods, may be improved when sold to livestock producers based on nutritive value. Similarly, if malting barley was downgraded due to excess protein, the price discount may be mitigated by selling on its nutritive value.

While it is encouraging that some trends appear in the 2010 results, further analysis over the next two seasons will assist in determining the strength of these trends and the influence of factors such as season, species and variety.

If trends are consistent, these may assist in the decision making process when determining which species or variety to sow for feed quality and to identify those that have the potential to maximize returns to growers under adverse seasonal conditions. A tool will be developed to provide growers with access to information on the potential dollar value of their grain when it is based on its production potential to livestock producers.

Analyses of grain samples from the 2011/2012 season are currently underway, with extension of these results planned for the 2012 Hart Field Day in September. For more information please contact Lauren Costin, Productive Nutrition on 08 88423192 or visit www.productivenutrition.com.au.