DRY DISTILLERS GRAIN WITH SOLUBLES (DDGS) TRIAL PROJECT

(December 2008-January 2009)

COPRICE FEEDS

TONGALA, NORTHERN VICTORIA, AUSTRALIA

Report by Phil Candy

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Trial report template and trial specifics acknowledgement to Razaq Balogun.

Effect of DDGS inclusion on pelletizing characteristics and milk production of dairy cows.

Objectives: This trial's objective was to measure the effect of varying levels of Corn DDGS on the following parameters.

1. Pellet quality parameters such pellet durability index (PDI), color, odour and bulk density
2. Milling parameters such as tonnes per hour, steam and feed rate, and Amps.
3. On-farm animal performance such as palatability and any change to milk production.

Trial methods.

1. Source and specifications of DDGS:

DDGS from corn was sourced from the US Grain Council and shipped to Australia. Energy (14.5MJME/kgDM) and protein (30%, dry matter basis) specifications of DDGS were as provided by USGC. These specifications were used in 'balancing' the ration nutritionally.

2. Trial selection:

4 farmers received various concentrations of the DDGS feed rations, ranging from 5% to 20% inclusion.

3. Ration formulations:

The choice of ration was maintained as per the current ration purchased by the farmer. These are as follows;

Summer Special (x3 treatments)
16% Protein (Dry Matter basis)
12.5 MJME/KG (Dry Matter basis)

Rovers Ration
20% Protein (Dry Matter basis)
12.3MJME/KG (Dry Matter basis)

Feeding rates were as follows;

Control			Treatment 0
Farm A	6kg/head/day	5% inclusion DDG-S	Treatment 1
Farm B	6kg/head/day	10% inclusion DDG-S	Treatment 2
Farm C	7kg/head/day	10% inclusion DDG-S	Treatment 3
Farm D	10/kg/head/day	20% inclusion DDG-S	Treatment 4

Rations were formulated to same energy and protein as the previous rations supplied.

4. Milling parameters

Milling parameters were measured and recorded during pelletising. Amps generated, optimum feed and steam rates were determined by millers and recorded. Base line measurements (for 0% inclusion) of same parameters were determined and recorded during the day, either prior to or after processing for each treatment.

The time taken to pelletise rations was recorded and tonnes per hour calculated. Bulk density was calculated by measuring the weight of sample in a 500mL steel cup. PDI was calculated after a 500g sample was tumbled in a stainless steel tumbler for ten minutes. Assessment of colour and smell were visual and subjective.

Of note was the conditioning/steam addition to the higher 20% inclusion into Rovers ration. The US DDGS appeared to absorb steam/moisture at a higher rate than the traditional wheat based DDG locally sourced. This did cause some issues in the pelletising process but were brought under control with a reduction in steam feed rates

5. On-farm feeding trial

Production data for seven days immediately prior to the start of trial was considered as control. The length of trial for each treatment varied between farms and also between treatments within farm. Feeding and management of animals were at the farmer's discretion and was considered to be consistent throughout the new ration introduction and subsequent removal.

Milk production records on the overall herd basis were as provided by the milk company that each farm supplies. Therefore average milk production per head per day was calculated from the total milk production divided by the number of cows in the herd. Milk fat and protein data were also collected where possible.

Anecdotal information from the farmer was noted on palatability of the DDGS ration compared to the control ration.

Table 1. Effect of DDGS on pelleting parameters

Ration	Treatment	Steam	Feed	PDI	Amps	Bulk	Tns/hr
Control	0	70	3.5	96	150	59	17.8
Summer Special							
	1	69	3.7	96	150	58	18.5
	2	71	3.6	94.7	148	58	17.6
	3	72	3.4	97	150	60.8	16.9
Rovers ration							
	4	65	3.2	96.4	155	60	17.3

6. Results

There were no statistical analyses performed on the results generated in this trial. All results are numerical and based on raw data.

The results on milling parameters are shown in Table 1.

- Compared to control treatment, there appears to be no big effect of DDGS inclusion on milling parameters.

Milk production results are shown in Table 2.

- For Summer Special, milk production did not seem to change following DDGS inclusion in the ration. This trend appears to be same with the 5%, 10% and 20% inclusions. Note that the rations were formulated to be the same energy & protein and no significant change was the expected result.
- With Rovers ration (20% inclusion), it appears that litres dropped after the original ration was re-introduced into the diet. The farmer commented that he believed that the change was a result of decreased palatability of the traditional DDG used prior, in turn highlighting the good/increased palatability of the US DDGS.
- All other parameters did not change significantly or any change was not statistically relevant, i.e. Butter fat and protein

Table 2. Effect of dry distiller's grain with soluble on milk production parameters

Ration	Treatment	No of Cows	No of days	Litres during/post	Fat (%)	Protein (%)
Summer Special						
	1	125	5	26.8/27	3.6	3.1
	2	320	8	27.1/26.7	3.9	3.1
	3	183	9	23.9/22.7	3.4	3.0
Rovers ration						
	4	390	12	34/31.8	4.2	3.1

7. Conclusion

These preliminary trials suggest that DDGS can be included in dairy rations in the Northern Victorian Dairy region of Australia. It may be possible to include DDGS up to 20% without any adverse effect on production of dairy cows or pelletising process. DDGS inclusions did not seem to have a major impact on pelletizing process at the mill giving the conditions of the trial, other than the issue with the steam conditioning of the higher 20% inclusion. While anecdotal, it is believed that the physical ability of the pelletising process to handle US DDGS is capped at 20% inclusion. Further trials are required to confirm this feedback.

DDGS is a tangible alternative for CopRice Feeds, and will become an great option if economical against current raw material protein and energy sources.