



Dairy industry perspective on NIR application

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Dairy Australia
24 March, 2009



Why is the nutrient content of feed grains important to the dairy industry?

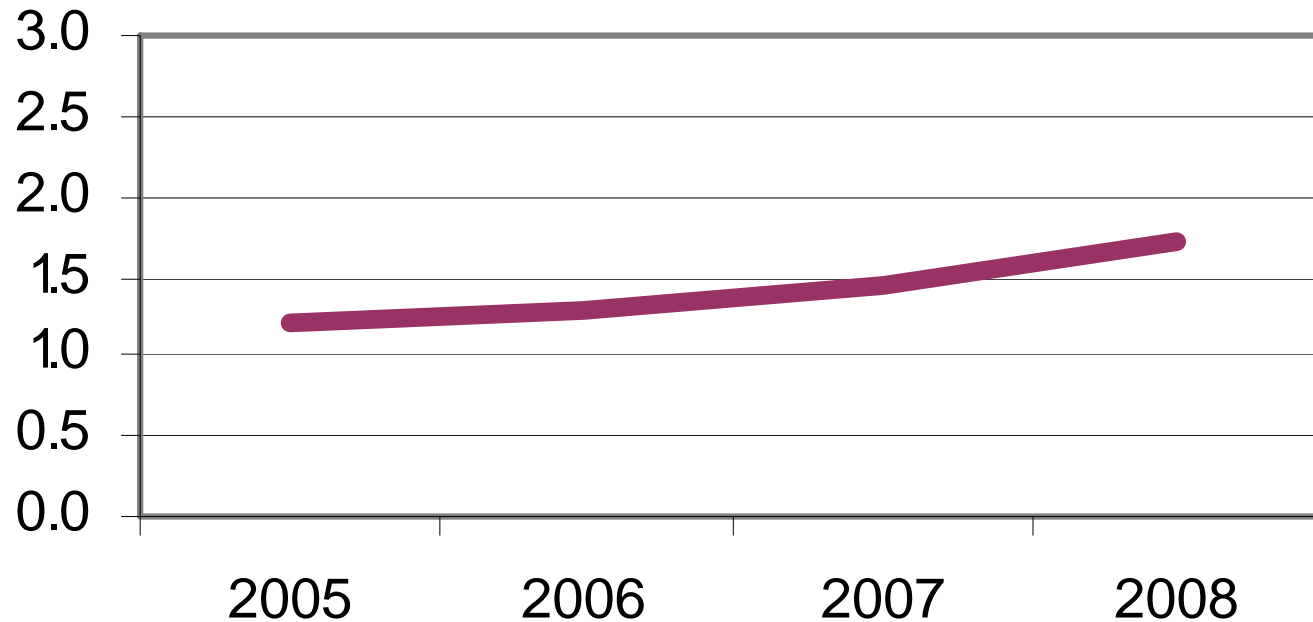
- **More than 25% of milk solids are now derived from use of feed grains / concentrates**
- **A step-change in feed grain prices has occurred**

It is critical for the dairy industry to be able to buy and use feed grains and concentrates much more effectively than in the past



More than 25% of milk solids are now derived from use of feed grains / concentrates

average tonnes fed per cow per year
(base: fed grain or concentrates)





Feeding systems used by dairy farmers

Pasture-based feeding systems,
with different levels of grains / concentrates



TMR
(housed)
systems



Light
feeders

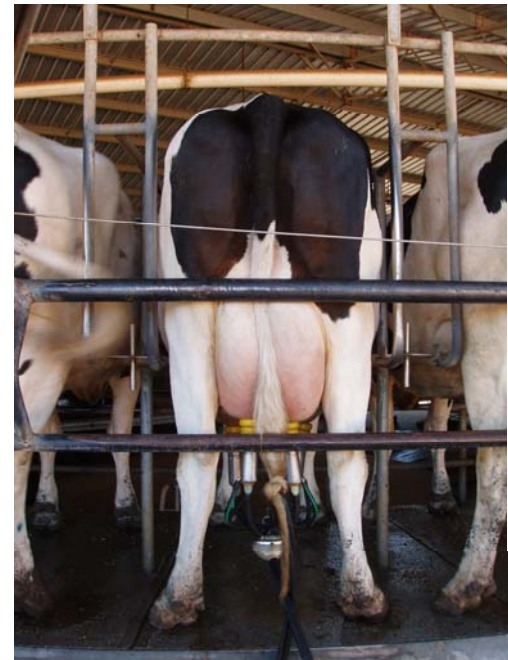
Medium
feeders

Heavy
feeders



So what does a balanced diet for a dairy cow look like?

- **16-18% Crude Protein (DM)**
- **30-35% Neutral Detergent Fibre (DM)**
- **34-42% Non-structural Carbohydrate (DM)**
- **12 MJ/kg Metabolisable Energy (DM)**
- **0-5% Crude Fat (DM)**
- **Minerals, vitamins, buffers, rumen modifiers, other additives**





Use of feed lab. services by dairy farmers

When.....

1. Making feed buying decisions

to buy on nutritional value, not on price tag

2. Receiving deliveries of purchased feed

to check that feed is to contract specs.

3. Formulating rations on farm

to ensure that diet provides nutrients required for target milk production level

4. Mixing rations and feeding out on farm

to ensure that the diet cows are offered is as formulated



However accurate information on the nutrient content of grains for the dairy cow may not be as critical as in other livestock industries.

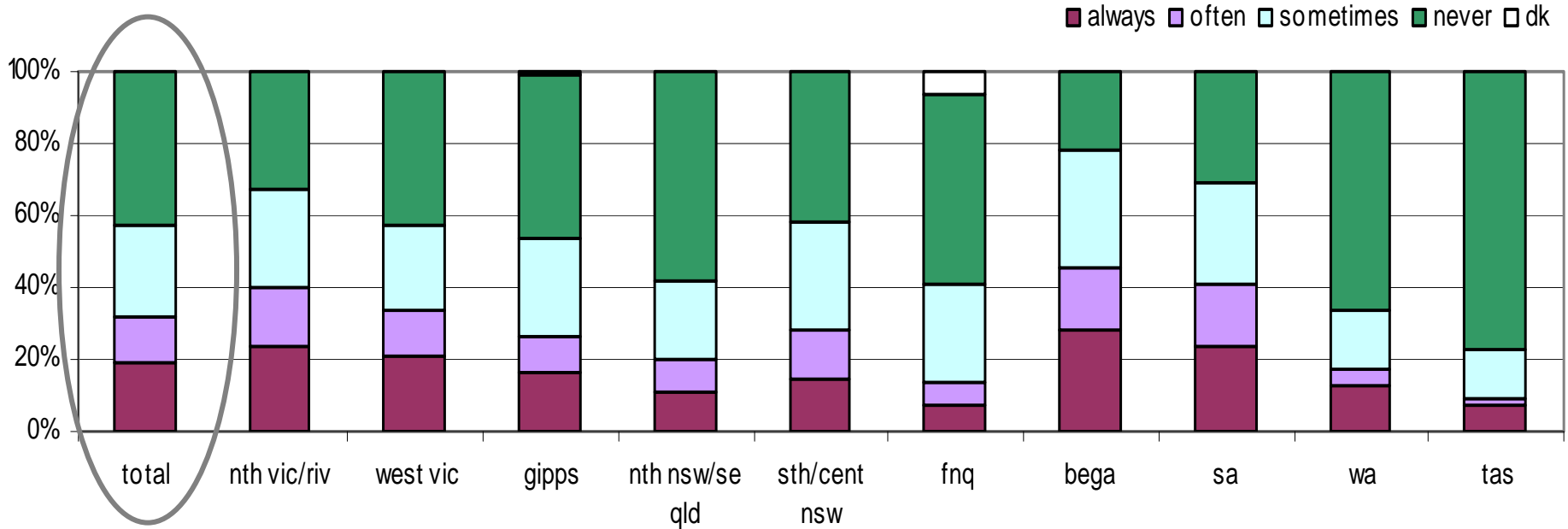
- Low use of testing feed samples by the dairy industry
- Low range in the ME content of grains for ruminants
- Low value of the major nutrients for dairy cows relative to other livestock



What dairy farmers have told Dairy Australia

Managing quality risk: Fodder

frequency of obtaining feed analysis report prior to purchasing hay/silage (base: purchase hay/silage)

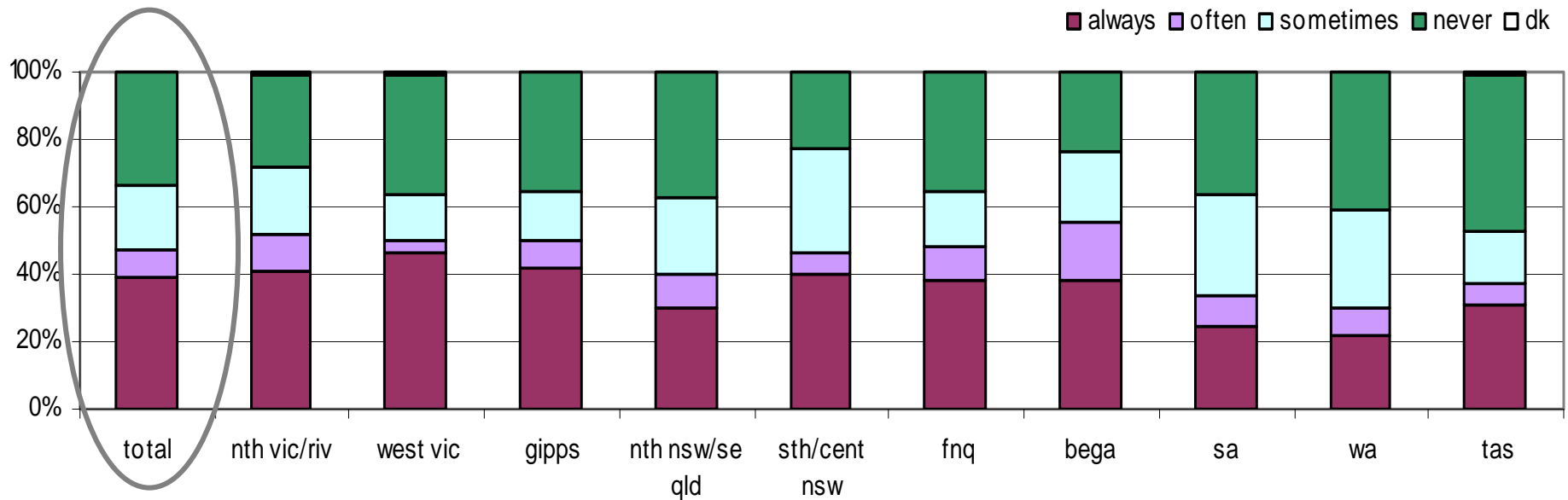




What dairy farmers have told Dairy Australia

Managing quality risk: Grain / concentrates


frequency of obtaining feed analysis report prior to grain or supplement purchase (base: purchase grain/supplements)





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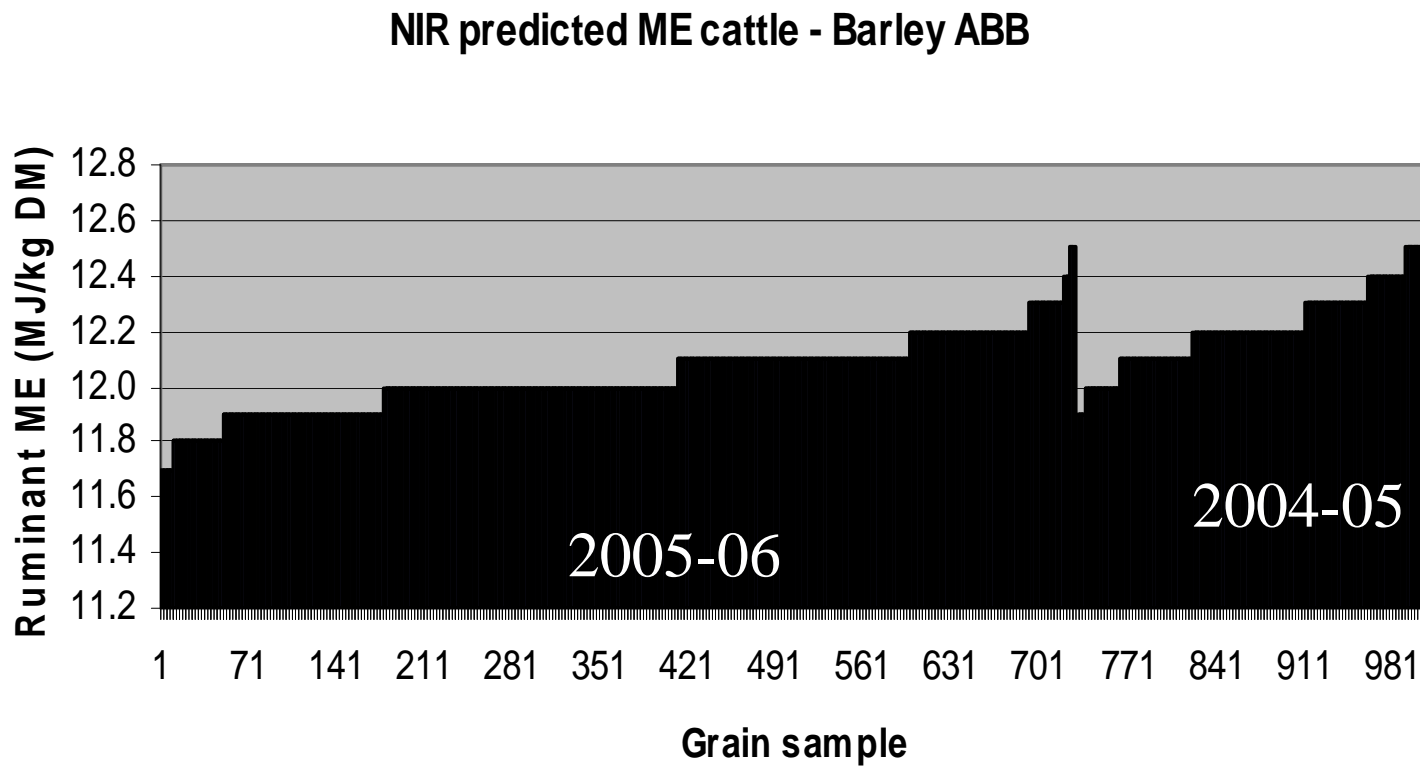
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Range, mean (in brackets) and number (n) of samples for *in vivo* available energy content of grains for each animal type examined in PGLP.

Measurement	Wheat	Barley	Oats	Triticale	Sorghum
Sheep at maintenance (MJ ME/kg DM)	12.8-13.7 (13.3) <i>n</i> =25	11.5-13.9 (12.9) <i>n</i> =32	11.2-15.7 (12.7) <i>n</i> =18	12.3-13.4 (13.0) <i>N</i> =9	13.6-14.3 (13.9) <i>n</i> =7
Cattle <i>ad libitum</i> (MJ ME/kg DM)	12.2-13.1 (12.7) <i>n</i>=8	12.2-13.2 (12.5) <i>n</i>=7	10.8-13.4 (12.3) <i>n</i>=6	12.9-13.2 (13.1) <i>N</i>=2	10.2-13.1 (11.1) <i>n</i>=7
Pig (MJ DE/kg DM)	14.2-16.9 (15.0) <i>n</i> =33	11.9-16.1 (14.4) <i>n</i> =38	-	12.3-16.5 (14.9) <i>N</i> =8	15.5-16.6 (16.2) <i>n</i> =18
Broiler (MJ AME/kg DM)	12.4-15.6 (14.1) <i>n</i> =36	11.2-13.7 (12.5) <i>n</i> =38	12.6-14.6 (13.5) <i>n</i> =3	11.0-14.6 (13.9) <i>N</i> =14	15.2-16.5 (15.7) <i>n</i> =18

Range in NIR estimate of the ME content of barley samples (PGLP)





Mean and range of nutritive value of fodder samples from the 2007/08 season (Feedtest)

	CP (%)	DMD (%)	ME (MJ/kg)	NDF (%)
Grass Hay	9.2 2.3-18.0	59.2 43.0-79.8	8.6 5.8-12.1	61.2 38.3-80.6
Cereal Hay	8.9 1.4-23.2	66.2 32.0-84.5	9.8 3.9-12.9	52.5 33.8-79.9
Grass Silage	14.1 6.1-25.5	68.3 45.6-83.9	10.4 7.3-12.5	52.2 30.3-78.9
Cereal Silage	12.4 5.6-25.6	68.9 44.3-83.8	10.4 7.1-12.4	49.5 34.1-77.9



However accurate information on the nutrient content of grains for the dairy cow may not be as critical as in other livestock industries.



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The value of an extra 1MJ available energy in feedgrains for livestock (\$/tonne)



- Pig \$14.30
- Broiler \$26.90
- Layer \$24.07
- Dairy cow \$7.48
- Feedlot \$14.20

J Black, PGLP report



Main NIR calibrations of the nutrient content in grains that are of interest to the dairy industry

- **Ruminant Metabolisable Energy (MJ/kg)**
- **Starch (%)**
- **Crude protein (%)**
- **NDF (%)**



Other AusScan NIR calibrations that are of interest to the dairy industry

- **Acidosis index (0-100)**
 - But poor comparison between *in vitro* acidosis index and *in vivo* measures within grains
- **Cattle faecal starch content (%)**
 - May be useful diagnostic aid





Faecal starch assay



Useful aid to ensure grain is being fully digested (Concern is farmer's ability to process grain on-farm and minimise cow wastage)





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