New Zealand Feed Manufacturers Association

Feed Forum

No 7, Spring 2008

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Remember to visit our website
www.nzfma.org.nz

Mill Run

Welcome to the 7th issue of **Feed Forum**. In our last issue we highlighted some of the work which had been done to increase media coverage for the NZFMA. These efforts have proven extremely successful with a constant stream of positive press stories throughout this year.

On a slightly less positive note, raw material pricing and availability continue to pose a challenge to the industry, with a number of novel ingredients being considered for inclusion in animal feeds. One of these is Distillers Dried Grains and Solubles (DDGS), the availability of which is increasing due to the large quantities produced as a result of ethanol production in the USA. Representatives of the US Grains recently met with NZFMA members and representatives to discuss the possibility of NZ feed manufacturers using DDGS. Look out for more information on this on our website and in future editions of **Feed Forum**.

Recent data from Conab, the Brazilian National Food Supply Company released in early September showed an almost 10% increase in the tonnage of grains harvested this year. It remains to be seen what impact, if any this will have on world commodity prices.

Also in the commodities area, Wheat Exports Australia have recently accredited 11 wheat exporters under new regulations which replaced the former Export Wheat Commission.

Members will be aware that Biosecurity New Zealand have been reviewing the Ruminant Protein Regulations. The proposed Ruminant Protein Regulation Amendments were released for public consultation on the 22nd of September 2008. For more information on the draft amendments please visit the NZFMA website www.nzfma.org.nz/Members/consultation.php

The NZFMA will be making a submission on the proposals and would welcome feedback on issues which are concern to members.

Finally, more information on the NZFMA AGM and Technical Seminar is given below. We would encourage members to attend what promises to be a thought provoking meeting.

AGM and Technical Seminar

The NZFMA AGM and Technical Seminar will be held in Christchurch on the 19th of November 2008. As usual the AGM will provide an opportunity for Members to raise issues and to provide feedback on the services offered by the NZFMA. In line with the NZFMA rules, a copy of the minutes, draft budget and Chairman's report will be sent out to members closer to the time.

The NZFMA is fortunate to have lined up some excellent speakers for the Technical Seminar with both speakers focusing on strategies which can be used by feed millers to help minimise the impact of increased raw material costs. These are detailed below:

The use of Format International's Single-Mix, Multi-Mix and Global-Mix Software Tools as a means of Minimising the Impact of Increased Raw Material Costs in the Feed and Livestock Industries. ***Dr. Michael Evans***

Enzymes to Enhance the Feed Value of Raw Materials. ***Prof. Ravi Ravindran***

Both presentations promise to be particularly interesting and we look forward to seeing you in there.

Nomination of Category B Representatives

NZFMA Members are reminded that the positions of Category B representatives for both the North and South Island will be up for annual election.

Both Alastair Orsborn (North Island) and Greg Wilson (South Island) have agreed to stand for re-election.

In accordance with the NZFMA rules, nominations for Category B representatives are being called for and the relevant form is included with this newsletter. Please complete the form and return it to the NZFMA Office by the **10th of October 2008** if you wish to make a nomination.

The Poultry Research Centre Massey University, Palmerston North

Prof. Ravi Ravindaran
Chair in Poultry Science, Massey University

The Poultry Research Centre (PRC), within the Monogastric Research Centre, has excellent facilities for growth, production and metabolism studies.

As an integral part of the Institute of Food, Nutrition and Human Health, the PRC has the unique opportunity to collaborate with other University academics staff for interdisciplinary research. Industry-oriented research, contract research, training and education in poultry production are the main thrust of the centre.

The aim of the centre is to serve as a focal point for the New Zealand Poultry Industry and to provide services including public-good and contract research, extension, education and consultancy to national and international industry sources. The retention of poultry research facilities at Massey University is currently supported by funding from the three major industry organizations – PIANZ, NZFMA and EPF.

The PRC research team is led by Professor Ravi Ravindran and ably assisted by Don Thomas, Colin Naftel and a strong group of postgraduate students (currently six PhDs and one Masterate). The Centre has an international reputation, particularly in the area of feed evaluation science. In addition, the PRC provides raw material chemical and bioassay services for local Industries. Furthermore, the PRC team can deal with on-farm layer monitoring, benchmarking and, research on animal welfare and husbandry. The experimental facilities available within the PRC for industry research are identified below.

Dissemination of research results is a major area of activity of the centre. The research outcomes are disseminated through conference presentations and publications in prominent international scientific journals. Our research interests vary from improving bird efficiency and advancing nutritional knowledge to increasing the nutritive value of raw materials to investigating the interactions between animals and the environment. While research is predominately concentrated on poultry, the PRC team also has access to personnel and facilities for studying native and endangered birds of New Zealand.

The PRC's ability to combine research, teaching and technology transfer is unique and sets it apart from many other science providers. This technology transfer function provides an important two-way flow of information from the researchers to the market place and visa-versa. The group organizes an annual technical update seminar, which has now become a regular feature in the poultry industry calendar in New Zealand. The PRC team is one of the active parties in the Ag ITO poultry programs providing certificate level industry training in different aspects of poultry husbandry to the wider industry.

Experimental Facilities

INCUBATION
- 400 egg-capacity incubator

INDIVIDUAL METABOLISM CAGES
- For digestibility, metabolisable energy and balance trials - 150 individual cages

GROUP CAGES
- Brooder pens for short-term feeding trials with chicks (92 cages x 8 birds/cage) – to 14 days of age.
- Grower and finisher cages (160 cages x 6 birds/cage) – from 7 to 42 days of age.

BROILER FLOOR PEN FACILITIES
- 48 pens x 20 birds (for growth studies to market weight)

ENVIRONMENTAL FACILITY
- Ten temperature-controlled rooms; temperatures can be adjusted from 8 to 36^{0}C. Each room houses 100 broilers from 1 to 42 days of age and can be subdivided into 2 pens of 50 birds each.

PENS FOR FREE RANGE RESEARCH
- 2 pens x 400 birds

LAYING HENS
- 160 Grower cages for pullets.
- 216 Layer cages (3 birds/cage)

FEED MANUFACTURE
- Feed processing unit - excellent facilities for milling, mixing, pelleting and feed storage. Facilities for mixing specialty diets from five kilograms to one tonne.

ANALYSIS
- Facilities for poultry product evaluation - carcass evaluation, sensory evaluation and egg quality parameters.
- Nutrient analysis - supported by a fully pledged analytical laboratory IANZ accredited to ISO 17025 and ilac-MRA 926.927.
- Veterinary services provided by the Institute of Veterinary, Animal and Biomedical Sciences, Massey University.
- Collaboration with the wider University provides access to a range of facilities in the areas of molecular-based microbial analyses (e.g. DGGE), rheology, particle size measurements, immunology and gut histological measurements.

Massey University

Sorghum: A different set of issues

Natalie Chrystal
Senior Executive Officer—Technical, NZFMA

The use of sorghum (*sorghum bicolor*) as an ingredient in animal feeds is not new to New Zealand. However, the usage of this grain is hugely variable from year to year and largely dependant on the availability and relative cost of other grains (e.g. wheat and barley). Figure 1 shows the total usage of sorghum by NZFMA members from 1 January 2004 to 30 June 2008.

Nutritional content of sorghum

The nutrient content of sorghum compared to other grain sources is shown in Table 1. Sorghum can be a relatively good energy source for most animal species, with a similar energy content to that of maize. The NRC (1994) reported that the energy content of sorghum is only about 5% less than that of maize.

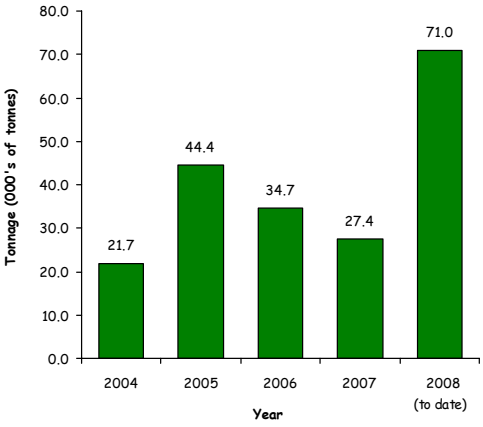
In general sorghum has a lower crude protein (CP) content than both wheat and barley, but a similar (or slightly higher) CP content to that of maize. However, sorghum is generally deficient in the essential amino acids - lysine, methionine and threonine. In addition, in the case of monogastric animals, the presence of tannins in the sorghum can reduce the digestibility of the protein present with the extent of the decrease in digestibility dependant on the amount of tannins present in the grains.

Prolamin storage proteins (kafirins) are also thought to have an impact on the digestibility of starch and protein contained in certain sorghum grain cultivars. Sorghum grain breeders have had some success in developing higher digestibility cultivars.

Anti-nutritional factors

Recent work presented by Perez-Maldonado (2008) showed that at least four factors can negatively affect performance of broilers fed sorghum-based diets.

Figure **1:** Usage of sorghum by NZFMA members from 2004 to 2008



These are

1. low cystine digestibility
2. the negative relationship between condensed tannins (CT) and tryptophan digestibility
3. the highly negative correlation between grain AME and the grain free and bound CT fractions and
4. the high sorghum P-phytate.

It was also suggested that the effect of CT may be particularly severe on the sorghum grain AME value for starter chicks. The performance of young birds fed sorghum based diets was worse than that of those fed wheat-based diets. However, the use of phytase and xylanase enzymes as well as the addition of synthetic methionine in sorghum based diets tended to improve bird performance.

Although many of the new varieties of sorghum have been bred with reduced tannin contents, even these so-called "low-tannin" varieties still contain a certain amount of tannin. As pointed out by Nyachoti *et al.* (1997), it is often assumed that seed coat colour is related to tannin content and hence nutritional quality of sorghum cultivars, with cultivars which have grains that are lighter in colour thought to contain less tannins than those with darker grains. However, this is not always the case, in particular for those cultivars which contain low to moderate tannin levels. In many cases those cultivars which have a high tannin content can exhibit a wide range of seed coat colours.

Evaluating the tannin content of sorghum grains

A simple test which is frequently used to qualitatively evaluate the tannin content of sorghum grains is given below:

- Randomly select 10 sorghum grains from a sample.
- Place these grains in enough 10% potassium hydroxide (KOH) solution to cover the grains and stir for ten minutes using a magnetic stirrer.
- Remove the grains from the solution and place on filter paper. Leave until try.
- Count the number of grains with a brown mark around them.

If one or two grains, have a brown mark around them, the sorghum can be considered to have a low tannin content. Where four to six grains have a brown mark around them, the tannin content is considered to be medium. If there are more than six grains with a brown mark around them, the tannin content of the sorghum can be considered to be high.

The effect of tannins on feed intake and animal performance

Although low tannin sorghums have a feeding value similar to that of maize, these varieties can be susceptible to damage by wild birds and therefore production can be somewhat limited.

Continued on page 4 .....

Table 1: Nutrient composition (as-is) of sorghum and other commonly used grains (From INRA, 2002).

	Low Tannin Sorghum	Wheat	Barley	Maize
Dry matter (%)	86.5	86.8	86.7	86.4
Crude Protein (%)	9.4	10.5	10.1	8.1
Lysine (g/kg)				
Total	2.2	3.1	3.8	2.4
Available (Poultry)	1.9	2.6	3.0	2.1
Total Methionine (g/kg)	1.5	1.7	1.7	1.7
Energy (MJ/kg)				
Broiler (AME)	13.9	12.5	11.5	13.4
Layer (AME)	13.8	12.1	10.9	13.1
Pig (DE)	14.2	13.9	12.9	14.2
Ruminant (ME)	11.7	11.3	10.7	11.7
Crude Fat (%)	2.9	1.5	1.8	3.7
Crude Fibre (%)	2.4	2.2	2.2	1.2

Sorghum: A different set of issues (continued)

... Continued from page 3

The anti-nutritional effects of tannins are largely considered to be a result of their protein-binding capacity. However, there is still some uncertainty about how tannins act *in vivo*. Jansman (1993) published an excellent review on tannins in feedstuffs for simple-stomached animals. Anyone interested in reading this review will find a link to the article in the Reference / Raw Materials section of the NZFMA website.

In their review Nyachoti *et al.* (1997) noted that some of the deleterious effects observed when feeding high tannins sorghum may be due not only to the presence of tannins but also as a result of the presence of flavonoids, found in large amounts in high tannin sorghums.

Using Sorghum by-products

In contrast to many of the other grains used in animal feeding, the outer husk of the sorghum grain contains the majority of the unpalatable components found in the sorghum, in particular the tannins. As a result the by-products of sorghum processing are unpalatable and are not commonly used in animal feeds.

Inclusion rates in commercial diets

As discussed earlier the biggest limitation to the use of sorghum in animal feeds as the presence of tannins. It is important therefore that feed manufactures know what type of sorghum they are using and, at least, the relative tannin content of this before using sorghum as an ingredient in animal feeds.

The recommended maximum inclusion levels for sorghum in livestock diets, given by Ewing (1997) are listed in table 2. In general, the inclusion limits provided in the Feeds Directory are conservative (especially for broiler in this example), but these are reliable starting points. Any increases in inclusion levels above these should be carefully evaluated and introduced over time.

Mycotoxin risks

Sorghum has an advantage over other grains (e.g. maize) in that it has a lower water requirement and can be grown in drier areas. However, it is easily water damaged and susceptible to fungal infestation with *Claviceps africana* and consequently the presence of ergot.

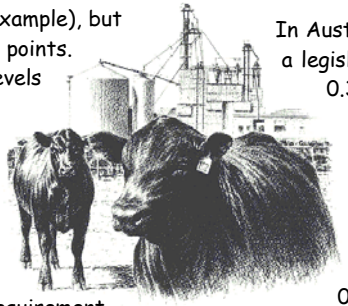
Table 2: Recommended maximum inclusion rates for sorghum in complete feeds for different livestock species and classes (From Ewing, 1997).

Ruminants		Pigs		Poultry	
Calf	5	Creep	0	Chick	0
Dairy	10	Weaner	0	Broiler	0
Beef	10	Grower	5	Breeder	5
Lamb	5	Finisher	5	Layer	5
Ewe	10	Sow	6		

Although ergot can occur at any time during the growing season if suitable weather conditions occur, the Queensland Department of Primary Industries and Fisheries reports that a constant temperature of 20°C and a humidity of close to 100% favours maximum infection. Summer outbreaks are associated with at least two days of rainy weather and daily maximum temperatures below 28°C.

The hard fungal bodies or sclerotes produced by *C. africana*, contain chemicals known as alkaloids. These chemicals have a wide range of biological effects and can cause vasoconstriction and hallucinations.

The consumption of ergot contaminated grain has been shown to cause decreased milk production in lactating sows and dairy cattle. Piglet performance is also affected where sows are fed ergot containing grains during lactation. The vasoconstriction effect of ergot alkaloids impacts on the ability of feedlot cattle to lose heat and consequently affects feed intake and growth rates. Growing pigs, boars, broilers and laying hens tend to be more tolerant of sorghum ergot.



In Australia, there is currently a legislated stockfeed limit of 0.3% sclerotes by weight for sorghum grain. In addition, the National Agricultural Commodities Marketing Association (NACMA) has introduced a limit of 0.1% sclerotes by weight for grains used in feedlot diets.

Biosecurity requirements for sorghum imported into New Zealand

The majority of sorghum used in New Zealand is imported from Australia. As with other imported grains, any sorghum grain imported into New Zealand must comply with the Import Health Standard (IHS) for the Importation of Grains/Seeds for Consumption, Feed or Processing.

Under this standard *sorghum bicolor* can either be imported as non-viable grains (following heat treatment or irradiation) or as viable grains. Post-entry transport, storage and processing restrictions apply to any imported sorghum.

If viable grains are imported these can either

- be subjected to heat treatment or irradiation on arrival at a MAF approved transitional facility or
- be processed in a MAF approved transitional facility which operates a MAF approved Grain Importation system.

The conditions for heat treatment require sorghum grains to be treated at a core temperature of 85°C and 40% relative humidity for a minimum of 15 continuous hours or at a time-temperature combination which has been verified as effective in devitalising seed.

As a result of these requirements, the majority of sorghum imported into New Zealand is finely milled in MAF approved transitional facilities prior to use in animal feeds. Unfortunately, the fine milling of sorghum grain is not the ideal option for inclusion in animal feed, as it can reduce feed intake and also has a detrimental effect on pellet quality.

Pellet Quality

Although it is generally accepted that sorghum is harder to pellet than other grains, Some authors (Taverner, 2004; Cao et al, 1999) have suggested that some sorghum cultivars pose more problems than others.

Conclusions

Sorghum can be used effectively in animal feed despite the fact that it presents feed manufactures and nutritionists with a different set of challenges. The most important thing is to know what you are buying and to "act" accordingly.

Animal Feeds – A Dairy Company Perspective

David Williams, Synlait Ltd

The New Zealand dairy industry has been receiving record prices for export produce. This is good news for dairy farmers and dairy companies, and the many support industries that thrive when dairying is performing well. However, this success does come with some risks, such as the well publicised issues relating to environmental sustainability and water allocation. Another risk and the focus of this article is the rapidly expanding types of purchased feed being utilised in dairying in New Zealand.

The main reason behind New Zealand's success as a dairy exporter has been the ability to meet customer requirements (assisted by an absence of agricultural subsidies) at a low cost. The secret to this low cost at the farm level has been based on cows receiving the vast majority of their required energy from pasture - low input, low cost systems, all this being assisted by a good climate. The increase in the value of dairy commodities, and the corresponding increase in land values has on the surface made it more economic for dairy farmers to feed supplements to their animals. This development should not be seen as a negative. However, it does come with some issues on the farm as farmers move to feeding purchased supplements that they are unfamiliar with. It also comes with some risks for dairy companies as far as actual and perceived quality of the purchased raw milk is concerned.

David Williams is the Supplier Liaison Manager for Synlait Milk Ltd. He has previously held roles with Fonterra and AsureQuality.

Everyone should be aware the issues that the feeding of copra to lactating dairy animals caused last season. The lessons learnt from this need to be taken on board to ensure these risks are adequately managed in the future. Not learning these lessons will lead to more stringent regulation, which will lead to increased costs, which will ultimately result in reduced use of supplementary feeds as it becomes less economic to do so. An outcome which will have a negative impact on all parts of the industry. It is unrealistic to expect dairy farmers to deal with this issue on their own. The feed manufacturers and distributors (along with dairy companies and other parties) need to ensure farmers have all the information required to make best of use of the feed supplied, and to effectively manage any problems that the type of feed may cause. Unfortunately in the past there has been a lack of communication between the feed manufacturer and dairy farmers.

To better manage this issue it is the responsibility of all parties too ensure:

- That the purchased supplementary feed is suitable for feeding to lactating animals in the first place - check with dairy companies first if there is ever any doubt.
- Dairy farmers are aware of what the feed is, and where it has come from.
- Dairy farmers are aware of any risks associated with the storage of the feed.
- Dairy farmers are aware of any animal health, welfare and productivity risks associated with using the purchased feed.

synlait™
making more from milk

Add Us To Your Safe Senders List!

Some members have reported that emails notifying members of updates to the NZFMA Website or requesting statistics return forms are being filtered as spam. To make sure you get all emails from the NZFMA please add our domain (@pianz.org.nz) to your safe senders list.

Industry Profiles

Caroline McGlashan:
Country Manager, Kemin Industries (NZ)

Caroline grew up on a hill country sheep farm in the Central North Island. Her family then established an egg layer operation and later a broiler operation that included both growing and processing of broilers.

Caroline has over 17 years commercial experience in the Poultry and Animal Feed Industries within New Zealand.

Caroline is currently the Country Manager for Kemin Industries (NZ) Limited and has held this role for 11 years. Prior to Kemin, Caroline worked for Tegel Foods and Golden Coast Commercial. Caroline has a Bachelor of Science and a post graduate diploma in Business Administration.

Prof. Ravi Ravindran:
Chair in Poultry Science, Massey University

Ravi earned his MSc and PhD in Animal Nutrition at Virginia Tech University, USA. Before moving to NZ in 1998, he held academic and research positions in Sri Lanka, Canada, USA and Australia.

Ravi's research interests are in early bird nutrition, amino acid availability, feed evaluation, gut flora management and feed enzymes. He has over 25 years of research experience and his findings are reported in more than 400 scientific publications.

Ravi has been awarded numerous research grants and a number of international awards. He has consulted for industry, government and international agencies. He currently serves on the Editorial Boards of a number of international journals and on the UN/FAO Expert Panel on 'New Feed Resources in Animal Feeding'.

Update Your Contact Details

The NZFMA website allows for members to update their own contact details (including telephone numbers and email addresses) should these change.

Contact details can be updated using the following steps:

1. Login into the NZFMA website (www.nzfma.org.nz) using your username and password.
2. Once you have logged in successfully, you will be redirected to the Members Home Page.
3. Click on the link "Click Here to Update your Details" on the bottom of the page - "Under Update Member Details".
4. Update your details on the form provided, making sure all mandatory fields are completed.
5. Click on submit.
6. Your details are now updated and an email will be sent with your new details to the NZFMA office.

Recent & Current Consultation

Submissions have recently been made by the NZFMA Office on

- The draft OIE Terrestrial Animal Health Code chapter on the control of Salmonella in poultry.
- The proposed regulatory changes resulting from the amendments to the ACVM Act.

Members currently have the opportunity to comment on the

- Draft Code of Practice for Rendering
- Proposed Amendments to the Ruminant Protein Regulations

For more information on these and other submissions visit the NZFMA website:

www.nzfma.org.nz/Members/consultation.php

Guidelines: NZFSA VA

The New Zealand Food Safety Authority (NZFSA) recently released a set of "Guidelines for Industry on the New Zealand Food Safety Authority Verification Agency". This is available at:

http://www.nzfsa.govt.nz/policy-law/publications/papers/va-guidelines/va-guideline-august-2008.pdf

The guideline outlines the purpose, roles and responsibilities of the VA and clarifies the circumstances in which the VA provides services to operators within the food and food-related sectors. Feed manufacturers who currently have a Risk Management Programme in place or who operate under a Ruminant Protein Control Programme will have had prior dealings with the VA.

The guideline is intended to provide information about the VA, the services which they provide and how the VA meets the requirements set out in the legislation administered by the NZFSA.

Changes to IHS's

A number of minor amendments to the Import Health Standard (IHS) for Processed Animal Feeds of Plant Origin have recently been made. These amendments were either editorial, for clarification, or additions to lists.

Some of the changes initially made to the standard required importers to have class determinations. This requirement has now been removed.

The reissued standard can be found at:

http://www.biosecurity.govt.nz/imports/plants/standards/bnz-pafp-imprt

Cereal Performance Trial Update

The NZFMA participated in the Cereal Performance Trials (CPT) for the 2006/2007 and 2007/2008 harvests. Analyses carried out as part of the NZFMA involvement in the project included

2006/2007 Harvest

- Analysis of 37 wheat and 17 barley samples by
  - Wet chemistry for dry matter, crude protein and crude fat
  - NIR for amino acids (excluding tryptophan)
- Analysis of 9 composite wheat and 2 composite barley samples by
  - Wet chemistry and NIR for amino acid composition, insoluble, soluble and total non-starch polysaccharides and starch content.
  - *In vivo* analysis using poultry for starch digestibility, apparent metabolisable energy and ileal digestible energy.

2007/2008 Harvest

- Analysis of 34 wheat and 24 barley samples by
  - Wet chemistry for dry matter, crude protein and crude fat
  - NIR for amino acids (excluding tryptophan).

The results of these analyses can be downloaded from the research section of the NZFMA website:

http://www.nzfma.org.nz/Members/cerealperformancetrials.php

Following a review of these results, the NZFMA CPT Working Party concluded that, although there is considerable variation in the crude protein content of wheat and barley samples, much of this variation is likely to be due to agronomic practices and without considerable extra funding it would not be possible to differentiate between the effect of cultivars vs. agronomic practices.

The variation observed in wheat and barley cultivars does mean that certain cultivars grown in certain conditions may be more suitable for monogastric production. However, it would not be possible to segregate different cultivars under the current NZ grain handling systems.

The Working Party has recommended to the NZFMA Executive that no further investments are made in the CPT at this stage.

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