FIAAP VICTAM grapas

Showtime

Issue 2 · Volume 18 · **Autumn 2013**

Coming soon: Asia's biggest feed and grain event

BITEC Thailand 8 – 10 April 2014

This major international event will attract trade visitors from all over South and South East Asia: feed millers, pet food manufacturers, biomass processors, integrators, fish farmers & hatcheries, nutritionists, veterinarians, farmers, rice millers, flour millers, grain processors, port authorities, wholesalers, importers and distributors.

Whether you are a visitor, conference delegate or exhibitor; this event, the biggest ever, will help you take advantage of the multiple opportunities available within these industries.

What is this event?

In fact it is three exhibitions and a series of conferences in one event – FIAAP Asia 2014, VICTAM Asia 2014 & GRAPAS Asia 2014; all in the same place at the same time and covering many different industry sectors and attracting senior executives from these diverse sectors from all corners of the growing and influential Asia/Pacific region.

These three co-located exhibitions will be held at the Bangkok International Trade and Exhibition Centre (BITEC) in Bangkok, Thailand from the 8 – 10 April 2014. This large, impressive, modern purpose built exhibition centre is capable of hosting such an event as this. One of the show's great advantages over other events in the area is that there is a lot of machinery on display. Whether it is an extruder, a pellet mill, colour sorter or a conveyor then this is what you will be able to see, examine, and discuss with the experts on the many manufacturers stands. You will not see such a wide range of this specialist technology anywhere else in the region.

One stop show

But this is not an event just for machinery. There is much, much more. Visitors will find a wide and varied range of specialist ingredients and additives used within the processing of animal feeds, dry petfoods, and aquafeeds and also within flour for baked products. Also to be found are the computer programs that will assist the formulators and nutritionists in their formulations.

We like to think of the event as a one stop show. Somewhere you will find everything you require to operate a successful, clean, green and cost effective production unit.

Free online registration

Please note our free online visitor registration system will go live on the 1st December. To register as a visitor, look at the subjects of the technical conferences or for a full list of current exhibitors go to **www.fiaap.com**, **www.victam.com** or **www.grapas.eu**

Inside your Autumn issue

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The three shows

FIAAP ASIA 2014
Is the only exhibition and conference profiling the specialist ingredients and additives used within the manufacture of animal feeds, dry petfoods and aquafeeds. Visitors to this trade show will comprise nutritionists, feed formulators, CEOs/ Directors, mill managers, veterinarians, etc.
For more information on FIAAP Asia 2014 go to www.fiaap.com

VICTAM ASIA 2014
This is the largest exhibition and series of conferences in Asia/Pacific for the equipment and technology used in the processing and manufacture of animal feeds, dry petfoods and aquafeeds. The senior industry executives who regularly attend this exhibition will be mill/production managers, CEOs/Directors, transport managers, nutritionists and feed formulators, etc.

Biomass pelleting technology is also included within the VICTAM exhibition profile. Visitors to this specialist yet expanding sector will include processors of biomass pellets for municipal, industrial and commercial facilities as well as for domestic use.

For more information on VICTAM Asia 2014 go to www.victam.com

GRAPAS ASIA 2014
Rice milling/packaging, flour milling, grain processing, noodle, breakfast cereals and extruded snacks are all encompassed by this event. Attendees will include rice millers, packers, etc., flour millers, grain storage and processing facilities, noodle, breakfast cereal and snack manufacturers, etc.
For more information on GRAPAS Asia 2014 go to www.grapas.eu

ASEAN Feed & Rice Symposium and ASEAN Feed Summit and ASEAN Rice Summit

New

The first ASEAN Feed & Rice Symposium will take place during the event at BITEC. The symposium will address the impact of the forthcoming ASEAN Economic Bloc, with particular emphasis on the food industries and food security. Senior officials from the ASEAN Economic Community, the Asian Development Bank and the UN's Food and Agricultural Organization have been invited to present key-note speeches at this unique and important event. The symposium will be open to all registered visitors, conference delegates and exhibitors.

The two summits, one for the animal feed industry and the second for the rice milling and processing sector, will be hosted by the local Thai Associations, the Ministry of Agriculture, The Department of Livestock and Co-Operatives, The Thai Chamber of Commerce and the Thai Convention and Exhibition Bureau.

The two summits will convene at BITEC and will comprise international forums for Animal Feed Associations and Rice Milling and Processing Associations together with related Government officials from

throughout the ASEAN region in order to discuss and determine the future policies and objectives for each industry. The Presidents and Secretary Generals have been invited to attend and use the summits to prepare and assess the impact of the new ASEAN Economic Bloc.

The summits will be sponsored by the Victam Foundation, a Dutch charitable trust, in order to promote the interests of these important industries within the ASEAN markets and throughout Asia.

Technical Conferences

8 APRIL

AQUAFEED HORIZONS
Organised by Linx Conferences

THE GRAPAS CONFERENCE 2014
Organised by Perendale Publishers

THE THAI FEED CONFERENCE
Organised by the Thai Feed Mill Association and the Thai Department of Livestock

9 APRIL

PETFOOD FORUM ASIA
Organised by Watt Publishing Co

THE FIAAP CONFERENCE 2014
Organised by Linx Conferences

THE FIRST ASEAN FEED & RICE SYMPOSIUM

10 APRIL

BIOMASS PELLETING ASIA 2014
Organised by Bioenergy International Magazine

ASEAN FEED SUMMIT

ASEAN RICE SUMMIT

The ASEAN economic community

ASEAN covers a land area of 4.46 million km^2, which is 3% of the total land area of Earth, and has a population of approximately 600 million people, which is 8.8% of the world's population. The sea area of ASEAN is about three times larger than its land counterpart.
In 2011, its combined nominal GDP had grown to more than US$ 2 trillion. If ASEAN were a single entity, it would rank as the eighth largest economy in the world.

Southeast Asian nations cannot afford to be complacent or lose focus as the region moves toward a formal economic community in the next two years, a senior Association of Southeast Asian Nations official has warned.

The Asean Economic Community, which is set to begin at the end of 2015, aims to liberalize the movement of goods, services, investment, skilled labour and capital within the region.

Lim Hong Hin, the ASEAN Deputy Secretary General responsible for the AEC, said ASEAN countries had between 2008 and March this year completed 77.5% of the necessary AEC measures. But as the December 2015 deadline approaches, Lim cautioned members to prioritize measures that are crucial for the AEC's success.

"Let's look at the measures that are building blocks for Community, get them done first, and then you can focus on other measures. What we need is to have a good foundation," Lim said in Jakarta. "The year 2015 is not the end of the day because after that we have something to follow."

Measures that need to be undertaken include the elimination of duties in order to establish a single market and production base; regional infrastructure to boost competitiveness; small and medium enterprise linkage to ensure equitable development; and a comprehensive economic partnership for integration in the global economy.

Lim added ASEAN aimed to establish an economic partnership that would form the world's largest economic bloc by 2015. Negotiations on the ASEAN Regional Comprehensive Economic Partnership, an initiative involving the 10 ASEAN members (Brunei, Burma, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam) and its dialogue partners – Australia, China, India, Japan, New Zealand and South Korea – started in April.

Indonesia was elected as the lead negotiator in RCEP, which aims to harmonize current ASEAN free-trade agreements under one umbrella agreement.

"ASEAN free trade agreements with its major trading partners have become ASEAN's main economic strategy for integrating the region into the global economy," Lim said.

Dion Bisara, Jakarta Globe

ASEAN Member States

Brunei Darussalam
Head of State: His Majesty Sultan Haji Hassanal Bolkiah Mu'izzaddin Waddaulah
Capital: Bandar Seri Begawan
Language(s): Malay, English
Currency: B$ (Brunei Dollar)
Website: www.mfa.gov.bn

Cambodia
Head of State: His Majesty King Norodom Sihamoni
Head of Government: Prime Minister Hun Sen
Capital: Phnom Penh
Language: Khmer
Currency: Riel
Website: www.mfaic.gov.kh

Indonesia
Head of State: President Susilo Bambang Yudhoyono
Capital: Jakarta
Language: Indonesian
Currency: Rupiah
Website: www.kemlu.go.id

Lao PDR
Head of State: President Choummaly Sayasone
Head of Government: Prime Minister Thongsing Thammavong
Capital: Vientiane
Language: Lao
Currency: Kip
Website: www.mofa.gov.la

Malaysia
Head of Government: The Honourable Dato' Sri Mohd Najib bin Tun Abdul Razak
Capital: Kuala Lumpur
Languages: Malay, English, Chinese, Tamil
Currency: Ringgit
Website: www.kln.gov.my

Myanmar
Head of State: President Thein Sein
Capital: Nay Pyi Taw
Language: Myanmar
Currency: Kyat
Website: www.mofa.gov.mm

Philippines
Head of State: President Benigno S. Aquino III
Capital: Manila
Languages: Filipino, English, Spanish
Currency: Peso
Website: www.dfa.gov.ph

Singapore
Head of State: President Tony Tan Keng Yam
Head of Government: Prime Minister Lee Hsien Loong
Capital: Singapore
Languages: English, Malay, Mandarin, Tamil
Currency: S$ (Singapore Dollar)
Website: www.mfa.gov.sg

Thailand
Head of State: His Majesty King Bhumibol Adulyadej
Head of Government: Prime Minister Yingluck Shinawatra
Capital: Bangkok
Language: Thai
Currency: Baht
Website: www.mfa.go.th

Viet Nam
Head of State: President Nguyen Minh Triet
Head of Government: Prime Minister Nguyen Tan Dung
Capital: Ha Noi
Language: Vietnamese
Currency: Dong
Website: www.mofa.gov.vn

Factors affecting rice milling quality

Environmental temperature and harvest moisture content can have dramatic impacts on quality.

Any factor that causes a reduction in the strength of rice kernels, and the resultant ability of kernels to withstand the forces imparted during hulling and milling, will impact milling yield.

These factors include those incurred during production, such as fungal diseases and insects, and high nighttime air temperatures during kernel filling. Additionally, the moisture content (MC) at which rice is harvested can have a dramatic impact on milling yield, with head rice yield (HRY) reductions occurring by harvesting at greater MCs (reductions due to increasing numbers of immature kernels) or lesser MCs (reductions due to moisture adsorption fissuring) than optimal.

Rice milling

Once harvested and dried, "processing" of rough rice into milled rice consists of several operations.

After cleaning to remove foreign material, rough rice is hulled to produce brown rice. The hull represents approximately 20% of the mass of a rough rice kernel. Brown rice is usually milled immediately after hulling, removing the bran layers and germ by frictional and/or abrasive action. The bran represents approximately 10% of the original rough rice mass.

The remaining milled or "white" rice comprises head rice, defined as those kernels retaining three-fourths or more of its original length and broken kernels (brokens). The milled rice yield (MRY) represents the mass of milled rice expressed as a percentage of the original dried rough rice mass. Typical MRYs range from 68% to 72%. Upon removal of brokens, only head rice remains. The mass of head rice, expressed as a percentage of the original rough rice mass, is defined as the head rice yield (HRY). Head rice yields can vary from 0 (all kernels are broken) to a theoretical maximum of approximately 70% (no kernels are broken). Milling quality is often expressed as a ratio of the HRY to the MRY (e.g., a 58/70 value would indicate an HRY of 58%, MRY of 70% and brokens yield of 12%, the difference between the two values).

Broken kernels reduce milling yield. Brokens produced during milling are generally the result of immature, chalky, or fissured kernels, all of which are weak and typically break during milling. Since brokens are only worth approximately 60% of the value of head rice, HRY directly determines the economic value of a rice lot, e.g., if the value of head rice is $0.20/lb and brokens $0.13/lb, the discount for HRY reduction would be $0.07 for every percentage point change in HRY for each 100 lbs of rough rice. Thus, if HRY decreases by 10 percentage points (e.g., from 60% to 50%), the price decrease would be $0.70 for every 100 lbs of rough rice, or $0.32 per bushel.

The degree to which rice is milled, or the degree of milling, is determined by the amount of bran/oil remaining on milled kernels. Whiteness, as often measured with a color meter, is sometimes used to indicate degree of milling. However, a more common method of quantifying degree of milling is measuring the amount of lipids, or oil, on the surface of milled kernels. Since bran is approximately 20% lipids, the surface lipid content of milled rice is directly related to the amount of bran remaining on milled kernels. As milling progresses and the degree of milling increases, the whiteness of milled rice increases, the surface lipid content decreases, and both MRY and HRY decrease. While there is currently no accepted standard for measuring degree of milling, most commercially milled rice must meet some form of degree of milling specification. ➤

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Production factors

Several factors during rice production can affect milling yield and quality. Such factors are generally manifested as individual kernel strength reduction, which ultimately determines the ability of the kernel to withstand the rigors of hulling and bran removal without breaking apart.

Diseases such as rice blast or sheath blight can cause milling quality reductions. In addition, kernel smut disease reduces milling quality and can sufficiently discolor rough rice to create problems during parboiling. Additionally, field insects can have detrimental effects on rice quality. Most notable is the stink bug, which bores into the kernel during development, resulting in a black spot on the kernel known as "peck."

Factors at harvest

Head rice yield typically varies with the MC at which rice is harvested. The harvest MC at which HRY is maximum, under Arkansas weather conditions, is approximately 19% to 21% for long-grain cultivars and 22% to 24% for medium grains. Harvesting at MCs greater than or less than optimal can result in decreased HRY, as is illustrated in Figure 1.

As rice matures, kernels on a panicle will exist at very different MCs, representing various maturity and kernel strength levels. An example of this is illustrated in Figure 2, which shows that when the average bulk MC is 23.1%, a large spread in individual kernel MCs exists.

Distributions of individual kernel MCs change with the bulk MC of the sample (e.g., individual kernel MC distributions usually have multiple "peaks" when rice is harvested at 16% MC or greater). These distributions transition to single peaks at lower MCs, yet there is still a large range in kernel-to-kernel MCs as is indicated in Figure 2, for rice at a bulk MC of 13.2%. At any given point in time, some kernels on a panicle may be at much different MC than others and thus will respond differently to ambient air changes.

Individual kernel MC distributions can be used to explain milling quality levels in that the distributions quantify the percentage of immature or "green" kernels, often considered as those kernels with MCs greater than 22%, as well as the percentage of "dry" kernels, often taken as those kernels with MCs less than 14%. Immature kernels can be a source of milling yield reduction because these kernels are typically weak in structure and often break during milling.

Rapid rewetting of low-MC kernels, such as would occur through exposure to rain or ambient air relative humidities greater than approximately 85%, cause dry kernels to expand rapidly at the kernel surface.

Figure 1: Harvest moisture content vs. head rice yield.

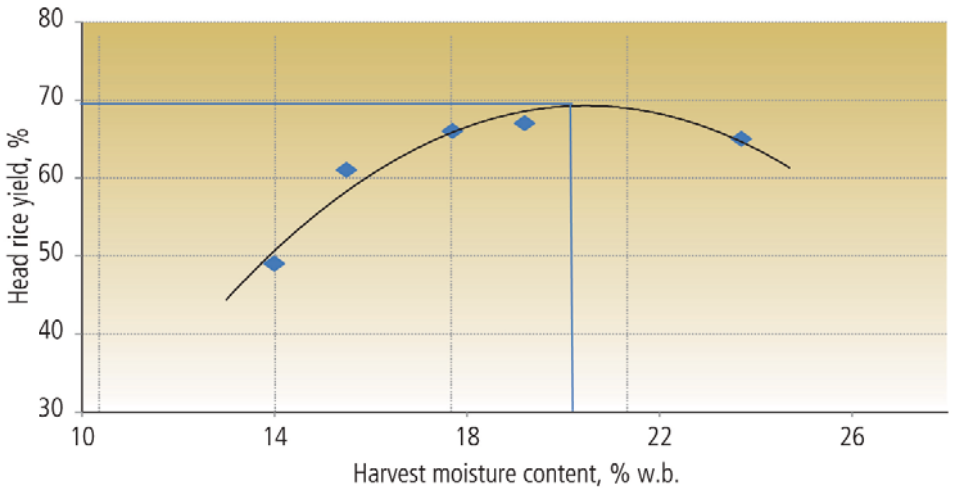


Figure 2: Individual kernel moisture content distributions within panicles (composite of kernels from five panicles) of Bengal rice at average harvest moisture contents (HMCs) of 23.1% and 13.2% from Keiser, AR. (Taken from Bautista and Siebenmorgen, 2005).

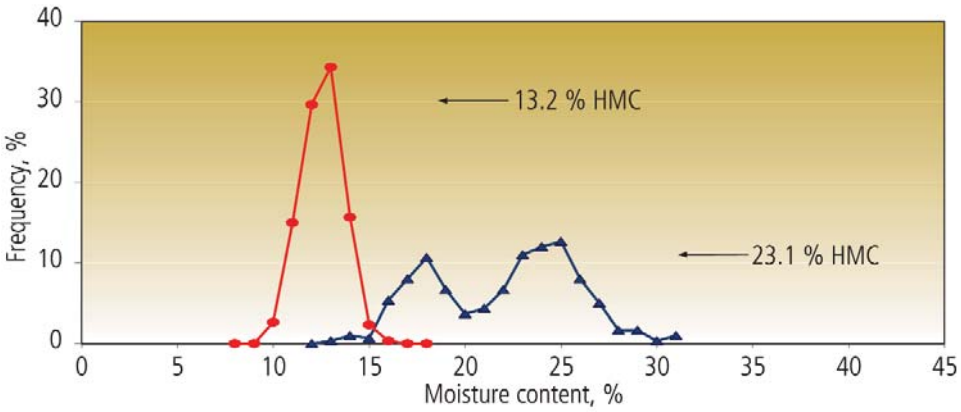
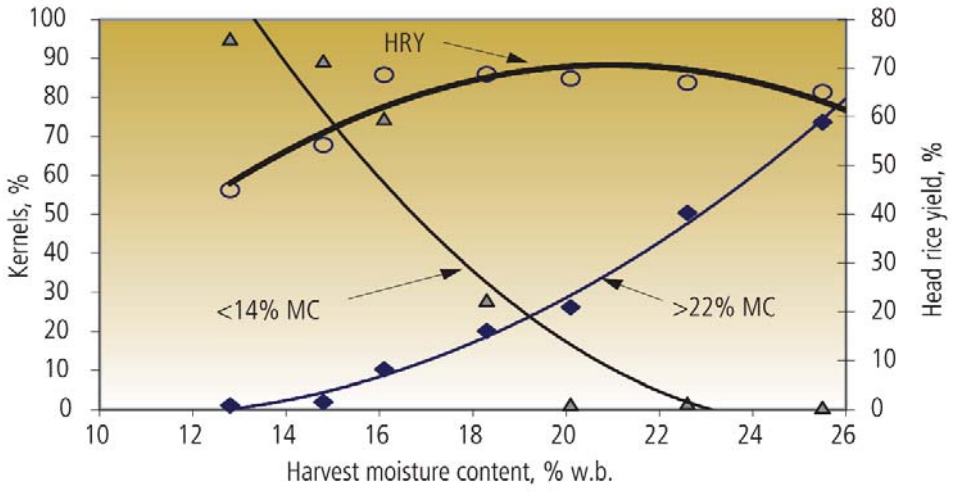


Figure 3: Relationships of percentages of kernels at moisture contents (MCs) >22% or <14%, and head rice yields (HRYs) to harvest MCs for long-grain cultivar Drew harvested at Keiser, AR.



However, because an extended time is required for the moisture to migrate inward, the kernel center cannot immediately expand, creating stress differences inside the kernel that ultimately result in material failure and fissure formation. Fissured kernels typically break apart during milling, drastically reducing HRY.

Generally, the percentage of fissured kernels in a sample increases as the MC at

which rice is harvested decreases. The percentage of fissured kernels increases approximately exponentially as the grain dries in the field, thus exposing increasing numbers of dry kernels to rapid moisture adsorption conditions. The propensity for kernels to fissure due to moisture adsorption increases as the kernel MC decreases. It is to be noted that the rate of fissured kernel percentage increase is not always perfectly correlated to the percentage of low MC kernels, since fissuring by moisture adsorption is dependent on moisture being supplied by the environment in some manner, such as precipitation or high relative humidity.

A HRY versus harvest MC curve is shown in Figure 3, indicating a peak HRY at approximately 21% MC. The decline in HRY at low harvest MCs corresponds to the increasing percentage of kernels with MCs less than 14%, depicted by the '<14% MC' line. These kernels likely fissure due to rapid moisture adsorption.

Figure 3 also shows that HRYs decline at harvest MCs greater than the peak of 21%, likely due to the increasing presence of thin, immature kernels. Figure 3 illustrates this increasing presence of immature kernels by the curve depicting the percentage of kernels with MCs greater than 22%.

Based strictly on maximizing HRY, it is generally recommended to harvest rice at the optimal MCs indicated above. However, when considering that drying costs generally increase dramatically with harvest MC, the economic optimum harvest MC may be slightly less than the optimal MC for maximizing HRY, depending on drying charges and the relative value of head rice to brokens.

Figure 4a: Relationships of chalk and the 95th quantiles of nighttime air temperature frequencies during the R8 stages of the indicated cultivars grown during 2007, 2008, 2009 and 2010.

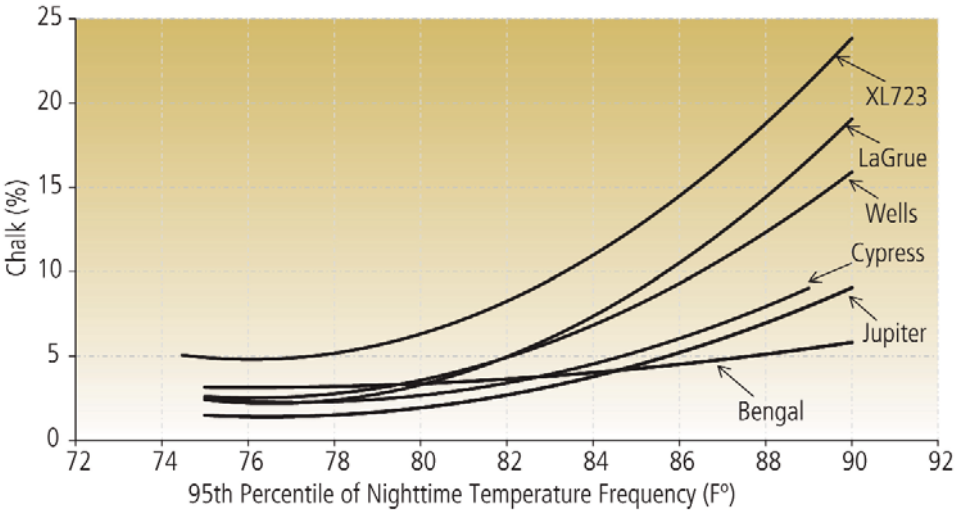
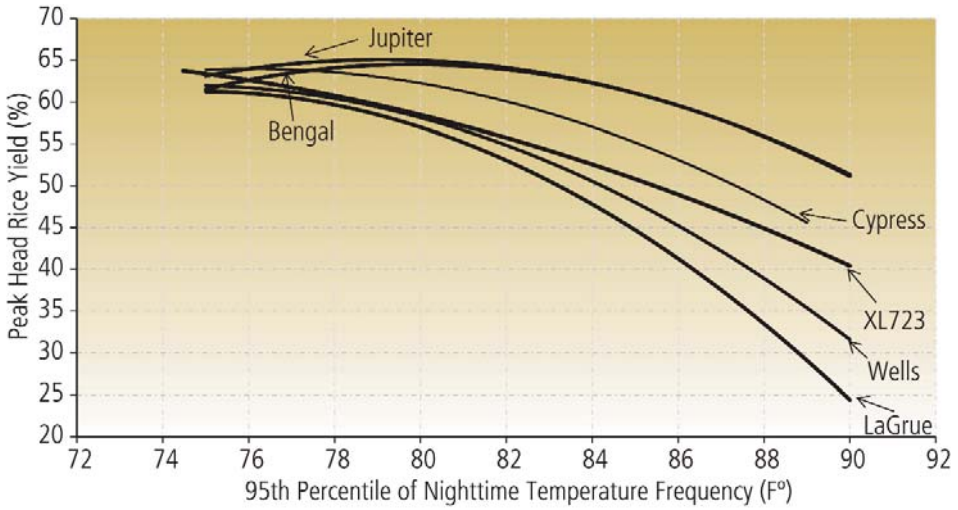


Figure 4b: Relationships of peak head rice yields and the 95th percentiles of nighttime air temperature frequencies during the R8 stages of the indicated cultivars grown during 2007, 2008, 2009 and 2010.



Nighttime air temperature effects

Another very important production factor that can impact rice quality is ambient temperature during kernel development. Previous research conducted in controlled-air chambers has shown that increasing nighttime air temperatures during certain kernel reproductive stages will dramatically increase chalkiness and reduce HRYs in several cultivars. Chalkiness reduces kernel strength and thus directly relates to milling quality reduction.

Recent field research has confirmed and extended these findings. This research shows that increasing levels of nighttime air temperatures during grain filling stages are strongly correlated to increasing levels of chalkiness and reduced HRYs.

The most dramatic impact on milling yield is that peak HRYs, obtained by harvesting at optimal MC levels, will be reduced substantially when high nighttime air temperatures occur during kernel filling. Figures 4a and 4b illustrate how nighttime air temperatures (defined as those occurring between 8 p.m. and 6 a.m.) during the R-8 reproductive stage impact chalkiness and peak HRYs, with data collected from six cultivars grown in 2007 through 2010 at locations from northern to southern Arkansas.

The 95th percentile of nighttime air temperatures was used to represent the temperature below which 95% of nighttime air temperatures occurred during a reproductive stage. Figures 4a and 4b show that, in general, as nighttime air temperatures during R-8 increase, chalk values increase and corresponding peak HRYs decrease, particularly in some cultivars.

It is especially noted that the data from 2010 generally represented extreme nighttime air temperatures as well as very high chalk levels and low HRYs, with peak HRYs often being below 50%.

This recent research has shown at both lab and field levels that peak HRY is inversely affected by nighttime air temperatures during the kernel filling stages of reproductive growth. The research has also shown that the effects of nighttime air temperatures are cultivar dependent; some cultivars are very susceptible to the negative impacts of high nighttime air temperatures while others are somewhat resistant.

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This article first appeared in World Grain magazine. We would like to thank the publishers for their permission to reproduce this article.

While Asia continues to dominate the market in number of companies and production, several players in other parts of the world continue to increase their market share.

Top feed companies 2011–2012

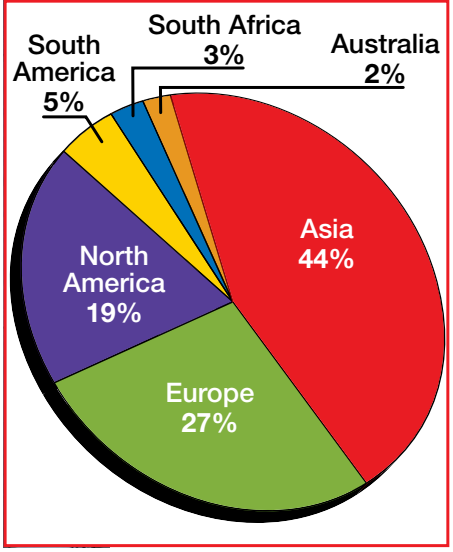
The volatility of grain prices made the past year a tumultuous one as feed producers worldwide worked to secure raw materials in an environment of fierce competition. For many feed companies, this was a time to hold on to current market share. However, some players – both large and small – used this past year to increase their share of the market by taking advantage of shifts in animal production in their region, through mergers or acquisitions, or increased capital investment.

Growth in the U.S.

When one of the world's largest manufacturers of animal feeds announces a 13 percent increase in annual volume, it is time to take notice. That was the scale of the growth reported in the U.S. by Land O'Lakes Purina for its livestock feed business in 2011.

According to the company, after several years of being a segment under stress, farm feeds finally benefitted last year from increases in the U.S. markets for dairy, beef and pork. For this reason, Land O'Lakes Purina has been moved from the number five to the number four slot in our overall rankings, specifically in the 25.0-10.0 million metric tons category (Table 1).

CHART 1: Locations of top feed companies, by percentage



Other North America notes

Other names in the top 10 of big North American feed players also have been making news headlines over the past 12 months. For example, Cargill added premix and specialty feed interests internationally by buying Provimi from equity fund Permira for EUR1.5 billion. Grains-to-feeds operator Viterra of Canada became the takeover target of commodities giant Glencore.

There was activity in the U.S. liquid feed market when Westway Group agreed to sell its 1.8-million-metric-tons-per-year Westway Feed Products liquid feed supplements business to the company's largest shareholder. And Archer Daniels Midland subsidiary, ADM Alliance Nutrition, moved into the liquids market by acquiring assets of U.S.-based supplements manufacturer Liquid Feed Commodities.

Elsewhere in the U.S., there was the announcement of a new joint venture involving major players JD Heiskell and Kent Nutrition Group, between them representing about 4.5 million metric tons of annual feed manufacturing capacity at North American locations. They are joining forces to operate four Kent-owned mills in the northeastern states of New York and ➤

TABLE 1: World feed manufacturers making more than one million metric tons per year of complete feeds in 2011, ranked in descending order by size.

Rank	Company	Headquarters
	25.0-10.0 million metric tons	
1	Charoen Pokphand (CP Group)	Thailand
2	Cargill	USA
3	New Hope Group	China
4	Land O'Lakes Purina	USA
5	Brasil Foods	Brazil
6	Tyson Foods	USA
	10.0-5.0 million metric tons	
7	Guangdong Wen's Group	China
8	Cofco	China
9	East Hope Group	China
10	Zen-noh Co-operative	Japan
11	Nutreco	Netherlands
12	ForFarmers	Netherlands
	5.0-2.5 million metric tons	
13	Tongwei	China
14	Twins Group Shuangbaotai	China
15	Agrifirm Feed	Netherlands
16	De Heus	Netherlands
17	DLG	Denmark
18	Glon	France
19	Smithfield Foods	USA
20	DaChan/East Asia Group	China
21	Hunan Tangrenshan Group (TRS)	China
22	Agravis Raiffeisen	Germany
23	ADM Alliance Nutrition	USA
24	Zhengbang	China
25	Veronesi	Italy
26	Bachoco	Mexico
27	InVivo NSA	France
28	Frangosul	Brazil
29	Kent Nutrition Group	USA
	2.5-1.5 million metric tons	
30	Marubeni-Nisshin	Japan
31	DTC Deutsche Tiernahrung Cremer	Germany
32	Perdue Farms	USA
33	Seara	Brazil
34	Dabeinong	China
35	Betagro	Thailand
36	AB Agri	UK
37	JD Heiskell	USA
38	San Miguel	Philippines
39	Zuellig Gold Coin	Malaysia
40	Mitsubishi Nosan	Japan
41	Wellhope Agri-Tech	China
42	Chubu	Japan
43	Japfa Comfeed	Indonesia
44	Kyodo Shiryo Feed	Japan
45	Meadow Feeds	South Africa
46	Zhenghong	China
	1.5-1.0 million metric tons	
47	Hengxing Evergreen	China
48	NNA	France
49	Southern States Co-op	USA
50	Viterra	Canada
51	Aveve	Belgium
52	Ridley Agriproducts	Australia
53	Bröring Unternehmensgruppe	Germany
54	CJ Cheil Jedang	Korea
55	Ridley Inc	Canada
56	Easy Bio System	Korea
57	Myronivsky Hliboproduct	Ukraine
58	Nippon Formula Feed	Japan
59	Proconco	Vietnam
60	Lantmännen Lantbruk	Sweden
61	Epol	South Africa
62	Itochu	Japan
63	Mega Tierernahrung	Germany

This year's top feed companies list includes 63 companies; but, it will likely increase as more companies move to become integrators.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Vermont that specialize in producing feeds for dairy cows. This signifies an extension of territory for Heiskell, whose feed interests until now have related mainly to western states.

Movement in Asia

Not to be outdone, there has been a great deal of activity throughout Asia as well. This is not really a surprise as the vast majority of the top 63 feed manufacturers we ranked are based in Asia, particularly China. (Chart 1, page 10).

Once again, we rank Charoen Pokphand of Thailand as the top producer globally, with China-based New Hope Group holding the third spot after U.S.-based Cargill. Following, that of particular note is Guangdong Wen's Group, a mover since the 2010 rankings.

Founded in 1983, Guangdong Wen's Group has business operations in 20 of China's provinces and has established more than 110 integrated companies. In 2010, it reported sales revenue of RMB21.94 billion, and for 2011, it indicated its feed production approached 10 million metric tons. In June 2012, it signed an agreement with Deya Agriculture Corporation for Deya to supply Guangdong Wen's Group with raw corn for four of its feed mills in southwestern China on a non-exclusive basis. The four feed mills use approximately 200,000 metric tons of raw corn per year. Based on this information, the company has been moved from its 2010 ranking of number 11 to number seven in the 10.0-5.0 million metric tons category, and moves to number three among Asian feed producers (Table 2).

Expansion through acquisition

Major moves since the middle of 2011 also have been taking place in Europe. The most obvious of these has involved a double acquisition by ForFarmers, a private company that is majority owned by a Dutch farm co-operative. Up until 2011, the ForFarmers operation consisted of production and sales of feed in the Netherlands, Belgium and Germany, with five production locations in the central eastern part of the Netherlands and five in Germany. In 2011, ForFarmers produced nearly 2.5 million metric tons of compound feed.

In November 2011, ForFarmers signed an agreement to purchase Hendrix UTD from Nutreco for EUR92.5 million. Hendrix UTD operates 10 mills in the Netherlands, Belgium and Germany. In 2011 the mills produced 2.9 million metric tons of feed. The purchase was approved by authorities in April 2012.

In March 2012, ForFarmers signed an agreement for the purchase of UK-based BOCM Pauls for EUR85 million, becoming Europe's largest feed manufacturer in the process. BOCM Pauls operates 11 feed mills. The purchase was approved by authorities in July 2012. The ForFarmers Group now has 8.8 million metric tons of feed production, of which 6.5 million metric tons is compound feed and 2.3 million metric tons are single products and co-products. These acquisitions enabled ForFarmers to leap from number 31 in our previous rankings to number 12 and a stone's throw away from being in the top 10.

TABLE 2: Asian companies in the top world feed manufacturers
(Listed in descending order by production volume.)

Rank	Company	Headquarters
1	Charoen Pokphand (CP Group)	Thailand
2	New Hope Group	China
3	Guangdong Wen's Group	China
4	Cofco	China
5	East Hope Group	China
6	Zen-noh Co-operative	Japan
7	Tongwei	China
8	Twins Group Shuangbaotai	China
9	DaChan/East Asia Group	China
10	Hunan Tangrenshan Group	China
11	Zhengbang	China
12	Marubeni-Nisshin	Japan
13	Dabeinong	China
14	Betagro	Thailand
15	San Miguel	Philippines
16	Zuellig Gold Coin	Malaysia
17	Mitsubishi Nosan	Japan
18	Wellhope Agri-Tech	China
19	Chubu	Japan
20	Japfa Comfeed	Indonesia
21	Kyodo Shiryo Feed	Japan
22	Zhenghong	China
23	Hengxing Evergreen	China
24	CJ Cheil Jedang	Korea
25	Easy Bio System	Korea
26	Nippon Formula Feed	Japan
27	Proconco	Vietnam
28	Itochu	Japan

Twenty-eight of the world's top feed manufacturers are located in Asia; nine are in the top 20.

TABLE 3: European companies in the top world feed manufacturers
(Listed in descending order by production volume)

Rank	Company	Headquarters
1	Nutreco	Netherlands
2	ForFarmers	Netherlands
3	Agrifirm Feed	Netherlands
4	De Heus	Netherlands
5	DLG	Denmark
6	Glon	France
7	Agravis Raiffeisen	Germany
8	Veronesi	Italy
9	InVivo NSA	France
10	DTC Deutsche Tiernahrung Cremer	Germany
11	AB Agri	UK
12	NNA	France
13	Aveve	Belgium
14	Bröring Unternehmensgruppe	Germany
15	Myronivsky Hliboproduct	Ukraine
16	Lantmännen Lantbruk	Sweden
17	Mega Tierernahrung	Germany

As the result of recent mergers and acquisitions, the Netherlands is rapidly becoming the center for feed production in Europe.

Capital investment

Another company with Dutch roots, De Heus, was also a mover in this year's rankings. De Heus is a family-run company with headquarters in Ede-Wageningen, Netherlands. It has 30 feed mills in eight countries and exports to more than 45 countries. In June of this year, De Heus opened a new feed mill in Dong Nai, its fourth in Vietnam. The plant was built at a cost of USD15 million and has a capacity of 300,000 metric tons per year.

De Heus moves from number 20 to number 16 in the overall list, and it now ranks as number four among feed producers located in Europe (Table 3).

We would be remiss if we did not mention that while Nutreco did divest itself of Hendrix UTD this past year, it is still a major player both in the Netherlands and in the global arena, simply with an adjusted focus. Nutreco welcomed a new chief executive in August 2012 and announced during the past 12 months a series of initiatives in the aquafeeds and premixes sectors.

What to expect

A final observation for our readers is that many of the top players listed here are integrators — a sign of the way things are going internationally. More integrated companies look certain to enter the one million metric tons (or more) category soon. One company we can look to as an example of this is Miratorg Agribusiness Holding in Russia.

Miratorg is already the largest pork producer in Russia, and its pig enterprises required an estimated 720,000 metric tons of feed in 2011. The company has already invested to increase its annual feed production capacity from 270,000 metric tons to 630,000 metric tons and is building another plant in 2012 that will add another 360,000 metric tons to that number. We expect to see more companies making similar moves in the years ahead.

Please note: Data used in this article came from public sources or directly from the companies mentioned. All companies mentioned in this article were asked, via email, for production information. For those that did not respond, the staff of Feed International used their best estimates for rankings. If your company is listed and you believe the data being used is incorrect, please contact Peter Best at pbest@wattnet.net or Ken Jennison at kjennison@wattnet.net so that future content may be corrected.

This article first appeared in Feed International magazine. We would like to thank the publishers for their permission to reproduce this article.

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VICTAM to celebrate 50th anniversary during 2015 shows in Cologne

2015 will be the 50th anniversary of the first VICTAM exhibition which was held from 26 to 29 May 1965 in Utrecht, The Netherlands.

The 1965 show was about 4,000 sqm net, and there were 64 exhibitors, these include some well-known industry names: Van Aarsen, Ottevanger, Wijnveen, Neuero, Poeth, Welgro, Amandus Kahl, Dinnissen, Molenschot (now Precia Molen), Heesen (now Andritz), Simon Europe (now also Andritz). It is good to see so many of these are still current exhibitors at our shows.

Since these early days the exhibition has changed as has the industry. The introduction of new technology and modernisation has meant fewer but more efficient mills but with greatly reduced workforces. Many famous names have gone or been integrated into new larger companies. The same is also true of the companies who provide the modern technology and ingredients. A number of these companies have gone or merged. The industry has also seen many new technological developments and nutritional advances emerge. Traditionally these were from Western European and American companies. Now it has become a global industry with manufacturers and suppliers introducing new products and services from all over the world.

And with it Victam too has changed. For the better we hope. From a small exhibition in Utrecht 1965 purely for the Dutch animal feed industry it has evolved into what is now the world's largest and most prestigious event for the multi $billion international animal feed, grain processing, milling and biomass pelleting industries.

The event in Cologne, from 9 – 11 June, 2015, will not only be a VICTAM exhibition as it will be co-located with sister shows – FIAAP International (animal feed ingredients and additives) and GRAPAS International (grain processing and flour milling).

Even VICTAM International is not quite the same as it used to be – a show mainly for animal feed processing technology. The show now also profiles, like many of its exhibitors, biomass pelleting technology.

The 50th Anniversary shows are not all that is happening to celebrate this milestone.There will be other surprise events that will ensure that VICTAM International 2015, together with FIAAP International 2015 and GRAPAS International 2015 should not be missed.

For now you will have to guess, but we will let you know all about it nearer the time.

Emerging markets in Asia among fastest-growing pet care markets worldwide

At Petfood Forum Asia, learn why China, Thailand and India are among the markets that will continue to drive growth in pet care and petfood sales.

Between 2013 and 2018, pet care sales in China are projected to grow by at least US$600 million, making it the fourth fastest-growing pet care market globally, according to Euromonitor International. It will be joined by fellow high growth Asian countries Thailand and India among the eight fastest-growing pet care markets.

Petfood professionals can learn about these hot Asian markets and what their future holds during Petfood Forum Asia 2014, scheduled for April 9 at the Bangkok International Trade & Exhibition Centre in conjunction with VICTAM Asia. In addition, Petfood Forum Asia delegates can hear the latest research on pet nutrition and ingredients, petfood safety, product development and processing, and much more. Delegates can also network with petfood professionals from throughout Asia Pacific and visit with leading industry suppliers exhibiting at FIAAP & VICTAM Asia. For more information, visit http://petfoodforum.petfoodindustry.com/PetfoodForumAsia.

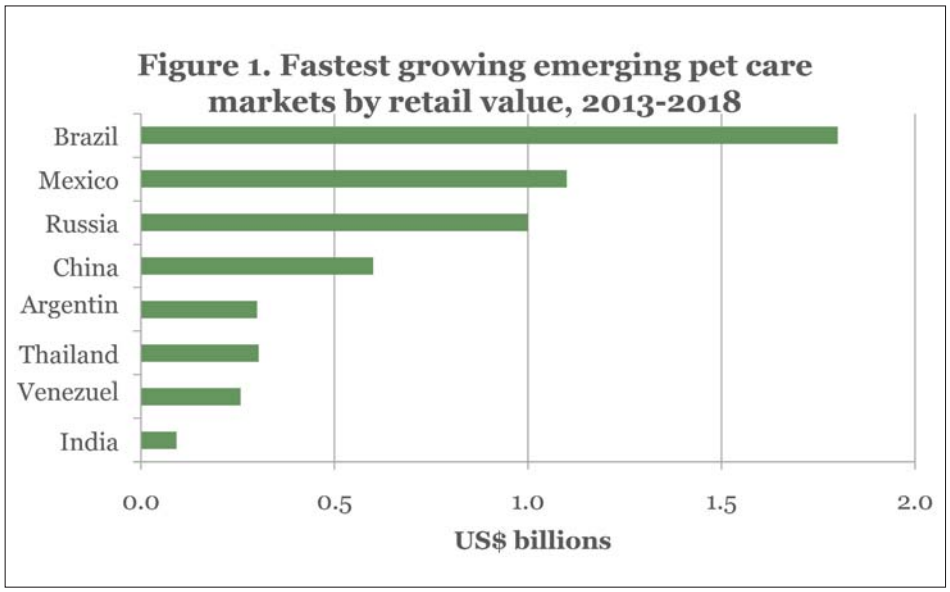
Why Asia is in the spotlight

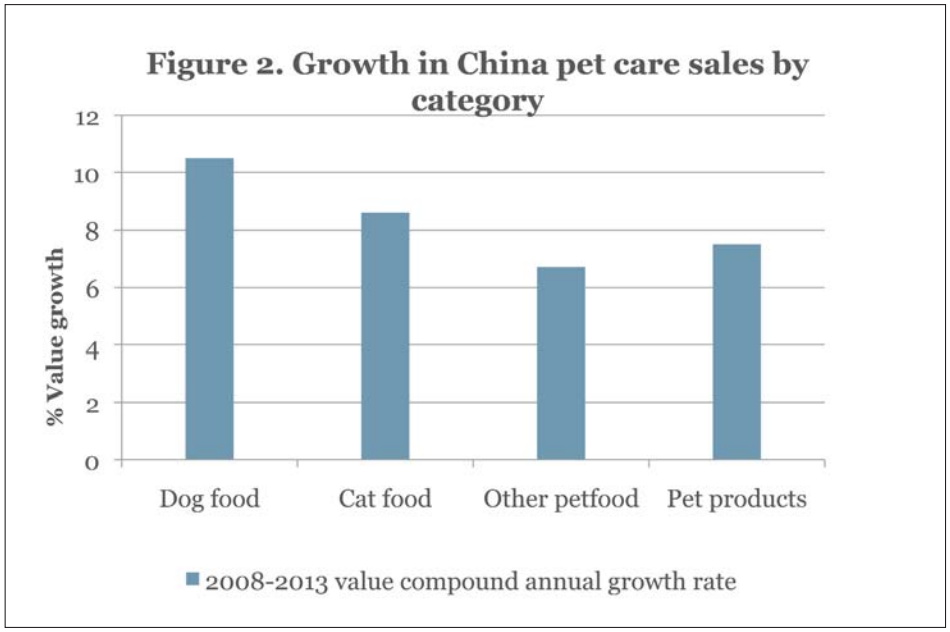
Pet care sales in Thailand will grow by about US$300 million between 2013 and 2018, Euromonitor projects, while India sales will grow by over US$100 million (see Figure 1). Rising incomes and levels of pet ownership will continue to drive this pet care sales growth, as will increasing numbers of pets in emerging markets eating commercial petfood.

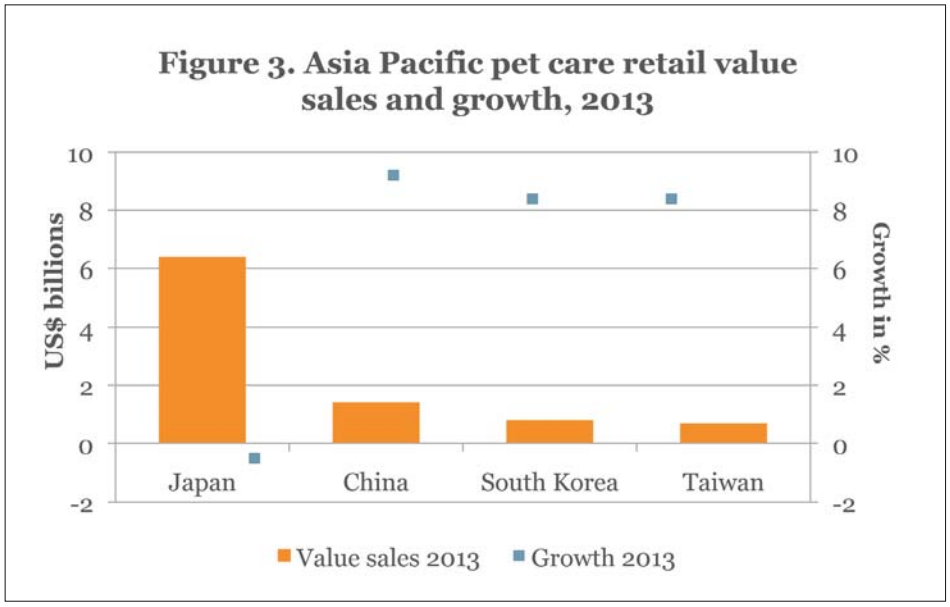
Currently petfood accounts for 77% of the US$96 billion in global pet care sales for 2013, according to Euromonitor. Yet in emerging markets like China, the situation is the opposite: petfood comprises only 37% of the pet care market there. That is because less than 10% of China's pets eat commercial petfood, meaning the potential for continued petfood sales growth is high.

Petfood sales have already been increasing rapidly in China. From 2008-2013, dog food sales grew more than 10% annually, while cat food rose more than 8% and food for other pets increased over 6% (see Figure 2). With most of China's 290 million pets being those other species – currently only 7% of Chinese households own dogs and only 2% own cats – that heightens the petfood sales growth potential. Premium petfood products have experienced the largest increases, at 15% for premium dog food and about 12% for premium cat food, Euromonitor says.

China's pet care sales are still relatively







Graphs courtesy of Euromonitor International

low, reaching just over US$1 billion by the end of 2013. That's second in the Asia Pacific region but still lagging far behind the current number one market, Japan, at over US$6 billion. Yet Japan, as a developed market, is experiencing no growth, while China ranks first in growth for the region. See Figure 3, which also features sales and growth rates for South Korea and Taiwan.

India also on the rise

While India does not appear in Figure 3, its status among the eight fastest-growing pet care markets is justified by its booming double-digit growth, especially for dog food, according to Indian petfood industry officials. Overall Indian pet care sales have reached US$800 million, with petfood growing at a torrid 24%, says Rutaksha Rawat, an Indian pet journalist.

This strong growth is expected to continue beyond 2013, driven by factors such as increasing numbers of pet adoptions, rising disposable incomes, delayed parenthood among urban career couples, higher awareness of the dietary needs of pets and benefits of petfood, more types of retail outlets carrying petfood, increasing humanization of pets and the booming population of the Indian middle class.

Sales of petfood by volume (metric tons) have increased steadily since 2011, according to Euromonitor data; by 2016 metric tons of dog and cat food sold will have nearly doubled from the 2011 figure. Sales of food for other species of pets are growing nicely, too, though volume is lower.

Petfood Forum Asia

Learn more at Petfood Forum Asia

Get updates on this market data, along with the latest information on pet nutrition, petfood safety, processing and more at Petfood Forum Asia 2014, April 9 at the Bangkok International Trade & Exhibition Centre. Specific topics and speakers will be announced soon, and registration will also be available. Please visit http://petfoodforum.petfoodindustry.com/PetfoodForumAsia

grapas CONFERENCE

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@ GRAPAS & VICTAM ASIA BANGKOK, THAILAND

8-10 APRIL, 2014

Bangkok International Trade & Exhibition Centre (BITEC)

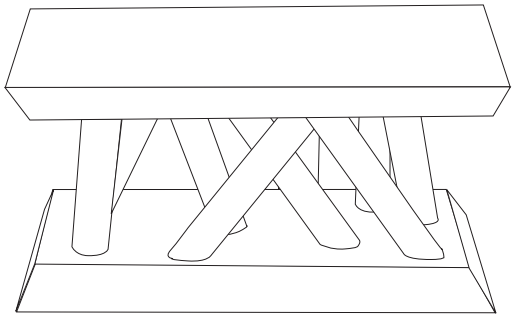
www.gfmt.co.uk/grapas

Conference delegates should pre-register on the VICTAM or GRAPAS websites (available from December 1, 2013 onwards)

Conference patron: GRAIN & FEED milling technology

The grapas award

Grain and Feed Milling Technology (GFMT) magazine - the oldest milling magazine still in print and established in 1891 – has joined Victam International to sponsor the Victam Award for Milling.
The award will be made to the most innovative and economically beneficial equipment, process or service exhibited at the GRAPAS Exhibition.
All nominations will be published in a special edition of GFMT along with a review of the event itself.
Nominations for the award will be clearly identified on the exhibition and in the show guide in order to attract visitor attention.



Entries can be from one of the three following categories:

- A milling technology development (flour, rice or other cereal)
- A production process or refinement that makes for more efficient and/or safe production
- A service (online or otherwise) that helps millers achieve their goals more efficiently

All entries are subject to the utmost confidentiality until publication of the special show issue. A panel of independent industry experts will judge the entries. The award will be presented during the GRAPAS Asia 2014 exhibition..

How to enter
Visit **www.gfmt.co.uk/grapasaward** and follow the instructions on the page.

Perendale Publishers is again hosting the GRAPAS Conference on food milling on 8 April 2014 during the co-located FIAAP, VICTAM and GRAPAS Asia Exhibitions in Bangkok, Thailand.

The GRAPAS Asia Conference

This coming year's program will be split into three separate sessions and held during the first day so that delegates can choose more precisely the topics they want to hear and the time they spend away from the exhibition proper.

"We are very aware that visitors want to spend time within the exhibition itself talking to exhibitors. However, there is a real opportunity for flour, rice and grain millers to learn more about their industries and gain a fuller insight into technical developments whilst in Bangkok," says Mr Roger Gilbert, who is organising the GRAPAS one-day conference and is publisher of Grain and Feed Milling Technology magazine.

"We're looking to attract rice, flour and grain millers from throughout South East Asia to Bangkok, not only to attend the GRAPAS exhibition, which is co-located with the FIAAP & VICTAM Exhibitions, but to attend our one-day conference.

"This event will be a 'must include' in any visitor's program who is attending GRAPAS or is interested in milling from a food production point-of-view in Bangkok in April 2014.

"Registration is free. Each delegate who pre-registers online and attends will receive a copy of our highly-reputable International Milling Directory, valued at over US$120."

The conference takes place from 10:00 on April 8, 2014 in the Bangkok International Trade & Exhibition Centre (BITEC) at Bangna which is easily reached by Skytrain.

The program itself will contain eight presentations broken into three sessions. Session A from 10:00-12:00; Session B from 3:30-15:00 and Session C from 15:00-17:00. Coffee will be served at the start of the morning session and between sessions B and C in the afternoon. Lunch is for delegates to take on their own.

The subjects of each of the three sessions include:

A: Food – Storage, Preservation and Transportation

B: Flour – Grain Processing and Handling

C: Rice – Milling Technology and Development.

The GRAPAS Awards

Bangkok, Thailand – 8 April, 2014

What do CPM Europe and Foss have in common? They are both winners of the GRAPAS Innovation Award, awarded during the VICTAM International and VICTAM Asia events in Koln, Germany and Bangkok, Thailand respectively in 2011 and 2012.

It's time to begin thinking about the 2014 GRAPAS Awards for Innovation. Yes, the GRAPAS Exhibition, which is a co-located exhibition taking place during VICTAM Asia from April 8 – 10, 2014, will again offer an award for the most innovative products and/or services designed and developed for the flour, pasta and rice milling industries.

All GRAPAS Award recipients will be published in a special report in Grain and Feed Milling Technology magazine along with a review of the event itself. Nominations for the awards will be identified on exhibition stands at the show.

Entries can be from one of the three following categories:

1. A milling technology development (for flour, rice or other cereal)
2. A production process or refinement that makes for more efficient and/or safe production
3. A service (online or otherwise) that helps millers achieve their goals more efficiently

How to enter

Application forms are available for download from: http://www.gfmt.co.uk/digital_media/grapasawards2014.pdf

However, to participate in the competition the innovation, process or service has to comply with the following:

1. Have been introduced to the market after July 2012
2. Be new
3. Make a contribution to efficiency and/or safety
4. Demonstrate significant practical value
5. Be presented at the exhibition

Companies entering the competition will have their products and/or services evaluated by a panel of independent judges.

Strong turnout expected for Aquafeed Horizons Conference

New formulations and innovative processing technology are the hallmarks of the aquafeed industry. Driven by the introduction of new species and farming systems, this complex, sophisticated and challenging industry is dynamic and evolving.

The Aquafeed Horizons conference is designed to help aquafeed professionals keep up with solutions and available options. The 7th in the series of this popular meeting will take place April 8, 2014 at the BITEC, in co-operation with VICTAM ASIA/ FIAAP ASIA 2014. The conference will address extrusion and drying technology and ingredients to help address the challenges facing aquafeed manufacturers.

In previous years, Aquafeed Horizons Conference, which is organized by the industry's information provider, Aquafeed.com, has attracted delegates from the major feed companies in Asia Pacific and beyond. Aquafeed production is expected to maintain a bullish 11% growth rate to 71.0 million tonnes by 2020 and most of that production is taking place in Asia; so the organizers expect a strong turn out once again.

"We are grateful to Andritz, Buhler, Buhler Aeroglide, Nutriad and Wenger for partnering with us to support the aquafeed industry with information", Suzi Dominy, Aquafeed.com, said. "Their sponsorship goes a long way to helping us keep delegate fees down and allows us to reach as many people as possible".

"This year, for the first time, as a courtesy to our host country, we are pleased to be able to offer simultaneous interpretation into Thai and very special rates for Thai delegates", Dominy said.

Pre-Registration

Pre-Registration will be available at the conference website (www.feedconferences.com) from December. Visit the website to be notified when registration opens, so that you don't miss early bird discounts.

FIAAP Conference to address developments in ingredients and additives

Feed ingredients and additives are an important and growing attraction at FIAAP Asia 2014 and the FIAAP Conference is an integral and important part of the event. At the 5th in the series of FIAAP Conferences, a strong international team of industry experts will update the animal feed industry on the latest developments in both micro- and macro-ingredients and feed additives, as they relate to practical animal nutrition and profitability in the commercial sector. The full program will be announced shortly at the conference website (www.feedconferences.com).

Previous conferences have attracted formulators, ingredient buyers, quality controllers, and other technical and senior management delegates from mills throughout the Asia Pacific region, and from as far as Europe and South Africa: the conference has become not just an important means of information transfer but a major international networking event.

The conference language is English with simultaneous interpretation offered in Thai.

Pre-Registration

Pre-Registration will be available at the conference website (www.feedconferences.com) from December. Visit the website to be notified when registration opens, so that you don't miss early bird discounts.

AQUAFEED HORIZONS ASIA 2014

April 8. 2014, BITEC, Bangkok

Aquafeed.com is proud to present it's popular international conference "Aquafeed Horizons Asia" once again during FIAAP & VICTAM 2014. The 7th in the series will focus on advances in processing and that offer practical solutions to commercial aquafeed companies in terms of production efficiency, quality improvements and profitability.

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An Aquafeed.com Conference in association with Victam International and supported by: Thai Ministry of Agriculture & Co-Operatives, Thai Department of Livestock Development, Thai Department of Fisheries, Thai Feed Mill Association, Thai Rice Processing Association, Thai Petfood Industry Association, Thai Chamber of Commerce and the Thai Conventions & Exhibition Bureau.

3RD BIOMASS & PELLETS UPDATE ASIA

10TH APRIL 2014 BANGKOK INTERNATIONAL TRADE & EXHIBITION CENTRE, (BITEC)

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VICTAM Asia2014

Conference delegates at the Pellets Update in Victam Asia 2010

Bio-Fuelling the Feed Industry

Thailand is a country rich in primary and secondary biomass resources not least the residue streams from the food and feed industries.

With 25 million tonnes the country is the world's largest exporter of cassava and tapioca products and it is the second largest exporter of rice. In addition there is also significant production of palm oil and coconut based products not to mention the rubber- and rubberwood industry.

The Thai Government has set a target to have 25 percent of the national energy consumption met with renewable energy sources by 2021. Biomass is expected to have the largest share with an estimated 8.2 million tonnes to go for heat needs. In the transport sector biofuels such as ethanol and biodiesel are to replace fossil fuels by up to 44 percent.

Strong governmental policy and steering instruments, support schemes including co-financing have been put into place to stimulate the speedy growth of renewables. For instance low fuel blend mandates for biofuels, direct incitements for biogas production and municipal waste management projects.

Conference to describe potentials and explore opportunities

The 3rd edition of "Pellets & Biomass Update Asia", a one day conference on fuel pellets and other bioenergy solutions held as part of VICTAM Asia 2014, will look at how husks, shells, nuts, EFB's, fines, dust or other residues can provide internal energy cost reductions, waste management solutions or become valuable revenue streams. The conference aims to describe the potentials, explore the opportunities and provide, for the region and sector, relevant examples and case studies.

Right: Fuel pellets made from Empty Fruit Bunches (EFB) an oil palm fibre residue.
Photo courtesy Global Green Synergy Sdn Bhd., Malaysia

Phytogenics – Digestibility is the key

Introduction

Feed represents roughly 70% of the cost in swine production making the current record-high feed prices a major concern to swine producers. Currently the drought in the United States, Eastern Europe and elsewhere and the use of grains for bio-fuels are certainly main contributors for such high prices. Considering the growing world population and the increasing demand for animal protein it is likely that feed prices will remain high in future. This calls for sustainable solutions to keep businesses profitable for producers long term. One such solution is to optimize feed utilization cost effectively by the best possible way.

Digestibility is the key

Lower digestibility of plant raw materials is not only visible in sub-optimal feed efficiency, but also by the negative effects directly on the gastro-intestinal tract. The lower the digestibility of the diet, the more undigested feed in the gut which is subject to microbial fermentation. Microbial fermentation takes place mainly in the large intestine, but also, to a lesser degree, in the small intestine. The presence of undigested nitrogenous compounds (i.e. proteins!) favors the formation of ammonia and biogenic amines by the intestinal microbiota. These metabolites are undesirable not only because of their toxicity, but also because they are produced by decarboxylation of dietary essential amino acids. Consequently, intestinal imbalances occur resulting in enhanced inflammatory processes and accelerated turnover of the intestinal tissue, which results in poorer performance and diarrhea.

Hence, improved digestibility increases the supply of dietary essential amino acids, while relieving the animal from intestinal imbalances.

Phytogenic feed additives

Increasing numbers of scientific reports are being published which indicate that phytogenic substances, i.e. plant-derived, have positive effects on feed efficiency in different animal species, including swine. These phytogenic substances include herbs, spices, essential oils and non-volatile extracts, from, for example, clove, anise, thyme, fennel or melissa, and many others (Table 1).

The flavoring properties as well as the beneficial effects of such substances on digestion and well-being in human nutrition have been recognized for thousands of years. In addition to their flavoring properties, other effects of phytogenic compounds include a stimulation of saliva and gastric juices, as well as anti-inflammatory, anti-oxidant and anti-microbial properties in the gastro-intestinal tract.

Table 1: Herbs and parts thereof used as feed additives

Common name	Latin name	Parts used
Aniseed	Pimpinella anisum	Seeds
Caraway	Carum carvi	Seeds
Cinnamon	Cinnamomum verum	Bark
Citrus	Citrus sp.	Peel
Clove	Syzygium aromaticum	Buds
Fennel	Foeniculum vulgare	Seeds
Garlic	Allium sativum	Bulb
Ginger	Zinigiber officinale	Rhizome
Melissa	Melissa officinalis	Leaves
Onion	Allium cepa	Bulbs
Oregano	Origanum vulgare	Leaves
Peppermint	Mentha piperita	Leaves
Rosemary	Rosmarinus officinalis	Leaves
Sage	Salvia officinalis	Leaves
Thyme	Thymus vulgaris	Leaves
Valerian	Valeriana officinalis	Root, rhizome

In view of the biodiversity and consequently large number of available plant substances, the utilization of phytogenic compounds in animal nutrition thus opens a lot of opportunities.

The products available in the market today are feed additives based either on single ingredients (such as oregano oil) or complex mixtures of plant-derived materials. Inclusion levels in complete feeds usually range between a few hundred grams to several kilograms per metric tonne, depending on the concentration of the phytogenic compounds in the feed additive.

The effects of phytogenic feed additives can differ significantly, depending on the actual ingredients. As these additives have pronounced flavoring properties, their addition to the diet can enhance palatability. The effects of phytogenic additives in the gastro-intestinal tract vary considerably between products. The combination of different phytogenic materials allows for making use of the full potential that plants offer. Recent studies indicate a pronounced effect of such mixtures on protein digestibility.

Impact of Phytogenic supplementation on digestibility

The effect of a phytogenic feed additive on nutrient digestibility is well illustrated in a project conducted at the Free University of Berlin, Berlin, Germany. The aim of this study was not only to show the effects of the phytogenic additive in a single standard trial, but the repeatability of effects over several trials. Four trials with a total of 300 weaned piglets were carried out. Three of these trials were made under experimental conditions at the research station, whereas one trial was made under commercial conditions in a swine farm. The piglets were weaned at 25 days of age and fed typical starter (1st and 2nd week after weaning) and grower diets (3rd to 6th week after weaning). The pigs receiving the diet containing the phytogenic product had the higher weight gain and a significant improvement in gain/feed ratio (0.66 vs. 0.64, P<0.001).

The results of two trials conducted under experimental conditions were pooled to determine the apparent ileal digestibility coefficients. Ileal protein and amino acid digestibilities were significantly improved (Figures 1 and 2).

In addition, numerical differences in mineral digestibility were evident between the two groups. Calcium and Phosphorus digestibility values were 5.8 and 19.7% higher in the groups fed the phytogenic feed additive.

The improvement in protein and amino acid digestibility is regarded as a major factor contributing to the improvements in feed efficiency and growth performance when commercial diets are supplemented with phytogenic feed additives.

Conclusion

With the current record-high feed prices, improving the digestibility of commercial diets is obligatory to optimize feed utilization. Recent research shows that phytogenic feed additives can improve feed digestibility, especially for proteins and amino acids. Therefore, phytogenic feed additives are considered valuable tools to help secure better feed efficiency and keep pig farming profitable.

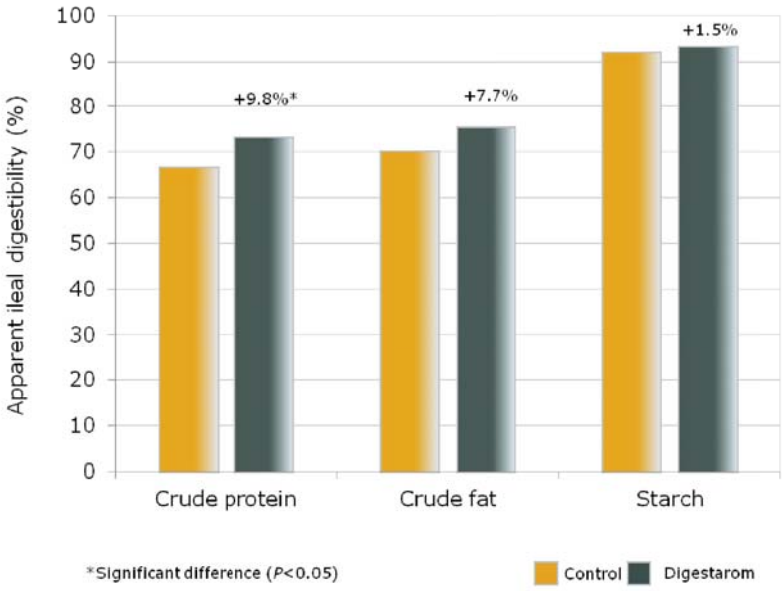


Figure 1 (above): Effect of a phytogenic feed additive on nutrient digestibility in piglets (adapted from Maenner et al., 2011)

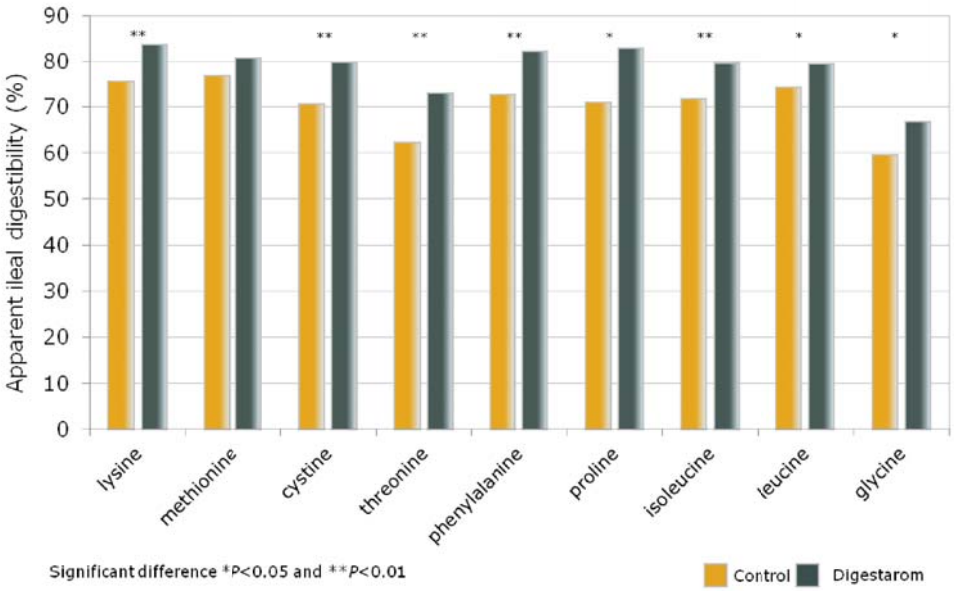


Figure 2 (above): Effect of a phytogenic feed additive on amino acid digestibility in piglets (adapted from Maenner et al., 2011)

Tobias Steiner
BIOMIN Holding GmbH, Industriestrasse 21, 3130 Herzogenburg, Austria

Nukamix: how dairy facilitates weaning

Introduction

Pre-weaning growth is a major determinant of post-weaning pig performance (Klindt, 2003), but, unfortunately, the biological growth potential of suckling piglets is largely unattained in commercial production (Pluske et al., 1995; Le Dividich and Seve, 2001). Due to larger litter sizes and increased competition for milk supply nutrient availability is often limited. Providing a solid, highly digestible creep feed to suckling piglets as a supplemental nutrient source may increase nutrient intake of the piglets and, therefore, improve pre-weaning daily weight gain and weaning weights (Mavromichalis, 2006). An effective creep feeding program has also proven to stimulate post-weaning feed intake and gains during the first few days after weaning, as it acclimatizes the piglets to solid feed before weaning and stimulates the development of the digestive system.

As piglets are weaned in an early stage, the initial management and care of the piglets is vital. To attain a successful transition of these highly vulnerable piglets at 21-28 days of age to healthy, well-grown pigs at 70 days of age, the process of weaning must be facilitated.

Nukamel, from origin a milk replacer company with lots of experience in dairy products, has put ample effort in the development of its Nukamix concept. Within this concept, the strength of dairy is central as a facilitating instrument in the nutrition of piglets during the weaning process. The inclusion of milk in creep and weaner diets contributes to the easy-acceptability and palatability due to a familiar smell, taste and digestibility. Nukamel even digs deeper than this as 'milk' and 'milk' is not the same....

The strength of fermentation

Fermentation is one of the oldest methods practiced by humans for the transformation of milk into products with extended shelf life. However, it is evident that the souring of milk was and, still is, by no means, a uniform process. The starter culture (yeast, lactic acid bacteria, moulds, therapeutic strains,) and the process conditions (temperature, duration,) dictate the properties like, e.g. flavor, and nutritional value of the fermented product (Tamime and Robinson, 1999).

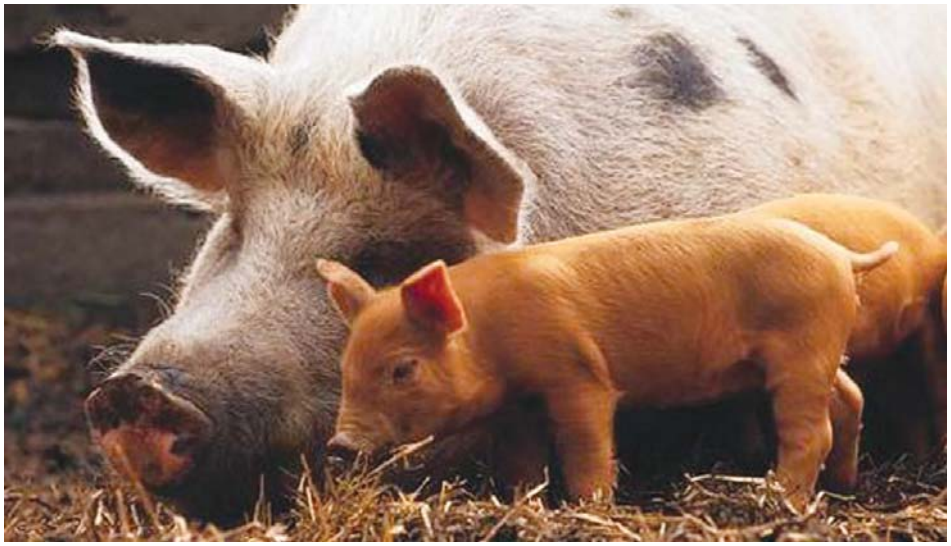
Lactic acid is synthesized by fermentation from lactose, the predominant sugar in milk. Lactic acid is very tasty and stimulates feed intake. It lowers the pH in the digestive tract to an optimal value for digestion by enzymes, and thereby can also compensate for insufficient gastric acid production in young animals. Moreover, reducing the pH in the gut results in anti-bacterial properties.

Fermentation not only brings about the partial transformation of lactose, but also causes proteolysis. The protein fraction in milk is composed of casein and whey proteins. The enzymatic hydrolysis (by endo- and exopeptidases) of milk proteins results in the release of peptides of varying sizes and free amino acids. Fermentation can thus be considered as pre-digestion.

Protein —(1st stage Endopeptidas)→ Amino acids

Polypeptides —(2nd stage Endopeptidas)→

Special attention can be given to physiologically active peptides. These are inactive within the sequence of the parent protein molecule and are, to some extent, liberated during fermentation. Milk protein derived peptides have been shown to exert various activities affecting, e.g. the



digestive (antimicrobial), cardiovascular (antihypertensive, anti-oxidative, hypocholesterolemic), immune and nervous systems. A variety of naturally formed bioactive peptides have been found in fermented dairy products. The exact mechanisms behind these effects are not fully understood. Caseinophosphopeptides can form soluble organophosphate salts and may function as carriers for different minerals, especially calcium. Immunomodulating casein peptides stimulate proliferation of lymphocytes and phagocytic activities of macrophages. Antimicrobial peptides kill sensitive microorganisms. Antithrombotic peptides inhibit fibrinogen binding to a specific receptor region on the platelet surface and also inhibit aggregation of platelets. Antioxidant peptides prevent peroxidation of essential fatty acids. Angiotensin-converting enzyme (ACE) inhibitory peptides can exert an antihypertensive effect (Pihlanto, A., 2011).

Because the digestive system of several microbial strains (*Lactobacillus acidophilus, L. casei, L. bulgaricus, Streptococcus lactis,* bifidobacteria, etc) used for cheese-making is completely different, a large variation exists in the extent and type of breakdown products formed during fermentation. Therefore, dairy by-products like whey powders differ greatly in nutritional value. Moreover, the positive characteristics of fermented dairy may be impaired by industrial processing, which almost always includes heat treatment, sometimes in combination with extreme pH conditions. This brings along an additional parameter of variation in quality.

This was shown in the following trial, performed at the Zootechnical Centre of the University of Leuven, Belgium. 184 piglets of 21 days of age were divided into 4 treatments receiving a maize-soybean diet to which 4 different whey powder sources were added (at an inclusion rate of 20%). To exclude effects of lactose and/or lactic acid, levels were kept equal between the different treatments. The main difference between the 4 treatments was the source of dairy protein.

Piglets receiving a diet with fermented sweet whey 'Nukamix 10' showed the highest average growth and feed intake although the dairy protein content was lower in this group (Nukamix 10 protein level = 10.5%) compared to treatments 2 and 3 (sweet whey protein level = 12.5%). This cannot be due to a higher lactic acid level, since this level was identical in all treatments. Therefore, this beneficial effect of Nukamix 10 is attributed to the protein quality of this product, which is related to the fermentation process, increasing the digestibility/functionality of the available protein. Although no differences in zootechnical parameters were expected between the Dutch sweet whey and the German sweet whey treatment (identical products on paper), the German sweet whey resulted in a lower FCR than the Dutch one. Overall, the production parameters of the whey permeate group were worse compared to the other treatments, most probably due to a lower quality protein and/or higher levels of non-protein-nitrogen.

Nutrition: How to stimulate pre-weaning solid feed intake?

The gastro-intestinal tract of the suckling pig is exposed to components of colostrum and milk (e.g. secretory immunoglobulins such as IgA, lactoferrin, lysozyme, lymphocytes, phagocytes, oligosaccharides). When these compounds disappear at weaning, the gut morphology and function alters and most likely, this will make the pig more vulnerable to infection by opportunistic and other pathogens (Pluske et al., 1997). Especially, a low feed intake immediately after weaning is responsible for villous atrophy and reduced growth in newly-weaned piglets (Dong and Pluske, 2007). Moreover, the piglet's immunity is at its lowest level around 3 to 4 weeks of age, as passive immunity (transferred from the sow) has dropped thoroughly and the active immune system of the piglet still needs to develop (Coffey et al., 2000). To overcome these health issues at weaning, an understanding of the nutritional parameters involved is necessary.

Nukamel has studied the influence of different nutritional ingredients on the intake and growth results of creep feeds. In several trials, performed at the Zootechnical Centre of the University of Leuven, Belgium, piglets were followed from 14d after farrowing and were weaned at 28 days of age. Different formulas were tested in addition to the sow's milk and this was continued till 12d after weaning.

Feed intake (and hence daily gain) in the pre-weaning period up till 12d after weaning was maximized in case of:

- Partial replacement of skimmed milk powder by other high-quality dairy, e.g. whey protein concentrate (WPC) or ultrafiltrated whey (other ratio of casein-to-whey proteins)
- Inclusion of wheat gluten as compared to soya protein
- Use of fermented dairy

Using this specifically designed creep feed, Porcomel Dry, a pre-weaning feed intake of 400-500 g/piglet was reached. This also stimulated feed intake in the first 12d after weaning, with values of ca. 300 g/d/piglet. Moreover, in these trials mortality was zero and little to no piglets needed veterinary treatment.

An outline of the nutritional benefits is ➤

Days after weaning	*Nukamix 10*[1]	*Dutch sweet whey*[2]	*German sweet whey*[2]	*German permeate*[3]
Weight at d19	12.0 ± 0.2	11.9 ± 0.2	12.2 ± 0.2	11.8 ± 0.2
Weight at d46	26.8 ± 0.5^{a}	25.9 ± 0.5^{ab}	26.5 ± 0.5^{a}	25.0 ± 0.5^{b}
Growth d1-19	181 ± 9	176 ± 9	188 ± 9	167 ± 10
Growth d19-46	546 ± 13^{a}	514 ± 12^{ab}	542 ±12^{a}	492 ± 13^{b}
Growth d1-46	395 ± 10^{a}	374 ± 10^{ab}	389 ± 10^{a}	356 ± 10^{b}
Feed intake d1-19	394 ± 20^{ab}	346 ± 20^{a}	445 ± 21^{b}	375 ± 21^{a}
Feed intake d19-46	965 ± 20^{a}	962 ± 20^{a}	883 ± 20^{b}	927 ± 20^{ab}
Feed intake d1-46	731 ± 20^{a}	706 ± 20^{ab}	680 ± 20^{b}	694 ± 20^{ab}
FCR d1-19	2.16 ± 0.17	1.96 ± 0.17	2.37 ± 0.17	2.30 ± 0.17
FCR d19-46	1.77 ± 0.08^{ab}	1.87 ± 0.08^{a}	1.62 ± 0.08^{b}	1.88 ± 0.08^{a}
FCR d1-46	1.85 ± 0.07	1.88 ± 0.07	1.75 ± 0.07	1.95 ± 0.07

[1] Nukamix 10: fermented whey, produced by Nukamel.
[2] Two origins of sweet whey (Dutch and German), on paper identical products.
[3] Whey permeate of German origin.

appropriate. Ultrafiltrated whey is a source of highly digestible protein (≥ 90%). The active immunoglobulin content can be quantified by specific and quantitative antibody recognition techniques and is considered to be a valuable tool to evaluate the quality and consistency of WPC sources (due to e.g. process conditions). Nukamel indeed found large variation (> 10-fold) in the level of immunoglobulins depending on the source of WPC. Low versus high heat treatment can be one of the factors influencing this level and therefore the general quality of the proteins. Moreover, immunoglobulins are believed to block the adherence of bacteria to the intestinal wall. This prevents micro-organisms from colonizing, reproducing and releasing toxins in the gut.

Secondly, wheat gluten has a different influence on feed intake and performance compared to soy protein. Wheat is a source of glutamine, which can be considered as fuel for the mucosal cells of the intestine. At times when the piglet's supply of maternal glutamine disappears, and the endogenous supply of this amino acid from muscle and plasma to the gut epithelium may be inadequate to maintain villous integrity, supplementation of creep and weaner diets with glutamine-rich raw materials offers a means of enhancing the structure and function of the gut after weaning (Pluske et al.,1997). Wu et al. (1996) reported that the addition of 1% glutamine to a corn-soybean diet prevented villous atrophy in the jejunum on the seventh day after weaning. Weaned piglets can suffer from a low feed intake and hence low intake of dietary glutamine in combination with a deterioration of the intestinal health due to stress. Dugan and McBumey (1995) found evidence in the piglet that luminal glutamine is beneficial for the maintenance of normal mucosal permeability in case of infection with enteric pathogens.

Finally, as already mentioned in the previous section, the use of fermented dairy contributes to the general health status of the animal.

One last remark in this: offering an easy-to-accept creep feed that stimulates feed intake reduces the risk of transient hypersensitivity to antigenic components of the diet (~allergic reaction). Part of the morphological changes of the gut observed after weaning are the result of the exposure of the gastro-intestinal tract to 'unknown' substances. Thus, an increased solid feed intake before weaning prevents the risk of diarrhea afterwards.

Nukamix: A valid alternative to blood plasma?

The long term use of medicated feeds and the carry-over to non-medicated feeds has led to antibiotic resistance in microbes due to a constant exposure to very small quantities of the drug. Although the use of growth promoting antibiotics is banned in Europe since 2006, the use of antimicrobials in pigs is continued under veterinary prescription and is still driven by the hope for better production results (Timmerman et al., 2006; Persoons et al., 2012; Callens et al., 2011). Common sense, however, urges to put a limit on the antibiotic usage in order to ensure the efficiency of antimicrobials, also for human purposes. In recent years, the overuse or misuse of antibiotics has been linked to the emergence and spread of micro-organisms which are resistant, rendering treatment ineffective and posing a serious risk to public health. Thus, any prophylactic (group) treatment of animals other than in very limited, clearly defined situations, and should be phased out. In this sense, e.g. the Dutch Ministry of Agriculture has set targets to a 50% reduction in the usage of antibiotics by producers in 2013, compared to 2009. This asks for radical changes in sow management, creep feeding, weaning time, barn climate, hygiene, and water quality. Also feed formulation becomes more important and the search for alternative ingredients to fill the gap continues. Improving gut health and stimulating feed intake are key factors in this, as was already mentioned in the previous section.

Spray-dried blood plasma is generally considered as a highly concentrated, well-performing source of proteins which is re-allowed to use in piglet diets (EU legislation 1292/2005). 36% are globulins, of which the immunoglobulin fraction is considered as beneficial for immunity and gut health. However, blood plasma is expensive and a dedicated production line is necessary.

Nukamel has developed its Nukamix range of products, destined to ease the weaning process of piglets. Nukamix Extra is a high quality piglet feed ingredient, which fits very well in the general concept. Highly digestible dairy and vegetable protein (together 41%) is combined with coconut and butter fat (together 8%). Nukamix Extra is highly suited to include in creep and weaner feeds and is basically designed to replace blood plasma or other high performing protein sources.

Milk powder and WPC are included to

Nutritional value	*Unit*	*T1a*	*T2a*	*T3a*
Age	**Days**	**2-9**	**2-9**	**2-9**
EW		1.20	1.22	1.22
Crude protein	%	17.91	19.75	19.19
Crude fat	%	5.98	5.92	5.95
ll. Lysine	%	1.12	1.26	1.26
Blood plasma	%	-	5.0	-
Nukamix Extra	%	-	-	10.0
Milk protein	%	1.00	1.00	3.08
Coconut fat + butter oil	%	0.90	1.30	2.13
Lactose	%	6.7	12.4	12.4
		T1b	*T2b*	*T3b*
Age	**Days**	**9-20**	**9-20**	**9-20**
EW		1.20	1.20	1.20
Crude protein	%	17.91	19.81	18.90
Crude fat	%	5.98	5.98	5.76
ll. Lysine	%	1.12	1.25	1.25
Blood plasma	%	-	3.0	-
Nukamix Extra	%	-	-	6.0
Milk protein	%	1.00	1.00	2.24
Coconut fat + butter oil	%	0.90	0.90	1.31
Lactose	%	6.7	8.0	8.0

Treatment	BW, 2 days kg	BW, 20 days kg	ADG g	ADFI g	FCR kg/kg	ECR /kg	Drop out %
T1	7.2	12.2[a]	263[a]	351[a]	1.340[a]	1.609[a]	1.1
T2	7.4	13.2[b]	314[b]	369[ab]	1.175[b]	1.414[b]	0.6
T3	7.3	13.5[b]	329[b]	393[b]	1.191[b]	1.434[b]	1.1
P > F		0.00	0.00	0.03	0.00	0.00	

Notes: 3 treatments with 12 replicates of 15 piglets = 180 piglets/treatment; BW = body weight; ADG = mean daily gain; ADFI = mean daily feed intake; FCR = feed/gain; Values in same column with no common superscript ([ab]) are significantly different (P≤0.05).

obtain an excellent mixture of easy digestible, dairy proteins (with an optimized ratio of casein vs. whey protein). Next to milk powder and WPC, hydrolyzed wheat gluten is added. Coconut fat and butter oil are highly digestible fat sources. They are rich in small to medium chained fatty acids, which have antibacterial properties. A high inclusion of butter oil is a tasty source of butyric acid, which fortifies intestinal walls and which gives additional protection against pathogens. The fact that butyric acid is naturally linked to glycerol makes it resistant to the low pH in the stomach and provides a gradual release in the small intestine.

As Nukamix Extra is designed to perform at least as good as blood plasma, a diet containing spray-dried blood plasma (T2) was used as a positive set-off in this trial.

The effect of Nukamix Extra (T3) on the performance of weaned piglets was measured and compared to the positive standard (blood plasma, T2) and a negative control diet (T1).

Piglets, weaned at 21 or 28 days, were offered ad libitum an experimental weaner feed (T1a-T3a) from 2-9 days post-weaning. From day 9 till d 20 post-weaning a grower feed (T1b-T3b) was provided. 540 piglets were divided in 3 groups.

Zootechnical performance of the piglets from days 2 to 20 post-weaning are shown in the following table. It is clear that the best results on growth and feed intake were obtained with the piglets receiving a diet with Nukamix Extra. This piglet ingredient proved to be a powerful and worthy alternative to blood plasma, easy to use and cost-effective. It is well established that excellent performing piglets leaving the nursery in good health are essential for economical and profitable pig production.

Conclusion

Piglets in commercial husbandry are generally weaned between 3 and 4 weeks of age for economic reasons. Many piglets have no experience with solid feed before weaning, resulting in low feed intake and growth after weaning. Newly weaned piglets often show a high incidence of diarrhea due to reduced gut health, low immune status and high stress levels at weaning. Nukamel therefore provides solutions to obtain good technical results in the whole nursery period. Being experts in dairy ingredients, Nukamel selects and combines the 'best out of the milk' and, in this way, facilitates the weaning process.

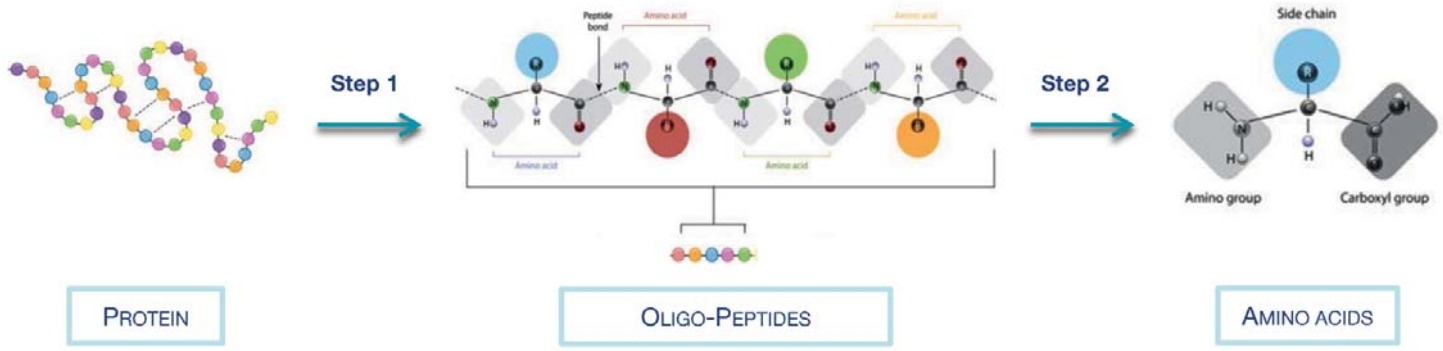


Figure 1. Protein fermentation – proteolysis
Step 1 = endopeptidases break peptide bonds within the protein molecule, releasing peptides
Step 2 = exopeptidases break terminal peptide bonds, releasing a single amino acid and peptides
(Nature education - http://www.nature.com/scitable/topicpage/protein-structure-14122136)

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New Prototype Aimed at Cutting Costs

by: LIROS ELECTRONIC

In the face of growing demand for food worldwide, temperature monitoring in arable storages has become increasingly important. There is a wide selection of temperature monitoring systems on the market today, but choosing the right one is not always easy.

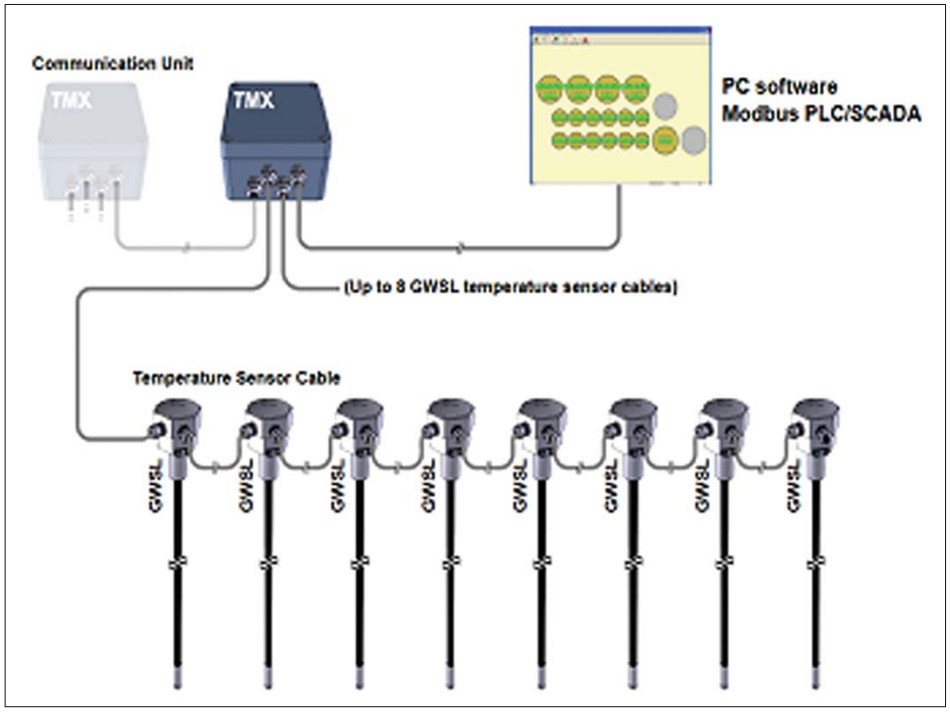
Costs are the determining factor
As in any business, food storage managers are determined to keep costs down. Digital systems are easier to install, consistently accurate over time and require very little maintenance, but they usually come with a bigger price tag. Many analogue systems are cheaper and thus more attractive, but they are complicated to install, increasingly less accurate over time and require regular maintenance to function properly. These are factors to consider. But both systems have one factor in common: The loss of stored commodity is even more costly and severe.

With simplicity in mind
Keeping these factors in mind, AB LIROS ELECTRONIC from Malmoe, Sweden, has begun to develop a new temperature monitoring system combining easy installation and high, lifetime accuracy with low system costs. The result: The Grain-Watch® TMX Digital Temperature Monitoring System. The TMX System is a simplified version of the fully digital Grain-Watch® TMS System. A prototype TMX System is currently undergoing extensive testing. Like its bigger brother, the TMX System will only require 2-wire and 3-wire cables for connecting all components. Installation made easy.

Self-addressing sensor cables
To make installation even easier, the sensor cables will not require a fixed placement scheme. They will simply identify and address themselves once connected to the system. And, of course, they are calibration-free. For life.

All the advantages of a digital system
The fully digital TMX System is modular and easy to expand. It consists of up to19 TMX Communication Units (10-30VDC) in series, each with 2 outputs. Each output accepts 8 self-addressing sensor cables in series (16 sensor cables per Communication Unit). Using a stabile RS-485 data bus and a well-defined communication protocol, the TMX System will connect seamlessly to the Grain-Watch® TMS Software or to an existing PLC/SCADA system using its built-in Modbus protocol.

www.grain-watch.com



SCAFCO Grain Systems makes important donation to new KSU feed mill

For over 20 years administrators at Kansas State University (KSU), in Manhattan, Kansas, U.S., were nurturing a vision for a modern feed mill for their Feed Science and Management program. It is now becoming a reality. Construction at the new O.H. Kruse Feed Technology Innovation Center at KSU began in early 2012. The new feed mill was made possible, in part, by donations from companies with serious interest in the research and the advancement of grain and feed science.

One of these companies is SCAFCO Grain Systems of Spokane, Washington State, U.S. SCAFCO Grain Systems made an important donation of grain storage bins/silos and grain handling equipment for use at the new KSU feed mill.

SCAFCO Grain Systems is a leading manufacturer of grain storage and handling equipment to over 80 countries around the world. The SCAFCO equipment at KSU will support programs at both the Animal Science and Grain Science departments and the mill will act as the new home of the Feed Science and Management program at KSU. The storage bins/silos donated by SCAFCO will serve as ingredient storage and for conducting large-scale grain storage quality preservation research. Assembly and construction of the SCAFCO equipment and the KSU feed mill is now nearing completion.

SCAFCO Grain Systems will be exhibiting at VICTAM Asia 2014 and GRAPAS Asia 2014. Plan to take advantage of the opportunity to visit with SCAFCO representatives.

SCAFCO Grain Systems Co.

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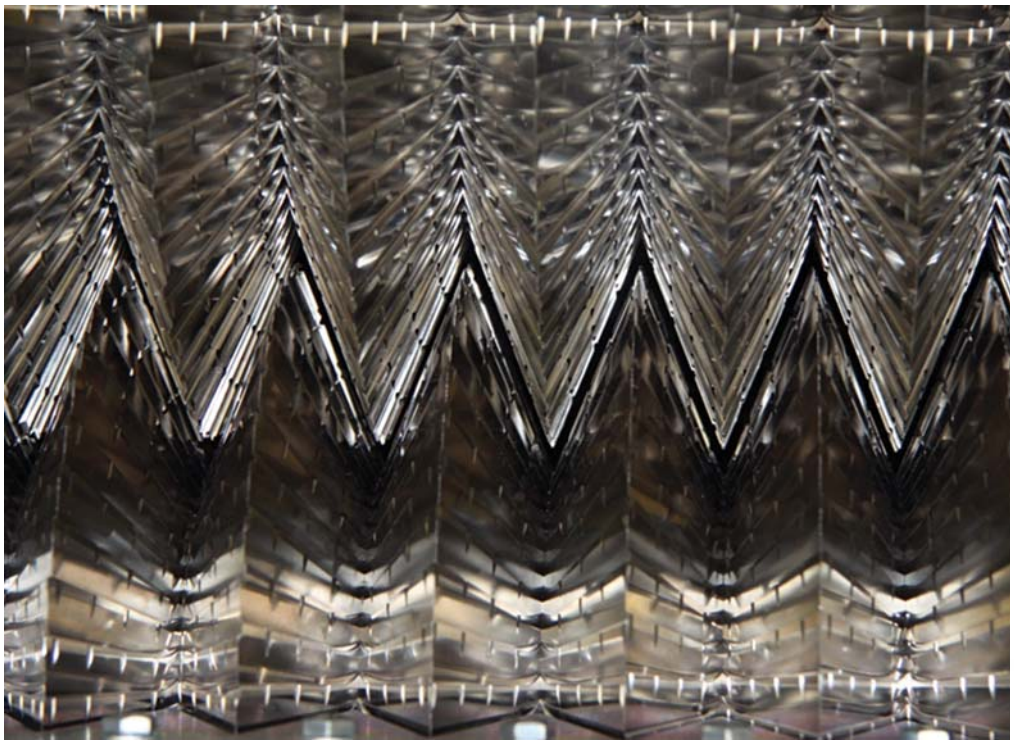


Pictured: Top left: Crackersatz, Top right: MC 7, Bottom left: MC 370, Bottom right: MC 600.

Dinnissen launches new Lean Mixing concept

SEVENUM – Dinnissen Process Technology has already built an enviable reputation for delivering sophisticated solutions for mixing powders, granules and granulates. Dinnissen is now launching its new Lean Mixing concept with a new and integrated transport system that can be more easily integrated and is gentler and less expensive than the pneumatic transport systems now commonly in use.

Total mixing concept without the disadvantages of pneumatic transport

The Lean Mixing concept offers a total and integrated solution for mixing powders, granules and granulates, including a highly effective and efficient system for transporting the raw ingredients as well as the finished product.

This new concept allows for a totally integrated mixing and transport process without having to resort to pneumatic transport with all the related disadvantages such as increased risk of product damage, higher energy costs, higher contamination risks, and extra handling.

Lean Mixing utilizes big bags in which the ingredients have to be lifted only once. Once the big bags are hoisted, they are transported via an automatic route guidance system to the proper unloading position on the transfer station and unloaded. The process operator then attaches the big bags to the discharging stations in a particle-free environment, connecting them to FeederValves specially developed by Dinnissen. These cost-efficient and fully integrated dosage valves ensure that the dosage ingredients are precisely weighed out when leaving the bag or entering the production process and can handle a widerange of capacities from 6 kg per hour to as much as 50 tons per hour.

Cost-efficient and Easy-to-Clean mixing method

The Lean Mixing Concept also integrates the well-known double-shaft PegasusR Mixer, which gently suspends powders, granules and granulates in the air while mixing them. The unique fluidized zone that is created in the process makes this multifunctional processing unit the perfect tool for mixing ingredients extremely accurately, gently, quickly, and energy-efficiently.

After the mixing process, the finished product goes through an automatic metal check and sieve check, after which it is transported further via an automated big bag filling system or a filling system optimized for the final packaging step. If desired, this can be carried out in a high-care environment. These processes are also carried out with the help of gravity, thereby saving energy and minimizing the use of moving parts.

Last but not least, the Lean Mixing Concept is also designed to be very Easy-to-Clean, which is why the mixer, hopper, sieve, and metal check unit are all fitted with a side guidance system, making it possible to easily and quickly access and clean all interior parts and components.

Higher-quality end product

Dinnissen's Lean Mixing concept is easier to integrate into existing production processes and also requires significantly less space when set up in a new environment. Initial investment costs are therefore much lower.

Lean Mixing consumes less energy and is easier to clean than comparable pneumatic transport systems and therefore reduces operating costs. As the transport process is extremely gentle, the materials handled, including powders, granules and granulates, suffer less breakage and damage, resulting in a higher-quality end product.

For more information go to www.dinnissen.nl

Mitchells wins business excellence award

Mitchells has won the 2013 Austrade Business Excellence Award for Small & Medium Enterprises.

The announcement was made at the Australia China Business Awards Gala, held at the Grand Hyatt in Beijing on June 6th.

Mitchells was a finalist in two categories, and proudly took home the coveted business excellence award from a field of high profile companies.

This was the fourth time Mitchells had been involved in the Australia China Business Awards, the third time as a finalist. Mitchells' Director Mic Mittasch was extremely pleased with the result, warmly congratulating his staff for their hard work, and inviting two long serving members to speak on his behalf during the acceptance speech.

Mitchells would like to congratulate all the finalists and winners of this year's awards, with a special mention to major sponsors AustCham Greater China and Westpac for hosting another successful event.

For information on the awards, please visit the AustCham website: http://www.austcham-china.com/

Mitchells designs, manufactures, services and supplies heavy duty equipment worldwide. Specialising in bulk material handling systems for Grain and Oilseed and Animal Feed, Mitchells also works with clients in the Mining, Minerals, Plastics and Paper industries.

Mitchells' Standard Product Range includes Bucket Elevators, Screw, Chain & Belt Conveyors, Pneumatic Systems and more. In addition to this, Mitchells' innovative engineering team provides specialty manufacturing, plant and equipment design, site assembly, testing and commissioning, maintenance and repair works, modular solutions, structural steelwork and programming and computer automation."

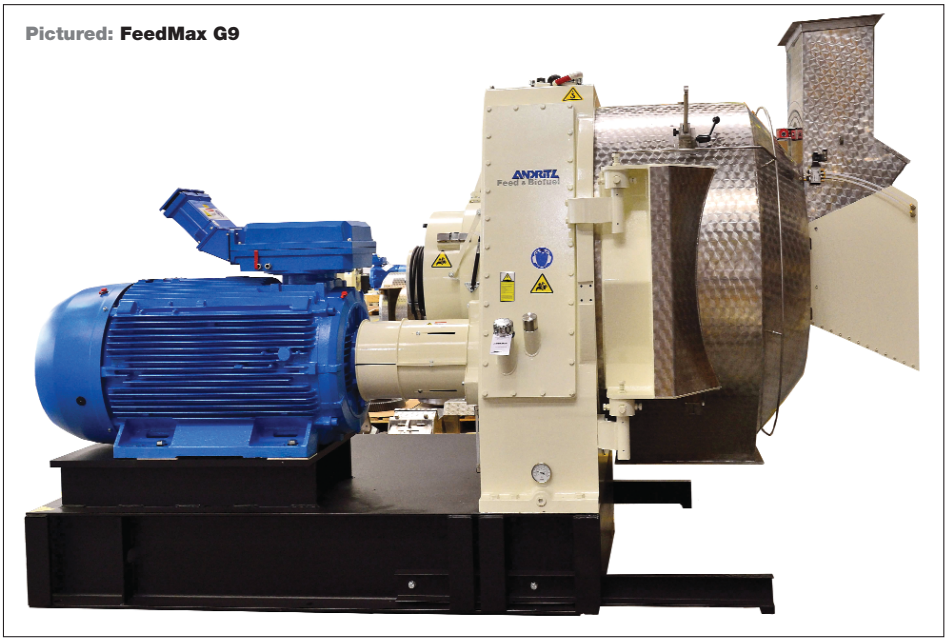
New line of pellet mills from ANDRITZ

ANDRITZ Feed Technologies proudly launch our new line of pellet mills – FeedMax G-Series

ANDRITZ Feed Technologies has focused on completing the development of the new Pellet Mill range "FeedMax", which will be the successor of the currently known PM pellet mill range. The first machines released for sale are the FeedMax G9 and the FeedMax G12, which will replace our popular PM919 and PM1219 pellet mills.

Our R&D Team has extensively overhauled one of our most tried and trusted platforms of all times. We have incorporated both large and small improvements based on feedback mainly from clients, sales managers, and supervisors.

For more information please contact: andritz-fb@andritz.com



Pictured: FeedMax G9

Petfood Forum Asia

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Bangkok International Trade & Exhibition Centre | Bangkok, Thailand

On April 9, 2014, Petfood Forum Asia convenes petfood industry speakers and subject matter experts to present the latest research on pet nutrition and petfood ingredients, safety and processing. Enhance your learning portfolio and get tomorrow's trends for today's global petfood marketplace.

Attendees can take advantage of free information and consultations with Petfood Forum Asia sponsors to find innovative product solutions.

Visit petfoodforum.petfoodindustry.com/PetfoodForumAsia

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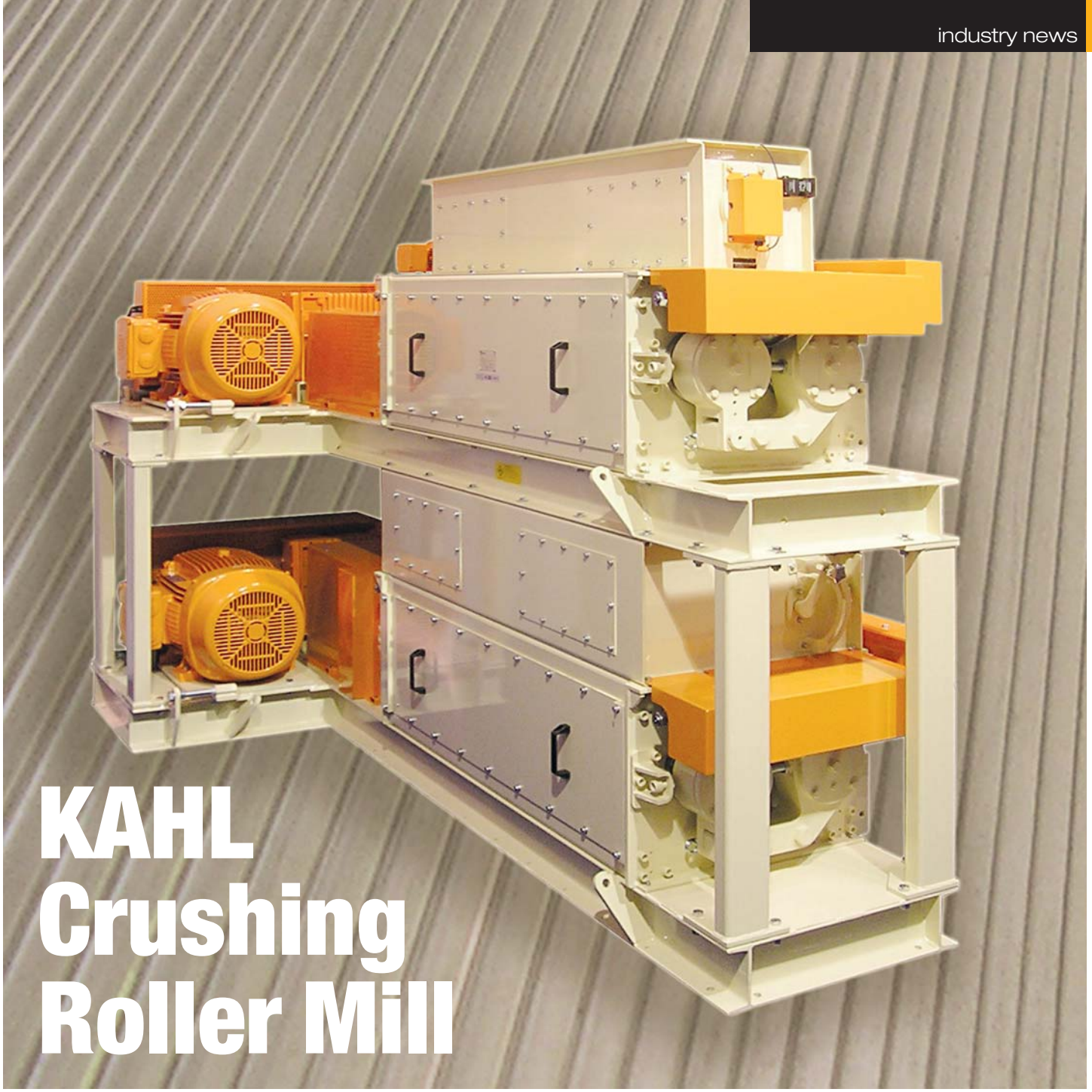


KAHL Crushing Roller Mill

Economic Crushing of Feed Mixtures, Cereals, Legumes and Oilseeds

Animal nutrition research findings have shown that not only the formula and the ingredients contribute to the feeding success, but also the feed structure. KAHL crushing roller mills break the grain into smaller particles with an as low as possible fines content. Thus, granular crumbles with a low fines content are produced instead of meal.

The crushing rollers are provided with a "sharp to sharp" corrugation and have different speeds so that a cutting effect is obtained instead of a crushing effect. The speed of the rollers and the grinding gap can be changed during operation or quickly and easily adapted for changing formulae.

The KAHL crushing roller mill WSB is very appropriate for economic grinding of different products, particularly for grain and other feed components.

Nutritional Advantages

Poultry Feed:

Poultry requires a coarse feed structure due their muscular stomach.

They are not to select the feed – and this is best achieved with a uniform feed structure, as produced by the crushing roller mill. Feed losses due to the meal content which is not eaten are reduced. Due to the coarser structure, the retention time in the stomach is longer and the manure is drier.

Successes in Turkey Feeding:

The drier manure results in less replacement of the litter and a lower sick rate due to thickening of the foot balls, particularly in turkey fattening, better housing climate and better meat quality.

Cattle Feed:

Objective: Lowest possible starch degradation in the rumen, since high starch degradation can cause metabolic disorder (ketosis) and thus reduced performance of the animal.

A coarse structure reduces the starch degradation in the rumen thus preventing this effect. The grains must only be halved/quartered. Further crushing of the (oat) husks is not required. Cattle need a coarse, fibrous structure for the ruminant activity. It is important to produce a good balance between fermentative (rumen) and enzymatic digestion (intestine).

Technical Advantages of the Crushing Roller Mill:

Narrow particle size distribution, simple roller gap adjustment, about 50% lower power consumption than hammer mills, reduced wear, smooth operation, simple roller change

Examples of Products:

Wheat, barley, oats, beans, peas, lupins, maize, soybeans, rape, feed mixtures, structurized feed for layers.

DSL partner Techmach to install flour mill control system in South Africa

DSL has teamed up with Techmach to install a flour control system for OVK in Clocolan, South Africa.

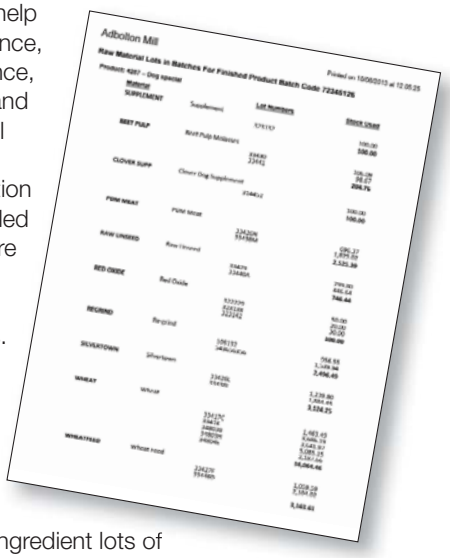
Techmach is a leading engineering company supplying the Agri sector in Africa. Techmach have built a new flour mill for OVK , a prominent agricultural company in South Africa. DSL's AutoPilot4Flour was recommended by Techmach to be used for the control of the mill and was approved following an evaluation by OVK.

Techmach engineers came to DSL for training and this enabled them to install the control system and perform the initial commissioning. A DSL commissioning engineer went to site for the final part of the commissioning and to provide Techmach with further commissioning training.

Lot traceability in pet food plants

DSL has continued the development of their lot traceability system. Lot traceability is an enhancement of the basic batch and production records that all AutoPilot4Feed systems have.

The AutoPilot4Feed full lot traceability option provides the facility of tracking each delivery (lot) of all raw materials through the plant and into each delivery of finished product. Full lot traceability can help with regulatory compliance, improve quality assurance, improve stock control and speed up product recall and customer service.



The lot traceability option has recently been installed in a pet food plant where the tracking is further complicated by a 2 stage blending process. There is also now a facility to provide bar-coding of reworks and fines and tracking the usage of these.

The example report pictured shows all the ingredient lots of a pallet of pet food that has been shipped to a customer.

VICTAM appoints new consultant for Vietnam

As the new consultant for Victam International in Vietnam, The North Ltd will take care of all companies that wish to exhibit at or visit Victam's shows. They will also co-operate closely with relevant associations, agencies involved in external trade promotion and other organizations.

Services provided for the exhibitor:
- Registration for show
- Providing information on space rental, stand construction, marketing services etc.
- Organizing of group exhibits
- Providing and support with information on travel and accommodation
- Supporting in Visa issues

Services provided for the visitor:
- Arranging entrance tickets and show catalogues
- Supplying with show brochures
- Information on show locations and Victam's other trade fair locations
- Providing and support with information on travel and accommodation
- Supporting in Visa issues

For any further information, please contact:
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Tel: +(84-8) 3822 7655
Fax: +(84-8) 3822 4775
Email: info@go2fair.com
Website: www.go2fair.com

User-friendly websites

Victam has recently re-launched its three show websites, making them more exciting and easier to navigate.

You are now able to find the latest information on each of our exhibitions – FIAAP, VICTAM and GRAPAS as each show now has a fully dedicated website.

As we approach the opening of the shows so new slides will appear on the websites so keeping our exhibitors, visitors and conference delegates up to date on what is happening and what needs to be done.

Don't forget to try out the new websites and let us know how you are finding the content, navigation etc.

We also have our own social networking sites, details of these are also on our websites, so keep in touch!

www.fiaap.com, www.victam.com, www.grapas.eu

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Built by feed millers for feed millers. Equipped with the industry's most efficient drive system, the new Bühler pellet mill Kubex™ T saves up to 30% of energy – while boosting line capacity to up to 80 tons per hour. With the Kubex™ T you save costs, reduce the release of CO_2 and make your operation even more productive. Gaining competitive advantages has never been easier. For more information please visit www.buhlergroup.com/kubex-t

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Kubex™ T pellet mill.

Developed in close cooperation with leading feed millers.

Direct drive concept. Saves up to 30% of energy compared to conventional drive systems.

Variable die speed. Formulation-specific optimization of production process and pellet quality.

Up to 585 kW motor power. Boosts line capacity to up to 80 t/h.

Belt- and gearless drive system. For minimum maintenance and ultimate machine availability.

ABS control for press rolls. Prevents roll slippage and protects machine against blockages.

360° accessibility. Wide-opening sliding doors on both sides.

The world's most compact design. Fits anywhere and everywhere. Almost double capacity with same footprint as conventional pellet mills.

Innovations for a better world.

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