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WEDNESDAY, FEBRUARY 15, 2012

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AQUAFEED HORIZONS ASIA 2012

Wednesday, February 15, 2012

Chairman: Warren Dominy, Director, Feed & Nutrition, Department, Oceanic Institute, Hawaii

9:00	REGISTRATION OPEN
9:30	Welcome Dr. Juadee Pongmaneerat, Thai Department of Fisheries
9:35	A review of amino acids levels in fishmeal in Southeast Asia Dhanapong Sangsue, Evonik Degussa (SEA)
10:05	Reducing feed cost in aquaculture by optimizing nutrient utilization and gut health Peter Coutteau, Nutriad
10:35	QUESTIONS/ COFFEE BREAK
11:00	New non-GMO high protein soybean meals without anti-nutritionals for aquafeed Alejandro Buentello, Shillinger Genetics
11:30	Total replacement of fish meal by poultry by-product meal in shrimp feeds Victor Suresh, Integrated Aquaculture International & Sergio Nates, Fats & Proteins Foundation, National Renderers Association
12:00	The missing link for fish meal substitution: low-cost, high-volume, sustainable protein and EPA-rich microalgae (<i>spirulina</i>) biomass Miguel Cizin, Biomat
12:30	Use of distiller's dried grains with solubles in tilapia diets Chhorn Lim, Aquatic Animal Health Research Unit, USDA, ARS
13:00	QUESTIONS/LUNCH/EXHIBITION VIEWING
14:00	Extrusion workshop: Practical extrusion and diet development for extrusion processing Peter Hutchinson, E.N. Hutchinson
15:30	QUESTIONS/ COFFEE BREAK
16:30	Extrusion workshop: Practical extrusion and diet development for extrusion processing (continued) Peter Hutchinson, E.N. Hutchinson
17:00	PANEL DISCUSSION/ END OF CONFERENCE Panelists: Peter Hutchinson -E.N. Hutchinson, New Zealand Kim Pagh, Sales Manager, Extrusion - Andritz Feed & Biofuel, Denmark Urs Wuest, Director Market Segment Aquafeed - Bühler, Switzerland Joe Kearns, Aquaculture Process Engineering Manager - Wenger Manufacturing, USA Warren Dominy, Director Feed & Nutrition Department, - Oceanic Institute, Hawaii



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AQUAFEED HORIZONS ASIA 2012

Wednesday, February 15, 2012



AQUAFEED.COM

09:35

A review of amino acids levels in fishmeal in Southeast Asia

Dhanapong Sangsue, Evonik Degussa (SEA) Pte. Ltd. Technical Sales Manager, Singapore

dhanapong.sangsue@evonik.com



Dhanapong has over 12 years work experience with various aquaculture feed manufacturers in Thailand. During that time, he was primarily involved in product development and as a technical research and development manager. He has given several poster presentations including one at WAS 2008 in Korea and two in 2010 at the International Symposium on Fish Nutrition and Feeding in China. Dhanapong is currently Technical Sales Manager for Evonik Degussa taking care of aqua customers in the Indian subcontinent, Southeast Asia, and ANZ. As part of his role as TSM, Dhanapong regularly meets with aqua nutritionists and feed mill personnel to share Evonik's knowledge of amino acid nutrition.

Animal protein sources, such as fishmeal, have typically been used in aquatic animal feed to provide essential amino acids and other nutrients, but the nutritional value of these protein sources can vary greatly due to type of species used and processing conditions. Considering the importance of fishmeal in aquatic feeds, it is important to understand this nutrient variation and its impact on production performance if not accounted for. In 2010, 266, 387, 241, 209, and 39 samples of locally-produced fishmeal from Vietnam, Thailand, Philippines, Indonesia, and Malaysia respectively, were analyzed for their crude protein and amino acid contents. The analyzed crude protein contents of those fishmeal samples ranged from 56.23 to 63.18 %, while methionine contents ranged from 1.34 to 1.75%, and lysine contents ranged from 3.61 to 4.71%. Fishmeal from Indonesia had the highest levels of CP, Met and Lys with 63.18, 1.75, and 4.18% respectively, whereas fishmeal from Vietnam had the lowest with 56.23, 1.34, and 3.61%, respectively. Fishmeal produced in Thailand had the greatest variation with a coefficient of variation of 9.23% for CP, while Philippines had the most-consistent production with a coefficient of variation of 4.59%. A portion of the variation can be explained by origin of fishmeal and processing. For example, analyses of 87 Tra catfish fishmeal samples from Vietnam (by-products from *Pangasius* processing) revealed 58.5%, 4.04%, 1.48% of average CP, Met and Lys respectively, with coefficients of variation of 6.0%, 12.3%, and 14.2%, respectively. To formulate diets as precisely as possible, it is critical to both understand the amino acid requirements of the aqua species being fed and to understand the nutrient variation in the ingredients that will be used to produce that diet. Without this knowledge, safety margins must be increased, which increases diet cost due to less efficient use of this costly raw material. These data

highlight the importance of analyzing fishmeal on a routine basis in order to better understand its nutrient content and the variation contained therein.

10:05

Reducing feed cost in aquaculture by optimizing nutrient utilization and gut health

Peter Coutteau, Business Development Manager – Aquaculture, Nutriad International NV, Belgium

p.coutteau@nutriad.com



Peter Coutteau obtained a Ph.D. in Biological Sciences at the Laboratory of Aquaculture & Artemia Reference Center, University of Gent. He continued his academic research at postdoc level on lipid nutrition of bivalves, fish and shrimp and published over 40 refereed papers in scientific journals. In 1997, he joined INVE Technologies NV, the R&D company of the INVE group, where he has held various research and product development roles. In 2009, Dr. Coutteau was appointed within INVE's Business Unit Nutriad as Business Development Manager Aquaculture; directing the development, product management and implementation of sales objectives for a specialized portfolio of aquaculture additives for farmed fish and shrimp.

As ingredient prices rise, nutritionists search for new options for cost reduction by maximizing the efficiency of digestive and metabolic processes which are at the basis of converting nutrients into meat gain. The presentation illustrates the potential to reduce cost of feeding in aquaculture by improving the efficiency of nutrient utilization and optimizing gut health. Digestibility enhancing additives have the potential to improve nutrient utilization from cheap ingredients and stimulate the conversion of nutrients into meat gain and less into fat accumulation in muscle and viscera. The potential of species-specific digestibility enhancers, tailored to the digestive physiology and feed formulation of each aquaculture species, is illustrated with results from feeding trials with Tilapia (*Oreochromis niloticus*), tra catfish (*Pangasius hypophthalmus*), European seabass (*Dicentrarchus labrax*), and white shrimp (*Litopenaeus vannamei*). Fish and shrimp are highly exposed to exchanges of microflora between the environment and the digestive system. Furthermore, the digestive system of fish and shrimp is the main entry port for bacterial and viral infections. Synergistic blends of natural compounds (“phytobiotics”) are capable of modulating the microflora towards a favorable composition, favoring the development of beneficial bacteria and inhibiting potentially pathogenic micro-organisms. The efficacy of phytobiotics was tested under lab and field conditions for fish and shrimp production, resulting in significant improvements in survival, growth and food conversion.

11:00

New Non-GMO High Protein Soybean Meals without Anti-Nutritionals for Aquafeeds

Alejandro Buentello, VP of Research and Aquaculture Business, Schillinger Genetics, Inc., USA

abuentello@schillgen.com



Alejandro Buentello is Vice-president for Research and Aquaculture Business, Schillinger Genetics. He has a long track record of experience in aquaculture: he has held a number of positions at Texas A&M University, where he gained both his M.S. and Ph.D., including Research Associate Scientist and Lecturer, Wildlife & Fisheries Sciences and Intercollegiate Faculty of Nutrition. Dr. Buentello also held the position of Assistant Professor, Department of Aquaculture and Biotechnology, Northwest Center for Biological Research, Baja, Mexico. He has also served as an aquaculture consultant for a Yellowfin tuna ranch, Rancheros del Mar, Baja, Mexico, and PORTEK-TAGC Shrimp farm, Hermosillo, Sonora, Mexico. He was Department Head, New Projects Department, and subsequently General Manager for the State of Mexico, Federal Fisheries Bureau, Mexico

Soybean cultivars have been selected with 15-20% higher protein content and with the difficult-to-digest carbohydrates raffinose and stachyose, as well as trypsin inhibitors significantly reduced. The defatted meal derived from these cultivars exceeds 56% in protein content and with further gentle processing will surpass 60% in crude protein (CP). Feeding trials comparing protein digestibility, metabolizable energy, mortality, FCR and growth performance have been conducted with Atlantic salmon, rainbow trout, Pacific white shrimp, European sea bass, cobia, yellowtail and red drum. Additional trials with other aquaculture species will be conducted in 2012. The search has been intensified for new soy meals and traits that will further improve the nutritive value of aquafeeds in key aquatic species. In order to expand testing efforts on aquafeeds, Schillinger Genetics (SG) has conducted replicated feeding trials utilizing “first feeding” rainbow trout fry with an average initial weight of ~ 0.1 g. Experimental diets were formulated to contain 42% CP, 15% lipid and derive the dietary protein from sardine meal (reference diet), sardine meal plus SG-cultivar 3010 (50:50) or sardine meal plus soy protein concentrate (SPC) obtained from regular commodity soybeans (also 50:50 replacement). The feeding trial was conducted over a 6-week period to allow for adequate treatment separation. Results on growth and survival indicate that SG-3010, substituting half of the fishmeal is able to support the same growth performance as the fishmeal-based diet and a significantly higher weight gain than the SPC diet. Taken together, these results indicate that the use of SG -3010 allows for a higher fishmeal replacement level in rainbow trout diets. In addition, due to its higher protein density, lesser amounts of SG-3010 are required to meet the dietary requirement for

this species. Therefore, the nutritional value of SG-3010 is significantly higher than that of SPC obtained from conventional commodity soybeans.

11:30

Total replacement of fish meal by poultry by-product meal in shrimp feeds

Victor Suresh¹ & Sergio Nates²

¹Integrated Aquaculture International, Brunei Darussalam

²Fats & Proteins Research Foundation, USA

victors@integratedaquaculture.com



Victor Suresh has been working in the aquafeed industry for the past 15 years. He started his career in Ralston Purina International in the Research & Technology division and moved to its spinoff Agribands International. He was Director of Aquaculture in the Research & Technology department in Agribands when Cargill Animal Nutrition acquired the company. He returned to his home country, India in 2001, and worked as an independent consultant for the aqua feed industry for a number of years. Projects included start up of a shrimp feed business in India; technical services for start up of a feed additive business in Asia; and research leading to product and applications development in aquaculture. In 2007, he became the Director of Nutrition & Feeds in Integrated Aquaculture International, a company specializing in vertical integration of the shrimp farming industry. Based in Brunei Darussalam, he manages the Shrimp Nutrition Research Center in Brunei and travels internationally to service IAI's clients. He is set to develop a new business focused on research services for the livestock and aquafeed industries in 2012. Victor received a Bachelor degree in Fisheries Science from Tamil Nadu Agricultural University in India in 1988; Master degree in Aquaculture from Asian Institute of Technology in Thailand in 1990; and Ph.D. from Southern Illinois University, Carbondale, USA in 1996.

The presentation will highlight efforts to completely replace fishmeal in shrimp feeds using poultry byproduct meal (PBM). In formulas that are similar to commercial feed formulas and containing 21-24% premium fishmeal, total replacement by PBM results in shrimp performance that is lower by about 15%. We have investigated the attractability and palatability factors in PBM, and found them to be present in significant quantities. Nutritive value of PBM's fat component for shrimp has also been extensively investigated. The results of the investigations will be discussed in the presentation.



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12:00

The missing link for fish meal substitution: low-cost, high-volume, sustainable protein and EPA-rich microalgae (*spirulina*) biomass

Miguel Cizin, President, Biomat, Uruguay

miguel@biomatsa.com



Miguel Cizin is the CEO and co-founder of Biomat S.A. Mr. Cizin's most recent executive positions are General Manager of the Argentina subsidiary of Pointer Ltd. and CEO of optical wireless equipment startup Celerica, Inc. Earlier in his career he was General Manager of Canada's Nortel Networks Israeli subsidiary and a member of the technical staff at AT&T Bell Laboratories in New Jersey. He was issued a US and a European patent and is co-inventor of Biomat's proprietary algae farming technology. Mr. Cizin earned a B.Sc. in Aerospace Engineering from the Technion, Israel Institute of Technology, and also holds a M.Sc. degree from Columbia University in New York, and an MBA in International Business from the University of Miami.

The debate over sustainability of fish feed ingredients such as fish meal, which is mostly sourced from unsustainable pelagic fish wild catch, has promoted the development of sustainable vegetable-sourced protein alternatives as a viable substitute. In addition to other aquatic and non-aquatic ingredients, such as soy, microalgae biomass in general, and *spirulina* algae in particular, has been identified and acknowledged as the most promising ingredient for high-volume, sustainable protein, due to its unique ability to capture CO₂ and available energy and very efficiently convert both into protein and nutrient-rich (EPA) biomass. There is a long-standing and still very strong global consensus that the single missing link for algae to fulfill its promise as the optimal ingredient to substitute a high percent of fish meal in animal feed is the availability of scalable, competitively priced algae biomass produced in a sustainable process, using a limited amount of non-fertile land, water, nutrients, and energy. A new, patent-pending, sustainable algae biomass production technology is described, which can be deployed on non-fertile land, and which does not require a nearby smoke-stack as it captures the large amount of carbon molecules required directly from the available CO₂ in the surrounding atmosphere. Typical production volumes per unit surface and overall production costs per ton of algae biomass produced in the first facility deployed in Israel will be presented.

In summary, a novel, timely solution to the missing link is presented for the first time in Asia: the production of cost-effective, highly-scalable, sustainable microalgae biomass as a viable protein and EPA-rich substitute for fish meal sourced from fish.

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12:30

Use of distiller's dried grains with solubles in tilapia diets

Chhorn Lim, Supervisory Nutrition Scientist, Aquatic Animal Health Research Unit, USDA, ARS, Auburn, USA

chhorn.lim@ars.usda.gov



Dr. Chhorn Lim has almost 40 years of experience in aquaculture nutrition and feed development research and as a research administrator. He is a Supervisory Nutrition Scientist and is serving as the Lead Scientist of the project, Nutrition and Feed Development of the United States Department of Agriculture Agricultural Research Service (USDA-ARS), Aquatic Animal Health Research Unit, where he conducts research evaluating dietary nutrients and nutritional values of alternative protein sources on growth and health of warm water fish. He is also Affiliate Researcher of HIMB, University of Hawaii and Affiliate Professor of the Department of Fisheries, Auburn University. He has authored and co-authored 149 publications and co-edited five books.

Distiller's dried grains with solubles (DDGS) are currently readily available and less expensive than other conventional protein sources. However, its nutrient content and nutritional value vary with the source and quality of grain, fermentation and drying processes and the quantity of distiller's solubles added. Generally, corn and wheat DDGS are deficient in lysine and methionine for tilapia, with lysine being the most limiting. Feeding studies showed that 20 - 30% corn or wheat DDGS can be included in tilapia diets without requiring lysine supplementation. With lysine supplementation, DDGS at levels of 40% or higher can be used without affecting growth and feed efficiency. DDGS also contain yeast, a rich source of beta glucan and nucleotides that have been reported to enhance immunity and disease resistance in fish. Corn DDGS, due to its high oil content that is rich in linoleic acid, is an excellent source of energy and essential fatty acid for tilapia. High concentrations of xanthophylls in corn DDGS may impart yellow pigment in fish flesh if included at high levels. Considering various factors affecting the nutritional value and quality of pellet and fish product, 15 - 20% DDGS appears to be optimum in diets of tilapia.

Enjoy your lunch! Please be back and seated by 14:00 hrs—thank you!



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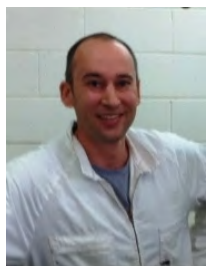
USA BELGIUM TAIWAN BRASIL CHINA TURKEY

14:00

Extrusion workshop: Practical extrusion and diet development for extrusion processing

Peter Hutchinson, Director, E.N. Hutchinson, Auckland, New Zealand

pete@enhutchinson.co.nz



Peter Hutchinson studied aquaculture in Tasmania, Australia, in the early nineties before returning to New Zealand where he worked primarily in the finfish hatchery industry. In 1997 he joined the family business (EN Hutchinson Ltd.) and established a small extrusion plant, with a focus on aquaculture nutrition and general R&D. Over the last decade Peter has consulted widely in the field of aquatic nutrition and extrusion, for a diverse range of major private and public sector companies, including development of starch based bio-polymers, breakfast cereals, pet foods, agricultural and aquatic feeds.

The workshop will comprise two sessions: Practical Extrusion and Diet Development for Extrusion Processing. Practical Extrusion will focus on feed extrusion principals such as screw designs and profiles; die design, extruder trouble shooting, drying and cooling. The session on practical nutrition will look at diet development for extrusion processing and cover such topics as sourcing locally available material, matching extruder profile to formulation, die design in relation to species, high retention (water stable) diets, optimizing the pellet through extruder settings (cook, minimizing nutritional damage, stability and density), basic quality control, post coating and density control through coating and dryer design. Practical problem solving is at the heart of the workshop and Peter will be joined by an international panel of extrusion experts to answer your extrusion questions:

- Peter Hutchinson, E.N. Hutchinso, New Zealand
- Kim Pagh, Sales Manager, Extrusion - Andritz Feed & Biofuel, Denmark
- Urs Wuest, Director Market Segment Aquafeed - Bühler, Switzerland
- Joe Kearns, Aquaculture Process Engineering Manager - Wenger Manufacturing, Inc., USA
- Warren Dominy, Director Feed & Nutrition, Oceanic Institute, Hawaii

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FIAAP ASIA CONFERENCE 2012

Thursday, February 16, 2012

Chairman: Warren Dominy, Director, Feed & Nutrition, Department, Oceanic Institute, Hawaii

9:00	REGISTRATION OPEN
9:30	Asia and the Americas: The increasingly delicate balance between feed demand, feed supplies, unstable climate and biofuels Eric J. Brooks, eFeedLink and FEED Business Worldwide
10:00	Opportunities for global feed safety and sustainability assurance Johan den Hartog, GMP+ International
10:30	QUESTIONS/ COFFEE BREAK
11:00	Feed Hygiene Program: Management & Additives Xabier Arbe Ugalde, Novus International
11:30	All clays are not created equal Fernando Tamames III, Citrex
12:00	Combination of Organic Acid to control Salmonella in soybean meal Juan M. Hernandez Vieyra, Yara Phosphates OY/ Technical Service Latin America
12:30	Effect of heat damage on the digestibility of amino acids in soybean meal Sheila Heidi M. Ramos, Evonik Degussa
13:00	QUESTIONS/LUNCH/EXHIBITION VIEWING
14:00	Improvements in the nutritive value of soybeans and soybean meals by selective breeding Sarah Cervantes-Pahm, Schillinger Genetics
14:30	Algae: a practical alternative for healthy aquatic and animal production Matthew Caspari, Aurora Algae
15:00	QUESTIONS/ COFFEE BREAK
15:30	Target release butyrate support intestinal development, enabling optimal performance Pim Langhout, Nutriad International
16:00	Strategies for non-linear constraints Merryl Webster, Format International
16:30	QUESTIONS/END OF CONFERENCE

FIAAP ASIA CONFERENCE 2012

Thursday, February 16, 2012

09:30



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Linking agribusiness

Asia and the Americas: The increasingly delicate balance between feed demand, feed supplies, unstable climate and biofuels

Eric J. Brooks, Senior Analyst, eFeedLink and editor, FEED Business Worldwide, Singapore

feedbusiness@efeedlink.com



Born in Toronto, Canada, Eric J. Brooks received his B. Comm. Degree (Economics and Finance) from the University of Toronto in 1992. Upon graduation, he began making studies of Canadian, American and Asian food processing and manufacturing industries for the South Korean government's trade promotion agency. Henceforth, he analyzed individual components of the entire agribusiness supply chain, focusing on major feed crop markets and meat lines. Based in Singapore, he has been analyzing global meat and feed grain markets for approximately seven years and been editor of FEED Business Worldwide since 2007.

Asia's burgeoning meat demand is being balanced against North and South America's limited arable land, flattening crop yields and biofuel production. The past ten years have seen a coincidence of these factors produce the most volatile, inflationary feed grain markets in living memory.

The first decade of this century saw soybeans kindle food price 'agflation' but the next ten years will see corn become the primary driver of meat price inflation. In early 2010, major institutions created corn price forecasts that showed the average price of CBOT corn staying below US\$5/bushel for the next five years. Corn then jumped over US\$5/bushel in less than six months. This is because China's demand for soy is now being joined by growing corn imports, both by China itself and increasingly, by Southeast Asia. When coupled with South America's unstable crop growing weather, this carries profound implications for the price of feed and livestock production.

We also disprove the entire 'climate change' argument while making an important qualification – South America's grain growing climate has always been unstable. We learn why Latin America's unstable weather now plays a growing, but mostly invisible role in the price volatility of feed crops.



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10:00

Opportunities for global feed safety and sustainability assurance

Johan den Hartog, Managing Director, GMP+ International, The Netherlands

johan.denhartog@gmpplus.org



As Managing Director of GMP+ International, and in his former role of Secretary General of Product Board Animal Feed from 1988 -2009, Johan den Hartog gained considerable experience and expertise in policymaking and project management regarding feed safety assurance, environmental issues, training and education, working conditions and scientific research related to animal nutrition. He has a Bachelor of Science degree in Agricultural Engineering and a Master of Business Administration (MBA).

In this presentation, the market and societal trends will be discussed. The vision and mission of GMP+ will be explained, such as its chain-oriented approach worldwide and that the feed industry is part of the food (animal production) chain. One of its important objectives of GMP+ is international involvement. How you can become a partner of GMP+ International will be explained and a brief overview of the GMP+ FSA scheme with its chain focus will be given. GMP+ has more than 11,600 participants. The advantages for GMP+ certified companies will be made clear.

11:00

Feed Hygiene Program: Management & Additives

Xabier Arbe Ugalde, RTM & FQ and Layers Specialist, Novus International, USA

Xabier.arbe@novusint.com



After graduating in Veterinary Science from the University of Zaragoza Spain where he specialized in animal production, Xabier worked as a vet for major Spanish fresh egg producers. His relevant commercial experience included supporting contract layer farmers, production manager and being in charge of the nutrition and R&D groups. He joined Novus in 2009 as Technical Services Manager for Spain and Portugal before being promoted to Poultry and Feed Quality Manager for Europe.

The feed sent to the farms should have the right physical and chemical characteristic and also the microbiological ones. HACCP system helps the feed mills to make the right assessment of the

different risk of the feed mill. A successful HACCP system needs to be link to the management of the feed mill, as cleaning practices, and can use different additives as part of the control measures of the system.

11:30

All clays are not created equal

Fernando Tamames III, Vice President, Citrex, USA

ft3@citrex.com



Fernando Tamames III has more than 25 years of experience with mycotoxins and mycotoxin binders: in 1987 he launched the first ever mycotoxin binder (Novasil) in Latin America. In 1992 he founded and was Vice-president of Special Nutrients, Inc. and went on to launch the mycotoxin binder, Myco-Ad, for poultry in Latin America and Myco-Ad and Citrex in Europe. He has conducted over 300 seminars on immunosuppression, mycotoxins and mycotoxin binders worldwide, including several Universities, and international events.

Clay based products are the most effective mycotoxin adsorbents. However they are diverse aluminosilicates with a variety of properties. Many types of clays do not capture mycotoxins; some can absorb water, others can absorb ammonia, and only certain clays can adsorb mycotoxins. There is no significant correlation between any single physical or chemical property and the mycotoxin binding capacity of clays. Therefore, the effectiveness of a mycotoxin adsorbent has to be evaluated by conducting in vivo test using a scientific experimental design which measures the beneficial effects of the product on animal performance and on the target organ(s) affected by the mycotoxin being studied. Scientific studies have demonstrated that some aluminosilicates are very effective in preventing aflatoxicosis at an inclusion rate of 5 or 10 kilos/mt of feed; and only few, can do it at 2.5 kg/mt. Very few products are effective against more than one type of mycotoxin. Recently, special purified phyllosilicates have been developed, which are capable of binding fusariotoxins such as zearalenone, deoxynivalenol, fumonisins, and T-2 toxin at very low inclusion rate (0.5 to 2.0 kg/mt).

12:00

Combination of Organic Acid to control Salmonella in soybean meal

Juan M. Hernandez Vieyra, Yara Phosphates OY/ Technical Service Latin America, Argentina

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Juan M. Hernandez Vieyra graduated as an Agriculture Engineer from University of Buenos Aires in 1995 with Honours. He took his post graduate courses in Animal Nutrition in Argentina and USA (Cornell University), and started private consulting in 1997. Since then he worked in the feed Industry as Technical Manager at Argent Export SA, a company developing new products in Argentina and other Latin American countries for international companies: Kemira GrowHow (now Yara), Pancosma and others. In 2003, he collaborated on Salmonella control for the soybean meal export industry.

Argentina is the main exporter of soybean meal (SBM) in the world, and in order to keep this position quality must be assured. In fact, microbiological quality is increasingly important in order to avoid transmission of potential pathogens through the feeds to the animals. However, the size of the crushing plants (eg. >5000 ton/day) does not make the control of microbiological contamination an easy thing to do. The use of organic acids to control Salmonella and other bacterial pathogens is widely used in complete feeds for swine or poultry, but information regarding its use in this important raw material is very limited. Several trials have been done in order to identify the best combination of acids to control salmonella in SBM in a way that is applicable to large scale production without negative effect for the workers and the infrastructure.

12:30

Effect of heat damage on the digestibility of amino acids in soybean meal

Sheila Heidi M. Ramos, Health and Nutrition, Technical Sales Manager, Asia South, Evonik Degussa, Singapore

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Sheila Heidi M. Ramos is Technical Sales Manager for Asia South of Evonik Degussa. She received her B.S. in Agriculture, major in Animal Science and M.S. in Animal Nutrition, from the University of the Philippines at Los Baños. She has been working with the company for more than seven years and is responsible for promoting Evonik's value added nutritional concepts and programs such as the use of digestible amino acids in feed formulation, net energy and low protein diets in swine nutrition and the use of the ideal protein concept and the latest amino acid recommendations, among others. She is also responsible for Evonik Degussa's Near Infrared Reflectance service (AminoNIR®) in the region.

Technologies such as solvent extraction and heat treatment of soybean meal (SBM) have been developed to minimize the impact of anti-nutritional factors (ANF's) on animal performance.

However, it has been shown that excessive heat treatment during these processes decrease the total amino acid contents as well as the digestibility of those amino acids. Tests, such as KOH-protein solubility, urease, and protein dispersibility, are used to indicate if a SBM sample is under or over processed. Unfortunately these tests are qualitative in nature, so they are limited in providing any indication of what happens to the digestibility of the amino acids. AMINORED® is a NIRs based tool that helps qualify and quantify the effect on heat damage in raw materials like SBM on the availability of amino acids to the animal. Validation trials show that with AMINORED®, heat damaged SBM can be used without there being any difference in performance to broilers fed diets with non-heat damaged SBM. Soybean meal samples analyzed in 2011 in Southeast Asia show variations in quality depending on the origin. They are imported mainly from Argentina, Brazil, India and USA. The analyzed crude protein contents of those SBM samples ranged from 47.28 to 48.94%, while lysine contents ranged from 2.88 to 3.02%. In addition to the variation in total amino acid content, some samples were found to be heat damaged, which impacts the digestibility of the amino acids. If not properly detected and accounted for in feed formulations there is a risk of not meeting the livestock's nutrient performance thus resulting in serious economic loss.

Enjoy your lunch! Please be back and seated by 14:00 hrs—thank you!

14:00

Improvements in the nutritive value of soybeans and soybean meals by selective breeding

Sarah Cervantes-Pahm¹, Alejandro Buentello², and John Schillinger³

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Sarah Cervantes-Pahm obtained her Masters degree in Animal Science in 2008 at the University of Illinois, Urbana where she worked on the digestibility of crude protein and amino acids in high protein soybeans, fermented and enzymatically treated soybean meals in pigs, and bypass soybean meals in dairy cattle. She also evaluated the effect of heat in the digestibility of crude protein and amino acids in soybean meals using three reactive lysine procedures. In 2011 she completed her doctorate degree in Animal Science, majoring in swine nutrition, also from the University of Illinois in Urbana. For her dissertation, she evaluated the digestibility of energy, carbohydrates (dietary fiber) and amino acids in novel carbohydrates, and cereal grains using animal as well as in vitro models. Prior to her

graduate work, she spent over ten years working in an integrated feed and livestock company in the Philippines as an animal nutritionist specializing in poultry and swine feed formulation, raw material and feed quality control, and feed processing. Recently, she was chosen as one of the recipients of the American Society of Animal Science Midwest Section Young Scholars Award for 2012. Sarah recently joined Schillinger Genetics, Inc., USA, as director of Feed Marketing for South East Asia.

Soybeans or soybean meals (SBM), are the major source of protein in livestock diets. Despite the presence of anti-nutritional factors (i.e., trypsin inhibitors [TI] and oligosaccharides) that limit their potential inclusion levels in diets for monogastric animals, soybeans or SBM are one of the best plant protein sources for animal feeds. The removal of anti-nutritional factors in soy products is usually achieved using various processing techniques. However, reducing the concentration of TI and oligosaccharides can also be attained by selective breeding. Recently, Schillinger Genetics has successfully produced novel soybean varieties (Navita™) that contain TI and oligosaccharides at significantly reduced concentrations as compared to those present in conventional soybeans or SBM.

Low TI SBM. Unique soybean cultivars have been developed that contain 65-90% less TI than conventional soybeans. We hypothesize that heat deactivation may not be necessary for these particular varieties of soybean. At the University of Georgia (unpublished data, Batal, 2011), SBM obtained from low and ultra-low TI soybean varieties were cold-pressed, and meals were fed to broiler chickens. The concentration of TI in the low-TI (16,000 TIU/g) and the ultra-low TI SBM (5,000 TIU/g) was less than the concentration of TI in cold-pressed conventional soybeans (46,000 TIU), but was greater than in conventionally-treated SBM (de-hulled, solvent extracted, roasted; 3,100 TIU). True metabolizable energy corrected for nitrogen (TMEn) in the low and ultra-low TI SBM was greater (average 3,749 kcal/kg) than in conventional soybean (3,612 kcal/kg) and conventional SBM (3,000 kcal/kg). The greater TMEn of the SBM obtained from low TI and ultra-low TI soybeans was attributed to the greater concentration of lipids in these meals (7.8-14.1%) compared with the 1.9% lipid concentration in conventional SBM. This indicates that less supplemental oil is needed when cold pressed low TI or ultra-low TI SBM replaces conventional SBM in diets for broilers.

Similar results were obtained in a swine experiment conducted at the University of Illinois, Urbana (unpublished data, Stein et al., 2011). Metabolizable energy of cold pressed low and ultra-low TI soybean (average 4,369 kcal/kg) was also greater than in conventional SBM (4,006 kcal/kg). Standardized ileal amino acid digestibility of Lys, Met, Thr, and Trp in cold pressed low and ultra-low TI soybeans did not differ from their heat processed counterparts, indicating that heat processing of low and ultra-low TI soybeans was not necessary for optimal AA digestibility of these novel soybeans.

Low oligosaccharide SBM. Soybean meal obtained from low oligosaccharide soybean varieties contained 91% less oligosaccharides (stachyose and raffinose) than conventional SBM. In a recent experiment conducted at Auburn University (unpublished data, Dozier et al., 2010), SBM derived from low-oligosaccharide and high crude protein (CP) soybean varieties were incorporated in diets and fed to broiler chickens. Apparent metabolizable energy values corrected for nitrogen (AMEn)

were 7% higher for birds fed low-oligosaccharide-high CP SBM (53% CP and 1.7 % oligosaccharide; AMEn 2,360 kcal/kg) compared with birds fed conventional SBM (46.6% CP and 7.3% oligosaccharide; AMEn 2,190 kcal/kg). Growth studies conducted with these same meals indicated that 13 day-old chicks fed the low oligosaccharide-high-CP SBM attained an 18 g advantage in body weight compared with birds fed conventional SBM (381 g versus 363 g). Feed conversion ratio and body weight at 40 days were not different between birds fed the low-oligosaccharide-high-CP SBM and conventional SBM, but 17% less SBM was required in low-oligosaccharide-high-CP diets to meet the chicken's CP and amino acid requirement.

From a practical perspective, the value added advantage in using these novel soybean varieties is highlighted by savings in processing costs (no need for heat-deactivation of protease inhibitors), absence of nutrient deterioration associated with heating, and the elimination of detrimental effects of oligosaccharides in novel soybean varieties developed at Schillinger Genetics.

14:30

Algae: a practical alternative for healthy aquatic and animal production

Matthew Caspari, Managing Director, Aurora Algae PTY, Ltd, Australia

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Matthew Caspari is responsible for cultivating strategic relationships and oversees the company's Australian operations. Prior to co-founding Aurora Algae, Matthew was a management consultant with Cambridge Pharma Consultancy, where he provided strategic advice to leading pharmaceutical and biotechnology companies. His professional experience also includes time with Hana Biosciences, where he was involved in Business Development and Marketing, and with Bloomberg, LP, where he worked in Mergers and Acquisitions. Matthew holds an MBA with a Certificate in Entrepreneurship from the University of California, Berkeley's Haas School of Business and a BS in Biochemistry from Georgetown University.

It is no secret that algal biomass has a huge and diverse application potential. For decades, companies and institutions have been analyzing the multitude of ways that this fast-growing green biomass can impact the world and address its growing problems. Applying algae as a source of aqua- and land-animal feed is one of the many exciting new opportunities that are coming to market through companies like Aurora Algae. In order for a feed product to become a staple in an animal diet on a global scale, a company will need to produce massive quantities in a sustainable manner. Aurora grows its proprietary strains of pale-green algae in open ponds using sunlight, seawater and CO₂ from local industrial emitters. There is no feed vs. fuel argument, as the company's algae can

be grown on an ever-increasing scale to simultaneously meet demand from feed, fuel and food markets. Algae is not only a great source of protein, but also provides other essential high value nutrients that are vital to the healthy growth of animals and humans alike, in a sustainable and infinitely scalable manner.

15:30

Target release butyrate support intestinal development, enabling optimal performance

Pim Langhout, Technical Director, Nutriad International NV, Belgium

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After graduation from the Agricultural University Wageningen, the Netherlands, Dr. Ir. Langhout started to work as a poultry nutritionist. From 1994 - 1998 he worked as a scientist in an independent research institute. He finished his PhD in 1998, entitled: "The role of the intestinal flora as affected by non-starch polysaccharides in broiler chicks". In August 1998 he joined Provimi as Product Manager Poultry by Provimi and subsequently manager of Proviad, a special division for Provimi additives, followed by the position of business unit manager feed additives for Citura, the feed additive company in Provimi. Since November 2009 he has been Business Development Manager Poultry for Nutriad.

In practical conditions, performance is often lower than the genetic potential of birds. This is generally associated with a sub-optimal development of the intestinal tract. A lot of research has been carried out over the last couple of years to study the nutritional factors that have a positive effect on gut integrity. An interesting molecule in this respect is butyric acid. Recent research in human health has shown interesting properties of butyric acid in the development and maintenance of optimal gut integrity. Butyric acid, when present in the blood stream, stimulates mRNA that increases cell proliferation for villi development. Moreover, when butyric acid is present in the lower part of the intestinal tract it can attach to specific G-protein receptor cells. These receptor cells will improve feed utilization via a better feed passage rate as well as regulate and optimize the response to inflammatory stimuli. In addition to this, butyric acid can also inhibit the colonization of pathogenic bacteria such as Salmonella. Trials with broiler chicks clearly show that providing butyric acid in the form of a slow release Na-butyrate improves the development of the intestinal tract which can, in part, explain the improvement in performance of the animals.

16:00

Strategies for non-linear constraints

Merryl Webster, Managing Director, Format International Limited, U.K.

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Merryl Webster is Managing Director of Format International Ltd, the UK-based company that develops formulation software for the aquafeed, animal feed, pet food and other industries. For more than 20 years with Format, Merryl has been responsible for the implementation of formulation software worldwide with clients ranging from sole traders to large multinational organizations. This, together with previous experience working for major food and premix manufacturers, has given Merryl a unique insight, from the view point of both user and supplier, into the use, potential and challenges faced by users of this type of software.

The enzyme problem, minimum weighing quantities, quadratic digestibility and energy constraints: these are just a few examples of the challenges facing feed formulators when some of the characteristics to be constrained are not straightforward or are not linear.

This presentation explores strategies for the optimization of animal, aqua and companion animal feeds in such situations and will look at:

- the alternative optimization algorithms available
- the inherent disadvantages and advantages of each one
- case studies to aid decision making .

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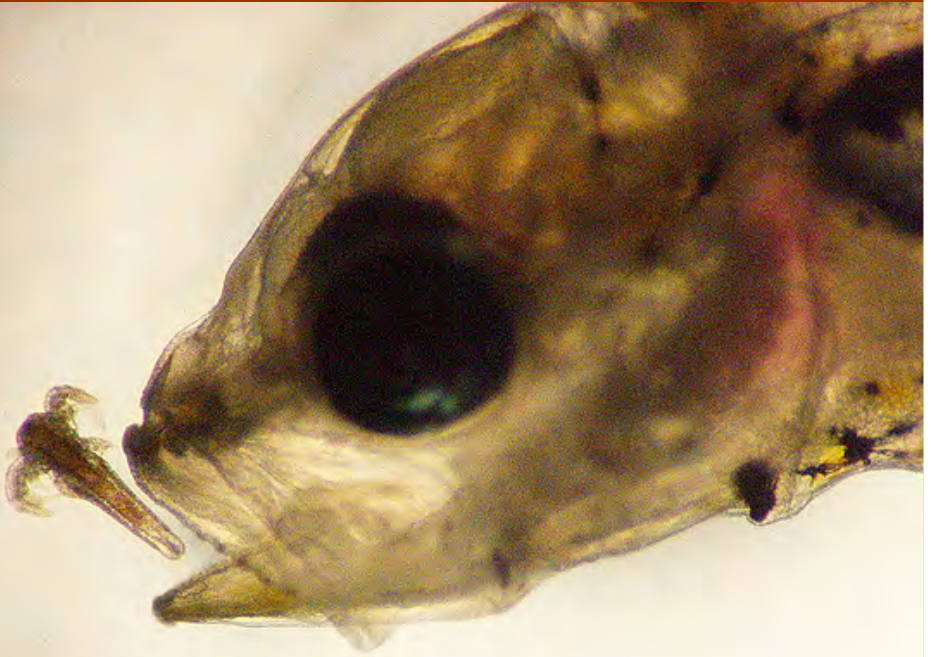
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