

**Sow nutrition, increasing feed intake in tropical conditions and reducing feed costs took centre stage at the 2018 Pig Feed Quality Conference held on April 26-27, at the Westin Grande Sukhumvit Hotel in Bangkok, Thailand.**



## Sow nutrition and feed intake in tropical conditions lead conference

The two-day annual event gave 200 participants from over 21 countries the chance to network not only with suppliers and potential customers, but with counterparts from other markets during conference breaks.

The three main pig producing countries in Asean led the delegates with 49 participants from Thailand, 48 from the Philippines, and 37 from Vietnam. As with previous editions, Vietnamese translation was provided.

While Asians dominated the participation it was a welcome sight to find a participant from as far as Kenya.

The conference followed the framework of 'science, trials & application', with 17 world-class speakers delivering 18 presentations that updated the participants on the latest regionally relevant research, with practical take-home messages to help improve productivity and profit margins. The speakers also made time during

the 'Meet the Speakers' cocktail party at the end of Day 1 to entertain, network and answer questions.

### Preventing lameness

Lameness accounts for 10-15% of culling in a breeding herd, of which 70% of lameness-associated culling occurs before sows reach the second parity. Meanwhile, fast growth rates due to genetic improvement exacerbates lames of developing gilts. Feeding them specific diets rather

than grower/finisher or gestation diets will reduce the prevalence of lameness in gilts and young sows.

Jae Choel Kim, Technical Manager-Asia Pacific of AB Vista said regulating fast



Jae Choel Kim



**Delegates registering their attendance.**



**Translation was provided for Vietnamese delegates.**

growth rate, improving Ca, P, Mg and Zn bioavailability, and supplementing with vitamin D and K can maximise bone mineral density for developing gilts.

Dr Kim explained that phytase super-dosing is a cost-effective dietary strategy to increase bone mineral density of gilts and young sows. Likewise, vitamin D and K, Mg, Zn should be included in diets for developing gilts to reduce lameness-associated premature culling.

**Insoluble fibre and sow nutrition**

Fibre is essential for gut health, gut motility and overall well-being of pigs. In sows, crude fibre concentrates (CFC) made of lignocelluloses not only fill the gut because of their insolubility and indigestibility, but they also have high water binding capacity as well as high fibre content. They are also mycotoxin-free.

“This leads to satiation in gestating sows, more space and flexibility in lactating sows,” explained Manfred Pietsch, Business Unit Manager-Animal Nutrition of J. Rettenmaier & Söhne. He added that more water intake leads to less constipation and therefore less heat stress and less

instances of mastitis, metritis and agalactia syndrome.

Dr Pietsch also cited a recent Thai study which showed that the use of CFC like Arbocel in gestation and lactation diets led to better fertility, more piglets born alive and more piglets weaned. The better fertility was because of less mycotoxins, calmer sows and less backfat loss in lactation.

**Integrating gilt and sow nutrition**

To maximise the number of piglets per sow per lifetime, pig producers and nutritionists must “focus on doing things correctly throughout the sow’s life,” including implementing the right nutrition programs,” said Mike Varley, Director of The Pig Technology



**Manfred Pietsch**

Company and Honorary Professor at the University of Nottingham in the UK.

He noted that there are already overall guides for feeding regimes. However, currently there are too many nutritional recommendations because research work has been done on various specific areas, but these are fragmented because they have been done without necessarily looking at the big picture.

Dr Varley said it is

necessary to integrate current knowledge from an early pre-pubertal phase through to culling at parity 6. He presented a plan that covers basic guidelines for management and feeding recommendations that aims to maximise the lifetime performance of sows to parity 6 when they are culled.



**Mike Varley**

**Sow nutrition for efficiency**

Maternity and reproduction are among the most challenging segments in pig production and should be addressed with short and long-term objectives, considering how sow nutrition affects piglet performance. It is difficult to define one criteria to optimise, but various nutritional approaches can bring about improvements, said Pierre Cozannet, Animal Scientist-Pig Nutrition at Adisseo.

Dr Cozannet said feed additives provide solutions, noting the advantages of



**From left: Pisey Mao of Vita Co Ltd; Theerawit Poeikhampha; Hang Chamnan of Kemlin Industries (Asia)**

## Kudos for the Pig Feed Quality Conference

Over the years, the Pig Feed Quality Conference has been tagged as a premiere animal nutrition conference dedicated to Asia, attracting a growing number of participants from the region and beyond. Here are some testimonies from a first-time participant and repeat participants.

"This is my first time at the conference organised by *Asian Agribiz* and it's also the first time in Asia for me. I heard from our regional office in Thailand that the conference is the best way to gain knowledge about the industry. But more importantly, I got to meet people in the industry. I did learn a lot from the conference and I got to network with many people, which is exactly what I am here for. I hope to come back to more conferences organised by *Asian Agribiz* in the future." - **Faith Wakibia, Technical Service Manager of Diamond V, Kenya.**

"This is my second Pig Feed Quality Conference but my fourth time with *Asian Agribiz's* conferences. Each time I come here I learn something new, especially from new research and findings from international speakers. It's hard to find any conference quite like this. I will definitely come back for the next conference. Besides the knowledge I get, I also get to meet potential customers as well as suppliers." - **Chiewcharn Petnin, Top Feedmill, Thailand.**

"I appreciated most of the lectures on managing sow nutrition in the tropics since I can apply it to our local condition and maximise the genetic potential with latest nutrition updates and products. As a nutritionist, I was given an insight into alternative ingredients and management strategies for coping with heat stress." - **Mae Bautista, nutritionist from the Philippines** who has regularly attended the conference.

"It was great to join the Pig Feed Quality Conference in Thailand last April. Its unique topics for specific farming conditions in tropical countries has given us broad understanding of and applications in our businesses. I and my colleagues are always happy to join *Asian Agribiz's* conferences and consider these events a special technical exchange forum in Southeast Asia." - **Dao Manh Luong, CEO of Mavin Group, Vietnam.**

"Just as the previous editions of the Pig Feed Quality Conference, this year's event helped us to strengthen our network in the industry especially since Adisseo has recently acquired Nutriad. We must widen our reach and introduce Nutriad products to our existing customers and vice versa. Also, it was good to hear that prospective customers' interest in our products and services was reinforced as they appreciated the topics presented. It's also an eye opener on the hottest trends in the industry today, ie AGP-free production and the options available for stakeholders. For sure we will attend future editions of the Pig Feed Quality Conference and look forward to its timely topics." - **Rochelle Vecino, Business Development Executive, Adisseo Asia Pacific Pte Ltd, Malaysia.**

"One of the reasons I attended the conference was because I get a lot of good and new information from different speakers which is useful for what I am doing. What I learned is beyond what I expect. Besides, this is a great opportunity to network with potential clients and other people in the industry. I will continue to come back for future conferences." - **David Sherwood, National Sales Manager Australia, EW Nutrition Australia Pty Ltd.**

"I always attend conferences like this, but this happens to be one of my favorites. Not only does *Asian Agribiz* bring together people in the industry but the conference also offers the latest research regarding the topic I am working on, which to me, is a very useful information since I can apply the new knowledge to what I am doing." - **Josep Mascarell, Asia-Pacific Director, Industrial Tecnica Pecuaría SA, Spain.**



Pierre Cozannet

improve nutrient allocation, the sow's body condition, and piglets' body weight.

He added that organic selenium fed to sows is efficiently transferred to piglets though the maternal diet and results in better piglet immunity.

### Integrated sow nutrition model

In most farms, we can find sows that have eight litters and on average 12 piglets weaned per litter, said Peter Ramaekers, Product Manager Models and Swine Nutrition of Trouw Nutrition. When these piglets grow out to healthy fattening pigs of 120kg, the total meat production of the sow's offspring will be around 10 tonnes of meat. Body condition management is the first key factor to reach this level.

The nutritional requirements of sows depend on many factors such as genotype, parity

increased supplementation of sulphur amino acids, antioxidant compounds such as organic selenium, and exogenous enzymes.

He said that maternal supplementation of DL-2-Hydroxy-(4-methylthio) butanoic acid during late gestation and lactation periods improves the sow's body condition

while enhancing the piglets' ability to cope with inflammatory stress, thus improving their performance. Meanwhile exogenous enzymes

**From left: Rolando Valientes of DSM Nutritional Products Phils; Nasril Surbakti of CP Indonesia; Kostas Stamatopolous of DSM Nutritional Products.**





Peter Ramaekers

number, body weight, production level, housing system, and climate. For this, Trouw Nutrition has developed the NutriOpt sow model, which is a web-based program developed by end-users, for end-users.

“With the NutriOpt sow model we evaluate current feeding programs in farms and the model can calculate the nutrient requirements and feeding schemes. The model can show the effect on heat stress and on feed intake during lactation. You can setup the tool to identify nutritional needs for high prolific sows,” Dr Ramaekers explained.

### Chemosensory dialogues

Optimising pig production requires maximising piglets born alive and lactation and post-weaning performance. Today, many new concepts are unfolding when it comes to sow and piglet nutrition. One that is quite unique, said Eugeni Roura, Associate Professor at the University of Queensland, Australia, is in understanding the relationship between the sow and the piglet before and after farrowing.

He said studies have shown that the “sow and piglets talk to each other in an orchestrated



Hoang Thi Thuong of Olmix North; Nguyen Thanh Tai and Thi Nguyen Thanh Tinh of Kemin Industries (Asia); Dang Dinh Trung of Hoa Phat.



Eugeni Roura

flow of chemically-coded messages.” For example, he explained that his group is studying how dietary nutrients and volatile compounds travel selectively from the maternal diet through maternal fluids to reach the foetus and/or the lactating pig. This has long-lasting effects on “foetal development, piglet feeding behaviour, gut health and welfare.”

In this context, Dr Roura discussed the potential function of essential oils as a tool in studying how volatile compounds in the diet travel from the sow to the piglet. Not only that, he added, essential oils are of particular interest because they are natural compounds with antimicrobial activity.

### Feed flavours boost feed intake

Studies have shown that using flavour enhancers and appetite stimulants

improve the voluntary feed intake, and consequently, performance of sows and suckling & weaned piglets, said Ab Greven, Commercial Manager of Nutriad’s Palatability Business Unit-Asia Pacific.

He added that inadequate lactation feed



Ab Greven

intake can lower growth rates after weaning and result in poorer lifetime growth performance and fewer pigs born per litter and fewer litters per sow

per year.

Studies also indicate a direct link between lactation feed composition and establishment of flavour imprinting in piglets during the suckling phase, reducing food neophobia and improving performance both pre and post-weaning. Mr Greven emphasised the importance for piglets to participate in or at least observe the sow eating.

“They prefer to eat with the sow and prefer similar flavoured feed. The sow shows the piglets what and where to eat; they trust the sow to direct them to safe and nutritious feed,” Mr Greven explained.

### Live yeast probiotics

In pigs, the role of the microbiota is important for digestion, especially in the hindgut for fibre and undigested feed. Probiotics like live bacteria, yeast or fungi, can help limit the growth of pathogens. They can improve the gastrointestinal microbial environment by increasing the diversity of the microbial community and modifying the gut microbiota towards beneficial microbes.



Watcharapong Poomongkutchai of Cargill Siam Ltd; Sureemas Nitikanchana of SPM; Chumpol Suworamngkol of Cargill Siam Ltd.



Fabio Catunda

Fabio Catunda, Global Swine Manager of Phileo Lesaffre Animal Care, explained how live yeast (*Saccharomyces cerevisiae*) helps modulate the gut microbiota. Because of its binding effect, it limits the proliferation of pathogens.

Among its other benefits are reducing anti-inflammatory response, acting as competitive exclusion, helping immune stimulation, improving colostrum and milk quality, improving IgG levels in colostrum and in piglet plasma at 24 hours and at 21 days post farrowing, and increasing fibre degradation in the large intestine, thus increasing production of volatile fatty acids. Due to its multiple functions, live yeast has been proven to improve animal performance and well-being.

### Oxidative defence and immune-response

New born piglets are vulnerable to stress factors due to limited antioxidant capacity and innate immunity at birth. This can be addressed by improving selenium (Se) reserve at birth through maternal Se supplementation then transfer from sow to piglets.

Thus, supplementing Se with organic form and



From left: Choi Jun Seung of DS Feed; Choi Young Jo of Farmsco; Hong Seok Man of WooSung Feedmill; Hans Lee of Kemin Industries (Asia); Hong Seong Min of CJ.

amount, such as the pure and highly bioavailable hydroxyl selenomethionine (OH-SeMet), to gestation and lactation sows, can greatly enhance Se transfer from sow to piglets and antioxidant capacity of the new born piglets, boost their immune-response, enable them to better cope with oxidative stress and achieve desired post-weaning growth performance, said Kevin Liu, VP of Adisseo Asia Pacific Ltd.

Recent studies show



Kevin Liu

that gestation sows supplemented with OH-SeMet delivered piglets with more Se reserves and higher immunoproteins. The piglets also exhibited higher capacity to cope with inflammation challenges. After weaning, supplementing OH-SeMet to piglets directly helps them to develop their own antioxidant capacity with reduced

diarrhoea incidence.

"Pure form of OH-SeMet is the new generation of Se supplement, much more efficient to be absorbed and stored in the tissues that enables piglets to respond to oxidative challenges rapidly," Dr Liu explained.

### Feeding for better performance

Raising pigs in a tropical environment subjects the animals to stress that negatively impacts performance. High ambient temperature, exacerbated by intensive rearing practices, almost always negatively impacts animal health and performance.

As environment-controlled houses are not a viable option for many producers due to cost, ordinary pig producers resort to dietary manipulations to alleviate the impact of heat stress, said Theerawit Poeikhampha of the Department of Animal Science, Kasetsart University.

These manipulations include increasing the digestibility of feed nutrients, balancing dietary energy and protein for maximum growth and applying nutritive feed additives in feed and in drinking water. Dr



Rider Perez of DSM Nutritional Products and Chai Yeng Fatt of Weissen Company Sdn Bhd.



Theerawit Poeikhampha

Theerawit also advised participants to weigh additional benefits and feed cost when using non-nutritive additives.

He also mentioned the need to plan appropriately to match the high return-of-investment periods and using the right interaction strategies during these times.

### Managing feed intake

Because pigs hardly sweat and have smaller lung capacity relative to their body size, they are more sensitive to high temperature. Sows are especially vulnerable to heat stress, especially after farrowing.

Heat stress results in lower feed intake and in sows this could lead to lower fertility, reduced milk production and decreased lactation performance, thus resulting in overall poor animal performance said Gustavo Ribeiro, Regional Technical Manager-Swine Asia Pacific of Trouw



Gustavo Ribeiro

Nutrition.

He discussed some management options to keep the animals cool, including the benefits of giving cooler water which leads to higher feed intake, higher water intake and better weaning weights.

Mr Ribeiro also presented some nutritional options to keep the sows in good condition during gestation, lactation and between weaning and mating.

### Formulating accurately

Efficient pig production calls for pigs to be fed the right amount of nutritionally adequate diets. To do this requires an understanding of how the nutrients and energy in feed ingredients are digested and utilised, said Layi Adeola, Professor of Animal Science at Purdue University.

He noted that feed evaluation and requirement for nutrients and energy are interdependent, thus the need for better

information on nutrients and energy available in different feeds. This knowledge is essential for efficient pig production and reducing nutrient excretion into the environment which are all central to sustainable agriculture.

Dr Adeola discussed



Layi Adeola

ways to best express the digestibility of each class of energy and nutrients so that will lead to the most accurately formulated diets that matches the needs of the pig.

He also emphasised that standardised ileal digestibility of AA is more consistent and additive in mixed diets than apparent ileal digestibility for predicting ileal digestibility of AA in mixed diets containing multiple protein sources.

### Improving performance

Local breeds in tropical regions are better adapted to higher temperatures,



Remylene Joy Achas of Unahco; Alma Jauhari of Pilmico; Gary Gonzales of Enovet Inc.

and there is the possibility for physiological adaptation even in well-bred genotypes born/reared in hot climates, said Julian Wiseman, Professor of Animal Production at the University of Nottingham. The adaptation is achieved early, associated mainly with lower basal metabolism and oxygen consumption per kilogram liveweight, with reduced thyroid activity.

Heat stress is a serious



Julian Wiseman

problem, he said, adding that "we can consider how to reduce the problem by not just nutrition. There's a range of environmental control from how to design the building to how to control the environment."

He noted a variety of mechanisms that help

eliminate heat in sows. The skin can transfer heat through infrared radiation. Heat lost through conduction can be aided by air movement in relation to skin which is also associated with ambient temperature.

The second major avenue of heat loss is evaporation of water through loss of water vapour from the lungs during exhalation. Pigs have relatively small lungs, but they overcome this by increasing respiration rate from 20-50/minutes or higher, which is normal up to 120-150/minutes. If it is higher, pigs cannot compensate, leading to death.

"There's a wide range of tools to reduce heat stress in sows from building ventilation and controlled environment to proper diets including adequate water. All of these can help ensure the sows' welfare as well as reduce heat stress," Prof Wiseman explained.

### Alternatives to antibiotics in pig nutrition

With the rise in antimicrobial resistance, livestock producers are

Arthur Ong of Family Farm; Mae Bautista of Cenmidis; Jean Marjorie Ensendencia of DSM Nutritional Products Phils; Jan Wenzel Ocampo of Smart Inc.



seeking alternative ways to raise their animals using no, or minimal, antibiotics (ABs). When AGPs were banned in the EU, however, there was higher use of therapeutic ABs and coccidiostats and a significant increase in the use of medicated feed mainly by use of zinc oxide (ZnO), said Ruud Huibers, Global Regulatory Strategy and Regulatory Affairs EU at EW Nutrition.

Mr Huibers presented



Ruud Huibers

four possible conceptual alternatives for ABs.

First is to directly target pathogens. Second is to favour beneficial bacteria so that pathogens are outcompeted. Third is to strengthen the animals' immune system through vaccines and immune modulators. Fourth is to strengthen biosecurity, feed hygiene, and other management strategies to reduce the risk of introducing and spreading pathogens.

He also identified feed additives that has potential to reduce AB use, including phytogenics, IgY from whole egg powder, pre and probiotics, enzymes, and acidifiers.

### Using alternative feed materials

Prof Wiseman also discussed the use of alternative raw materials to

reduce cost.

He stated that grower/finisher diets based on total/faecal digestible amino acids can affect performance and carcass quality, but ileal digestible amino acid data allow more accurate estimates of all raw materials to be obtained.

"There's a lot more feeds for sows than what we think. When people are looking at using compound diets, think wider. We need to consider how to measure the nutritional value and we must move toward ileal digestible amino acid," said Prof Wiseman.

He noted that alternative feed ingredients are important since prices of conventional ingredients are rising. A wider range of feed ingredients would lead to more flexibility in feed formulation.

Three materials valuable in Southeast Asia are copra meal, canola meal, and palm kernel meal. He also identified additional issues with respect to alternative feed ingredients in pig diets, not just amino acids.

### The use of copper in pig diets

Copper (Cu) is an essential nutrient in pig diets, but beyond that it has beneficial effects on growth, health and performance of young pigs. However, its use is



Paul Bikker

under debate because of its excretion into the environment.

Paul Bikker, Senior Researcher at Wageningen University & Research, discussed the physiological requirements of copper, its growth promoting effects, influence of level, period and source of supplementation, and their modes of action.

He noted that Cu requirements are low, approximately 5 mg/kg feed. Studies have also shown that high Cu supplementation (160 mg/kg) improves performance (feed intake, ADG, FCR) and faecal consistency in weaned pigs.

Dr Bikker also explained that the monovalent  $Cu_2O$  is equal or more effective for performance as  $CuSO_4$ . However, both substances affect pigs' regulatory mechanisms differently, with less Cu accumulation in the liver for  $Cu_2O$ , which may potentially reduce toxicity for the animal. Research is ongoing to clarify the biological differences and metabolic

consequences between both copper sources.

### ZnO is a successful additive

Zinc oxide (ZnO) is one of the most successfully used additives in feed production, but it must be replaced, said Felipe Barbosa, Head of Technical-Swine Nutrition of EW Nutrition.

He explained that for maintaining piglet performance in a non-ZnO era it is crucial to support gut health. There is no silver bullet but a bundle of different actions in feed quality, feed processing and feed formulation concepts must be taken. As such, alternative feed additives play a crucial role in such concepts. Within this scenario, the new generation of secondary



Felipe Barbosa



Above: Chook Chian Lin and Ng Weng Yee of Peterlabs.

From left: Chai Yeng Fatt of Weissen Company Sdn Bhd; Jinxiao Zhang of Animine; Enyu Yee Ling of Soon Soon Oilmills Sdn Bhd.



Panel discussions were held at the end of each session.

plant compounds and immunoglobulins are interesting possibilities for better coping with challenges in the replacement of ZnO.

“We are under pressure to produce piglets without ZnO in therapeutic levels. There’s a ban coming out from the EU and we believe it’s non-reversible. ZnO is indeed an effective tool to control post-weaning diarrhoea but the nutritionists must find solutions for its withdrawal. We are evaluating different

solutions that combine nutritional expertise and effective feed additives and are ready to work with our customers to find the right approach,” Dr Barbosa explained.

### **Barley as an alternative in pig diets**

As use of alternative ingredients in pig diets increase, one alternative is barley. Global barley production was 142 million tonnes in 2017-18, making it the fourth most widely grown grain after corn,

wheat and rice.

Brenton Hosking, Technical Director of AMJ Feed Services, Australia, said that on average 70% of the Australian barley crop is used for animal feed, either in domestic or export markets. Australian barley is predominantly of the 2-row type. It is highly palatable, clean, low moisture and low risk. This makes it suitable for inclusion in all forms of pig feed provided adjustments are made for its nutritional content and test weight.

“Barley is widely used in pig feeds,” Dr Hosking explained. “Mills in Asia already formulating to standard ileal digestibility specifications will almost certainly find Australian barley a useful inclusion to



Brenton Hosking

their current rations.”

Throughout the two-day affair, conference sponsors were available in their booths to provide information to delegates. The conference closed with a raffle for ‘Achieving sustainable production of pig meat Volume 3: Animal health and welfare’, edited by Dr Wiseman and published by Burleigh Dodds Science Publishing, which was won by Jennie Evangelista from the Philippines. **Ap**