World Nutrition Forum reaches new heights in Austrian Alps

Biomin recently held their third World Nutrition Forum in the Austrian Tyrol and producers and nutritionists from some 66 countries around the world attended. International Pig Topigs was also there and in this review we highlight some of the issues that were discussed that are relevant to pig producers.

In the general sessions there were many observations pertinent to pig production. Did you know that over the last 50 years total global meat production has increased from 45.7 to 280.9 million tonnes and that pig meat has increased from 15.6 to 100.6 million tonnes?

Parameter	Target
Total number born per year per sow	32.5
Total number born alive per year per sow	29.9
Pre-weaning mortality (%)	8
Pigs weaned per year per sow	27.5
Post weaning mortality (%)	5
Pigs sold per year per sow	26.1
Lactation length (days)	20
Replacement rate (%)	45
Sow mortality (%)	6
Days on feed	165
Market weight (lb)	275

Table 1. How to improve whole herd FCR.

The only meat with a better growth is poultry from 4.4 to 92.9 million tonnes. Currently, pigmeat accounts for 35.8% of all meat consumed globally compared to 33.1 and 24.2% respectively for poultry and beef.

Asian and African growth

One interesting, but somewhat alarming, fact is that 89.7% of future human population growth will be in Asia and Africa. This increase in population size will be further compounded by dramatic increases in per capita consumption of meat as incomes rise.

Looking to the future, a key limiting factor in human food production could be the availability of water. Interesting statistics on this were shown. Did you know it takes 450 litres of water to produce 1kg of maize, 1,150 litres to produce 1kg of wheat and that approaching 3,000 litres are required to produce 1kg of poultry meat or pork and 15,977 litres of water are required to produce 1kg of beef.

Thus, with water scarce in many parts of the world there is a strong argument for being vegetarian or a poultry and pork eater rather than a beef eater.

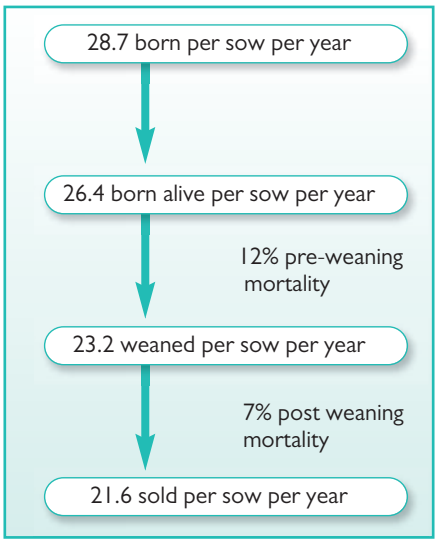
Parameter	Improvement	Impact on WHFCR
Replacement gain (%)	10	-0.02
Increase pigs sold per year per sow	1	-0.03
Decrease pre-wean mortality	1	-0.03
Benefit of above		-0.08
Decrease in feed in gestation (lb/sow/day)	0.5	-0.05
Improvement in post weaning FCR	0.10	-0.08

Table 2. How to improve whole herd FCR.

Phase feeding

When it comes to producing animal proteins for human consumption we only utilise some 20-30% of the protein nitrogen in the animal feed. This could be significantly improved by more use of phase feeding in pig production. Similarly, statistics were available for phosphorus utilisation.

Fig. 1. Typical North American performance data.



Dr Casey Neil from PIC in North America focused on feed issues that were particularly pertinent to pig production.

Key among these was feed price with 185, 95 and 145% price rises for maize, soyabean meal and finisher diets, respectively, so far this decade.

He then considered typical pig production parameters (see Fig. 1).

Dr Casey went on to consider whole herd feed conversion as a means of measuring a farm's efficiency and how this impacts on costs.

In the example in Fig. 1 a whole herd FCR of 3.00 is achieved, but by attaining the targets set in Table 1 this could be significantly reduced to 2.75. The impact of various improvements on whole herd FCR is shown in Table 2.

Dr Casey then considered the merits of letting the sow feed her piglets for longer against those for early weaning. Feeding the piglet by feeding the sow to produce milk costs $US0.18 per pig compared to weaning early and feeding the piglet more feed which costs $US0.40 or, to put it another way, $US0.33 and 0.73 respectively.

Against this cheaper cost you have to offset elevated farrowing house costs and the fact that sows after a long lactation may take longer to be successfully served.

Nutritional strategies

R. J. van Barneveld from Barneveld Nutrition Pty Ltd in Australia then considered nutritional strategies for optimising gut health in

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	Particle size (µm) 1000	800	600	400
ADG (per day)	960	940	950	980
Feed intake (kg per day)	3.25	3.21	3.26	3.16
FCR	3.38	3.41	3.44	3.22
Mean stomach ulceration	1.1	1.2	1.5	1.8
Mean stomach keratinisation	1.4	2.4	2.5	3.2
App. dig. of dry matter (%)	79.9	78.9	81.7	84.8
App. dig. of nitrogen (%)	72.6	70.8	76.3	79.5
App. dig. of gross energy (%)	77.6	75.7	79.6	84.1

Table 3. Effect of grain particle size on gastric ulceration and nutrient digestibility (J. of An. Sci. 73 757-763).

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swine. He highlighted that a range of nutritional management strategies can be used to assist the development and functional morphology of the intestinal tract and to manipulate bacterial populations to optimise gut health.

Some strategies included the regulation of grain particle size to reduce the incidence of stomach ulcers (see Table 3), the proportion of energy intake post-weaning and the maintenance of feed intake to promote intestinal development, the use of elevated levels of specific amino acids to enhance mucin secretion and nucleotide biosynthesis and the exposure of piglets to diets high in IGF-I and II.

Diet composition

Diet composition can also be manipulated to influence bacterial populations particularly through the use of fermentable carbohydrates such as inulin, the restriction of other fermentable carbohydrates in the diet and by limiting the protein content of the diet.

When combined with the selective use of organic acids, enzymes, essential oils and/or probiotics the gut health of the pig will be enhanced and performance improved.

The Poster Session featured several interesting posters on pigs. In one study Biomin staff and research colleagues in Mexico reported on a novel concept for the simultaneous deactivation of various mycotoxins in piglets.

Treatment	Weight at 42 days (kg)	ADG
Negative control	24.00	437
Positive control	21.72	380
Positive + 0.5kg deactivator	23.08	412
Positive + 1.0kg deactivator	24.39	443

Table 4. Mexican research results.

Table 5. South African research results.

	Com. clay binder (5 kg per t)	Mycofix Select (1.5 kg per t)
ADG (g)	516	588
Final weight (kg)		+3

They looked at using a combination of a yeast and Eubacterium BBSH 797 and T. mycotoxinivorans to counter ochratoxin A and zearalenone in a feeding trial with weaning piglets.

The results are shown in Table 4.

Countering negative impact

In other poster presentations, Biomin staff and researchers in Taiwan looked at strategies for countering the negative impact of mycotoxins.

In addition, scientists in South Africa looked at the efficiency of Mycofix Select at countering all agriculturally relevant mycotoxins in growing pigs (Table 5) and Brazilian researchers looked at the use of Mycofix Plus to reduce the toxic effects of zearalenone in prepubertal pigs. ■

B.R.A.I.N. Award

The Biomin Research and Innovation Network (B.R.A.I.N.) is a program created to support young and highly skilled scientists. Its aim is to foster and fund groundbreaking research projects and innovative ideas in the area of animal nutrition and animal health.

An expert jury evaluates submitted research proposals (B.R.A.I.N. Projects) and the best and most innovative projects will be realised, i.e. funded by Biomin.

Within the last two years B.R.A.I.N. had close to a hundred applications, out of these 28 projects were carried out and successfully finished, 35 projects are currently evaluated or already conducted.

The B.R.A.I.N. internship provides skilled students the opportunity to actively participate in one of Biomin's R&D projects.

Students become part of a Biomin research team for up to a year, which establishes very often the basis for further cooperation and employment.

Dr Kostas Mountzouris, a nutritional biotechnologist from the University of Athens, Greece was nominated the B.R.A.I.N. Award 2008 winner.

He is an academic lecturer in nutritional biotechnology at the University of Athens, Greece. His primary research interests concern the study of the effects of bioactive functional food/feed components on host digestive function and gut ecology parameters such as microflora and immune function. Dr Mountzouris (second left in photograph) received a monetary award of €5000 and was invited to present his paper at the World Nutrition Forum 2008.