JSR TECHNICAL BRIEF

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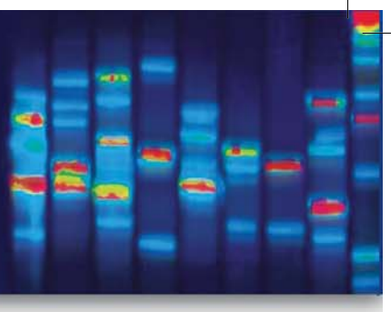

...making pork more profitable...

Latest international developments in genetics and Research & Development from the JSR technical team

JSR 19th Annual Technical Conference 50 Years of Excellence in Breeding

The long and proud history of JSR within the pig industry, both locally and internationally, was strengthened at this year's Technical Conference, which brought together over 130 delegates from wide ranging areas of agriculture. The theme '50 Years of Excellence in Breeding' recognised the work being done to improve and advance the pig industry and wider scientific developments.

Tim Rymer, Chairman stressed the need to continue previous industry success, with the topical example of the recent Olympic Games. Funding directed at British sports has produced excellent results, and the same would work in the pig industry. However lack of investment has dented the confidence of the producer and undermined overall competitiveness of the British sector.

JSR aims to use feed as efficiently as possible, by producing the most saleable per tonne of feed meat. This will only be possible through increased scale and international development, improved technologies and bioscience and last but not least the skill and training of staff who run and work within the industry.

Students Star at JSR Press Dinner

In a new initiative for the 2008 Technical Conference, JSR invited students working in a pig related scientific field to submit a press release about their work. The winners of the competition presented their work to the pig industry press at the dinner, the evening before the conference. JSR chose two winners Dagmar Kapell from SAC, Edinburgh and Claudia Richards from the University of Bristol.

Dagmar's studies had looked at the relationship between pre-natal survival and more traditional performance traits such as growth rate, muscle and fat depths. Further, the work was able to distinguish between effects in the sire and dam lines separately. The work concluded there was an unfavourable correlation between backfat traits and still born piglets in sire lines with genetic selection for leaner piglets potentially increasing numbers born dead.

In contrast this result was not seen in the dam lines however a small unfavourable correlation was seen between growth rate and still born piglets. Overall the work demonstrated the importance of multiple trait selection including piglet survival along the lines implemented by JSR on all the genetic products.

Claudia's work looked at the levels of skatole and androstenone in pork from un-castrated boars. Skatole and androstenone are the two chemicals responsible for boar taint and the aim of Claudia's work was to assess at what levels consumers can detect these undesirable compounds. The work concluded skatole to be the most important of the two chemicals for causing boar taint and suggested that levels of 0.5ug/g to be a suitable threshold for identifying tainted pork. This is approximately double the current recommendation and suggests current scientific opinion to be excessively harsh in determining critical levels of skatole.

JSR wish both students future success in their scientific careers hopefully in the pig industry and hope that the introductions and experience of the press dinner and Technical Conference provides useful experience for their future.

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JSR GENETICS

Professor Dianna Bowles - Bioscience - The Science of the 21st Century

As a Biologist and Botanist, Professor Bowles is convinced that Agriculture is vitally important for the World's future. Her vision, to give producers the access to science they require, is slowly being realised, but needs to be given respect by Government Policymakers to truly unleash the kind of development that is possible.

Dianna discussed how industry profit is linked to Feed Conversion Efficiency and explained the relationship between crop science and the livestock industry. The importance of Bioscience needs to be promoted for advances to be made in agriculture as scientists have the skills and tools to solve the problems found on the farm.

Oil has taken millions of years to produce and is a finite product, whereas plants use todays sunlight to produce tomorrows grain. The transition from an oil based economy to a bio (grain) based economy is underway and will complete in 10 to 15 years. Photosynthesis is clean, renewable and high capacity. This is the future of food and fuel security, Dianna stated. Bio-refineries, rather than oil refineries are required to sustain the petrochemical industries into the future. Climate change, urbanisation and population rise mean more and more people are turning to agribusiness, and the demand for productive land and scarcity of resources in turn will have a knock on effect on these related chemical and fuel industries. Particularly in the animal industry, where damage is already being done through lack of investment, this research is also required to give the largest pallet of resources in genetics for the future.

Professor Bowles stressed, that although science is constantly looking for advances, alternatives and improvements, an integrated vision and investment to link industries together is required.

Dr Huw Jones - Are UK Breeders Helping to Reduce Emissions?

FAO studies show that livestock accounts for 18% of the worlds emissions of greenhouse gases and governments are now putting pressure on the industry to solve this problem. Ruminants are responsible for the largest proportion of this, with the pig and poultry sector having a smaller impact. The global demand for meat is increasing and predictions show a three fold increase in consumption by 2020. The fact is that changes can be made to decrease the amount of greenhouse gas emissions per unit of product.

Dr Jones said in the future, responsibility will be borne by the producer to offset these emissions. He highlighted industry options for changes in management of farms, manure, feed and the less talked about possibility of changing the genetics in animals themselves. He gave the example of the JSR Geneconverter 700 boar, which has been genetically selected for improved Feed Conversion Efficiency, as a case in point.

A thorough investigation by Cranfield University provides us with an insight into the improvements already made in the industry over the past 10 years:

% change through genetic improvement (1988-07)

	CH_4	NH_3	N_20	GWP100
Layers	-30	-36	-29	-25
Broilers	-20	10	-23	-23
Pigs	-17	-18	-14	-15
Dairy	-25	-17	-30	-16
Beef	0	0	0	0
Sheep	-1	0	0	-1

Huw asked whether further investment in the Beef and Sheep Industry would improve their poor uptake of genetic improvement.

In conclusion Dr Jones' key message echoed that of the previous speaker, and was that we need to ensure that the science of breeding is recognised as an important tool for reducing emissions from livestock production.

JSR recognise that success in today's rapidly changing marketplace depends on meeting the exacting demands of consumers

Dr Grant Walling - 50 More Years of Breeding Excellence

Grant took us back to the time of a previous JSR Conference in 1998, when sensationalist and outrageous claims of disease and catastrophe risked destroying the livestock industry, none of which came to fruition. In fact, he stated, the modern genotype has substantially improved production efficiency. As shown by Dr Jones, the number of piglets Born Alive has increased by 1.6/sow/year, with further significant improvements in growth rates.

Changing and updating techniques and technology has yielded remarkable results. Dr Walling highlighted the facts:

- Genetic improvement is cumulative, sustainable and permanent.
- Cross breeding has resulted in improved efficiency, reproduction and disease resistance
- Technology has gone from casting an eye over an animal, to putting the animal into a CT scanner.

Grant raised the question of the difference between current production levels, and the known genetic potential of modern pigs. The answer to this discrepancy is that top quality products need top quality facilities. Currently countries like Russia and China lack scientific expertise, but are investing heavily, their pig units are becoming ever more state of the art, and they will soon overtake UK in terms of performance.

Grant highlighted the need to develop the supply chain, to a stage where funding for research can be drawn from the progress it makes, such as JSR's 'Taste The Difference' partnership with Sainsburys and Cranswick Country Foods, but noted deep mistrust between members of the industry chain, and the lack of communication and integration between international producers.

Grant concluded by saying that we have the opportunity to introduce new technologies such as Deep Intrauterine Insemination and further research in Genomics and DNA study, but require staff, scientists and investment to develop these technologies.

Rob Cumine - Connecting Farmers and Customers – Joined Up Farming

Rob set the scene for his presentation, by outlining part of the current situation in the agribusiness sector. The cumbersome Agricultural Policies of government, the Curry Commision for sustainable farming and food, the increasing disposable income of the consumer, and even the rise of the celebrity chef, promoting local and organic products. Furthermore there is the international challenge of rising energy prices, food shortages and climate change.

So what do Customers want? Transparency...
Clear differentiation, Consistent delivery, Food safety including traceability, Animal welfare and the Environment

And what do Farmers want? Transparency…
Certainty of market, Business security, Performance based reward, Better margins, Advice and inputs, and to be an integral part of the "team" connected to the final customer.

Rob and his Farmright organisation has a vision to create a joined up agri-food supply chain that facilitates the flow of information and product from farm to the consumer, and for this process to either add value or improve the efficiency of the supply chain. In a similar way to the suggestion by Dr Walling that funding must be derived from the effectiveness of scientific research, Rob suggests payment based on measurable outcomes of value to the customer and underwritten by the supply chain, payment systems that reward performance.

Some of his closing points included the fact that somebody needs to coordinate information and product flow, all parties must earn a fair return for their effort, all parties must be willing to accept change, and funding R&D is the responsibility of all.

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Wouter Seynaeve - 25 Pigs Sold per Sow per Year and 12000 Pigs Per Full Time Equivalent

During his 7 years experience in pigs for an integrator, Wouter had his first experience with JSR. There were several different genetics on the farm, and he used the opportunity to compare them. In 2004 he began to build his own unit. By putting in many hours of his own labour, the total costs were reduced to €2.300/sowplace.

In total he runs 460 high-health sows in a 4-week-system. The replacement animals come from the UK every 16 weeks, from the same JSR source. He manages the entire system alone, with the help of his father part-time on the separate fattner unit and hires an external contractor once a month to pressure wash after weaning.

Wouter went on to describe his 4 week weaning system, which is a first for Belgium.
The herd is devided in 5 production groups:

- -3 groups in gestation.
- -1 group in the service area
- -1 group in the farrowing acommodation

The ongoing routine involves

- week 1: serving (64hrs labour)
- week 2: farrowing (69hrs labour)
- week 3: delivering piglets at 25kg (40hrs labour)
- week 4: weaning at 21 days and 5.5kg (18hrs labour)
- week 1: serving, etc.

So although some weeks require intensive labour, other weeks are rather quiet.
He finds the efficiency and lower cost of production make the unit much easier to manage, as well as more profitable. He plans to expand his unit to 550 sows in the near future.

Some of the production figures he realises are:

Number of sows	460
Total born/litter	13.4
Born alive/litter	12.5
Litter index	2.46
Weaned/litter	10.89
Replacement %	41
Daily gain weaners (5.5 - 25.5kg)	380
% loss weaners	1.6
Medication €/piglet	0.28
Sold piglets/year	11607

To conclude, Wouter gave a comparative indication as to the efficiency of his system

Efficiency farrowingcrates (300 sow unit)

		1 week	4 week
Necessary crates		75	60
Litters/crate/year		10.4	13
Occupation percentage		90	98
Piglets per litter weaned		10.5	10.5
Total production		7371	8026
Costs/crate/year/piglet	(€)	3.56	2.62