

By Stuart Cartwright

Vitapork™ is a patented technology giving the opportunity for pork producers, processors and retailers to differentiate their product not only from standard pig meat products, but also from other meats.

Vitapork™ is a natural product that delivers an extra 83% of the omega-3 polyunsaturated fatty acids compared to standard pig meat, together with key natural antioxidants.

Vitapork™ also delivers the correct balance of omega-6: omega-3 fatty acids required in our diet.

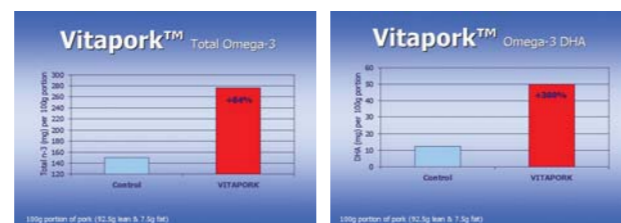
Omega-3 and omega-6 fatty acids are essential nutrients, meaning that they cannot be made in the human body, and so have to be provided in our diet. One of the fatty acids within the omega-3 group is a precursor to the synthesis of docosahexaenoic acid (DHA). DHA is a hugely important long



chain polyunsaturated fatty acid, being a major constituent of the brain, retina and spermatozoa. The structural components of DHA are a major requirement for the development and maintenance of brain structure and function, and a key component in the retina. A wealth of scientific papers highlight the advantages of consuming DHA, particularly for pregnant women, newborn infants, children up to 18 years old and the elderly.

With changes in eating habits the average consumption of DHA in the EU is only around a third of the target set by the UK government (1500mg/week), with the most common dietary source being oily fish. **Vitapork™** can significantly contribute towards increasing weekly intake of DHA providing 50mg of DHA per 100g of pig meat compared to the 13mg that standard pig meat would deliver.

Effect of Supplementation on Fatty Acid Profile



	Loin Joint		Leg Joint	
	Standard	Vitapork™	Standard	Vitapork™
Age (days post kill)	14	14	14	14
Tenderness	2.58	3.17	3.33	3.42
Flavour	2.92	3.17	3.17	3.25
Succulence	2.75	3.33	3.33	3.42
Average	2.83	3.25	3.25	3.5

A 5 point category scale was used to evaluate the products 1 = poor and 5 = good. A total of 20 samples were used in the study, the samples were prepared randomly from 40 animals. Independent processor, 2003.

PMWS and the Benefits of Changing Breed

By Dr Grant Walling, and Stuart Cartwright

Many farms unfortunately now have practical experience of Postweaning multisystemic wasting syndrome (PMWS). The effects on the cost of production are large due to the increased mortality of both the growing and finishing pig. The true impact of the disease further escalates due to decreased growth rates, increased FCR and the difficulties of managing larger numbers of sick animals.

Whilst a potentially successful vaccine may now be on the horizon, producers have had to adopt alternative measures to controlling the disease. One anecdotal method has been the change of terminal sire. This has led producers to try alternative terminal sire breeds such as Pietrain, Duroc and Hampshire. Interestingly the Danes have recently stopped using Hampshire terminal sire boars in the belief that it to be the cause of higher levels of mortality. Their programme is now purely based around the Duroc terminal sire.

At JSR we have investigated whether the anecdotal reports are scientifically robust by organising trials through standard commercial UK farms. This has involved detailed recording of over 2000 slaughter pigs through a farm that has PRRS, EP and

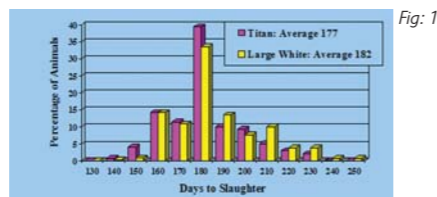
PMWS. Results are summarised in Table 1 and the days to slaughter summarised in the Figure 1.

The results demonstrated a significant advantage (up to 6.8p/kg reduction in cost of production) and therefore a benefit of changing breed to the Titan sire line for farms with higher levels of disease challenge.

Those farms that do change their terminal sire should ensure that they fully research the effect on their business. Duroc terminal sires will produce more coloured progeny with deep seated hair but may allow access to higher meat eating quality markets. Hampshire progeny may also produce more coloured progeny and lower carcass yields and killing out percentage making them less desirable to the processors. Titan genetics may require producers to readdress their feeding rations during the growing and finishing phase on their farms, due to lower feed intakes but higher levels of feed efficiency (lower FCR).

Changing to an alternative terminal sire is therefore beneficial for many producers but only if properly researched and integrated into the business.

	Large White Sired Progeny	Titan (Pietrain) Sired Progeny	Benefit to Titan
Number	902	1151	
Pre-Weaning Mortality	13.4%	6.5%	-51.3%
Post-Weaning Mortality	9.0%	4.4%	-50.5%
Days to Slaughter	182	177	- 5 days



...making pork more profitable...

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

Introduction

By creating the right pigs through proven science JSR genetics delivers tailor made solutions to the world wide pork industry. These solutions are more profitable if we get the best out of our products. This is why technical support is so important for our customers, so that you can receive the most up-to-date information on our products and the services we provide.

By re-launching the JSR Technical Brief we are committing to provide you with six monthly technical information in an easy to read format suitable for busy people.

In this issue we have features on CT Scanning, raising the genetic status of your herd without compromising health, Vitapork and the benefits of using a 3rd breed.

We hope you enjoy this issue and would welcome any feedback so that we can keep a steady flow of relevant technical articles that are useful to you and your business.

Tim Rymer
 chairman

CT Scanning *By Dr Grant Walling*

X-ray Computer Tomography (CT) is a technology many will be familiar with from hospitals. It allows cross-sectional images to be produced for a living animal (see figure 1). The image is produced using information gained from the absorption of a low dosage X-ray beam that passes through the pig from all angles around the body. The image allows the identification of different types of tissue, as dense tissue (such as bone) appears light and less dense tissue (such as air in the lungs) appears darker.

The result of a series of scans on a pig is very accurate prediction of the carcass composition. The improvement in prediction of carcass muscle, fat and bone is 6.4, 5.6 and 15.0% respectively when compared with more conventional ultrasonic techniques. Of even greater benefit to the processing and retail sector is the ability to be able to differentiate muscle yield within the different primal cuts (loin, ham, belly and shoulder).

The heritability of the CT musculing traits is moderate-high (typically around 40%) and so suited to genetic improvement. More recent work with CT scanning in the sheep sector has suggested methodology for selection of meat quality using measures of muscle density.

Without this technology breeding companies have previously had to use carcass dissection data. The downside of such techniques is the necessity to slaughter animals prior to data collection. CT scanning is able to collect the valuable information on live animals (under anaesthetic).

This new technology is allowing JSR to scan all AI boars prior to entry into the AI studs. The resultant information is therefore available to the processing and retail sector to ensure that only the most suited boars are used in their supply chains.

Although originally developed as a tool to aid human medicine, CT scanning is now a useful tool for a healthy pig industry.

Fig: 1



Raising your herd's genetic status, without risking its health

By Dr Grant Walling, Research and Development Director JSR Genetics and Janet M Owen, Veterinary Pig Specialist, Garth Partnership

A pig producer receives significant advice from many sources. Much of it comes from the supply industry - feed companies, veterinary practices, breeding companies. Occasionally opinions clash - creating a dilemma. Recently, to protect herd health, some vets have advised producers to close their herds to new breeding stock; how then to prevent the erosion of genetic performance? Larger producers often purchase purebred damline animals and run a miniature in-herd breeding pyramid. This takes a great deal of organisation in managing three different types of sow on the farm, and detailed record keeping, but can produce good results.

For smaller sized pig enterprises the breeding pyramid is not an option. A common alternative is rotational criss-cross breeding in which F1 parent gilts are mated to dam line semen from one of the two breeds in the F1. Their progeny are mated to the other breed present in the F1. This oscillation between the breeds continues by using the damline semen, with herd replacements selected from the progeny.

This simplistic system produces a far inferior product and presents some challenges. The F1 parent gilts need to be clearly identified to prevent selection as slaughter pigs or visa versa. Selected F1 parents also need to be raised on a gilt rearing ration from approximately 60kg. Slaughter progeny produced from damline matings (which will make up 7.7% of the slaughter pigs) can be up to 14 days slower to finish and will typically grade at least 0.5mm fatter - even greater at heavier slaughter weights. Due to the selection of breeding stock alone, the herd will produce 2.5% less slaughter pigs.

The performance of the breeding herd will also be affected. Using an F1 parent maximises heterosis, which affects traits such as litter size. A criss-cross programme decreases the heterosis, initially by 50% in the parent sow, because they are no longer produced from two unrelated purebred lines; decreasing numbers born alive by up to 10%.

The selection intensity of gilts chosen for the herd is typically poor with producers selecting primarily on type rather than quantitative traits. In contrast, reputable breeding companies have trained geneticists, sophisticated hardware and dedicated software to perform the same task.

JSR calculates that a criss-cross scheme and the related inferior performance can cost around 4p/kg deadweight. Harder hit will be those with 'all in-all out' finishing facilities (due to slower growing damline genotypes) and those on tighter contracts less tolerant to variation in slaughter product.

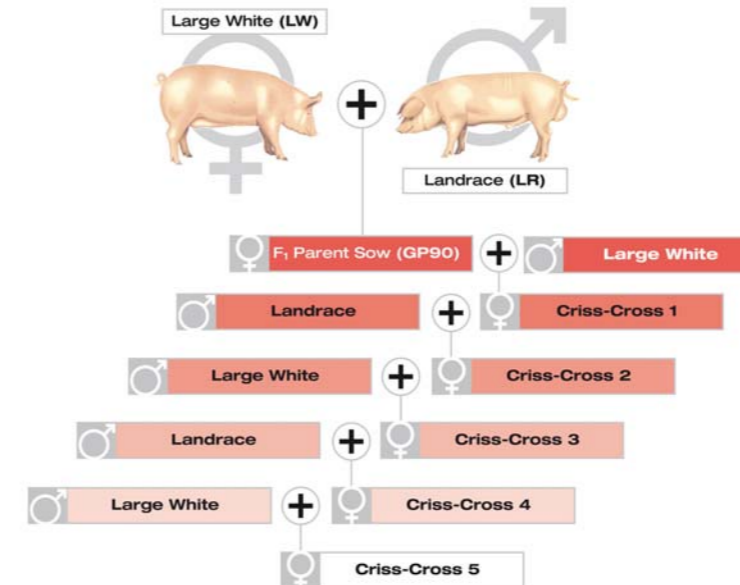
Ultimately there are no shortcuts to producing good breeding stock. However, with practical and clear protocols in place alongside good communications between vets regarding unit biosecurity and stock integration pig producers can be confident in obtaining the best genetics by regularly purchasing replacement breeding gilts and boars from a reputable breeding company.

Risks that cannot be controlled include the location of the unit regarding neighbouring pig farms, roads, slaughterhouses, markets and topography.

Pig pathogens spread best in moderate temperatures, high humidity and low air turbulence. The distance airborne pathogens can travel varies but, in general, for pigs in close proximity the risks of a herd health breakdown are high. These risks can be reduced by structures to break up plumes of wind borne pathogens, and by vaccinating animals against serious health issues.



Warning signs and perimeter fencing provide good restrictions for on-farm access



The challenges that can be controlled relate to everything that comes into the unit, ranging from stockmen and vets to food and the pigs themselves. The following guidelines are recommended:

- A period of pig freedom before entry.
- A change into boots and overalls belonging to the unit, even a shower.
- Goods should be bought from reputable sources.
- Plant and equipment must not be moved from farm to farm.
- Disposal of deadstock preferably by incineration on site.



Entrance to unit showing single staff entrance, changing and showering unit



Exit loading ramp

- Knacker collection sites must be secure and well away from the unit.
- Feed delivery vehicles should not enter the unit.
- Herd replacements should be bought from a reputable breeding company with a robust health monitoring programme.
- The health status of the supplying unit should be discussed by the vets of both breeding company and customer.
- Pre-delivery vaccinations can protect higher health animals.
- Isolation and acclimatisation can minimise the risk of destabilising the resident herd.
- The age of gilts delivered might also be adjusted.
- Off-site isolation, including the testing of sentinels and rechecking the herd of origin after 6-8 weeks.
- Breeders' delivery vehicles should be fully cleaned and disinfected.
- Two disinfectable loading docks are needed, one for incoming animals, the other for dispatches.
- Loading docks must be immaculate.
- Drivers must never walk beyond their side of the ramp.
- Unit staff must never step onto the vehicle or driver's side of the ramp.

In conclusion, most pig producers will obtain the best results by the regular purchase of replacement breeding gilts and boars from a reputable breeding company with a robust health monitoring programme. Any risks can be minimised by good communications between vets and good veterinary advice regarding unit biosecurity and new stock integration.