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## Trial work:

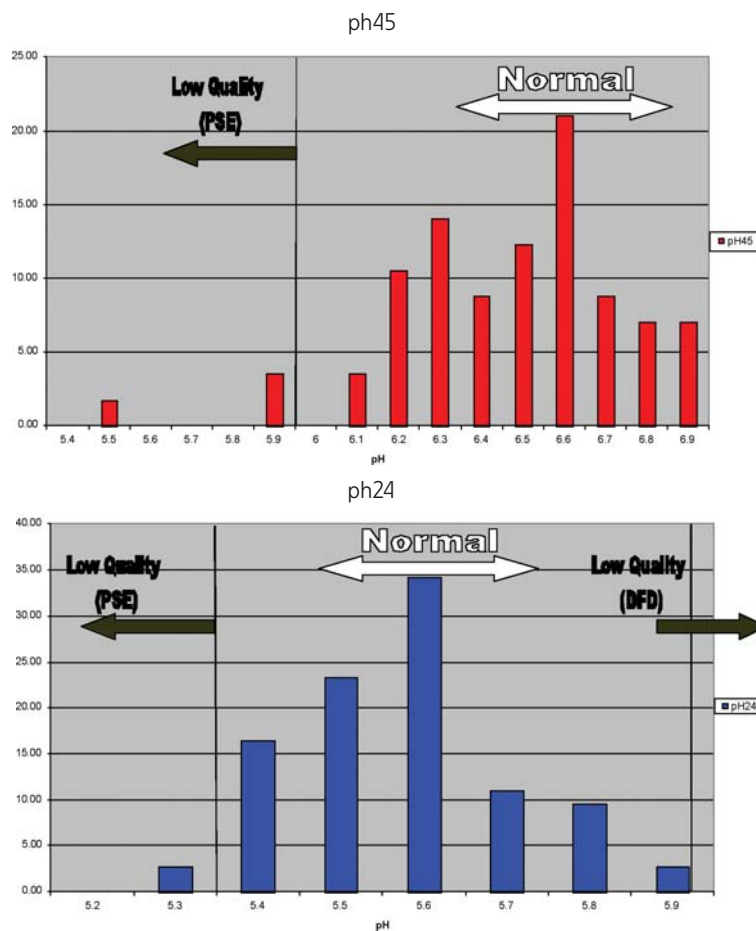
JSR have just finished a trial with Blythburgh Free Range Country Pork. They were interested in looking at the pH of their commercial pigs post slaughter, so that the incidence of low quality meat could be assessed.

Two types of low quality meat occur: PSE (Pales, Soft, Exudative) meat is indicative of an animal that has undergone acute stress pre-slaughter. The stress factor can have lasted for anywhere between a few minutes to an hour prior to the slaughter of the animal. DFD (Dark, Firm, Dry) meat is indicative of an animal that has suffered from chronic stress pre-slaughter. The duration of the stress is measured in hours, days and months.

By monitoring the pH of an animal post slaughter it is possible to look at the frequency of both PSE & DFD meat, which in turn, corresponds to the levels of exposure the animals have had to stressors. The level of stress an animal experiences is correlated to the welfare of the animal.

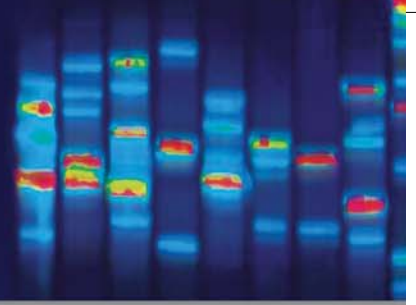
As a result, alongside the pH monitoring that occurred in the abattoir, JSR carried out a welfare assessment of the pigs from the point of loading to slaughter, which included reviewing the production system. The welfare assessment allowed any potential causes of PSE meat to be identified and may also have highlighted areas that could result in DFD meat.

Blythburgh Free Range Country Pork is marketed as a high welfare premium product and they wanted some scientific data that would be able to verify the claims they were making.



*If there are any areas with regards to meat quality that you would like to know more about then please do not hesitate to contact the R&G Team.*



**JSR****TECHNICAL BRIEF**

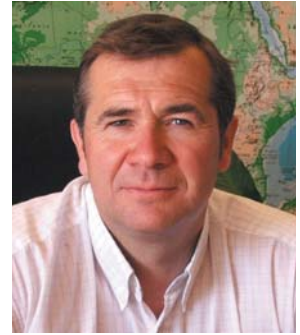
...making pork more profitable...

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

## Introduction

TS Rymer  
Chairman

The breeding gilt is an extremely valuable animal. Whether she has been bred on the farm or purchased elsewhere, the housing, nutrition and management of the gilt will determine whether she leads a long and productive life. During her life the JSR gilt will expect to produce over 75 pigs or 6000kg of pig meat. In the UK at present that is £8000 of output, after taking into account mortality.



So, Gilts have an important effect on the financial result of the farm. At an average replacement rate of 45% this means nearly half of the sow herd must be replaced with Gilts every year. It is always worth the effort to take a good look at this group of animals as they affect the future profit.

JSR works closely with Paul Wright of Checkmate in the UK and exclusively in International markets. The Checkmate system was developed to provide easy understanding of key pig business performance indicators, against an agreed targeted value. Target setting is the key to understanding a pig units potential. This is achieved initially through assessment of farrowing places available within the facility, which is usually the primary limiting factor to production. Checkmate can then predict the levels of achievable sales from the available farrowing places. The number of farrowings per week also provides an indication of the minimum number of sows required. From this figure the necessary replacement maiden Gilt numbers to maintain the minimum herd size can also be calculated. The Checkmate Regumate System ensures a consistent number of Gilts to be served each week, which makes the focus on 240 day age so much easier.

## Managing the gilt for future profit

Dr. Grant Walling,  
Director of Research and Genetics, JSR Genetics

One of the largest challenges for pig producers does not come from established animals in the breeding herd but achieving good performance from new animals entering the herd and hence gilt management is often key to successful herd production statistics and business profitability. If the management of the gilt is wrong then young animals have a high culling rate or produce good statistics in parity 1 but poor results during parity 2 whilst they recover from the mismanagement during the previous parity. This phenomenon is known as second parity drop and is typically seen when animals loose too much body condition during first lactation.



The questions that are therefore raised in relation to gilts and parity 1 sows are about the weight, age and fat levels of the animals and the volume and specification of feed that should be fed to try and ensure high levels of performance throughout their productive life. Recent detailed work monitoring gilts through JSR trial facilities at Harper Adams University College in the UK is now able to provide answers to such questions. The following results are designed as recommendations to pig producers but as with any data individuals should survey the performance of the animals on their farms and if necessary amend the strategy to maximise performance though their own facilities.

### When to serve the modern gilt

Undoubtedly the most important criteria for assessing the suitability for serving the modern parent gilt is the age of the animal. Sexual maturity typically occurs at a specific age in an animals' lifetime and is not determined by their weight or their levels of backfat. Age should therefore be used as the criteria to trigger the first service of the gilt. Accumulated JSR data over the last 10 years has shown a significant benefit for serving animals at 240 days

**JSR**

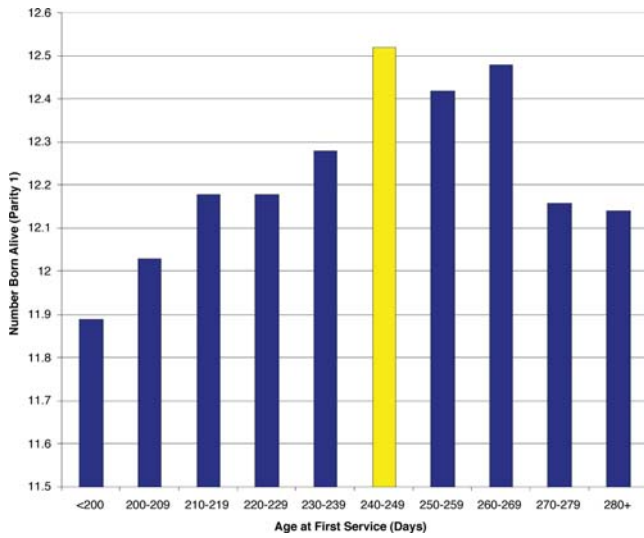
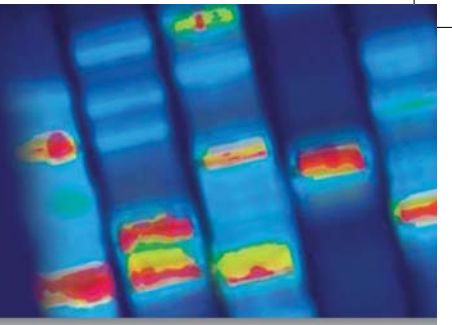


Figure 1: Graph to show the relationship between age at first service and numbers born alive

of age (see figure 1). This gives maximum performance (number born alive) during the first litter and these performance benefits are maintained through later parities.

The benefit of serving animals at the correct age of 240 days is up to 0.6 piglets born alive over other service ages. For most animals 240 days is likely to represent the third heat experienced by the animal and therefore provides the animal with the opportunity to establish sexual maturity before becoming pregnant for the first time. In order to achieve service at 240 days good records need to be kept by the farm to allow services to be targeted at the correct age group.

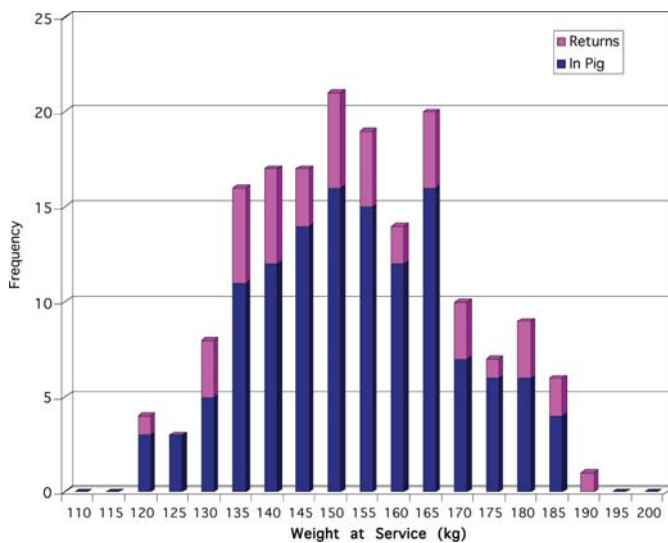


Figure 2: Relationship between body weight and outcome of first service

### Weight and fatness levels of gilts at service

Some pig producers may be concerned that serving gilts based on age may be less beneficial than using weight or backfat level as an appropriate indicator. The data we have collected at JSR suggests that targets for sow body weight and fatness levels at the point of first service are less important. For example Figure 2 shows the success or failure to first service for a group of gilts or varying weights. As can be seen from the graph animals returning from their first service occur in similar proportions across all weights and hence this would suggest weight is not a critical factor in gilt fertility.

One of the other indicators of fertility of the gilt is numbers born alive for their first litter. The relationship between weight of gilt at service and numbers born alive for their first litter is shown in figure 3. The graph shows a wider scatter of data points and only a weak correlation with an optimal weight between 130kg and 180kg (a 50kg spread) with significantly smaller sows (<130kg) and significantly larger sows (>180kg) producing lower litter sizes. Based on this the criteria for the weight of gilt at first service is relatively relaxed incorporating a 50kg range.

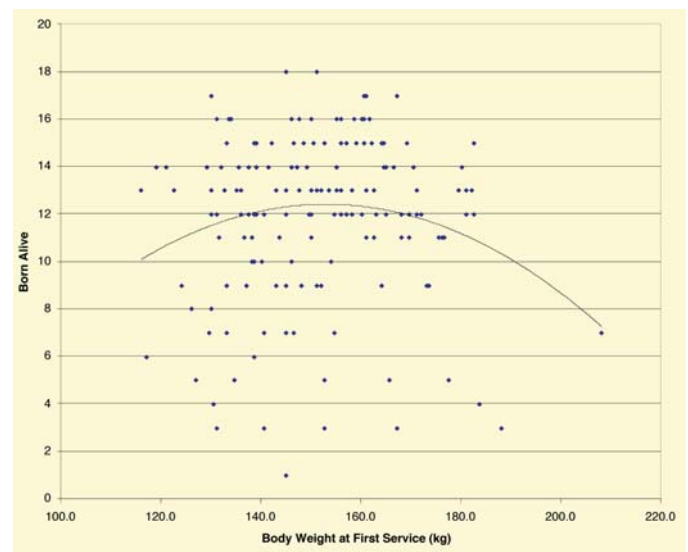


Figure 3: Relationship between body weight of the gilt at first service and numbers born alive of her first litter

Similar trends can be calculated for the relationship between fatness levels and conception rates and numbers born alive. Typically pig producers often worry that modern sows lack sufficient fat coverage at point of service. Figure 4 showing the success of first service on gilts with differing levels of fatness suggests some role of fat depth on farrowing rates in gilts. The graph clearly shows larger proportions of returns coming from leaner animals especially those below 14mm. The best performing group were those animals with 18-22mm of backfat



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



and hence suggests that having sufficient fat is necessary for good conception and subsequent farrowing rates.

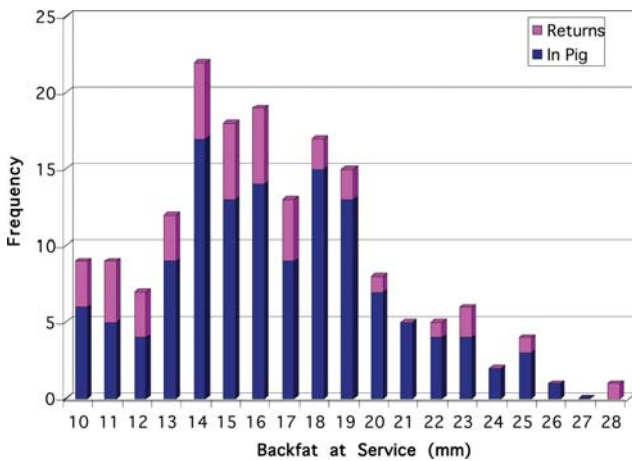


Figure 4: Relationship between fat depth and outcome of first service

The trend between backfat depth at first service and the subsequent numbers born alive at their first litter is shown in figure 5. There was very little evidence to suggest that fat depth of the gilt had any impact on the litter size of their first litter. The trendline shows a decline in numbers born alive in animals with backfat depths >22mm however there was very limited data to support this.

Overall we conclude that age is the most important criteria for determining the date a gilt should be first served. Traits such as weight and fatness levels have only minimal affects on gilt conception and performance at first farrowing with the data suggesting a weight spread of 130kg-180kg and fatness levels of 14-22mm suitable for producing high performing animals provided that are served at 240

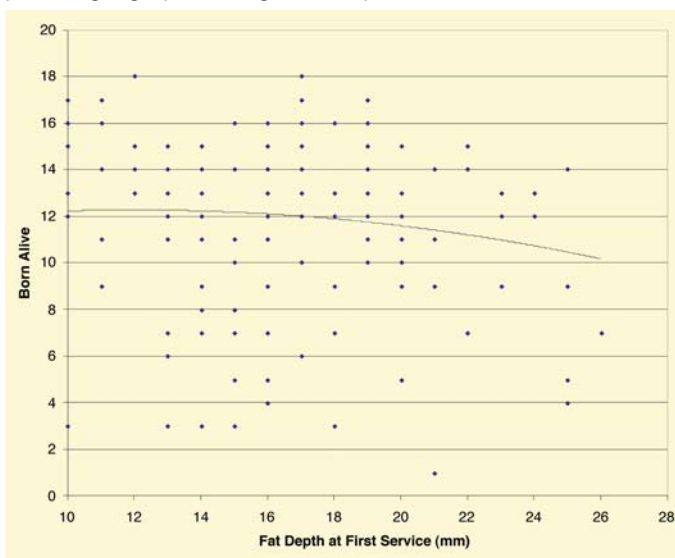


Figure 5: Relationship between body weight of the gilt at first service and numbers born alive of her first litter

days. It is for this reason that all breeding animals should retain their date of birth to allow pig producers to ensure there are achieving optimal service age. This means good accurate record keeping for those producers breeding their own animals and detailed paperwork from breeding stock suppliers delivered at the same time as animals are brought onto the farm.

## Changes at JSR

Due to these findings JSR is changing their ordering system. Historically the JSR sales team have taken orders from customers for F1 parent gilts at an agreed weight. This can result in the age of animals being up to 4 weeks apart. JSR are now changing their order system to ensure that animals will be 240 days at the point of service. Customers are therefore recommended to inform the salesman of the intended service date of animals they purchase. JSR will then ensure animals are grouped based on their age and not weights or fat levels. This should ensure that all customers optimise the performance from their gilts.

## Did you know?

Total muscle fibre number is established between days 85 of gestation and a few days post parturition.

Foetal development is the most important stage for muscle formation. Post parturition muscle fibre diameter increases but the number of muscle fibres present stays constant.

Therefore a malnourished foetus will never result in a "meaty" animal. If foetal development is restricted by the sow, her diet and health controls the amount of energy available. As a result it is important to increase emphasis on dry sow feed spec around day 85 of gestation.

## What is PSE & DFD meat:

PSE (Pale, Soft, Exudative) and DFD (Dark, Firm, Dry) are defined by the pH value of meat at specific times post slaughter.

PSE meat leads to a reduced yield as a result of excessive drip loss. The meat also appears pale and is discriminated against by the consumer.

DFD meat has a high spoilage potential leading to a short shelf life. DFD can result in serious health concerns if vacuum packed. The meat often appears dark and does not meet the expectations of the consumer.