Understanding the lifetime performance of your pigs

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If you ask staff working on farms how the business is performing they will often give you a specific parameter from their section of the business. Farrowing house managers quote numbers born alive, service teams quote conception and farrowing rates and staff raising finishing pigs will often quote growth rates or mortality figures.

Whilst each figure is interesting and relevant to the business, in isolation they are useless. An animal which produces large numbers born alive at the first litter but then fails to return to oestrus is a costly problem on the farm yet the farrowing house manager may consider the animal to be a great success.

Recent studies

Some recent studies using JSR sows has looked at the overall lifetime performance of a commercial parent gilt in a standard production unit. The aim of doing such work was to improve the understanding of the lifetime performance of an animal rather than a single point estimate of performance at a particular point in life.

The information is a sensible guide to business owners who have to pay the same price for a parent gilt at delivery regardless of whether the animals produces one or six parities on the farm.

This provides an expected lifetime payback for a parent gilt. All gilts were targeted a service age of 240 days (based on JSR recommendations) and were kept in the herd for a maximum of six parities (again based on standard JSR recommendations).

Animals were removed from the trial and culled if they did not show signs of oestrus, failed to become pregnant after three attempts to serve the animal or showed significant signs of illness or structural frailty, for example lameness or udder damage.

Sow survival

The survival of the herd is demonstrated in Fig. 1. Of the 100% of animals that started parity 1, 93% started parity 2, 87% parity 3, 81% parity 4, 71% parity 5 and finally 60% of the animals completed all six parities.

If this level of performance was repeated on a commercial farm it would suggest an average parity of 2.68 and a replacement rate of 47% per annum would be required for gilts coming into the farm to ensure the herd structure remains consistent. This would mean approximately 40 gilts per month were required for every 1,000 sows in the herd. Pig producers running at a lower replacement rate should ensure that their herd parity profile is not starting to age with excessive number of parities 7-10.

Previous research has shown these animals to be less productive, less efficient and a lot more costly to keep than the younger sows six parities or less.

Continued on page 27

Fig. 1. Sow survival across parities.

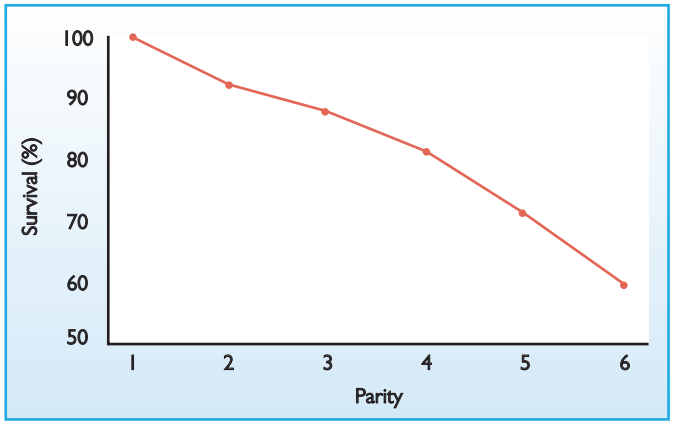
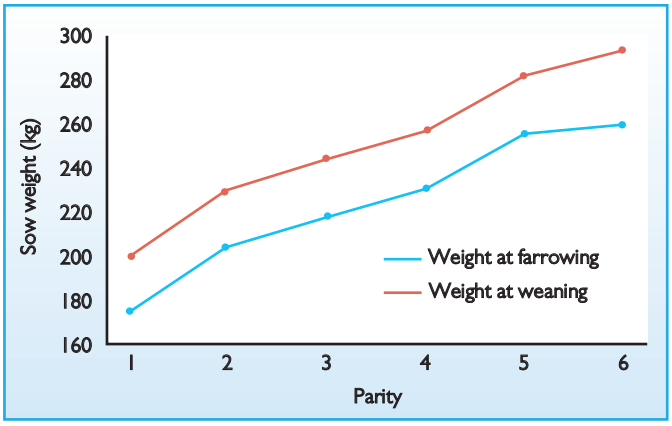


Fig. 2. Sow farrowing and weaning weights.



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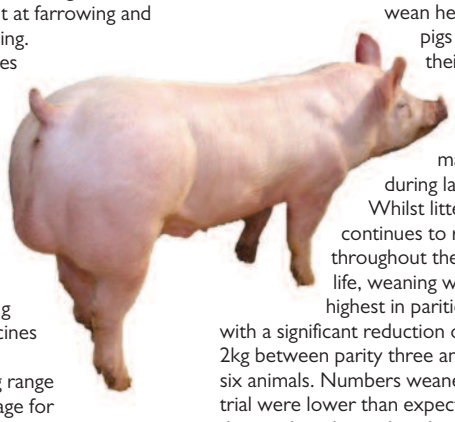
Those producers working in herds where a higher replacement rate is required should carefully look to see where they are losing the sows in their system.

Previous research has demonstrated that sows that fail to reach parity three do not make a profit for the company (they fail to return their investment).

Excessively high mortalities in parities one and two can very rapidly turn a high producing pig production enterprise into a loss making business without impacting on the traditional measures of success such as numbers born alive or numbers weaned.

Sow farrowing

With all animals having a targeted age at service of 240 days the average weight at first service was 142kg. At first farrowing animals had gained an extra 60kg from service. In future parities animals demonstrated relatively linear growth becoming on average 17kg heavier per lactation and a 25kg difference between weight at farrowing and weight at weaning.



The differences in physical size between a parity one and a parity six animal demonstrates a clear need to differentiate between sows when calculating dosages of vaccines or treatments.

With a 100kg range clearly the dosage for parity one and two animals would be very different compared to a parity five or six. This is often not considered on medication guidelines from veterinary professionals who often simply group gilts into one weight category and sows into another.

Sow backfat at farrowing

At first service gilts averaged 16mm of backfat. This increased during the first gestation and was 19.2mm at first farrowing. However it is very clear that sows use their fat reserves during lactation to mobilise energy stores when there is a large demand on them during this period. Hence the backfat levels at weaning for parities 1-4 were all around 14mm.

Similarly backfat depths at farrowing during these initial parities were also consistent – typically around 17mm. This suggests the sow is mobilising around 3mm of backfat during the lactation process.

Interestingly during parities five and six the backfat levels of the sow are very different to the previous parities.

Sows appear to become fatter during gestation (18.3mm and 21.2mm for parities five and six respectively) and also fail to mobilise this fat store during lactation resulting in a fatter pig at weaning (16.3mm and 19.3mm for parities five and six respectively).

It is for this reason that older sows can have poorer rearing performance with insufficient resources to support the new born piglets but instead diverted into the body composition of the sow.

For this reason experienced farrowing house operators will cross foster litters from older sows onto gilts or younger animals due to their better maternal performance.

Lifetime performance

The lifetime performance of the sows is illustrated in Table 1. Older sows (parities five and six) produced large litters and heavier pigs at birth.

However, as previously outlined with the changes in sow body composition, these older sows did not wean heavier pigs due to their significantly poorer performance during lactation. Whilst litter size continues to rise throughout the sow's life, weaning weight is highest in parities 2-4 with a significant reduction of over 2kg between parity three and parity six animals. Numbers weaned in the trial were lower than expected given the numbers born alive due to a number of factors.

Firstly the disruption of the additional weighing required by the trial meant sows were often disturbed more than a standard commercial farm. This typically lead to a significantly higher proportion of piglets being laid on.

Also, due to the nature of the trial, cross fostering could only take place between animals on the trial.

Realistically most farms would be able to cross foster piglets from large litter older sows onto the younger gilts.

However, given the nature of the trial this was not possible in this experiment. It therefore contributed to a higher than expected pre weaning mortality of 17.6%. In a more realistic commercial environment it would be expected that this figure would be typically 10-12% on a well managed unit. The trial therefore generated significantly lower numbers weaned than what would normally be expected from the initial figures born alive.

Parity	Born alive	Weaned	Birth weight (kg)	Weaning weight (kg)
1	11.9	10.0	1.39	7.29
2	13.3	11.3	1.44	7.77
3	13.6	11.3	1.48	8.10
4	14.0	11.5	1.44	7.85
5	14.3	11.6	1.57	6.40
6	14.5	11.2	1.54	5.94
Average	13.6	11.2	1.48	7.23

Table 1. Sow output.

Parity	Born alive	Lactation feed intake (kg)	Days in lactation	Daily feed intake (kg/day)
1	11.9	158	26	6.08
2	13.3	177	27	6.56
3	13.6	187	27	6.93
4	14.0	188	27	6.96
5	14.3	179	27	6.62
6	14.5	182	27	6.74
Average	13.6	179	27	6.65

Table 2. Lactation feed intake.

Feed intake

One area that is often criticised with the modern sow is difficulty in achieving sufficiently high feed intakes during the lactation period.

The actual levels achieved in this study are present in Table 2. Unsurprisingly, parity one animals eat the least during their first lactation averaging around 6kg per day across the entire period.

This rises to nearly 7kg per day for parity three and four animals before decreasing again in the older sows.

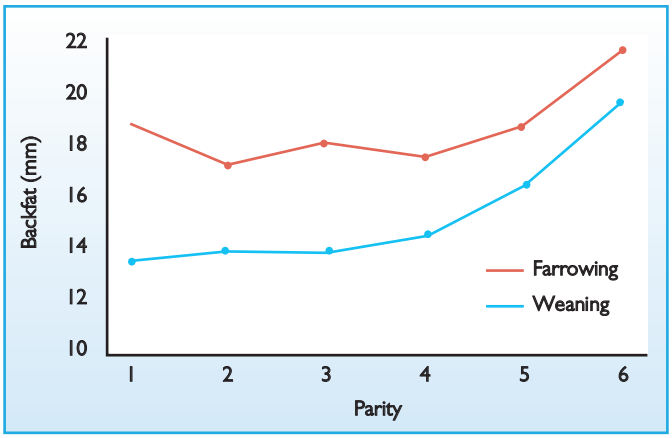
Given the litter sizes of the sows and these feed intakes the data underlines the need for a high quality lactation ration to be fed to the modern sow if it is to meet her nutritional requirements.

A typical level would be a digestible energy level of 14.2 with 0.95% lysine with all other amino acids balanced. Poorer quality rations are likely to have a deleterious effect on both the sow and the piglet weaning weight.

Farms struggling to achieve such levels of daily feed intake should review their feeding strategies for lactating sows.

Increases in feed intake can be achieved by feeding three times a day instead of only two, changing feeding times to cooler periods of the day, increasing water availability and ensuring any unused feed is cleared from troughs before presenting the animals with more food.

Fig. 3. Sow backfat levels at farrowing and weaning.



Conclusion

Overall the study gives us a detailed understanding of the modern sow and her performance on a modern pig unit. The work highlights important factors for businesses such as replacement rates and feeding targets as well as the biological changes on the sow over time.

Based on these figures 20.3% of the herd at any point in time will be parity one animals. This drops to only 12.1% of the herd being the more productive but more difficult to manage parity six animals.

The study of lifetime performance highlights the whole investment in the animal rather than a single point estimate of their productivity and is a better guide to the expected benefits and challenges of working with the modern genotype. ■