The 2012 Annual Report of Denmark's Pig Research Centre describes the latest progress on sow feeding, including extra feed in pregnancy, feed conversion rate and ketosis.

Extra Feed in Late Gestation

Sows require more energy in late gestation as foetuses grow rapidly in the final weeks before farrowing. On two farms, Pig Research Centre (PRC) examined the effect of feeding sows 2.5, 3.5 or 4.5 FUsow a day for the last four weeks before farrowing. All pigs were weighed at birth and survival until day 7 was recorded.

Litter birth weight was significantly lower when sows were fed 2.5 FUsow a day the last four weeks before farrowing than with 3.5 or 4.5 FUsow a day.

It is therefore recommended to feed sows 3.5 FUsow a day the last four weeks before farrowing to optimise litter birth weight. It is not recommended to feed 4.5 FUsow as this did not increase survival after seven days nor birth weight significantly but it did increase feed consumption.

The project 'FCR on sow farms' frequently found adjustment of routines concerning sow feed level during lactation to be important

Ideal Feed for Sows

Phase feeding of lactating sows is one of the areas that will be further investigated by PRC in the future.
The aim is to reduce mortality among newborn piglets by using a new feeding concept for sows in late gestation and the first week after farrowing. This concept is based on various sources of fibre and fat in sow feed, and the aim is to increase the production of colostrum.

The project, planned for completion by 2015, will also produce more information on protein supply and optimum feeding levels prior to farrowing.

The project is conducted in cooperation with DLG and Aarhus University, and is financially supported by the GUDP programme. Journal no.3405 11 00342.

**Feed Conversion Ratio (FCR) on Sow Farms**

Feed prices have soared over the past years; feed costs now constitute 65 per cent of the costs related to producing weaners.

PRC monitored feed consumption on eight farms with a fairly high feed consumption. Initially, the exact FCR in each section was determined and productivity levels were recorded.

Secondly, an action plan was made to reduce feed consumption. and when this action plan was implemented, FCR was recorded.

Table 1 shows the development in productivity and the reduction in feed consumption achieved on the six farms where the study is now finished. Routines on most farms generally got smoother and, therefore, productivity increased simultaneously with the reduction in feed consumption on most farms.

Table 1. Effect of feed dose in the last 4 weeks of gestation on piglet birth weight and survival in the first 7 days post-partum (a,b: P<0.05)

<table>
<thead>
<tr>
<th>Feed level in final 4 weeks (FUsow/day)</th>
<th>2.5</th>
<th>3.5</th>
<th>4.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average parity</td>
<td>3.8</td>
<td>4.0</td>
<td>4.1</td>
</tr>
<tr>
<td>Litters born</td>
<td>379</td>
<td>374</td>
<td>385</td>
</tr>
<tr>
<td>Total piglets born per litter</td>
<td>17.8</td>
<td>18.0</td>
<td>18.0</td>
</tr>
<tr>
<td>Live born per litter</td>
<td>16.2</td>
<td>16.3</td>
<td>16.4</td>
</tr>
<tr>
<td>Average weight per liveborn piglet (kg)</td>
<td>1.34 a</td>
<td>1.36 b</td>
<td>1.37 b</td>
</tr>
<tr>
<td>Stillborn piglets per litter</td>
<td>1.6</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Weight per stillborn piglet (kg)</td>
<td>1.03</td>
<td>1.05</td>
<td>1.02</td>
</tr>
</tbody>
</table>
A series of recommendations was implemented on the eight farms:

- Assessment of body condition at service, approximately 60 days into gestation and three weeks before farrowing
- Different feed curves for gilts and thin, normal and fat sows
- Three to four daily feeds in the farrowing facility.
- Introduction of feed curves in the farrowing facility to ensure enough energy for milk production
- Adjustment of feed approximately 30 minutes after feeding to ensure that the amount of feed is correct
- Sows tend to as many of their own piglets as possible to reduce the number of nurse sows
- Temperatures in the farrowing section should not reach more than 18 to 20°C
- Regular USK examination for gastric ulcers. Ulcers are kept to a minimum by using feed that is medium-ground or by adding 10 to 15 per cent grain that is not heat-treated nor pelleted to pelleted feed or alternatively by using expanded feed
- Focus on efficient oestrus and gestation detection to reduce the percentage of non-productive days
- Implementation of a strategy for managing oestrus in gilts to ensure that gilts are served in the second oestrus.

On all farms, sow weight was recorded at farrowing and at weaning. On several farms, sows’ loss of body condition during lactation was reduced through efficient management of body condition and subsequent focus on adjusting the feed dose during lactation. Results from one farm are shown in Figure 1.

**Figure 1** - Sow weight loss (kg) from transfer to the farrowing unit until weaning (adjusted for litter birth weight).
Danish versus Dutch Feed

PRC is currently studying whether sow productivity, FCR and longevity are affected when sows are fed according to either Dutch or Danish recommendations. Mortality rates are lower among sows in the Netherlands than in Denmark, which makes it interesting to analyse Dutch recommendations.

The Dutch recommendations are based on different mineral composition in the feed and on a higher fibre content in gestation and lactation feed. Recordings of backfat thickness are also an essential tool for managing feed curves in the Dutch recommendations.

The project will run over a period of 18 months on two Danish farms and is set to be complete in 2014.

Sow Protein Requirement

International research demonstrates that a sow's milk production is limiting to piglet growth after the first week of lactation.

In Denmark, litter size has been steadily increasing, which requires sows to produce more milk. It is therefore being investigated whether the Danish standards for protein and amino adds for sows are sufficient for production of embryos as well as the subsequent milk performance. Protein and lysine standards for lactating sows were revised 10 years ago, and that revision did not take into account feed intake and weight changes among sows during lactation.

The aim of these research activities is to ensure a high milk performance and nutritional balance in the sow and thereby improve sow longevity.

The project consists of two sub-projects:

1. determination of protein and amino acid standards for lactating sows, and
2. determination of protein standards for sows the final two to four weeks before farrowing and analysis of the effect on the sows subsequent milking capacity, piglet birth weight and subsequent survival.

The project ends in 2015.

Ketosis is Not a Problem

Ketosis is a metabolic disorder primarily occurring in cattle. As the symptoms observed in sows resemble cows with ketosis, the disorder was investigated in sows.
Research revealed that two factors may trigger ketosis: a negative energy balance (primary ketosis) or other disease that adversely affects appetite (secondary ketosis).

Researchers at the Department of Animal Science at Aarhus University attempted to induce ketosis in sows by feeding farrowing and lactating sows extremely high-fat diets.

The use of 4.5 per cent fat in lactation feed did not trigger ketosis. In order to increase the load on the sows, one trial group was fed octanedioic acid, which is a medium-chain fatty acid. The sows in this group produced slightly more ketone bodies than the sows in the other groups but since the sows’ blood glucose levels were unaffected, this was not categorised as ketosis.

Secondary ketosis is observed in sows

One of the sows in this trial became sick and stopped eating. As is the case for all fasting animals, ketone levels increased. However, the blood glucose level of this sow was not affected, and it was therefore not diagnosed as suffering from ketosis. The sow likely had an infection as antibiotic treatment normalised its body temperature within approximately 10 hours.

Once the sow started eating again, ketone levels in the blood returned to normal within two hours.

On the basis of this new information, PRC does not find ketosis to be a production disorder among sows.

*ThePigSite News Desk*