Transition feeding and feeding sows during lactation

In this white paper you will read about how to feed sows in the time just before farrowing and during lactation. You will learn about the importance of transition feeding and how to achieve high milk production during lactation. This white paper gives you practical tips that will help you to produce efficiently and at a high level.
The transition from late gestation to lactation is crucial for the sow and her offspring. As colostrum is being synthesized pre-partum, nutrients are reallocated from the conceptus to the mammary tissue, massive mammary and fetus growth occurs, and milk production is being initiated.

The period around farrowing is also critical for the sow because she needs to cope with numerous changes such as moving from a group to an individual pen, changes in diets, and the birth of piglets. These environmental and nutritional changes can influence the parturition process, which includes the initial start-up of milk production.

The process of parturition is energetically demanding and a larger litter size may increase those energy demands. If the energy demand of the sow during farrowing is not met it might result in reduced contractions of the uterus increasing the risk of asphyxia and stillbirth.

A proper transition diet can:
• improve start-up of the milk production in the sow.
• reduce constipation around farrowing.
• lower the risk of mastitis, metritis and agalactia (MMA) and udder congestion.
• improve transition between the lower nutrient dense gestation diet to the higher nutrient dense lactation diet.
• Improve piglet vitality and survivability.

Preparing the sow with transition feeding

The transition from late gestation to lactation is crucial for the sow and her offspring. As colostrum is being synthesized pre-partum, nutrients are reallocated from the conceptus to the mammary tissue, massive mammary and fetus growth occurs, and milk production is being initiated.

The period around farrowing is also critical for the sow because she needs to cope with numerous changes such as moving from a group to an individual pen, changes in diets, and the birth of piglets. These environmental and nutritional changes can influence the parturition process, which includes the initial start-up of milk production.

The process of parturition is energetically demanding and a larger litter size may increase those energy demands. If the energy demand of the sow during farrowing is not met it might result in reduced contractions of the uterus increasing the risk of asphyxia and stillbirth.

A proper transition diet can:
• improve start-up of the milk production in the sow.
• reduce constipation around farrowing.
• lower the risk of mastitis, metritis and agalactia (MMA) and udder congestion.
• improve transition between the lower nutrient dense gestation diet to the higher nutrient dense lactation diet.
• Improve piglet vitality and survivability.

Normally when changing to a higher density lactation feed, the feed quantity is reduced to prevent unnecessary pressure on the udder (MMA). The lower quantity and reduced fiber inclusions in the feed can result in constipation. Constipation and reduced intestinal transit times allow the formation of endotoxins and gram-negative bacterial growth. Endotoxins are responsible for reduced formation of prolactin as well as the stimulation of the immune system. This reduces milk production (dysgalactica) and increases the risk of mastitis. Constipation could also lead to narrowing of the birth canal and more stillborn piglets because of a prolonged parturition process. Feeding a high fiber diet during the transition phase could prevent constipation around farrowing.

### HOW TO REDUCE THE INCIDENCE OF CONSTIPATION

- Give free access to water (if possible, put extra water in the trough, even before farrowing). Sows need between 17-25 liters of fresh water per day during the transition period.
- Water flow of the water nipple should be at least 3 liters per minute.
- A minimum amount of feed should be supplied to ensure a laxative effect through intestinal movements.
- Supply sows with some additional natural laxative e.g. Wheat bran.
- Mineral laxatives can also be added e.g. MgO.
- Feed a high fiber diet to prevent constipation.
The advantage of feeding a transition diet is that you can increase the feed allowance before farrowing without any negative effects on udder development and start-up of milk production. Feeding higher volumes of the transition diets around farrowing is also a way to prevent constipation and may result in more relaxed sows.

The objective is to feed a similar amount of daily energy on the last day when sows are on the gestation feed as on the first day when they are on the transition feed (or lactation feed). The ideal feed amount during transition will thus depend on the total energy supplied before the transition period.

Preparing the sow with transition feeding

<table>
<thead>
<tr>
<th>Feed curve</th>
<th>Min kg *</th>
<th>Max kg *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 110</td>
<td>2.8</td>
<td>3.0</td>
</tr>
<tr>
<td>Day 111</td>
<td>2.7</td>
<td>2.9</td>
</tr>
<tr>
<td>Day 112</td>
<td>2.5</td>
<td>2.7</td>
</tr>
<tr>
<td>Day 113</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Day 114 (Farrowing)</td>
<td>1.5-2.0</td>
<td>1.5-2.0</td>
</tr>
<tr>
<td>Day 1</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Day 2</td>
<td>3.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

*It is recommended to follow the Min for gilts and Max for older parity sows.

This advice is for the TN70 sow of Topigs Norsvin. Contact us or your feed advisor to enquire about the specific needs of your genetics.

Excess feed intake during the pre-farrowing period can result in excessive production of milk that leads to congestion of the udder and can also lead to further tissue damage. If sows are fed high levels of protein/energy (such as in the lactation diet), udder development can be rapid and too excessive in the immediate period leading up to farrowing. The failure of new born piglets to “milk out” the sow will lead to pressure build-up in the udder, damaging the milk producing cells and thus compromising milk yield during the entire lactation period. The key to avoid this problem is to gradually reduce the feed levels prior to farrowing and gradually increasing feed intake after farrowing.
• Move sows to the farrowing crates 5-7 days before expected farrowing.
• Start feeding the transition diet 5-7 days before expected farrowing.
• Feed the transition diet until 2 to 3 days after farrowing. This also depends on the length of the lactation period:
  - 21 days lactation period: until 2 days after farrowing
  - 28 days lactation period: until 2-3 days after farrowing
  - 35 days lactation period: until 3-4 days after farrowing
• Ensure that similar raw materials are being used in the gestation, transition, and lactation diets to minimize the stress of a diet change.
• Use the right fiber sources during gestation, transition, and lactation. Some fibers will give a more laxative effect, whereas others will bring more consistency (Barley effect).
• Add the right components to protect and boost the liver (choline, L-carnitine, citric acid and B vitamins).
• Optimize the dEB content of the gestation, transition and lactation diets.
• Minimize all stressors around farrowing and avoid medicating if possible.
• Make sure the sow has free access to water.
Feeding for milk and piglet growth in lactation

For a sow to achieve a high rate of milk production during lactation, the appropriate amount of nutrients must be available. If the dietary supply of nutrients is not sufficient to support milk synthesis, the sow will mobilize her own maternal body tissues, or “milk off her back”. With leaner genotypes the amount of reserves available is rather limited and therefore nutrient intake to support her needs is of utmost importance.

The performance of genetically lean sows during lactation hinges on the provision of sufficient dietary energy to fuel maximum milk synthesis. As a result, increasing body stores of fat during gestation may offer improvements in performance during lactation.

The aim of feeding the sow during lactation is to maximize milk production without incurring substantial losses in body condition that might impair subsequent reproductive performance. With increased milk production, management and nutritional factors must be changed to facilitate the increased demands of sows.

**Topigs Norsvin litter weight gain calculation:**

\[
\text{Litter weight gain} = \frac{(\text{Litter wean weight} - (\text{Number piglets to be nursed} \times \text{Average birth weight of piglets}))}{\text{Lactation length}}
\]

Sows with larger litters produce greater amounts of milk, have higher litter gains and therefore have higher nutrient requirements when compared to sows with smaller litters. Reaching litter gains of 3.3 kg per day is highly dependent on (1) total litter size, (2) lactation feed intake, (3) density of the diet and (4) piglet feed intake.

Designing lactation diets, the actual litter gain of the specific farm should be known. Nutrient requirements and diets are given based on daily litter gains and lactation length. Diet calculations are based on the average of second and third parity sows.
Feed curve from moderate to ad lib

The recommended feeding curve is moderately conservative in the first 10 days of lactation in order to minimize incidents of feed refusal among the sows. The objective is to increase the overall lactational feed intake by slowly increasing the daily allowance in the first part of lactation. Feed levels from day 10 onwards should be at a maximum.

This advice is for the TN70 sow of Topigs Norsvin. Contact us or your feed advisor to enquire about the specific needs of your genetics.

Regardless of parity, it is highly advisable to control the feed curve for lactating sows during the first 10 days of lactation. In cases where the feeding system or farm layout does not allow for more controlled lactation feeding, we recommend monitoring at least the first two to three days after farrowing. After this period sows can be fed ad libitum. We do, however, recommend monitoring the feed intake and appetite of the sows.

**Water intake**

The sow should be given additional water from 2 days before farrowing until 2 days after farrowing. During lactation the water requirement per sow increases as milk production increases. If possible, ad libitum water supply should be provided. The minimum amount of water required per animal is 15 liters plus 1.5 liters of water for each piglet farrowed.

### Feed curve from moderate to ad lib

<table>
<thead>
<tr>
<th>Days/Feed intake (kg/day)</th>
<th>Wheat-Barley-Soy</th>
<th>Corn-Soy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feed curve, kg</td>
<td>NE, MJ/d</td>
</tr>
<tr>
<td>0</td>
<td>2.0#</td>
<td>19.6</td>
</tr>
<tr>
<td>1</td>
<td>2.5</td>
<td>24.5</td>
</tr>
<tr>
<td>2</td>
<td>3.0</td>
<td>29.4</td>
</tr>
<tr>
<td>3</td>
<td>3.5</td>
<td>34.3</td>
</tr>
<tr>
<td>4</td>
<td>4.0</td>
<td>39.2</td>
</tr>
<tr>
<td>5</td>
<td>4.5</td>
<td>44.1</td>
</tr>
<tr>
<td>6</td>
<td>5.0</td>
<td>49</td>
</tr>
<tr>
<td>7</td>
<td>5.0</td>
<td>49</td>
</tr>
<tr>
<td>8</td>
<td>5.5</td>
<td>53.9</td>
</tr>
<tr>
<td>9</td>
<td>6.0</td>
<td>58.8</td>
</tr>
<tr>
<td>10</td>
<td>6.5</td>
<td>63.7</td>
</tr>
<tr>
<td>21</td>
<td>Ad lib</td>
<td>&gt;75</td>
</tr>
<tr>
<td>28</td>
<td>Ad lib</td>
<td>&gt;80</td>
</tr>
<tr>
<td>35+</td>
<td>Ad lib</td>
<td>Max 90</td>
</tr>
</tbody>
</table>

#The feed amount and schedule around farrowing and the first days after farrowing depend on whether a transition diet is being used or not. If a transition diet is being used, begin with the recommended feed curve as soon as the diet change has occurred.
#The daily feed allowance can be reduced with 500 grams/day for first parity gilts, until day 10 of lactation.
+Limit energy intake to 90 MJ/day for lactation periods of 35 days.
Nutrition is one of the key components to ensure that the modern sow achieves her genetic potential for production and reproduction. The nutritional demands of the modern gestating and lactating sow and her litter have changed significantly over time. Today’s genetic advancements have resulted in feed efficient, fast growing, and leaner pigs.

However, this progress has also created new challenges when it comes to feeding the modern sow. Nutrient supply, in the form of amino acids and energy, must be designed to optimize the reproductive performance and to maintain the optimal condition (body reserves) for the sow’s entire productive life.

Diet should also be optimized to ensure nutritional welfare and comfort to the animals and also to minimize the environmental impact through excretions. To achieve this, a precise adjustment of the feeding level and the feed composition according to the performance level of the sows is required.

This series of white papers about sow feeding covers the following issues:
• Controlling condition
• Transitions and feeding during lactation
• Feeding after weaning and in gestation
• Improving piglet weight

You can download these white papers as well as others from the download section on our website www.topigsnorsvin.com

We hope you find these white papers useful. We have published these to enable our clients to get the maximum out of our genetics. These papers have been produced by our nutrition team.

You can visit our website if you want to get into contact with them or you can reach them via feed.group@topigsnorsvin.com

The advice in these documents is based on the perfect feeding of Topigs Norsvin TN70 sows. Nevertheless most of the information is usable for other lines. Use the knowledge of your local Topigs Norsvin advisor or other specialists for the perfect feeding advice for your genetics and situation.

Disclaimer:
The data (hereinafter: Information) that Topigs Norsvin makes available or supplies to you is for informational purposes only. The Information has been drawn up by Topigs Norsvin with care but without warranty as to its correctness, its completeness, its suitability or the outcome of its use. Nor does Topigs Norsvin warrant that intellectual property rights of third parties are not infringed by publication of the Information. The Information is not intended to be a personal advice to you. The Information is based on general circumstances and not based on your personal circumstances. It is your own responsibility to check whether the Information is suitable for your activities. Use of the Information by you is entirely your own responsibility. The outcome of that use will depend on your personal circumstances. To the fullest extent permitted by applicable law Topigs Norsvin rejects any liability to you for losses of any kind (including direct, indirect, consequential, special and punitive damages) resulting from you using the Information or from relying on the correctness, the completeness or the suitability of the Information.

January 2017