The TN70 is a unique female; balancing prolificacy, efficiency and productivity. The TN70 is a hybrid maternal product combining the Large White Z-line and Norsvin Landrace L-Line. TN70 is a prolific female with exceptional weaning abilities and with an outstanding and unique contribution to finishing performance.

Unique characteristics of the TN70 include:
- Superior productivity with a high number of born and weaned piglets.
- Prolific with uniform piglets.
- Superior underline quality and weaning capacity.
- High lean meat yield to heavier weights.

In short, the TN70 can be described as a dam line with a superior genetic input to the finisher in terms of feed efficiency, lean growth and excellent carcass quality. In combination with good reproductive and maternal traits this results in large litters with strong and vigorous piglets.

Most commercial pig diets are either corn-soybean based or wheat-barley-soybean based. Pigs fed well-balanced wheat-barley-soybean based diets can perform as well as those fed corn-soybean diets, the main difference being the minimal energy levels reachable when using these two different feed sources.

Introduction

The aim of this feed manual is to provide a feeding guideline based on the nutritional requirements of the TN70 sow. Topigs Norsvin conducts a variety of trials to determine the performance potential of our animals and uses this information to develop up-to-date and practical feed advice for all markets.

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 optimal condition (body reserves) for the sow's entire productive life. Diets should also be optimized to ensure nutritional welfare and comfort to the animals and also 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.
The objective of the feeding program for the TN70 sow is to:

- Maximize the number of pigs per litter.
- Optimize piglet birth weight and uniformity.
- Maximize number of litters per year per sow.
- Maximize lactation yield.
- Optimize longevity and lifetime productivity.

The management of lean deposition and fat deposition is of major importance when feeding leaner sow genotypes. Lean genotypes must maintain a certain level of fatness throughout their breeding life to enhance their lifetime production.

This can be accomplished by minimizing lactation condition losses and enable gestation fat recovery. To minimize lactation condition losses, nutrient intake during lactation needs to be maximized. If more backfat is desired during gestation, research has shown that high-lean reproductive females can be fed a slightly deficient amino acid diet, which will moderate lean deposition and increase fat deposition; and possibly improve longevity.

The feeding strategy for the TN70 sow is based on the body condition targets and the stage of production. Topigs Norsvin recommends to feed a minimum of five well developed sow diets. The practicalities of feeding different diets are always a concern.

**The recommended sow diets**

1. **Flush diet:**
   Fed from weaning to mating to stimulate ovum development.

2. **Gestation Diet 1:**
   Backfat stimulating diet (lower AA to energy ratio). Fed after insemination (day 5 of pregnancy) till day 84 of gestation or fed to older parity sows.

3. **Gestation Diet 2:**
   Late gestation diet to enhance piglet birth weights. Fed from day 85 till day 110 of gestation or fed to first parity sows.

4. **Transition Diet:**
   Fed during the transition period between gestation and lactation (from day 110 of gestation till 2-3 days after farrowing).

5. **Lactation Diet:**
   To maximize feed intake and milk yield during lactation. Fed for the duration of the lactation period.

**Flush diet**

Feed sows ad libitum from weaning to mating. Short term, high level feeding (flushing) after weaning until mating will increase the quality of the oocytes in breeding animals.

**TIPS**

- Develop a special flush feed, that is 100% focused on improving reproduction performance from weaning to mating.
- Do not use a lactation feed as a flush feed. Lactation feeds are developed to achieve maximum milk production, not to flush sows.
- Feeding sows ad libitum requires feeding more often per day. Feed at least three to four times a day smaller portions to increase total daily feed intake from weaning till mating.
- Sows will naturally reduce their feed intake when they are in heat. Reduce feed allowance to normal levels to reduce wastage.
- Provided water ad libitum, but prevent wet floors.
Gestation

Topigs Norsvin recommends to feed a minimum of two gestation diets. Feeding two gestation diets, offers the possibility to better meet the daily demands of the gestating sows, but also offers the possibility to further enhance sow productivity and longevity.

Advantages of backfat stimulating diets:
- Better coverage around the shoulders before farrowing to prevent shoulder sores.
- More reserves to be used for milk production.
- Better lifetime performance and stayability.
- Calmer, more relaxed sows during gestation and lactation.

The main difference between the two gestation diets, is in the ratio between the amino acids and energy. The two gestation diets are described as follows:

**Gestation 1** (Lower amino acid to energy ratio)
- Backfat stimulating and body weight recovery diets.
- Fed directly after insemination till day 84 of gestation.
- Can also be fed as single gestation diet to older parity sows (>3rd parity).

**Gestation 2** (Higher amino acid to energy ratio)
- Improvement in piglet birth weights.
- Fed from day 85 till day 110 (or until transfer to the farrowing unit).
- Can also be fed as single gestation diet to young sow (<3rd parity).

Multipurpose gestation diets

<table>
<thead>
<tr>
<th>Mixed parities</th>
<th>Lower AA: Energy (5-84 d)</th>
<th>Higher AA: Energy (85-110 d)</th>
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</thead>
<tbody>
<tr>
<td>Parity 1 and 2</td>
<td>Gestation 1</td>
<td>Gestation 2</td>
</tr>
<tr>
<td>Parity ≥ 3</td>
<td>Gestation 2</td>
<td>Gestation 1</td>
</tr>
</tbody>
</table>

The advantage of feeding two gestation diets:
- Minimizing the overfeeding of nutrients to sows.
- Easier to manage and control the body condition of sows.
- Feeding two gestation diets also has economic benefits by reducing sow feed cost per year.
- Improved sow and litter performance.

Wheat-Barley-Soybean Markets

<table>
<thead>
<tr>
<th>Days/Cycle</th>
<th>TN70</th>
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<tr>
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Corn-Soybean Markets

<table>
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<tr>
<td></td>
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</tr>
<tr>
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<tr>
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<td>2.3</td>
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<tr>
<td>85-110</td>
<td>2.8</td>
<td>2.9</td>
<td>2.9</td>
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</tr>
</tbody>
</table>

Corrections for body condition losses

Gestating multiparous sows should be fed according to body condition lost during the previous lactation, so that most sows will be in the desired condition before being transferred to the farrowing crates. In other words, this means increasing the feed allowance for skinny sows and restricting the feed allowance somewhat for fat sows. Use the Topigs Norsvin Sow Feed monitor to determine the most appropriate feed curve based on body condition of the TN70. The Topigs Norsvin Sow Feed monitor can be found at feedmonitor.topigsnorsvin.com.
Transition diet

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. Feed a special developed transition diet for sows during this period.

Main advantages of a transition diet:

• Improved start-up of the milk production in the sow.
• Reduce constipation around farrowing.
• Lower risk of mastitis, metritis and agalactia (MMA) and udder congestion.
• Improved transition between the lower nutrient dense gestation diet to the higher nutrient dense lactation diet.
• Improved piglet vitality and survivability.

Practical considerations for a good transition diet/phase:

• Move sows to the farrowing crates at least 5-7 days before expected farrowing.
• Start feeding the transition diet at least 4-7 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 - Until 2 days after farrowing
  - 28 days - Until 2-3 days after farrowing
  - 35 days - 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.

Recommended feed curve when using a transition diet

![Feed Curve Diagram]

The objective is to feed a similar amount of daily energy the last day when sows are on the gestation feed than 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.

Producers not using a transition feed should make sure to decrease the feed allowance 1-2 days before parturition and give roughage in this period to maintain bowel movement and avoid constipation; and of course ad lib water in excess.
Lactation

The nutritional requirements for the TN70 are based on estimated production levels. Litter weight gain serves as an indicator for production performance of lactating sows. The litter gain estimate for the TN70 is between 2.5 kg/day and 3.3 kg/day. Measuring and registration of piglet litter weight at birth and at weaning are key aspects in determining the nutrient requirements of the sows. The nutrient requirement during lactation depends on the length of lactation. The norms used in this feed manual are 21 and 28 days of lactation.

**Topigs Norsvin litter weight gain calculation**

Litter weight gain = (Litter wean weight-(Number piglets to be nursed x Average birth weight of piglets)) / 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.

### Days/Feed intake (kg/day)

<table>
<thead>
<tr>
<th>Days/Feed intake (kg/day)</th>
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<th>Corn-Soy</th>
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<tr>
<td>21</td>
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<tr>
<td>28</td>
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<td>Ad lib</td>
</tr>
<tr>
<td>35+</td>
<td>Ad lib</td>
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</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.

**TIPS**

**Tips to ensure maximal appetite during lactation:**

- The feed should always be fresh, never stale, dirty or contaminated.
- Pellets give better intake than meal. Liquid feeding results in an improved feed intake compared to dry feeding. However, hygiene control becomes more important when using liquid feed.
- A gradual increase of daily feed allowance, thus matching the sows nutritional needs with feed levels.
- Reduce environmental stress, heat stress will reduce the feed intake.
- Fat sows have a lower feed intake during lactation.

- Two to four meals per day is recommended to ensure higher feed intakes and make sure that the feed is always fresh.
- Controlled feeding is not restricted feeding. Managing the feed intake during lactation will improve sow performance and reduce feed wastage.
- Automated feed delivery systems are an easy means of managing ad libitum feeding.
Body condition

Top performance comes with having sows in the right physical condition throughout their productive life, which means that they conform to the optimal weight, backfat and body condition score at farrowing and weaning as defined by Topigs Norsvin. The optimum will vary according to sow parity and chosen feed program.

Box concept

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Weight, kg</th>
<th>Backfat, mm</th>
<th>BCS, points</th>
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</tr>
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<td>3rd</td>
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<td>285</td>
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</tr>
<tr>
<td>4th</td>
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<td>305</td>
<td>14</td>
</tr>
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<td>5th</td>
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</tr>
<tr>
<td>6th</td>
<td>285</td>
<td>305</td>
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</tbody>
</table>

* BCS-Body condition score

Recommended body composition before farrowing (end of gestation)

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Weight, kg</th>
<th>Backfat, mm</th>
<th>BCS, points</th>
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<tbody>
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<td>3rd</td>
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<td>5th</td>
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</tr>
<tr>
<td>6th</td>
<td>235</td>
<td>255</td>
<td>12</td>
</tr>
</tbody>
</table>

* BCS-Body condition score
Backfat measurement instructions
Consistency of probe placement is of great importance in obtaining comparative measurements. The procedure must be performed while the pig is standing. The animal must be restrained in a stall, scale, or walkway to simplify handling.

To locate the P2 site and measure backfat the following must be done:

- Find the rearmost edge of the last rib on the pig’s left hand side.
- Mark a spot vertically above on the midline.
- From this spot, measure 50mm down the left side from the midline.
- Place the probe of the ultrasound machine directly over the P2 site according to the manufacturer’s instructions and record the fat measurement (a contact solution is usually required to get an accurate reading).
- It is important to record two layers of backfat.

There are several makes of these devices available thus it is very important to measure the backfat according to the manufacturer’s instructions.

TIPS
• Be cautious when using the traditional Body Condition Scoring (BCS) when judging the condition of the TN70. In reality, the sows are leaner than they appear.
• The Topigs Norsvin Feed Tool is available at: feedmonitor.topigsnorsvin.com