Chapter 2
From feed to pig – supply and utilisation of nutrients

N. Kjeldsen

This chapter provides:

- An outline of the efficiency of Danish pig production
- A description of the amount of feed required to produce a pig
- An understanding of the nutrients in pig feed
- An understanding of nutrients used for deposition
- A quantitative description of growth animals' productivity levels
- A quantitative description of the composition of a carcass
- A quantitative description of sow productivity
- A description of what is not deposited and is thereby excreted and impacts the environment
- An insight into feed allocation

1. Introduction

This chapter describes the conditions of the pig production industry in Denmark, and the figures and facts presented are primary based on results from production reports from modern Danish pig farms. Production reports are an "up-to-the-minute account" and reflect the fact that in Denmark we have only one breeding company. Consequently the genetic material is fairly uniform compared with pig production industries in other countries. The aim of the genetic work is to produce the most efficient pig and to spread the genetic material as quickly as possible.

For the Dam lines Landrace and Large White there is strong emphasis on litter size measured as live pigs 5 days post-partum, which has averagely increased litter size by 0.3 pig/litter annually. Danish sows have a considerably higher litter size than sows in other countries, and consequently the requirements for feeding and handling of the sows are a great deal more comprehensive in Denmark.

Duroc is almost exclusively used as sire line with strong emphasis on progress in gain and feed conversion, while progress in lean meat percentage is fairly limited as the current level is considered appropriate.

Chapter 2 is divided into a couple of general paragraphs (paragraphs 2 and 3) describing practical pig production and the growth of the pig, production efficiency and feed input. This is followed by a series of paragraphs describing the individual stages of a pig's life cycle. Paragraphs 4, 5 and 6 concern animals in growth, and paragraph 7 is dedicated to the production cycle of a sow. A sow's production cycle can be split into two periods: a growth period during gestation followed by a lactation period which is accompanied by weight loss in the farrowing facility as a massive production of milk drains the body reserves because the negative energy balance.

In each paragraph, the average feed supply and the average production is reviewed while basic physiological correlations and influences are excluded.

Data presented in the first paragraphs in this chapter can also be used for more in-depth descriptions of biological correlations.

2. Productivity in pig production

Feed conversion ratio is a significant factor for the economy of the pig production industry. Feed costs constitute approx. 60% of all variable costs in pig production. In different countries, different models are used for evaluating energy content in feed, which makes it difficult to compare production data across countries – and, for that matter, to compare research results in international publications with Danish results. In Chapter 21, the Danish feed evaluation system is reviewed, but for now Table 2.1 provides an overall impression of what Danish feed units correspond to in other energy units. In most countries, MJ metabolisable energy, or MJ net energy, is used to define the energy content of feed, while in Denmark MJ physiological energy converted to feed units is employed. The energy content of a typical Danish pig diet is shown in Table 2.1. An in-depth description of the Danish evaluation system is provided in Chapter 21.

Table 2.1. Energy content of typical pig diets under different evaluation models (per kg complete diet)

	Feed units	MJ ME*	MJ NE**	MJ NE***	MJ physiological energy****
Lactation diet	1.06 FUsow	13.0	9.9	9.3	8.2
Gestation diet	0.99 FUsow	12.0	9.2	8.7	7.6
Weaner diet, 6-9 kg	1.18 FUgp	13,9	10.4	9.9	8.7
Weaner diet, 9-30 kg	1.17 FUgp	14.1	10.3	9.8	8.6
Finisher diet, 30-100 kg	1.07 FUgp	13.1	9.6	9.0	7.9

* MJ calculated according to the old Danish system.
** French net energy system.
*** Dutch net energy system.
**** Current Danish system.

Many Danish pig producers use efficiency control reports as a tool to form an outline of the productivity of their herd. There are two systems for this purpose: DLBR SvineIT and AgroSoft. Results are compiled in a report from Pig Research Centre (PRC) in which the average productivity of the farms is analysed. The following tables provide a summary of the productivity levels, and more data can be found in the latest 2009 report.

In Table 2.2, productivity figures for Danish weaners and finishers are shown as an average of all pig farms. Daily gain increases, while feed conversion ratio deteriorates as weight increases.

Table 2.2. Productivity of weaners and finishers, 2009

Pigs	Gain, kg	Daily gain, g	FUgp/kg gain	Lean meat %	Slaughter weight, kg
Weaners (7-30 kg)	23	448	1.92	-	-
Finishers (30-105 kg)	75	888	2,77	60.2	81.4

The productivity of Danish weaner and finisher farms is compared with that of a number of other leading pig producing countries. Figure 2.1 shows Denmark to be leading in terms of gain among finishers adapted to the weight interval used in Denmark. Feed conversion ratio is also efficient, and here Denmark is also one of the leading countries. It is difficult to make exact comparisons of feed conversion between the different countries because of different feed evaluation systems. Therefore feed conversion ratios are not shown here. For more information on feed conversion, see Brief 1005 from PRC.

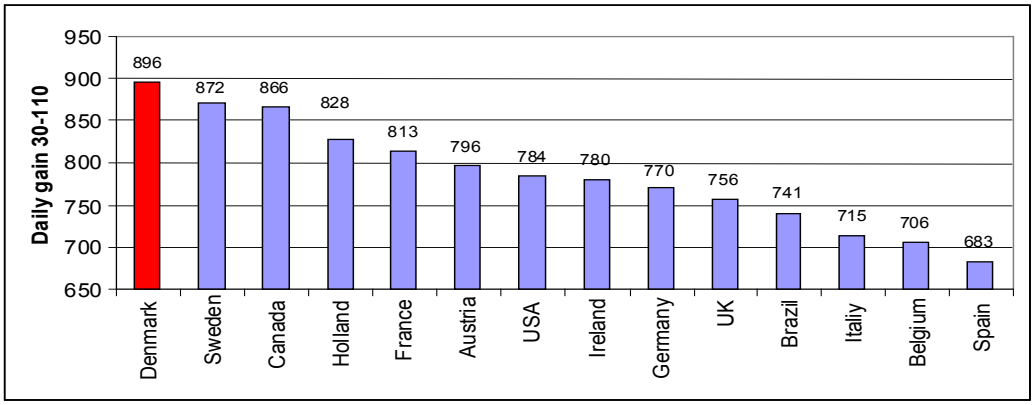

Figure 2.1. Standardised daily gain, 30-100 kg.

Despite the fact that there is only one breeding system in Denmark and that the genetic material is therefore fairly uniform, there are large variations between farms in productivity and efficiency. This indicates that on-farm conditions, such as feed supply, climate, housing conditions and health, are highly influential. Tables 2.3 and 2.4 show examples of averages and quantiles of the 25% best and 25% poorest weaner and finisher farms, respectively (data originates from production reports).

Table 2.3. Productivity of weaner farms, according to production value/place unit/year

	2009 - all	2009 – bottom 25%	2009 – top 25%
Production value/place unit/year, DKK	411	329	490
Daily gain, g (7-30 kg)	448	401	495
FUgp/kg gain (7-30 kg)	1.92	2.09	1.77
Mortality	2.5	2.9	2.1
Start weight, kg	7.4	7.6	7.3
End weight, kg	31.5	31.0	32.1

Table 2.4. Productivity of finisher farms, according to production value/place unit/year

	2009 - all	2009 – bottom 25%	2009 – top 25%
Daily gain, g (30-100 kg)	888	804	965
FUgp/kg gain (30-100 kg)	2.77	2.98	2.60
Weight at transfer, kg	31.9	32.0	31.6
Av. slaughter weight, kg	81.4	80.7	82.2
Gain per produced pig, kg	74.7	73.7	76.1
Av. lean meat %	60.2	60.1	60.2
Dead and rejected, %	4.1	5.7	3.0

These tables show very large variations between farms and a considerable potential for improvement. The difference in feed conversion ratio, for instance, between the 25% best producers and 25% poorest is approx. 0.4 FUgp per kg gain corresponding to approx. 20 FUgp per produced finisher, which in turn corresponds to a difference in gross margin of DKK25-35 per pig depending on the current feed prices.

Genetic progress is obviously a priority among animals in growth, but Denmark is in particular leading on genetic progress for sows. The genetic progress in litter size is quite unique internationally, and the result is the efficiency levels shown in Table 2.5. The figure "weaned pigs per sow/year" reveals that Denmark has the most efficient sow production in the world, and a significant milk production is therefore necessary to supply energy and protein to the piglets.

Table 2.5. Milk production and weight loss of a typical sow

Output	**Lactating sow**
Piglets/litter	16
Liveborn/litter	14
Weaned/litter	12.1
Days of lactation	32
Litters/sow/year	2.25
Weaned/sow/year	27.3
Pigs' weight at weaning, kg	7.3
Pre-weaning mortality	13.8
Sow's weight loss during lactation, kg	10-15*
Total milk yield at 28 days' lactation, kg	340**

*Not stated in production reports, but found in trials. Weight is further reduced by approx. 20 kg (litter, amniotic fluid and foetal membranes).
**Not stated in production reports, but found in trials. Sow milk consists of 18.5% DM, 0.8% ash, 5.6% crude protein, 6.9% fat, and 5.2% lactose. Energy = 5.1 MJ GE/kg, ie. a sow produces daily approx. 11 kg milk, 2 kg lactic DM, and 55 MJ GE in milk. (see Grøn Viden no. 33)

When the productivity of Danish sows is compared with that of sows in other countries, it is clear that Danish sows have a significantly higher litter size than other pig producing countries. As mentioned, litter size increases by approx. 0.3 pig per litter annually, but this also increases mortality. In 2004, a revision of breeding goals moved focus from total born piglets per litter to live pigs on day 5 post-partum (LP5). This revision seems to reduce piglet mortality relatively. Thus, Figure 2 demonstrates that Danish litters are 2-3 pigs larger than in countries such as the Netherlands, Belgium and France without mortality in % being correspondingly higher.

Table 2.6. Herd variation in sow productivity according to weaned pigs/sow/year

	2009 - all	**2009 – bottom 25%**	**2009 – top 25%**
Weaned pigs/sow/year	27.5	24.8	29.9
Sows/year	579	477	660
First parity litters, %	23.9	24.6	23.4
Liveborn/litter	14.2	13.6	14.8
Stillborn/litter	1.9	1.9	1.8
Weaned/litter	12.2	11.4	13.0
Lactation, days	30.8	32.1	29.6
Weaning weight, kg	7.4	7.7	7.1
Pre-weaning mortality	14.0	16.1	12.2
Non-productive days/litter	14.9	19.3	11.7
Weaning-first service, days	5.6	6.0	5.2
Returners, %	6.6	9.0	5.0
Farrowing rate	86.4	82.8	89.1
Litters/sow/year	2.25	2.18	2.31

As seen for weaners and finishers, there are also large variations between farms in sow productivity. Table 2.6 reveals a difference between the best and poorest producers of approx. 1 pig per litter, which is part of the reason why the best group produces approx. 5 pigs more per sow/year than the poorest group.

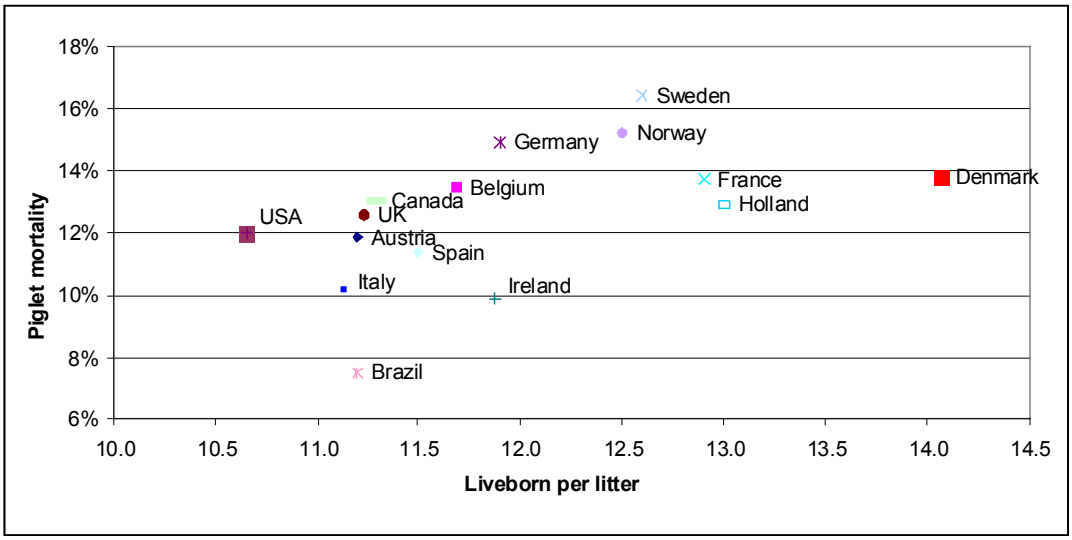

Figure 2.2. Liveborn per litter and piglet mortality.

3. Nutrition

A typical Danish pig diet consists primarily of grain, protein, vitamins and minerals. There is a wide range of models for feed formulation, but most comply with the same set of standards.

The nutrient content of a diet is essential to be able to utilise the pigs' production potential. It is therefore extremely important that the specific nutrient requirements are determined as accurately as possible. The Danish standards for nutrients are laid down in co-operation between PRC, the Faculty of Agricultural Sciences and the advisory service, and can be found here.

Unlike most countries, all nutrient requirements in Danish pig feed are proportional to the energy content of the diet (FUgp). In some countries, nutrient requirements are stated in proportion to kg feed, and in other countries a given daily nutrient supply is recommended. It is therefore tricky to compare nutrient recommendations between countries.

Pig feed in Denmark is formulated in accordance with one basic principle: to produce the cheapest feed unit possible (FUgp) that meets all nutrient requirements to benefit the production in a given growth period. This requires a vast amount of information on the nutrient and energy content of the individual ingredients, the price of ingredients and the desired nutrient content of the finished diet. In addition, there may also be a range of requirements to the composition of the diet based on the actual conditions on the individual farms, such as feeding systems (liquid or dry feeding), health status of the pigs etc.

Approximately 40% of all finishers in Denmark are fed meal based grain, purchased ingredients and mineral diets (3-4% inclusion). Approximately 15% are fed home-grown grain mixed with supplementary diets delivered as pellets. The rest (approx. 45%) are fed complete diets purchased from feedstuff mills delivered as pelleted feed ready to use.

Approximately 35% of all sows are fed diets mixed on-farm; 18% are fed supplementary feed and 47% are fed complete diets. Approximately 32% of all weaners are fed diets mixed on-farm; 21% are fed supplementary feed and 47% are fed complete diets. For years, the trend has been moving towards more pigs being fed feed mixed on-farm concurrently with the structural development giving way to larger production units better capable of paying interest on large investments in on-farm mixing equipment.

Table 2.7 provides examples of typical diets for the various groups; all diets meet the nutrient standards. Only the main ingredients are listed, as the exact compositions can be very detailed. The examples are provided by DLG (the biggest feedstuff company in Denmark), and outlines of detailed compositions are shown in Appendix. The Appendix also provides outlines of other diets such as a low-protein diet for weaners and finishers; an organic diet for finishers; and a high-fibre diet for sows. All the diets can be used to calculate nutritive consequences of the composition during teaching.

The majority of the diets purchased from a feedstuff mill are purchased on periodic contracts, and the ingredient content is rarely the same for the entire period. Ingredients normally vary within certain intervals, which enables the feedstuff producer to benefit as much as possible from fluctuations in ingredient prices, while still observing all nutrient requirements. Examples of such commercial diets are shown in Appendix where the general information necessary is shown on the product sheet from the company.

Table 2.7. Examples of typical pig diets (source: DLG)

	Weaner diet (7-10 kg)	Weaner diet (10-30 kg)	Finisher diet (30-100 kg)	Gestation diet*	Sow diet (unity mix)
Ingredients					
Barley, %	10	25	25	37	25
Wheat, %	55	42	43	34	54
Wheat bran, %			5	15	
Fat/vegetable oil, %	3	2	1	1	1
Dehulled soybean/special soy, %	12	26	6		4
Rapeseed meal/cake, %			10	8	8
Sunflower meal, %			5		4
Lactic products, %	6				
Fishmeal, %	5				
Potato protein, %	4				
Limestone, %	0.2	1.1	1.3	1.4	1.2
Mono calcium phosphate (22.7% P), %	1.0	1	0.3	0.2	0.8
Salt, %	0.2	0.5	0.4	0.4	0.4
Amino acids, vitamin, other, %	3.6	2.4	3.0	3.0	1.6
Nutrient content					
Energy, FUgp/kg	1.20	1.10	1.04	1.02	1.06
Protein, %	20.5	19.7	15.9	12.0	14.2
G dig. protein/FUgp	151	157	125	91	110
G dig. lysine/FUgp	10.8	10.4	7.4	3.3	6.0
G dig. P/FUgp	3.3	3.1	2.5	2.0	2.7

*This gestation diet contains the nutrients laid down by the standards. In practice, many sow producers use a lactation diet for the entire cycle, which results in an unnecessarily high consumption of, for instance, protein and phosphorus in the gestation period. The reason for making this choice could be that the farm only has one feeding system or that the gestation diet is only marginally cheaper than a unity mix for short periods only, and it is therefore easier to use just one diet.

As shown in the table, the younger the pigs, the higher the level of energy and protein in the feed as the relative growth capacity is highest among weaners and drops as they grow older (see Chapter 3 for examples of growth curves). Likewise, feed intake capacity in relation to growth capacity is lowest for the smallest pigs. It is therefore crucial that while the pigs are young the feed has a high concentration of nutrients. As they get older, their capacity for feed intake increases and the nutrient content of the feed is therefore reduced. See Chapter 18 for a description of how to regulate pigs' feed intake.

Sows have lower nutrient requirements during gestation and are capable of eating considerably more feed than they need. They are therefore fed restricted with a diet low on energy and nutrients. Lactating sows, on the other hand, have large requirements for energy and nutrients for production

of milk. They are therefore primarily fed ad lib with diets containing more energy and nutrients than gestation diets.

4. Piglets – growth and production

This paragraph provides an outline of piglet growth in the farrowing facility. In the period up to weaning, they feed almost exclusively on sow's milk. Trials have demonstrated that supplement of dry feed for piglets has no effect in terms of growth at weaning at approx. 4 weeks of age.

4.1. Birth weight and importance of weight

A newborn piglet weighs averagely 1.5 kg, but birth weight may vary greatly (see Figure 2.3). 13-15% of all piglets weigh 1 kg or less at birth, and they require optimum care to survive. A piglet that weighs less than 650 g at birth is at a high risk of dying. Figure 2.3 includes both liveborn as well as stillborn piglets.

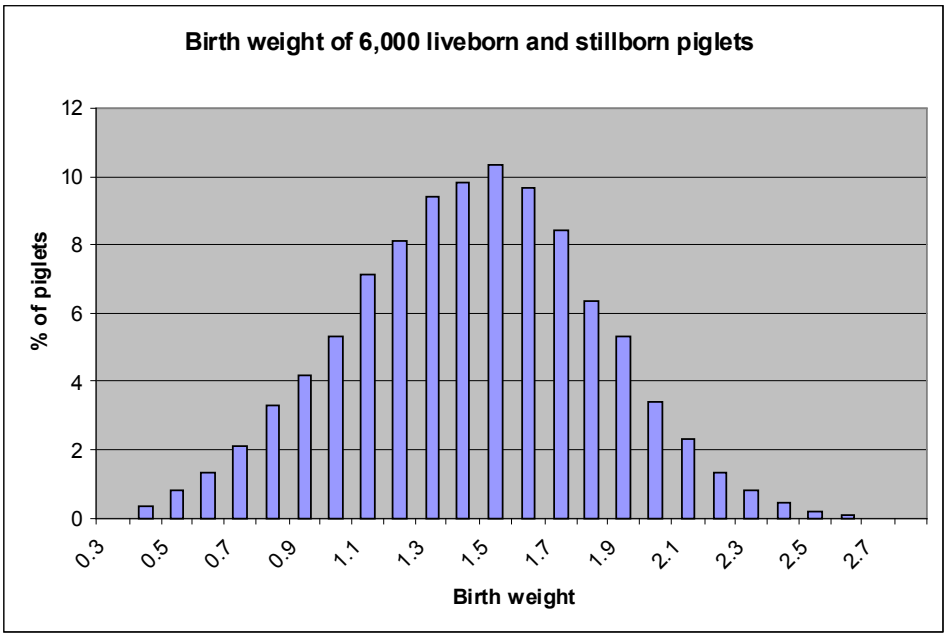

Figure 2.3.Birth weight, % (non-published data, PRC).

Figure 2.4 shows that the lower the birth weight, the higher the risk of a piglet being stillborn. When birth weight is lower than 700 g, half of the piglets are stillborn. If a piglet weighs more than 2 kg, the risk of it being stillborn is low.

Birth weight also influences a piglet's chances of survival in the farrowing facility. The risk of a piglet dying immediately after birth increases as birth weight drops (Figure 2.5). If the birth weight is below 700 g, there is a 50-70% risk of the piglet dying in the farrowing facility. First parity sows have fewer and smaller piglets than older sows, which is likely caused by less room in the uterus of the young sows. Even if a piglet is smaller than its litter mates, weight alone seems not to be decisive to its chances of survival as the smallest piglets of young sows have slightly higher survival rates than those of older sows.

If a piglet weighs 2 kg or more at birth, the risk of dying in the farrowing facility during or after birth is virtually non-existent.

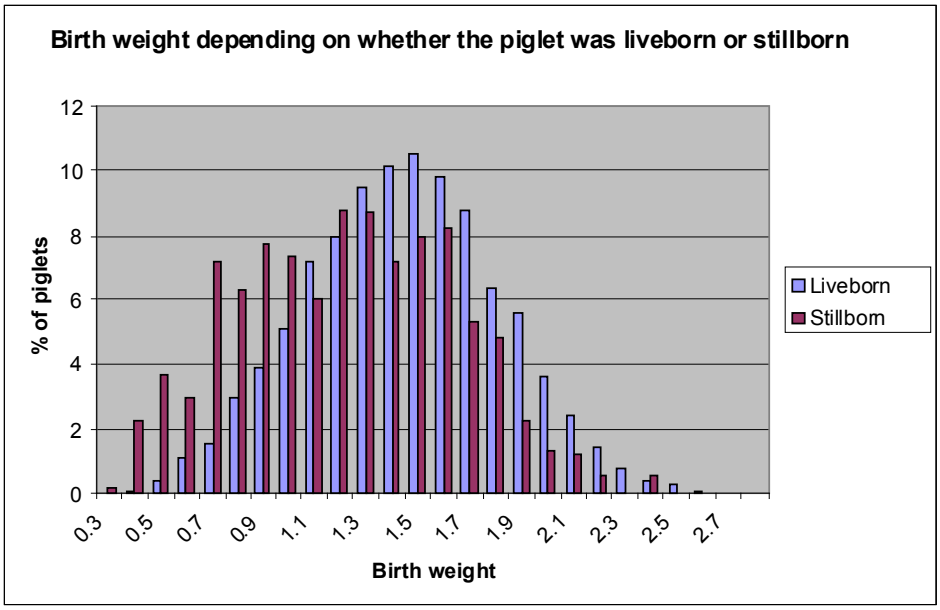

Figure 2.4. Stillborn and liveborn in propotion to birth weight (un-published data, PRC).

A piglet's birth weight also influences its ability to grow. The lower the birth weight, the lower the gain in the farrowing facility. It is generally said that a difference between two piglets of 1 kg at birth will be a 2 kg difference at weaning and a 4 kg difference at 30 kg.

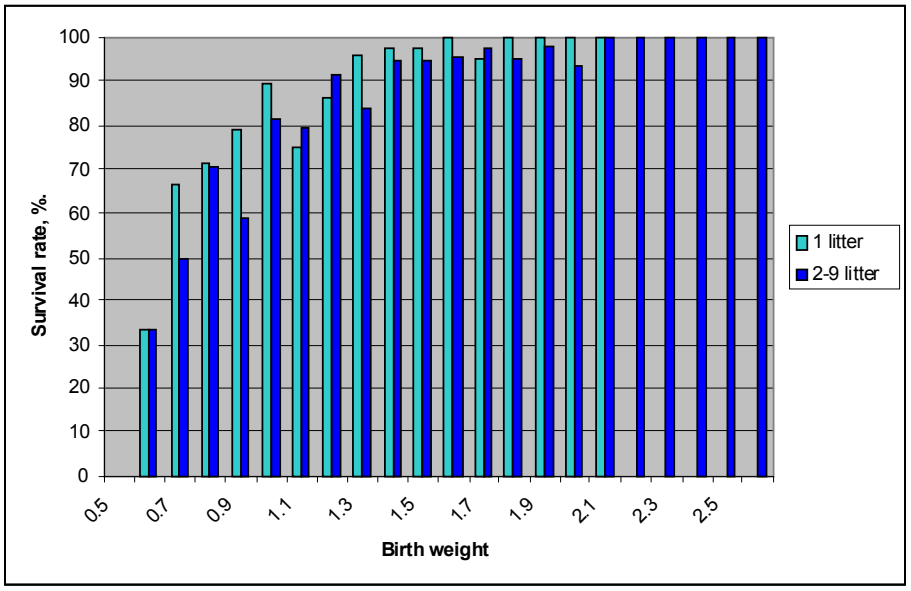

Figure 2.5. Survival in proportion to birth weight (un-published data, PRC).

This means that even though the piglets in a litter have the same genetic origin, there are huge variations in the growth in the foetal stage and later in life. Nutrient supply in the foetal stage influences foetal growth, but the exact regulation of foetal growth and birth weight variation is unknown. Chapters 3 and 16 provide a more detailed account on how to regulate foetal growth and on how to influence the interaction between uterus and foetus through feeding.

4.2. Growth and deposition of nutrients during nursing

In approx. 4 weeks, from birth to weaning, piglets grow from approx. 1.5 kg to approx. 7 kg. At birth, piglets consist of approx. 79.8% water, 14.9% protein, 3.7% ash and only 1.6% fat (Chapter 3), ie. at birth, their energy reserves are very low and therefore they completely depend on immediate energy intake from the sow. For many of the smallest pigs weighing less than 1 kg it is difficult to get a teat in the competition with bigger litter mates and they will often die from starvation and cold within the first 24 hours post-partum as a result of inadequate energy intake and inadequate heat production.

At weaning, they consist of approx. 68.2% water, 16.8% protein, 3.3% ash and 11.7% fat (Chapter 3); the most distinct change being the percentage of fat. A drastic deposition of fat is seen during nursing as a piglet deposits approx. 0.9 kg fat from birth to weaning, but absorbs approx. 1.6 kg fat from sow milk; ie. a piglet absorbs twice as much fat as it deposits. In comparison, a weaned pig absorbs approx. 2.0 kg fat from its feed in weeks 4-11, but deposits approximately the same amount. A finisher absorbs approx. 8 kg fat from the feed, but deposits 18 kg. Consequently, during the growth stages, the need for de novo synthesis of fat varies greatly (see Chapter 10 for a description of the turnover of fat).

4.3. How to influence birth weight and growth rate of piglets

In 4.1 it was shown that birth weight is essential to a piglet's survival and growth. A range of options are available for affecting the large variations in birth weight and in the subsequent growth process. In principle, we have the following possibilities:

- Change the sow's diet during gestation and thereby add more nutrients to the uterus in different amounts or composition.
- Reduce litter size post-partum (by using nurse sows) and thereby improve the individual piglet's chances of a high milk intake.
- Increase the sow's feed dose in the farrowing facility and thereby increase the production of milk.
- Feed the piglets a supplement to sow milk and thereby increase the piglets' energy intake.

Ad 1): PRC investigated the effect of nutrient supply on birth weight in a trial with two different inclusion rates of protein (90 and 110 g digestible protein per FUsow). The trial comprised gestating sows from day 80 of gestation until farrowing at approx. 115 days (trial report 821). Approximately 6,000 newborn piglets were weighed individually, but the results demonstrated no effect on average birth weight or weight variation between the two groups. This indicates that it is extremely difficult to affect birth weight through changes in protein supply.

Ad 2): Cross-fostering is another option to improve piglets' chances of a sufficient milk intake to survive. PRC studied the effect of cross-fostering to 11, 13 or 15 piglets per litter with the same average start weight of approx. 1.5 kg per piglet (trial report 872). Results revealed that the piglets in the large litters (15 pigs) weighed 600 g less at weaning compared with the piglets from the small litters (11 pigs) that had had a greater chance of milk intake. This corresponds to a loss of approx. 150 g average weight per piglet for each extra piglet in the litter. The difference resulting from manipulating piglets' milk intake through litter size was almost doubled by the end of the trial at approx. 30 kg.

Ad 3): Lactating sows are normally fed three times a day with so much feed that they eat up every time. It is thereby up to the staff to assess how much a sow can eat without overfeeding it and thereby causing the sow to "stop". A sow will normally put milk performance over its own weight, which is why sows normally lose weight during lactation, despite the fact that the daily feed supply increases from approx. 5.5 FUgp to 8-9 FUgp at weaning. New trials have focused on whether it is possible to "force" sows to an even higher energy intake to increase milk production. This has been tried through increasing the energy content of the feed or though more frequent feedings. The results of a trial with lactation diets with an energy content of 1.07 and 1.15 FUsow per kg feed,

respectively, revealed an increased energy intake and a lower weight loss, but no increase in piglet growth rate was seen (trial report 686). The results of a trial with frequent feedings (3-8 times a day) demonstrated a tendency to an increased weaning weight of the litter (trial report 847).

Ad 4): Some pig producers offer dry feed to the piglets as a supplement to sow milk, but this is of very little nutritional value if the pigs are weaned at 4 weeks. Nevertheless, many do this anyway to teach the piglets to eat dry feed before weaning. Piglets that are weaned at 5 weeks have a fairly significant intake of dry feed in the final week before weaning.

4.4. Nutrient turnover

Piglets have a huge growth potential. On Danish commercial farms, piglets have an average daily gain of 200 g during nursing corresponding to an average daily increase of body weight of approx. 4.5%. In comparison, finishers have a daily weight gain of approx. 1.3%.

However, research results demonstrated that piglets actually have a far greater growth potential than what we see today during nursing. Research with milk replacers given to piglets taken away from the sow revealed that piglets are capable of doubling their growth rate, which indicates that there must be something in the sow that inhibits piglet growth. The milk output of the sow is the most significant factor as that would have to double as a minimum to satisfy the piglets' potential. Sow milk is very rich in fat compared with the deposition of fat in the piglets, and it may be questioned whether this composition is optimum for piglets accommodated in climate-controlled facilities that do not necessarily require a large deposit of fat. However, extensive research has shown that it is difficult to change the composition of sow milk through feeding.

Piglets have an extremely efficient utilisation of the nutrients in sow milk. Table 2.8 shows that piglets on Danish commercial farms deposit approx. 38% of milk DM, approx. 64% of milk protein and approx. 42% of milk fat. In comparison, finishers have a 40% utilisation of dietary protein. The high utilisation of nutrients in piglets is attributed to a highly efficient digestion of the nutrients in sow milk (97-98%) versus the nutrients in dry feed where protein is digested by approx. 83-86% depending on the ingredients. In addition, the amino acid composition in the milk protein is very close to the amino acid requirements of the piglet

The calculations in Table 2.8 are based exclusively on intake of sow milk as the piglets are either not given supplementary dry feed or they have a very limited intake of dry feed.

Table 2.8. Intake and deposition of nutrients in a piglet

Nutrient	Intake from sow milk	Deposited	% utilisation for deposition
Dry matter, g	5200	2000	38
Protein, g	1570	1000	64
Fat, g	1940	820	42
Phosphorus, g	33	29	87*

Assumptions: 340 kg sow milk. Gain: 5.8 kg/piglet. 12.1 pigs per litter. Approx. 4.8 kg sow milk for 1 kg gain. See Table 5 for content of sow milk. Composition of body tissue is described in paragraph 4.2. * Based on few data, hence slightly uncertain

5. The weaned pig (7-30 kg) - growth and production

The overall aim in the weaner period is to produce healthy pigs with a high daily gain and low mortality at the lowest possible costs for feed and medication.

Weaners are highly affected by the sudden and abrupt transition from sow milk to dry feed. Besides minor changes in accommodation and environment (such as pen conditions, absence of the sow, climate, often new pen mates, feeding in feeders etc.), the pigs' feed radically changes na-

ture. Though many producers offer the piglets supplementary feed in the farrowing facility, the pigs have rarely eaten much dry feed when they are weaned at approx. 4 weeks of age.

5.1. Feeding

Feeding must take into account not only maximum productivity, but also the pigs' health, primarily diarrhoea, and this may be a hard balance to strike.

Theoretically, weaning pigs would be easier if they could simply continue getting liquid feed approx. 20 times a day as they did by the sow, but this is not practically possible with the technologies available today. Most weaners are therefore fed dry feed from feeders. Weaner feed is often purchased pelleted diets: weaner diets contain significantly more different feedstuffs than feed for finishers and sows and are therefore more difficult to mix on-farm. The pigs typically start out on a special diet containing zinc oxide (allowed the first 14 days post-weaning provided that the herd veterinarian has agreed to this) as prevention against post-weaning diarrhoea. After 14 days, the pigs switch to a simpler diet containing cheaper feedstuffs. Often, 2-3 different diets are used in the period 7-30 kg (see Table 2.7).

The composition of a diet often depends of the health status of the individual herd. The more easily digestible a diet is, the more expensive it is. Diets for weaners often contain expensive feedstuffs such as lactic products, fishmeal, blood products, specially-treated soy protein etc. The more digestible the protein, the lower the risk of post-weaning diarrhoea. Digestion processes and gastric health of weaners are often affected by protein quality as well as inclusion rates.

A range of weaner diets are therefore available containing less protein and fewer amino acids than recommended by the standards. These low-protein diets are widely used for weaners to prevent outbreaks of diarrhoea. However, there is a considerable risk of reduced gain and poor feed conversion ratios when these diets are used as the pigs typically end up with a deficiency of one or more essential amino acids.

Good production results among weaners are actually possible with a simple and cheap diet based on grain and soybean meal. Research has shown that expensive starter diets (rich in lactic products, additives, heat-treated grain products etc.) improve production results, but not enough to pay the higher price of this so-called advanced feed.

At weaning, pigs' overall feed intake normally drops. Foreign research assumes that a consistently high feed intake the first days post-weaning is important for optimum function of the intestinal surface. Energy deficiencies in this critical period reduce the surface area of the intestine and thereby the ability to absorb nutrients, which in turn reduces gain and increases the risk of diarrhoea.

However, Danish research has demonstrated that post-weaning diarrhoea can be reduced through restricted feeding. One trial demonstrated that fasting for 24 hours post-weaning did not affect the frequency of diarrhoea, but influenced daily gain negatively. Gruel feed (dry feed mixed with water) the first 1-2 weeks post-weaning may help stimulate feed intake and thereby gain, but research has shown varying effects. It is very important that gruel feed is supplied under hygienically correct conditions.

5.2. Growth and composition at 30 kg

In the period 7-30 kg, weaners have an average daily gain of 450 g. The first week is the most vulnerable period when gain is less than 100 g a day. Some pigs take a long time to get used to eating from a feeder. Many pigs have not had a sufficient feed intake within the first 24 hours, and research shows that many pigs are unable to eat enough feed to cover their requirement for energy for maintenance until day 5 post-weaning.

In some trials, it has been attempted to “train” the pigs in the farrowing facility to start eating before weaning in order to be able to start feed intake faster post-weaning, but it remains unclear whether it is actually worth the effort. Trials with liquid feeding as well as dry feeding and with varying compositions also show varying results.

At weaning, pigs consist of approx. 68.2% water, 16.8% protein, 11.7% fat and 3.3% ash (6.0 g P/kg). When they weigh 30 kg, they consist of approx. 70% water, 18% protein, 9% fat and 3% ash (5.1 g P/kg); the most significant difference being the drop in fat percentage from weaning until 30 kg (see Chapter 3 for more information).

5.3. Nutrient turnover

The national average (from the efficiency control reports) shows a feed intake of approx. 44 FUgp in the period 7-30 kg. There are no statistics of which diets are used for weaners, but often 2-3 different diets are used with decreasing protein content throughout the period and with cheaper feedstuffs as the pigs get older. The estimated protein content is approx. 19%.

Table 2.9 shows the individual nutrient fractions added through the feed; how much is deposited in the body and how much is excreted over the entire growth period 7-30 kg.

Table 2.9. Nutrient turnover in the period 7-30 kg

Nutrient	Intake from feed (approx. 44 FUgp = approx. 37 kg feed)	Deposited	% utilisation for deposition
Dry matter, g	33,000	6,800	21
Protein, g	7,400	4,200	57
Fat, g	2,000	1,900	95
Phosphorus	230	113	49

Assumptions: Average feed 7-30 kg contains:1.13 FUgp per kg, 87% DM, 19% protein, 5.5% fat and 0.6% P.

The table shows that weaners have a lower utilisation of protein and phosphorus than piglets (Table 8), whereas they have a distinctly better utilisation of added fat. Weaners deposit largely all the fat they take in via the feed, whereas piglets deposit only half and use the rest for heat (maintenance).

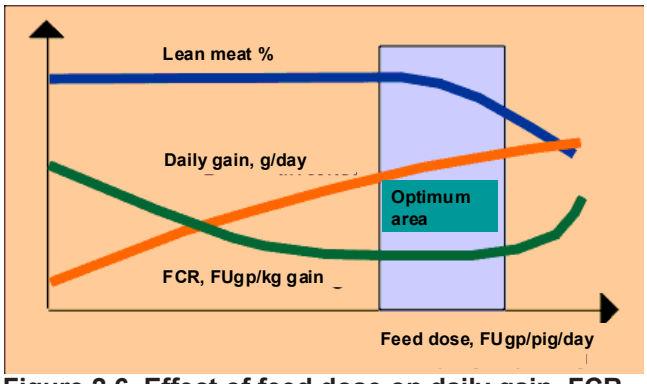

Figure 2.6. Effect of feed dose on daily gain, FCR and lean meat %.

6. Finishers – growth and production

Finishers must grow as fast as possible with as efficient feed conversion ratios as possible along with a high lean meat percentage. Breeding stock in the Danish breeding system is selected for optimum performance under ad lib feeding conditions. The recordings for this are made on male pigs at a test station, but in practice very few entire males are produced as most male pigs in Denmark are castrated, which affects the productivity of the pigs. Castrates have a higher feed intake, a poorer feed conversion ratio and a lower lean meat percentage than entire males. This particular

group of pigs is often the reason why many producers choose to feed restricted according to a feed curve.

6.1. Feeding

Restricted feeding is possible on farms with liquid feeding where feed is supplied 3-4 times a day in long troughs and where all pigs can eat at the same time. Approximately 40-50% of all finishers are fed liquid feed and the rest are fed dry feed from feeders where all pigs cannot eat at the same time. On farms with dry feed, the pigs are usually fed ad lib. Feeding systems for restricted dry feeding are rare in practice – they exist, but they are extremely expensive.

The daily supply of feed affects daily gain, lean meat percentage and feed conversion ratio per kg gain (see Figure 2.6). Gain increases when the feed dose increases, but when the pigs' potential for meat production becomes a limiting factor, lean meat percentage drops. A very high feed dose therefore results in a poor feed conversion ratio as more energy is required for deposition of fat instead of meat. Feed conversion is also poor at a low feed dose as the pigs use a large part of the energy intake on maintaining their body condition. The exact correlations depend on gender and breeding level for meat production.

When deciding on a feeding strategy, it is important that the feed dose lies within the economically optimum area to obtain a good feed conversion. It must then be decided whether the aim is a high gain or a high lean meat percentage and accordingly increase or reduce the feed dose. In each case, the economically optimum feed dose depends on the price of feed, the value of gain, the feed conversion and the lean meat percentage.

6.2. Growth and composition at 105 kg

Finishers gain averagely approx. 900 g a day from 30 kg to 105 kg when they are slaughtered. See Chapter 3 for more information on growth curves.

In the production control reports, live weight is calculated on the basis of the slaughter weight provided by the slaughterhouse. Conversion factor 1.31 is used, which means that a slaughter weight of 80 kg corresponds to a live weight of 105 kg. The difference is constituted by gastric content (approx. 5 kg); blood (approx. 5 kg); and internal organs (approx. 15 kg), totalling approx. 25 kg.

Table 2.10 shows the composition of the body in per cent of carcass weight. Carcase weight includes head and feet. The higher the carcass weight, the higher the fat percentage at the expense of lean meat percentage – this applies to females as well as barrows.

Table 2.10. Composition of carcass in % of body weight (un-published data from Danish Meat Research Institute)

Slaughter weight, kg	Gender	Number of carcasses	Head + feet, %	Lean meat%	Fat %	Bones, %	Skin, %
70-80	Females	19	9.2	61.7	18.5	8.4	2.2
	Castrates	28	9.3	58.2	22.6	8.1	1.8
80-90	Females	87	8.2	60.4	20.3	8.1	2.0
	Castrates	76	9.3	58.4	22.6	7.8	1.9
90-100	Females	32	9.1	59.4	21.7	7.8	2.0
	Castrates	30	9.3	57.3	24.0	7.6	1.8

There is a clear correlation between lean meat percentage and fat percentage. Table 2.11 shows variations in the pools when lean meat percentage varies. The figures are based on the group "slaughter weight 80-90 kg".

Table 2.11. Composition of carcass at different lean meat percentages (un-published data from Danish Meat Research Institute)				
Lean meat %	**Fat, %**	**Bones, %**	**Skin, %**	**Head + feet, %**
56	25.2	7.8	1.7	9.3
58	23.0	7.9	1.7	9.4
60	20.8	8.0	1.8	9.4
62	18.6	8.1	1.9	9.4
64	16.4	8.2	2.0	9.4

There is an adverse correlation between lean meat percentage and fat percentage, whereas percentages for bones, skin and head remain fairly stable.

The below formulas can be used for more detailed calculations of the correlation between slaughter weight, lean meat percentage and the remaining pools. These formulas are not gender-specific, ie. the correlation between meat and fat/bones/skin is identical for both genders.

Carcase fat % = 84.28 + 0.0306xslaughter weight – 1.102xleanmeat%
Carcase bone % = 5.98 – 0.0232xslaughter weight + 0.0671leanmeat%
Carcase skin % = - 0.38 – 0.002slaughter weight + 0.0395xleanmeat%

Thus, when lean meat percentage drops by 1%, fat percentage increases by 1.1%.

6.3. Feed intake in the finisher period

A finisher has an average intake of 200 FUgp in the growth period, but this figure may vary greatly depending on feeding strategy.

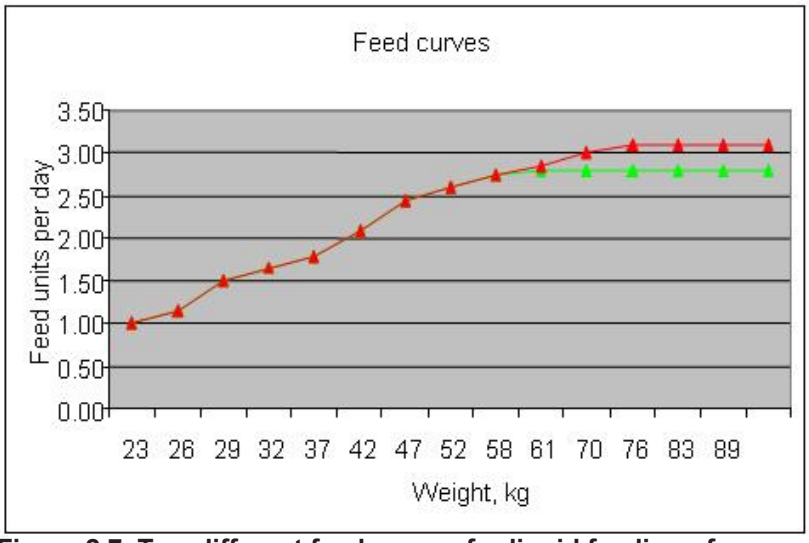

Figure 2.7. Two different feed curves for liquid feeding of finishers at the end of the growth period.

As mentioned, a large part of pigs in Denmark are fed liquid feed. Pigs generally have a higher feed intake when their feed is mixed in water as opposed to dry feed. Feed intake must therefore be restricted in the last part of the growth period to prevent the pigs from becoming too fat. Table 2.12 shows the results from a trial with liquid feed where the pigs were given two different feed doses towards the end of the growth period (2.8 FUgp or 3.1 FUgp a day). The pigs were sorted according to gender to be able to demonstrate the reaction of females and barrows, respectively. The two feed curves are shown in Figure 2.7.

Table 2.12 shows that when feed intake increases, a pig grows faster and lean meat percentage drops. In this trial, feed conversion ratio hardly deteriorated. Depending on the economical weighting of feed conversion ratio, gain and lean meat percentage, it is possible to calculate if it is

profitable to increase feed intake. In this trial, it would in fact be profitable to increase feed intake, particularly for the barrows, despite a drop in lean meat percentage.

Table 2.12. Effect of different feed curves on finisher productivity (depending on gender)				
Gender	**Females**	**Females**	**Barrows**	**Barrows**
Max. feed dose in last part of growth period, FUgp/day	2.8	3.1	2.8	3.1
Daily gain, g	917	944	889	931
Feed dose, FUgp/day	2.54	2.64	2.55	2.69
FCR, FUgp/kg gain	2.77	2.80	2.87	2.89
Lean meat %	61.2	60.8	60.4	59.9
GM/place unit, DKK	645	648	546	563

6.4. Nutrient turnover

At 30 kg, a pig consists of approx. 70% water, 18% protein, 9% fat and 3% ash (5.1 g P/kg).

The chemical composition of a finisher is approx. 57% water, 20% protein, 20% fat and 3% ash (5.5 g P/kg). Only a very small percentage is deposited as carbohydrates, primarily as glycogen in liver and muscles.

Table 2.13 shows the individual nutrient fractions added through the feed, how much is deposited in the pig's body and how much is excreted in the entire growth period 30-105 kg.

Table 2.13. Nutrient turnover in the period 30-105 kg			
Nutrient	**Intake from feed (approx. 210 FUgp = approx. 200 kg feed)**	**Deposited**	**% utilisation for deposition**
Dry matter, g	174,000	36,000	21
Protein, g	32,000	15,600	49
Fat, g	8000	18,300	230
Phosphorus, g	950	425	45

Assumptions: Finisher feed contains 1.05 FUgp per kg, 87% DM, 16% protein, 4% fat and 0.48% P.

A finisher thus deposits approx. 2.3 times its intake of fat, 50% of its protein intake and 45% of its P intake. Finishers have a very high synthesis of fat as opposed to piglets and weaners.

7. Sows – production

Sow productivity data is found on this link showing the 2009 results from the Production reports. The data in this brief is the average of data from approx. 660 Danish farms and provides a good impression of the productivity of Danish sow herds. The data listed below is simplified averages covering large variations, but provides a good basis for further calculations in the following chapters.

7.1. Feed intake

The 2009 Production reports show that sows have an average annual feed consumption of 1,530 FUsow for a production of 27.5 pigs with a weaning weight of 7.3 kg. Sows produce 2.25 litters a year, which means that 680 FUsow are used per cycle. This primarily covers the sows' consumption during gestation and lactation, but also includes feed for boars and gilts. The exact distribution is unknown and varies from farm to farm. Put simply, it might be suggested that approx. 30% of the feed is eaten during lactation and 70% eaten in the empty period and the gestation period, which would mean that approx. 205 FUsow are required for 31 days' lactation and approx. 475 FUsow for the empty period and gestation period. Table 2.14 shows the nutrient requirement of sows.

Table 2.14. Intake of nutrients in a sow's cycle shown according to lactation period and empty/gestation period. Nutrient intake is stated in total amounts and not digestible nutrient			
Nutrient intake per cycle	**Lactation**	**Empty/gestation**	**Total**
Feed units, FUsow	205	475	680
Dry matter, kg	165	405	570
Protein, kg	27	55	82
Fat, kg	8	14	22
Carbohydrate, kg	110	290	400
Ash, kg	10	21	31
Phosphorus, g	950	2,000	2,650

The figures in the table are based on the diet shown in Table 2.7. Note that the overall nutrient intake will increase compared with the table if lactation feed is used for the entire cycle.

7.2. Growth and production in the form of foetuses

Sows grow while also producing foetuses and subsequently milk. Table 15 shows that during the first gestation periods a sow gains approx. 55 kg per gestation of which approx. 20 kg are foetal weight, etc. Post-farrowing, a sow loses the 20 kg foetuses and a further 10 kg body weight from a high production of milk. A sow thus increases her body weight by 25 kg per gestation in the first couple of litters after which the sow's own growth decreases from weaning to weaning. On farms practising a regular culling strategy, with an average litter number of 3.5 and where only 7 % sows have more than 6 litters, sows rarely reach their full-grown weight of approx. 375 kg (see Chapter 3). It is therefore important to adjust the feed dose to match both production of foetuses/milk as well as a weight increase in the sow. Weight changes per cycle are very high and constitute approx. 20% of the sow's own weight. In the course of one cycle (from service to service), a sow goes through physiologically changes: from deposition of nutrients for weight increase and foetal production during gestation to farrowing where it needs to produce large quantities of milk and is at the same time mobilising body reserves and losing weight in the process.

Table 2.15. A sow's weight changes during 5 litters	
Output	**Weight of a sow, kg**
Weight at 1st farrowing, kg	225
Weight at 1st weaning, kg	195
Weight at 2nd farrowing, kg	250
Weight at 2nd weaning, kg	220
Weight at 3rd farrowing, kg	270
Weight at 3rd weaning, kg	240
Weight at 4th farrowing, kg	285
Weight at 4th weaning, kg	255
Weight at 5th farrowing, kg	300
Weight at 5th weaning, kg	270

In Table 2.15 above, weight at farrowing is stated as weight shortly before farrowing.

7.3. Lactating sows – production

It says above that a lactating sow loses av. 10 kg body weight during lactation and produces approx. 300 litres milk. In table 5 it was shown that 300 litres milk correspond to a production of milk of approx. 16 kg protein, 21 kg fat and 16 kg lactose.

Table 2.14 shows that a sow has an intake of approx. 27 kg protein, 8 kg fat and 110 kg carbohydrate from the feed. Consequently, almost twice as much protein is added from the feed than deposited in the milk. This corresponds with an efficiency in the utilisation of dietary protein of approx. 50% as described in literature.

It is also clear that a sow gets 8 kg fat from the feed, but deposits 21 kg in the milk. To be able to produce such large quantities of fat, body reserves are mobilised and the sow loses approx. 10 kg body weight of which approx. 5 kg are fat. The rest of the fat is produced from a synthesis of fat from the carbohydrate fraction of the feed.

Research at the Faculty of Agricultural Sciences (FAS) in 2006 demonstrated that weight loss is primarily made up of fat as approx. 40-45% of the weight loss is fat corresponding to 4.4 kg fat. If a 15% water loss in connection with the loss of fat is included, fat loss constitutes approx. 5 kg fatty tissue. The rest is loss of proteins and water. For each kg protein lost, 4 kg water is released. The 10 kg weight loss is then made up of approx. 5 kg fat, 1 kg protein and 4 kg water. Whether protein is lost from the body reserves is being discussed. The research results from FAS do not reveal a protein loss, but other sources demonstrate a fairly large mobilisation of protein from body tissue depending on feed intake. If sows eat more than approx. 7 kg feed a day, there is very limited mobilisation of protein from body tissue.

7.4. Nutrient turnover

The average production of a sow in a cycle from service to weaning is one litter of pigs (12.1 pigs of 7.3 kg each = 88 kg weaner) and a weight increase of approx. 25 kg.

A sow's body reserves consist of approx. 42% dry matter made up of 17% protein, 22% fat and 3% ash depending on the cycle. Weaners' body composition consists of 31.8% dry matter made up of 16.8% protein, 3.3% ash and 11.7% fat. Nutrient turnover of sows is shown in Table 2.16.

Table 2.16. Nutrient turnover for sows per cycle

Nutrient	Deposited in 25 kg weight increase	Deposited in a litter (12.1 pigs of 7.3 kg)	Deposited in total	Intake from feed	Not deposited	% utilisation for deposition
Dry matter, kg	10.5	28	38.5	570	531	7
Protein, kg	4.3	15	19.3	82	62.7	24
Fat, kg	5.5	10	15.5	22	6.5	70
Ash, kg	0.7	3	3.7	31	27.3	12
Phosphorus, kg	140	440	580	2650	2070	22

Carbohydrate is not deposited to a large extent and is used for production of heat or synthesis of fat.

Sows deposit very little of the dry matter from the feed, which indicates that in a cycle a sow spends most of the energy from dry matter on maintenance and production of heat or on synthesis of fat. Fat from feed is efficiently deposited, but it is not established how much of the amount deposited originates from synthesis of fat from carbohydrates and how much originates directly from the feed. As Table 2.16 shows, the utilisation of nutrients such as protein and phosphorus is not particularly efficient at 22-24%. The rest is discharged to the environment through slurry (phosphorus and NH_4^+) and through ventilation air in the form of ammonia (NH_3).

If the loss in Table 2.16 is converted to loss per sow/year (×2.25 litters a year), the result is a nitrogen loss per sow/year of approx. 22 kg N and a loss of phosphorus of approx. 4.7 kg P. This is slightly lower than the official standard values used in environmental accounts (26 kg N and 5.7 kg P, respectively). This is primarily due to the fact that in the above calculation gestation feed is used, which has a lower content of protein and phosphorus than what is used in the national average.

7.5. Feeding

Gestating sows are fed restricted with grain-based gestation diets to obtain an appropriate body condition and to prevent reproductive problems. With restricted feeding, in this period sows

are given 30-50% of their ad lib feed intake depending on their body condition. PRC recommends the below feed units for feeding of gestating sows based on their body condition score at the time of service (see Table 2.17).

Table 2.17. Feed curves for gestating sows based on the body condition of the sow

Feed curves	Fat sow	Medium sow	Thin sow	Gilt
FUsow day 0-28	2.5	3.0	4.0	2.7
FUsow day 29-84	2.0	2.5	3.7	3.0
FUsow day 85-114	3.5	3.5	4.0	3.3
FUsow day 144-farrowing	2.5	2.5	2.5	2.0
Winter regulation, FUsow	0.2	0.3	0.4	0.3

Group-housed gestating sows are fed according to one of three principles:

- **Electronic sow feeding** (ESF): The sow is isolated while feeding and the amount of feed supplied for each individual sow is managed by a computer.
- **One feeding stall per sow**: The sow is isolated while feeding, but all sows in the group are given the same amount of feed. Extra feed for thin sows must be supplied manually.
- **Floor feeding/long trough**: The entire feed ration for all sows in the pen is supplied on the floor or in long troughs (liquid feeding). It is then up to each sow to get its ration, and it is not possible to supply extra feed to individual sows unless they are taken out of the pen.

Sows are normally fed once a day and are given straw and rooting and enrichment material in the lying area. It is recommended to use diets containing extra fibre (for instance beet pellets) in housing systems with competitive feeding systems.

The feed intake of **lactating sows** must meet their need for nutrients for production of milk. It is difficult to make sows eat enough to prevent a weight loss. It is possible to minimise the problem by increasing the energy content of the feed or by using liquid feed or dry feed with pre-watering in stead of regular dry feeding. Generally, however, a low feed intake during lactation is often attributed to the feeding strategy or the sows' body condition at farrowing.

Under the right conditions, it is in fact possible for lactating sows to eat enough feed for them to gain weight, but, from an economic point of view, weight gain in lactating sows is not beneficial.

The optimum feed dose (FUsow/day) is when the amount of feed increases with the sows' milk performance, ie. a feed dose of 2.0 FUsow/day at farrowing increasing to 5 FUsow by the end of the first week of lactation. After that, the sows should be fed approx. ad lib, but it is extremely important that the sows are able to keep up when the feed dose is increased. The aim is for the sows to have an intake of approx. 180 FUsow in a 4-week lactation period.

Sows' feed intake during lactation is affected by a number of factors:

- **Body condition:** Fat sows eat less than normal sows.
- **Age:** Young sows require extra feed for development, while large sows require extra energy for maintenance.
- **Diet formulation:** Daily feed intake may drop if the feed changes taste or significant ingredients are replaced by new ones.
- **Segregation:** The composition of the feed given to the individual sow may vary greatly. Variations are primarily seen in content of minerals and protein.
- **Feeding technique:** Feed intake increases when more sows share liquid feed trough.
- **Water:** Inadequate amounts of water reduce sows' feed intake (see description of water supply).
- **Housing temperature:** The optimum temperature for sows is 18 °C. Feed intake drops under temperatures higher than this as feed intake is adversely affected by temperature.
- **Gastric health:** A high frequency of gastric ulcers affect feed intake negatively.

Feeding principles

Generally use the same feeding principle – liquid/dry – throughout the entire production cycle, as the volume of the feed differs significantly between the two principles, and it will take the sows longer to adjust from one principle to another.

Dry feed

Approximately 50-60% of all sows are fed dry feed, and the rest liquid feed. Dry feed can be used in all production systems and can easily be supplied manually because of limited and homogenous amounts. It is easy and simple to adjust the feed dose; this can be done manually by the herd manager. The only exception is ESF systems.

Liquid feed

Gestating sows can be given liquid feed in long troughs or in ESF stations. With long troughs, there should be no more than 4-6 sows per feed valve. In long troughs, it is not possible to supply feed individually unless extra dry feed is supplied manually. In ESF stations it is possible to supply liquid feed individually. The amount fed is managed by a liquid feed computer, and this makes it tricky to adjust the feed dose beyond what is entered in feed curves. Diets with a large content of soluble fibre, for instance more than 20% beet pellets, cannot be used in liquid feed without the addition of extra liquid.

It is important to pay attention to hygiene as the feed may make a mess in the pen if too much feed is filled in the trough or if the feed is pumped too fast into the trough and a sow plays with the feed. Immediately post-farrowing, when the sow is given only a small feed dose, feeding may be very inaccurate, and it is therefore recommended to check the feeding accuracy.

Texture of the feed

Approximately 40-50% of all sows are given pelleted feed and the rest are fed meal feed either mixed on-farm or as supplementary diet mixed with own-grown grain. This shows that a very large part of all sows is given pelleted feed that is proven to cause gatric problems (ulcers). Research has not documented any differences in production between meal and pelleted feed, but nevertheless many feedstuff producers deliver the feed in pellets mixed with structurally treated grain before pelleting or as pellets mixed with ground grain after pelleting. This is done to benefit the gastric health of the sows.

Axelborg, 1503 Kbh V. Tlf 33 68 30 00

Weaning diet

Complete diet for weaners
Weaning diet for pigs from 6.5 kg

FUgp per 100 kg	120 FUgp
Crude protein	20.5 %
Crude fat	6.2 %
Fibre	2.0 %
Crude ash	5.0 %
Lysine	14.3 g/kg
Methionine	4.4 g/kg
Phosphorus	6.5 g/kg

Wheat, “specifically cultivated”	55.16 %
Barley	10.00 %
230) AGB Soya	6.09 %
230) Soya bean, extracted, dehul., toa.	6.00 %
Dried whey, partially desugared	6.00 %
Fish meal (LT)	5.00 %
Potato protein concentrate	3.50 %
Coconut oil	2.74 %
130) Acid One Liq.	1.24 %
Mono calcium phosphate	0.99 %
Calcium formate	0.70 %
235) Vitalys Dry	0.63 %
Sugar beet molasses	0.50 %
401/165) Grisevit 198	0.40 %
Salt	0.22 %
Vitamin E mixed in wheat tailings	0.16 %
Calcium carbonate (chalk)	0.16 %
Threonine 98	0.12 %
Porzyme 8300, E1626	0.10 %
DL–Methionine	0.09 %
101) Valine 40%	0.09 %
L–Tryptophan 40%,wheat tailings 60%	0.07 %
Phytase enzyme, E4a6	0.03 %
Flavour additives and aromatic compounds	0.01 %

Additives, added per kg:

	Nutrient-wise:
150.00 mg	Cu (E4, copper sulphate)
110.00 mg	Zn (E6, zinc oxide)
200.00 mg	Fe (E1, iron sulphate)
0.30 mg	I (E2, calcium iodate)
50.00 mg	Mn (E5, manganese oxide)
0.30 mg	Se (E8, sodium selenite)
12000 I.E.	Vitamin A, E672
200.00 mg	Alpha–tocopherol (E–vitamin)
2.40 mg	Vitamin B1
0.02 mg	Vitamin B12
10.00 mg	Vitamin B2
7.20 mg	Vitamin B6
0.24 mg	Biotine
28.00 mg	D–Pantothenic acid
1200 I.E.	Vitamin D3, E671
4.80 mg	Vitamin K3
24.00 mg	Niacine
3.2 g	L–Lysine sulphate and by-prod. of this
0.9 g	DL–Methionine, technically pure
1.2 g	L–Threonine, technically pure
0.3 g	L–Tryptophan, technically pure
0.4 g	L–Valine, 98% technically pure
	Zootechnical:
1500 units	6–phytase EC3.1.3.26
1000000	Toyocerin (CFU/gram) (se 165/207)
5000 units	Endo–1,4–Beta–Xylanase, EC3.2.1.8
500 units	Subtilisin(protease), EC3.4.21.62

This feed must not be used for pigs older than 12 wks.

Contains fish meal – must not be used as feed for ruminants.

101) Made from Escherichia Coli (K–12 AG314) Ferm ABP–10–640, mixed in wheat tailings

130) Preservative based on formic and lactic acid.

165)Toyocerin: Product of *Bacillus Cereus* var. *toyoi* NCIMB 40112/ CNCM 11012 EC no. E1701 (4b1701). Contains min. 1*10(10) CFU/G additive.

230) Made from genetically modified soya beans

235) Made from fermenting with Corynebacterium Glutamicum

401) Grisevit 198/199/200 add to the diet the vitamins and micro minerals listed in the guarantee.

Phosphorus requirements of the diets are calculated on the basis of 100% phytase.

Directions for use:	per kg	per FUgp
Feed unit	1.20	
Kg feed		0.83
Std. dig. crude protein, g	180.7	150.6
Calcium g/kg	7.9	6.6
Sodium g/kg	2.2	1.8
Std. dig. lysine, g	12.9	10.8
Std. dig. methionine, g	4.1	3.4
Std. dig. meth./cystine, g	6.9	5.8
Std. dig. theonine, g	7.9	6.6
Std. dig. tryptophan, g	2.5	2.1
Std. dig. isoleucine, g	7.3	6.1
Std. dig. leucine, g	13.2	11.0
Std. dig. histidine, g	4.0	3.3
Std. dig. phenylalanine, g	8.3	6.9
Std. dig. tyrosine, g	6,5	5.4
Std. dig. valine, g	8.7	7.2
Dig. P, g, phytase 100%	4.0	3.3

Data sheet is not used as delivery note upon delivery of the diet

Axelborg, 1503 Kbh V. Tel. 33 68 30 00

Weaners 9-20 kg

Complete diet for weaners
For pigs from 10 kg

FUgp per 100 kg	113 FUgp
I–Factor	92.2 %
Crude protein	20.0 %
Crude fat	5.1 %
Fibre	2.7 %
Crude ash	5.7 %
Lysine	13.3 g/kg
Methionine	4.2 g/kg
Phosphorus	6.0 g/kg

Wheat	45.83 %
230) Soya bean,extracted, dehul., toa.	20.00 %
Barley	18.00 %
230) AGB Soya	6.00 %
Palm fat	3.00 %
Salmon protein concentrate	2.00 %
Mono calcium phosphate	1.09 %
Calcium carbonate (chalk)	0.88 %
Calcium formate	0.80 %
235) Vitalys Dry	0.61 %
Sugar beet molasses	0.50 %
Salt	0.46 %
405) Grisevit 172	0.30 %
DL–Methionine	0.13 %
Threonine 98	0.13 %
101) Valine 40%	0.13 %
Porzyme 8300, E1626	0.10 %
Phytase enzyme, E4a6	0.03 %
Flavour additives and aromatic compunds	0.01 %

Additives, added per kg:

	Nutrient-wise:
150.00 mg	Cu (E4, copper sulphate)
110.00 mg	Zn (E6, zinc oxide)
180.75 mg	Fe (E1, iron sulphate)
0.23 mg	I (E2, calcium iodate)
45.20 mg	Mn (E5, manganese oxide)
0.30 mg	Se (E8, sodium selenite)
5649 I.E.	Vitamin A, E672
150.00 mg	Alpha–tocopherol (E–vitamin)
2.26 mg	Vitamin B1
0.02 mg	Vitamin B12
4.52 mg	Vitamin B2
3.39 mg	Vitamin B6
0.23 mg	Biotine
11.30 mg	D–Pantothenic acid
565 I.E.	Vitamin D3, E671
4.52 mg	Vitamin K3
22.60 mg	Niacine
3.1 g	L–Lysine sulphate and by-prod. of this
1.3 g	DL–Methionine, technically pure
1.3 g	L–Threonine, technically pure
0.5 g	L–Valine, 98% technically pure
	Zootechnical:
1500 units	6–phytase EC3.1.3.26
5000 units	Endo–1,4–Beta–Xylanase, EC3.2.1.8
500 units	Subtilisin(protease), EC3.4.21.62

This feed must not be used for pigs older than 12 wks.

Contains fish meal – must not be used as feed for ruminants.

101) Made from Escherichia Coli (K–12 AG314) Ferm ABP–10–640, mixed in wheat tailings

230) Made from genetically modified soya beans

235) Made from fermenting with Corynebacterium Glutamicum

405) Grisevit 172 adds to the diet the vitamins and micro minerals listed in the guarantee.

Phosphorus requirements of the diets are calculated on the basis of 100% phytase.

Directions for use:	per kg	per FUgp
Feed unit	1.13	
Kg feed		0.89
Std. dig. crude protein, g	176.5	156.5
Calcium g/kg	9.2	8.2
Sodium g/kg	2.0	1.8
Std. dig. lysine, g	12.1	10.7
Std. dig. methionine, g	3.9	3.4
Std. dig. meth./cystine, g	6.8	6.0
Std. dig. threonine, g	7.4	6.6
Std. dig. tryptophan, g	2.3	2.0
Std. dig. valine, g	8.1	7.2
Dig. P, g, phytase 100%	3.6	3.1

Data sheet is not used as delivery note upon delivery of the diet

Axelborg, 1503 Kbh V. Tel. 33 68 30 00

Weaners 9-20: Low-protein

Complete diet for weaners
For pigs from 10 kg

FUgp per 100 kg	113 FUgp
I–Factor	93.1 %
Crude protein	18.6 %
Crude fat	4.5 %
Fibre	2.5 %
Crude ash	5.4 %
Lysine	12.4 g/kg
Methionine	3.9 g/kg
Phosphorus	6.0 g/kg

Wheat	54.92 %
230) Soya bean, extracted, dehul., toa.	16.00 %
Barley	15.00 %
230) AGB Soya	4.00 %
Palm fat	2.50 %
2)Daka Haemoglobin meal	1.38 %
Mono calcium phosphate	1.23 %
Salmon protein concentrate	1.00 %
Calcium formate	0.80 %
Calcium carbonate (chalk)	0.79 %
235) Vitalys Dry	0.59 %
Sugar beet molasses	0.50 %
Salt	0.48 %
401/165) Grisevit 199	0.40 %
Threonine 98	0.14 %
DL–Methionine	0.13 %
Porzyme 8300, E1626	0.10 %
Phytase enzyme, E4a6	0.03 %
L–Tryptophan 40%,wheat tailings 60%	0.01 %

Additives, added per kg:

	Nutrient-wise:
150.00 mg	Cu (E4, copper sulphate)
110.00 mg	Zn (E6, zinc oxide)
192.00 mg	Fe (E1, iron sulphate)
0.29 mg	I (E2, calcium iodate)
48.00 mg	Mn (E5, manganese oxide)
0.30 mg	Se (E8, sodium selenite)
11500 I.E.	Vitamin A, E672
150.00 mg	Alpha–tocopherol (E–vitamin)
2.30 mg	Vitamin B1
0.02 mg	Vitamin B12
9.60 mg	Vitamin B2
6.90 mg	Vitamin B6
0.23 mg	Biotine
26.80 mg	D–Pantothenic acid
1150 I.E.	Vitamin D3, E671
4.60 mg	Vitamin K3
23.00 mg	Niacine
3.0 g	L–Lysine sulphate and by-prod. of this
1.3 g	DL–Methionine, technically pure
1.4 g	L–Threonine, technically pure
	Zootechnical:
1500 units	6–phytase EC3.1.3.26
1000000	Toyocerin (CFU/gram) (se 165/207)
5000 units	Endo–1,4–Beta–Xylanase, EC3.2.1.8
500 units	Subtilisin(protease), EC3.4.21.62

2) Contains blood products – must not be given to ruminants

This feed must not be used for pigs older than 12 wks.

Contains fish meal – must not be used as feed for ruminants.

165)Toyocerin:Product of *Bacillus Cereus* var. *toyoi* NCIMB 40112/ CNCM 11012 EC no. E1701 (4b1701). Contains min. 1*10(10) CFU/G additive.

230) Made from genetically modified soya beans

235) Made from fermenting with Corynebacterium Glutamicum

401) Grisevit 198/199/200 add to the diet the vitamins and micro minerals listed in the guarantee.

Directions for use:	per kg	per FUgp
Feed unit	1.13	
Kg feed		0.89
Std. dig. crude protein, g	163.0	144.2
Calcium g/kg	9.1	8.1
Sodium g/kg	2.1	1.9
Std. dig. lysine, g	11.3	10.0
Std. dig. methionine, g	3.6	3.2
Std. dig. meth./cystine, g	6.3	5.5
Std. dig. threonine, g	6.8	6.0
Std. dig. tryptophan, g	2.2	1.9
Std. dig. valine, g	7.4	6.6
Dig. P, g, phytase 100%	3.6	3.2

Phosphorus requirements of the diet are calculated on the basis of 100% phytase.

Data sheet is not used as delivery note upon delivery of the diet

Axelborg, 1503 Kbh V. Tel. 33 68 30 00

Wea 9-30 Classic AU

Complete diet for weaners

FUgp per 100 kg	110 FUgp
I–Factor	92.1 %
Crude protein	19.7 %
Crude fat	3.9 %
Fibre	2.7 %
Crude ash	5.6 %
Lysine	12.6 g/kg
Methionine	3.9 g/kg
Phosphorus	5.8 g/kg

Wheat	42.26 %
Barley	25.00 %
230) Soya bean, extracted, dehul., toa.	21.00 %
230) AGB Soya	5.00 %
Palm fat	1.80 %
Calcium carbonate (chalk)	1.13 %
Mono calcium phosphate	1.00 %
235) Vitalys Dry	0.58 %
Calcium formate	0.50 %
Sugar beet molasses	0.50 %
Salt	0.47 %
405) Grisevit 172	0.30 %
DL–Methionine	0.12 %
Threonine 98	0.11 %
Porzyme 8300, E1626	0.10 %
101) Valine 40%	0.10 %
Phytase enzyme, E4a6	0.03 %

Additives, added per kg:

	Nutrient-wise:
150.00 mg	Cu (E4, copper sulphate)
110.00 mg	Zn (E6, zinc oxide)
180.75 mg	Fe (E1, iron sulphate)
0.23 mg	I (E2, calcium iodate)
45.20 mg	Mn (E5, manganese oxide)
0.30 mg	Se (E8, sodium selenite)
5649 I.E.	Vitamin A, E672
150.00 mg	Alpha–tocopherol (E–vitamin)
2.26 mg	Vitamin B1
0.02 mg	Vitamin B12
4.52 mg	Vitamin B2
3.39 mg	Vitamin B6
0.23 mg	Biotine
11.30 mg	D–Pantothenic acid
565 I.E.	Vitamin D3, E671
4.52 mg	Vitamin K3
22.60 mg	Niacine
3.0 g	L–Lysine sulphate and by-prod. of this
1.2 g	DL–Methionine, technically pure
1.1 g	L–Threonine, technically pure
0.4 g	L–Valine, 98% technically pure
	Zootechnical:
1500 units	6–phytase EC3.1.3.26
5000 units	Endo–1,4–Beta–Xylanase, EC3.2.1.8
500 units	Subtilisin(protease), EC3.4.21.62

This feed must not be used for pigs older than 12 wks.

101) Made from Escherichia Coli (K–12 AG314) Ferm ABP–10–640, mixed in wheat tailings

230) Made from genetically modified soya beans

235) Made from fermenting with Corynebacterium Glutamicum

405) Grisevit 172 adds to the diet the vitamins and micro minerals listed in the guarantee.

Phosphorus requirements of the diets are calculated on the basis of 100% phytase.

Directions for use:	per kg	per FUgp
Feed unit	1.10	
Kg feed		0.91
Std. dig. crude protein, g	172.6	157.0
Calcium g/kg	8.8	8.0
Sodium g/kg	2.0	1.8
Std. dig. lysine, g	11.4	10.4
Std. dig. methionine, g	3.6	3.3
Std. dig. meth./cystine, g	6.5	5.9
Std. dig. threonine, g	6.9	6.3
Std. dig. tryptophan, g	2.3	2.1
Std. dig. valine, g	7.7	7.0
Dig. P, g, phytase 100%	3.4	3.1

Data sheet is not used as delivery note upon delivery of the diet

Axelborg, 1503 Kbh V. Tel. 33 68 30 00

Pig Unity

Complete diet for finishers

Low-protein – meets amino acid standards

FUgp per 100 kg	104 FUgp
I–Factor	91.7 %
Crude protein	15.4 %
Crude fat	3.7 %
Fibre	4.5 %
Crude ash	4.7 %
Lysine	8.9 g/kg
Methionine	2.7 g/kg
Phosphorus	5.1 g/kg

Barley	40.00 %
Wheat, cut	20.00 %
Rape seed, extracted, double-low	12.00 %
Wheat	11.76 %
230) Soya bean, extracted, dehul., toa.	5.00 %
Sunflower seed, extracted, partly dehulled	3.00 %
Sugar beet molasses	2.00 %
Wheat bran	1.90 %
Palm fat	1.30 %
Calcium carbonate (chalk)	1.19 %
Mono calcium phosphate	0.48 %
235) Vitalys Dry	0.48 %
Salt	0.43 %
404) Svinevit 425	0.20 %
Triticale	0.10 %
Threonine 98	0.08 %
Xylanase enzyme, E1628	0.04 %
Phytase enzyme, E4a6	0.03 %
DL–Methionine	0.01 %

Additives, added per kg:

	Nutrient-wise:
15.00 mg	Cu (E4, copper sulphate)
110.00 mg	Zn (E6, zinc oxide)
88.00 mg	Fe (E1, iron sulphate)
0.23 mg	I (E2, calcium iodate)
44.00 mg	Mn (E5, manganese oxide)
0.40 mg	Se (E8, sodium selenite)
5000 I.E.	Vitamin A, E672
60.00 mg	Alpha–tocopherol (E–vitamin)
2.20 mg	Vitamin B1
0.02 mg	Vitamin B12
2.20 mg	Vitamin B2
3.30 mg	Vitamin B6
0.06 mg	Biotine
11,00 mg	D–Pantothenic acid
1200 I.E.	Vitamin D3, E671
4.40 mg	Vitamin K3
22.00 mg	Niacine
2.5 g	L–Lysine sulphate and by-prod. of this
0.1 g	DL–Methionine, technically pure
0.8 g	L–Threonine, technically pure
	Zootechnical:
1500 units	6–phytase EC3.1.3.26
3200 units	Endo–1,4–Beta–Xylanase, EC3.2.1.8

230) Made from genetically modified soya beans

235) Made from fermenting with Corynebacterium Glutamicum

404) Svinevit 425/429/434 add to the diet the vitamins and micro minerals listed in the guarantee

Directions for use:	per kg	per FUgp
Feed unit	1.04	
Kg feed		0.96
Std. dig. crude protein, g	124.9	120.1
Calcium g/kg	7.0	6.7
Sodium g/kg	2.0	1.9
Std. dig. lysine, g	7.7	7.4
Std. dig. methionine, g	2.4	2.3
Std. dig. meth./cystine, g	5.1	4.9
Std. dig. threonine, g	5.1	4,9
Std. dig. tryptophan, g	1.6	1.5
Ford. P, g, phytase 100%	2.6	2.5

Phosphorus requirements of the diets are calculated on the basis of 100% phytase.

Data sheet is not used as delivery note upon delivery of the diet

Axelborg, 1503 Kbh V. Tel. 33 68 30 00

Finishers 30-100 kg with 200% phytase

Complete diet for finishers

FUgp per 100 kg	104 FUgp
I–Factor	91.7 %
Crude protein	15.9 %
Crude fat	3.7 %
Fibre	4.6 %
Crude ash	4.7 %
Lysine	8.9 g/kg
Methionine	2.7 g/kg
Phosphorus	4.7 g/kg

Wheat	43.13 %
Barley	25.00 %
Rape seed, extracted, double-low	10.00 %
230) Soya bean, extracted, dehul., toa.	6.20 %
Sunflower seed, extracted, partly dehulled	5.00 %
Wheat bran	4.60 %
Sugar beet molasses	2.00 %
Palm fat	1.30 %
Calcium carbonate (chalk)	1.26 %
Salt	0.44 %
235) Vitalys Dry	0.43 %
Mono calcium phosphate	0.28 %
404) Svinevit 429	0.20 %
Threonine 98	0.06 %
Phytase enzyme, E4a6	0.06 %
Xylanase enzyme, E1628	0.04 %

Additives, added per kg:

	Nutrient-wise:
10.00 mg	Cu (E4, copper sulphate)
105.00 mg	Zn (E6, zinc oxide)
84.00 mg	Fe (E1, iron sulphate)
0.21 mg	I (E2, calcium iodate)
42.00 mg	Mn (E5, manganese oxide)
0.35 mg	Se (E8, sodium selenite)
4200 I.E.	Vitamin A, E672
40.00 mg	Alpha–tocopherol (E–vitamin)
2.10 mg	Vitamin B1
0.02 mg	Vitamin B12
2.10 mg	Vitamin B2
3.15 mg	Vitamin B6
0.05 mg	Biotine
10.50 mg	D–Pantothenic acid
420 I.E.	Vitamin D3, E671
4.20 mg	Vitamin K3
21.00 mg	Niacine
2.2 g	L–Lysine sulphate and by-prod. of this
0.6 g	L–Threonine, technically pure
	Zootechnical:
3000 units	6–phytase EC3.1.3.26
3200 units	Endo–1,4–Beta–Xylanase, EC3.2.1.8

230) Made from genetically modified soya beans

235) Made from fermenting with Corynebacterium Glutamicum

404) Svinevit 425/429/434 add to the diet the vitamins and micro minerals listed in the guarantee

Phosphorus requirements of the diets are calculated on the basis of 200% phytase.

Directions for use:	per kg	per FUgp
Feed unit	1.04	
Kg feed		0.96
Std. dig. crude protein, g	130.1	125.1
Calcium g/kg	7.0	6.7
Sodium g/kg	2.1	2.0
Std. dig. lysine, g	7.7	7.4
Std. dig. methionine, g	2.4	2.3
Std. dig. meth./cystine, g	5.1	4.9
Std. dig. threonine, g	5.1	4.9
Std. dig. tryptophan, g	1.7	1.6
Dig. P, g, phytase 200%	2.6	2.5

Data sheet is not used as delivery note upon delivery of the diet

Axelborg, 1503 Kbh V. Tel. 33 68 30 00

Organic Finishers

Complete diet for organic finishers

FUgp per 100 kg	104 FUgp
Crude protein	17.2 %
Crude fat	3.1 %
Fibre	3.9 %
Crude ash	4.9 %
Lysine	8.9 g/kg
Methionine	2.7 g/kg
Phosphorus	5.3 g/kg

Barley Organic	24.35 %
Triticale Organic	20.00 %
Wheat Organic	15.00 %
Soybean cake toa. organic	13.18 %
Pea Organic	10.00 %
Oats Organic	5.03 %
Rye Organic	5.00 %
Potato protein concentrate	2.56 %
Calcium carbonate (chalk)	1.42 %
Rape see cake	1.00 %
131)Natur Acid	1.00 %
Mono calcium phosphate	0.69 %
Rock salt	0.47 %
33)Natur Svine Vit	0.20 %
Magnesium oxide, Norwegian	0.10 %

Additives, added per kg:

	Nutrient-wise:
15.00 mg	Cu (E4, copper sulphate)
110.00 mg	Zn (E6, zinc oxide)
84.00 mg	Fe (E1, iron sulphate)
0.23 mg	I (E2, calcium iodate)
42.00 mg	Mn (E5, manganese oxide)
0.35 mg	Se (E8, sodium selenite)
5000 I.E.	Vitamin A, E672
60.00 mg	Alpha–tocopherol (E–vitamin)
2.20 mg	Vitamin B1
0.02 mg	Vitamin B12
2.20 mg	Vitamin B2
3.30 mg	Vitamin B6
0.06 mg	Biotine
11.00 mg	D–Pantothenic aic
600 I.E.	Vitamin D3, E671
4.40 mg	Vitamin K3
22.00 mg	Niacine

33)Svinevit adds to the diet the amounts of additives mixed in calcium carbonate as listed in the guarantee.

131) Preservative based in formic and lactic acid mixed on E562

Directions for use:	per kg	per FUgp
Feed unit	1.04	
Kg feed		0.96
Std. dig. crude protein, g	145.5	139.9
Calcium g/kg	7.3	7.0
sodium g/kg	1.9	1.8
Std. dig. lysine, g	7.5	7.2
Std. dig. methionine, g	2.3	2.2
Std. dig. meth./cystine, g	5.0	4.8
Std. dig. threonine, g	5.4	5.2
Std. dig. tryptophan, g	1.7	1.7
Dig. P, g, phytase 0%	2.3	2.2

Data sheet is not used as delivery note upon delivery of the diet

Axelborg, 1503 Kbh V. Tel. 33 68 30 00

Sow Unity U

Complete diet for breeding stock

FUsow per 100 kg	106 FUsow
I–Factor	92.8 %
Crude protein	14.2 %
Crude fat	3.5 %
Fibre	3.9 %
Crude ash	4.7 %
Lysine	7.4 g/kg
Methionine	2.4 g/kg
Phosphorus	5.4 g/kg

Wheat	33.53 %
Barley	25.00 %
Wheat, cut	20.00 %
Rape seed, extracted, double-low	8.00 %
Sunflower seed, extracted, partly dehulled	4.10 %
230) Soya bean, extracted, dehul., toa.	4.10 %
Palm fat	1.30 %
Calcium carbonate (chalk)	1.24 %
Mono calcium phosphate	0.77 %
Sugar beet molasses	0.50 %
Salt	0.45 %
Vitamin E mixed in wheat tailings	0.39 %
235) Vitalys Dry	0.36 %
403) Sovit 231	0.20 %
Threonine 98	0.03 %
Phytase enzyme, E4a6	0.03 %

Additives, added per kg:

	Nutrient-wise:
15.00 mg	Cu (E4, copper sulphate)
110.00 mg	Zn (E6, zinc oxide)
84.00 mg	Fe (E1, iron sulphate)
0.21 mg	I (E2, calcium iodate)
42.00 mg	Mn (E5, manganese oxide)
0.40 mg	Se (E8, sodium selenite)
8400 I.E.	Vitamin A, E672
160.00 mg	Alpha–tocopherol (E–vitamin)
2.10 mg	Vitamin B1
0.02 mg	Vitamin B12
5.25 mg	Vitamin B2
3.15 mg	Vitamin B6
0.21 mg	Biotine
15.00 mg	D–Pantothenic acid
840 I.E.	Vitamin D3, E671
1.58 mg	Folic acid
2.10 mg	Vitamin K3
21.00 mg	Niacine
1.8 g	L–Lysine sulphate and by-prod. of this
0.3 g	L–Threonine, technically pure
	Zootechnical:
1500 units	6–phytase EC3.1.3.26

230) Made from genetically modified soya beans

235) Made from fermenting with Corynebacterium Glutamicum

403) Sovit 230/231 add to the diet the vitamins and micro minerals listed in the guarantee.

Phosphorus requirements of the diets are calculated on the basis of 100% phytase.

Directions for use:	per kg	per FUsow
Feed unit	1.06	
Kg feed		0.94
Std. dig. crude protein, g	116.7	110.0
Calcium g/kg	8.0	7.5
Sodium g/kg	1.9	1.8
Std. dig. lysine, g	6.4	6.0
Std. dig. methionine, g	2.1	2.0
Std. dig. meth./cystine, g	4.6	4.3
Std. dig. threonine, g	4.2	3.9
Std. dig. tryptophan, g	1.5	1.4
Dig. P, g, phytase 100%	2.9	2.7

Data sheet is not used as delivery note upon delivery of the diet

Axelborg, 1503 Kbh V. Tel. 33 68 30 00

Sow gestating U-High fibre

Complete diet for breeding stock
Gestation diet

FUsow per 100 kg	97 FUsow
I–Factor	86.1 %
Crude protein	12.1 %
Crude fat	3.7 %
Fibre	5.9 %
Crude ash	4.7 %
Lysine	6.2 g/kg
Methionine	2.3 g/kg
Phosphorus	4.0 g/kg

Barley	55.77 %
Sugar beet waste, dried	12.00 %
Oats	8.00 %
230) Soya bean, extracted, dehul., toa.	6.60 %
Wheat bran	6.00 %
Wheat	5.00 %
Sugar beet molasses	3.00 %
Palm fat	1.30 %
Calcium carbonate (chalk)	0.81 %
Mono calcium phosphate	0.51 %
Salt	0.40 %
403) Sovit 231	0.20 %
235) Vitalys Dry	0.18 %
Vitamin E mixed in wheat tailings	0.15 %
DL–Methionine	0.05 %
Phytase enzyme, E4a6	0.03 %

Additives, added per kg:

	Nutrient-wise:
15.00 mg	Cu (E4, copper sulphate)
110.00 mg	Zn (E6, zinc oxide)
84.00 mg	Fe (E1, iron sulphate)
0.21 mg	I (E2, calcium iodate)
42.00 mg	Mn (E5, manganese oxide)
0.40 mg	Se (E8, sodium selenite)
8400 I.E.	Vitamin A, E672
100.00 mg	Alpha–tocopherol (E–vitamin)
2.10 mg	Vitamin B1
0.02 mg	Vitamin B12
5.25 mg	Vitamin B2
3.15 mg	Vitamin B6
0.21 mg	Biotine
15.00 mg	D–Pantothenic acid
840 I.E.	Vitamin D3, E671
1.58 mg	Folic acid
2.10 mg	Vitamin K3
21.00 mg	Niacine
0.9 g	L–Lysine sulphate and by-prod. of this
0.5 g	DL–Methionine, technically pure
	Zootechnical:
1500 units	6–phytase EC3.1.3.26

Phosphorus requirements of the diets are calculated on the basis of 100% phytase.

230) Made from genetically modified soya beans

235) Made from fermenting with Corynebacterium Glutamicum

403) Sovit 230/231 adds to the diet the vitamins and micro minerals listed in the guarantee.

Directions for use:	per kg	per FUsow
Feed unit	0.97	
Kg feed		1.03
Std. dig. crude protein, g	92.8	95.3
Calcium g/kg	6.5	6.7
Sodium g/kg	2.0	2.1
Std. dig. lysine, g	5.0	5.1
Std. dig. methionine, g	2.1	2.1
Std. dig. meth./cystine, g	3.9	4.0
Std. dig. threonine, g	3.1	3.1
Std. dig. tryptophan, g	1.2	1.2
Dig. P, g, phytase 100%	2.1	2.2

Data sheet is not used as delivery note upon delivery of the diet

Axelborg, 1503 Kbh V. Tel. 33 68 30 00

Sow Gestation U

Complete diet for breeding stock
Gestation diet

FUsow per 100 kg	102 FUsow
I–Factor	92.5 %
Crude protein	12.0 %
Crude fat	3.9 %
Fibre	4.4 %
Crude ash	4.3 %
Lysine	5.2 g/kg
Methionine	2.0 g/kg
Phosphorus	4.2 g/kg

Barley	37.36 %
Wheat, cut	20.00 %
Wheat bran	15.00 %
Wheat	14.30 %
Rape seed, extracted, double-low	7.70 %
Sugar beet molasses	2.00 %
Calcium carbonate (chalk)	1.41 %
Palm fat	1.30 %
Salt	0.40 %
403) Sovit 231	0.20 %
Mono calcium phosphate	0.18 %
235) Vitalys Dry	0.12 %
Phytase enzyme, E4a6	0.03 %

Additives, added per kg:

	Nutrient-wise:
15.00 mg	Cu (E4, copper sulphate)
110.00 mg	Zn (E6, zinc oxide)
84.00 mg	Fe (E1, iron sulphate)
0.21 mg	I (E2, calcium iodate)
42.00 mg	Mn (E5, manganese oxide)
0.40 mg	Se (E8, sodium selenite)
8400 I.E.	Vitamin A, E672
65.00 mg	Alpha–tocopherol (E–vitamin)
2.10 mg	Vitamin B1
0.02 mg	Vitamin B12
5.25 mg	Vitamin B2
3.15 mg	Vitamin B6
0.21 mg	Biotine
15.00 mg	D–Pantothenic acid
840 I.E.	Vitamin D3, E671
1.58 mg	Folic acid
2.10 mg	Vitamin K3
21.00 mg	Niacine
0.6 g	L–Lysine sulphate and by-prod. of this
	Zootechnical:
1500 units	6–phytase EC3.1.3.26

235) Made from fermenting with Corynebacterium Glutamicum

403) Sovit 230/231 add to the diet the vitamins and micro minerals listed in the guarantee.

Phosphorus requirements of the diets are calculated on the basis of 100% phytase.

Directions for use:	per kg	per FUsow
Feed unit	1.02	
Kg feed		0.98
Std. dig. crude protein, g	92.3	90.5
Calcium g/kg	6.9	6.8
Sodium g/kg	2.0	2.0
Std. dig. lysine, g	4.1	4.0
Std. dig. methionine, g	1.7	1..7
Std. dig. meth./cystine, g	3.9	3.8
Std. dig. threonine, g	3.1	3.0
Std. dig. tryptophan, g	1,2	1.2
Dig. P, g, phytase 100%	2.0	2,0

Data sheet is not used as delivery note upon delivery of the diet