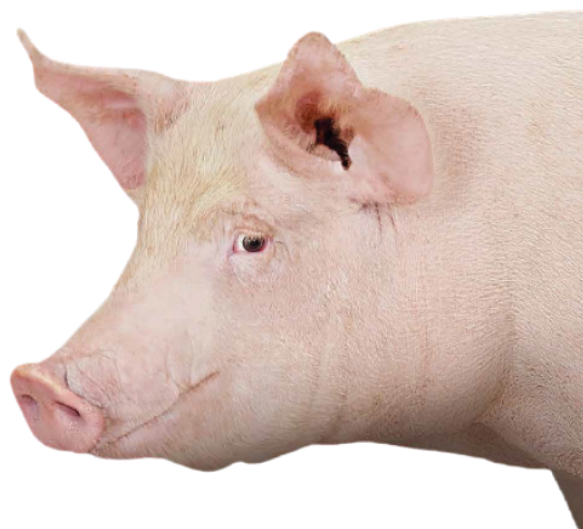


Due to the complex nature of introducing gilts to each individual sow farm, the developing gilt is often underappreciated in most farms today. This is due to the various weights that gilts are moved from the developing unit into the sow farm which makes evaluating individual closeout data very difficult. However, many commercial farms have replacement rates ranging from 30-60%. Due to this replacement rate, gilt litters can represent about a quarter of all litters farrowed. Thus, any improvements in gilt productivity will have an impact on the future productivity of each sow farm. In order to reach the maximum reproductive potential of gilts and longevity in the herd, we need to produce healthy and structurally sound gilts which are at the appropriate age at first mating. Excellent gilt development will also result in a steady supply of gilts eligible to be inseminated which will enable the sow farm to reach weekly breeding targets.

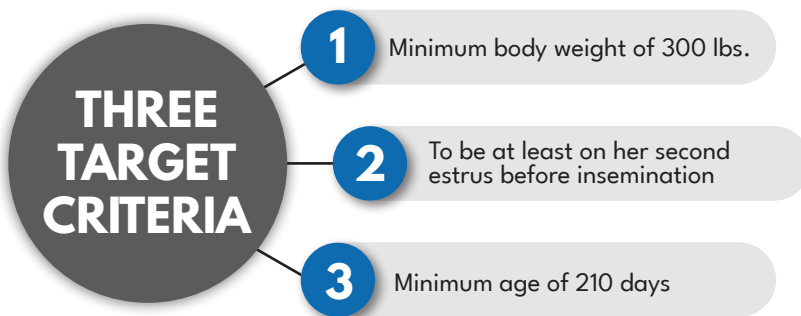
THE PRIMARY FACTORS AFFECTING GILT PRODUCTIVITY ARE:

- ▶ PROPER ACCLIMATION PERIOD
- ▶ AGE & BODY WEIGHT AT FIRST SUCCESSFUL MATING
- ▶ OVULATION RATE AT THE ESTRUS OF MATING
- ▶ FIRST LITTER SIZE
- ▶ SUCCESSFUL REBREED



AGE AND WEIGHT AT MATING

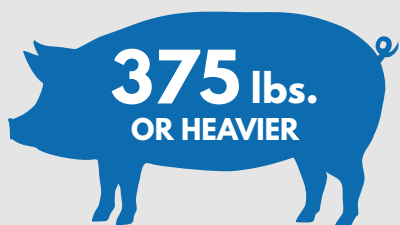
The delayed breeding of gilts to an appropriate weight is one of the most important requirements for high lifetime litter size. Selection of maternal lines, which are highly prolific and exhibit rapid lean growth, has resulted in a later maturing animal with a larger mature size. This makes it necessary to breed gilts at an older age and greater body weight. To reach this goal, **three target criteria** should be in place before any gilt may be inseminated and enter the sow herd (right):



Body weight at breeding is the most important factor for successful gilt management and lifetime productivity and is more important than the animal's age at first breeding. It is best to weigh the animals to make sure they are reaching a minimum target weight, but it can be simulated by using a measuring tape from flank-to-flank for approximate weight. A measurement of 34 inches is equivalent to approximately 300 lbs. of body weight. If a gilt should exhibit first estrus at ≥ 36 weeks, only then should she be inseminated at first observed estrus.

NUTRITION FOR DEVELOPING GILTS

The nutrition program for replacement females should focus on aiding structural development and reproductive maturity. It isn't necessary to design a nutritional program to maximize lean gain in growing gilts because a gilt carrying more body condition at 300 lbs. of body weight is desired. Dietary calcium and phosphorous levels should be higher than normal grow/finish levels to encourage strong bone development. **Suggested diets to maximize performance can be found in Tables 1 through 4.** These will need to be adjusted based on feeding levels, nutritional program goals and ingredient availability. See below for **suggested diets to maximize performance.**



- LIMIT FEEDING AS OVER CONDITIONED ANIMALS PRODUCE LESS COLOSTRUM, RISK OF LACTATION FAILURE AND LOW LIFETIME PRODUCTIVITY



- FED TO CONDITION
- FULL FEED
- INCREASING FIBER LEVELS

From 200 lbs. until breeding, gilts should be fed to condition or on full feed. Increasing fiber levels in the feed allows the gilt to be fed ad libitum and maintain appropriate body condition. There is some research that suggests slowing the growth rate down on gilts can help with structural soundness. Gilts heavier than 375 lbs. body weight at first service tend to be heavy at farrowing with more energy demands for maintenance. Over conditioned animals produce less colostrum and have a higher risk for lactation failure and low lifetime productivity. However, it is still important to reach the correct body weight at breeding within a given system, so your nutritionist will need to balance the diets accordingly to achieve optimum growth patterns. By making sure gilts are in a positive energy balance, the number of animals coming into estrus in a timely manner will improve. Also, a “flushing” effect may be induced which results in gilts ovulating more eggs, thus increasing their potential litter size. If gilts are limit-fed during this period, increasing them to full-feed a minimum of 14 days prior to breeding can induce this same “flushing” effect.

Additional vitamins and trace minerals should be added to the diet at approximately 170 lbs. of body weight. Additional vitamins and trace minerals are recommended because they are associated with reproductive function, immunity and hoof development. See suggested dietary levels in **Tables 1 through 4.**

IMPERIAL MEASURES

TABLE 1. NUTRIENT REQUIREMENTS FOR DEVELOPING DNA GENETICS GILTS^a

	WEIGHT RANGE, LBS.					
	150 - 175	175 - 200	200 - 225	225 - 250	250 - 275	275 - 300
Required SID Lys:Cal Ratio, g/Mcal ME ^b	2.79	2.57	2.38	2.23	2.10	2.02
Required SID Lys:Cal Ratio, g/Mcal NE ^b	3.66	3.37	3.12	2.92	2.77	2.68
Amino Acid Requirements (% of SID Lysine)						
SID Met & Cys:Lysine ratio, %	58	58	58	58	70	70
SID Threonine:Lysine ratio, %	62	62	63	65	70	70
SID Tryptophan:Lysine ratio, %	18	18	18	18	18	18
SID Isoleucine:Lysine ratio, %	55	55	55	55	60	60
SID Valine:Lysine ratio, %	65	65	65	65	70	70
Calcium and Phosphorus Requirements						
Calcium, %	0.60	0.60	0.70	0.70	0.80	0.90
Available Phosphorus, %	0.30	0.30	0.35	0.35	0.40	0.45
STTD Phosphorus, % ^c	0.26	0.26	0.30	0.30	0.34	0.39



^aLevels of nutrients may need to be adjusted based on whether gilts are limit fed or fed ad libitum in the last two diet phases. If feed mill and delivery constraints inhibit the use of a specialize gilt development diet, producers may use the gestation diet from approximately 225 lbs. BW to breeding. Energy values used to establish the Lysine:Calorie ratios were based on NRC (2012) values using a corn-SBM-DDGS ration. Use of other ingredients and estimation models may provide a different Lysine:Calorie estimation.

^bThe SID Lysine:Cal ratio for the developing gilt is adopted from the recommendations of market gilts to encourage maximal growth rate. Producers that have abundant amounts of service eligible gilts and want to regulate growth rate may reduce the SID Lysine:Cal ratio.

^cSTTD = Standard Total Tract Digestible.

► METRIC MEASURES

TABLE 2. NUTRIENT REQUIREMENTS FOR DEVELOPING DNA GENETICS GILTS^a

WEIGHT RANGE, KG.

68 - 79.4	79.4 - 90.7	90.7 - 102	102 - 113.4	113.4 - 124.7	124.7 - 136
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Required SID Lys:Cal Ratio, g/Mcal ME^b

2.79	2.57	2.38	2.23	2.10	2.02
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Required SID Lys:Cal Ratio, g/Mcal NE^b

3.66	3.37	3.12	2.92	2.77	2.68
------	------	------	------	------	------

Amino Acid Requirements (% of SID Lysine)

SID Met & Cys:Lysine ratio, %

58	58	58	58	70	70
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SID Threonine:Lysine ratio, %

62	62	63	65	70	70
----	----	----	----	----	----

SID Tryptophan:Lysine ratio, %

18	18	18	18	18	18
----	----	----	----	----	----

SID Isoleucine:Lysine ratio, %

55	55	55	55	60	60
----	----	----	----	----	----

SID Valine:Lysine ratio, %

65	65	65	65	70	70
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Calcium and Phosphorus Requirements

Calcium, %

0.60	0.60	0.70	0.70	0.80	0.90
------	------	------	------	------	------

Available Phosphorus, %

0.30	0.30	0.35	0.35	0.40	0.45
------	------	------	------	------	------

STTD Phosphorus, %^c

0.26	0.26	0.30	0.30	0.34	0.39
------	------	------	------	------	------



^aLevels of nutrients may need to be adjusted based on whether gilts are limit fed or fed ad libitum in the last two diet phases. If feed mill and delivery constraints inhibit the use of a specialize gilt development diet, producers may use the gestation diet from approximately 100 kg BW, to breeding. Energy values used to establish the Lysine:Calorie ratios were based on NRC (2012) values using a corn-SBM-DDGS ration. Use of other ingredients and estimation models may provide a different Lysine:Calorie estimation.

^bThe SID Lysine:Cal ratio for the developing gilt is adopted from the recommendations of market gilts to encourage maximal growth rate. Producers that have abundant amounts of service eligible gilts and want to regulate growth rate may reduce the SID Lysine:Cal ratio.

^cSTTD = Standard Total Tract Digestible.

IMPERIAL MEASURES

TABLE 3. MINERAL/VITAMIN REQUIREMENTS FOR DEVELOPING DNA GENETICS GILTS^{1,2}

	WEIGHT RANGE, LBS.					
	150 - 175	175 - 200	200 - 225	225 - 250	250 - 275	275 - 300
Minerals						
Zinc, ppm	131	128	124	120	116	100
Copper, ppm	13.1	12.8	12.4	12.0	15.0	20.0
Iodine, ppm	0.26	0.26	0.25	0.25	1.00	2.00
Iron, ppm	131	128	124	120	116	78
Manganese, ppm	35	34	33	32	31	31
Selenium, ppm	0.30	0.30	0.30	0.30	0.30	0.30
Vitamins¹						
Vitamin A, IU/lb.	2,625	2,550	3,000	3,000	4,080	4,080
Vitamin D, IU/lb.	328	319	500	500	750	750
Vitamin E, IU/lb.	11	10	10	20	40	40
Vitamin K, IU/lb.	1.05	1.02	0.99	0.96	2.00	2.00
Vitamin B12, µg/lb.	9.25	9.00	8.75	8.50	16.00	16.00
Riboflavin, mg/lb.	2.00	1.95	1.90	1.85	3.50	3.50
Pantothenic, mg/lb.	6.50	6.30	6.10	8.00	16.00	16.00
Niacin, mg/lb.	11.80	11.46	11.12	10.78	20.00	20.00
Biotin, µg/lb.	55.00	55.00	55.00	55.00	113.00	113.00
Choline, mg/lb.	125.00	125.00	125.00	125.00	250.00	250.00
Folic Acid, mg/lb.	0.45	0.45	0.45	0.45	0.91	0.91



¹Supplemental vitamins (not total as obtained from commodity ingredients) recommended in a standard North American diet (unique ingredients may necessitate adding other vitamins).

²Vitamin E requirements and /or antioxidant requirement is affected by polyunsaturated fatty acid intake and may need to be increased with +20% DDGS.

► METRIC MEASURES

TABLE 4. MINERAL/VITAMIN REQUIREMENTS FOR DEVELOPING DNA GENETICS GILTS^{1,2}

		WEIGHT RANGE, KG.					
		68 - 79.4	79.4 - 90.7	90.7 - 102.1	102.1 - 113.4	113.4 - 124.7	124.7 - 136.1
Minerals							
Zinc, ppm		131	128	124	120	116	100
Copper, ppm		13.1	12.8	12.4	12.0	15.0	20.0
Iodine, ppm		0.26	0.26	0.25	0.25	1.00	2.00
Iron, ppm		131	128	124	120	116	78
Manganese, ppm		35	34	33	32	31	31
Selenium, ppm		0.30	0.30	0.30	0.30	0.30	0.30
Vitamins¹							
Vitamin A, IU/kg.		5,787	5,622	6,614	6,614	8,995	8,995
Vitamin D, IU/kg.		723	703	1,102	1,102	1,653	1,653
Vitamin E, IU/kg.		24	22	22	44	88	88
Vitamin K, IU/kg.		2.3	2.2	2.2	2.1	4.4	4.4
Vitamin B12, ppb		20.4	19.8	19.3	18.7	35.3	35.3
Riboflavin, ppm		4.4	4.3	4.2	4.1	7.7	7.7
Pantothenic, ppm		14.3	13.9	13.4	17.6	35.3	35.3
Niacin, ppm		26	25.3	24.5	23.8	44.1	44.1
Biotin, ppb		121.3	121.3	121.3	121.3	249.1	249.1
Choline, ppm		275.6	275.6	275.6	275.6	551.2	551.2
Folic Acid, ppm		1.0	1.0	1.0	1.0	2.0	2.0



¹Supplemental vitamins (not total as obtained from commodity ingredients) recommended in a standard North American diet (unique ingredients may necessitate adding other vitamins).

²Vitamin E requirements and /or antioxidant requirement is affected by polyunsaturated fatty acid intake and may need to be increased with +20% DDGS.

OPEN GILT GROUPING

Starting at 27-weeks (189 days) of age and a minimum weight of 275 lbs., all replacement gilts should be housed in stalls/pens within the open gilt line and exposed to a mature boar at least once a day. Boar exposure should be prevented until the desired time of obtaining the first identified heat. Gilts should be housed in a separate area away from the smell and sight of heat check boars. The target age for a boar used for gilt stimulation is at least 10-12 months old for traditional breeds and 6-8 months old for Mieshans, because older boars give off more pheromones or hormonal scents that stimulate gilts into estrus. The boar should be walked daily in front of each stall, allowing the boar enough time to stimulate each gilt individually. Optimum boar stimulation is achieved by placing boars in pens with gilts, but this is not always possible.

Starting at 27-weeks of age and a minimum weight of 275 lbs., all replacement gilts should also have their estrus cycles recorded on individual gilt cards. Each card should contain the animal's individual identification number, the week she was born and the day she was found in estrus. This knowledge will increase the likelihood of a successful mating on the subsequent estrus.

As gilts are found in heat and skipped (heat-no-service), they should be placed in line/pens with other gilts that will all be bred together on their next estrus. This procedure "groups" gilts for future mating and allows these gilts to be bred together on their next estrus. This also allows for gilts to become accustomed to the crate environment and may reduce stress. They should remain in the same line from "grouping," through A.I. and until pregnancy check at 4-weeks of gestation. Keeping gilts in line from initial grouping until pregnancy check should reduce movement stress and lead to better reproductive performance.

Gilts that have not been observed in estrus by week 36 should be "stress managed" to induce estrus. This can involve mixing animals, feed restriction for up to 3-days, followed by ad-lib feeding or "flushing," and intense boar exposure.

HEALTH

Work with your consulting veterinarian to develop an appropriate introduction and acclimation program for your developing gilts. A proper acclimation period will allow the gilts to become exposed to farm specific pathogens before entering the same air space as the existing population. Health challenges, including vaccination programs, cause the nutritional requirements of the immune system to increase and may slow growth for periods of time. It is important for gilts to return to a positive energy balance to achieve optimum reproductive performance.



SUMMARY

Gilt development and management can have a major impact on both short and long-term productivity. Producers need to place an emphasis on gilt development to recapture the value of their genetic investment and to help maximize the return on that investment. In order to reach her maximum reproductive potential and longevity in the herd, we need to produce healthy, structurally sound gilts. It is important to recognize that delayed breeding of gilts is one of the most important requirements for high lifetime litter size. Work with your veterinary and nutritional consultants to develop the proper health, nutrition, and management programs to get gilts off to an excellent start.