

# Replacement Gilt Evaluation Pocket Guide



*For the Evaluation of Structural, Feet, Leg and  
Reproductive Soundness in Replacement Gilts*

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This pocket guide is designed to help pork producers more effectively screen replacement gilt candidates before placing them in their breeding herds.

Visual appraisal can help identify replacement gilts with various problems that negatively impact sow longevity. The items shown in the pocket guide include conformation and structural soundness, feet and leg abnormalities, and reproductive soundness (underlines, external genitalia).

Identifying replacement gilts with one or more of these deficiencies and culling them, before they enter the breeding program, may be one of the keys to lowering breeding herd replacement rates and/or mortality rates.

Whether you purchase replacement gilts or you are producing your own in an internal multiplication program, this pocket guide provides examples of the types of problems that should be avoided when selecting replacement gilts.

This pocket guide covers the following criteria that are critical to selection of functional females that will remain in the herd for a long, productive life:

#### **Feet and Leg Soundness**

- Feet and leg problems represent the second largest reason for sows leaving the breeding herd. This is particularly true for parity 1, 2, and 3 females.

#### **Underline Soundness**

- Underlines should be visually evaluated and scored on ALL replacement females.

#### **External Genitalia**

- Involves visually evaluating the vulva for size, shape, and injuries.

- Feet and leg problems are a major reason for sow culling and this is particularly true of parity 1, 2, and 3 females.
- Feet and leg soundness should be evaluated on ALL replacement females.
- Evaluation can involve a scoring process that is outlined in these documents.
  - *Pork Industry Handbook fact sheet PIH-101: "Feet and Leg Soundness in Swine"*
  - *National Swine Improvement Federation Guidelines for Uniform Swine Improvement available at the following web site <http://www.nsif.com/guidel/guidelines.htm>*
- Gilts that score "poor" or "unacceptable" should be culled.

## Other Traits on Which Selection Should Occur for Replacement Gilts

### Growth

- Gilts should be in the fastest growing 50-60% of the contemporary group.
- Adequate growth increases the probability of proper reproductive development.
- Slow growing females (within a group) can have delayed first estrus and may be lifelong problem breeders.

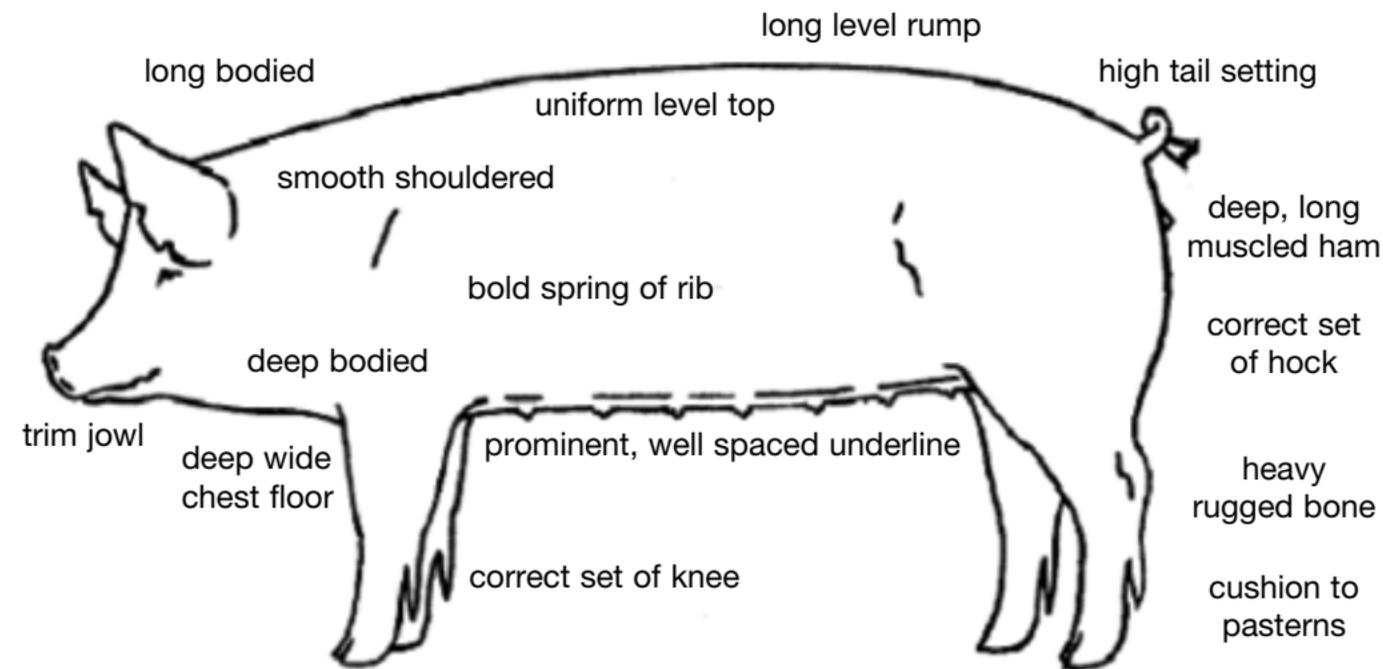
### Backfat

- Backfat is important if replacement females are produced within the herd.
- Consult NSIF Guidelines for Uniform Swine Improvement to obtain proper measurement and adjustment criteria.
- Recommended levels of backfat are farm specific and may change due to genetics, environment, and end market.



## Gilt Selection Criteria – Traits to Examine

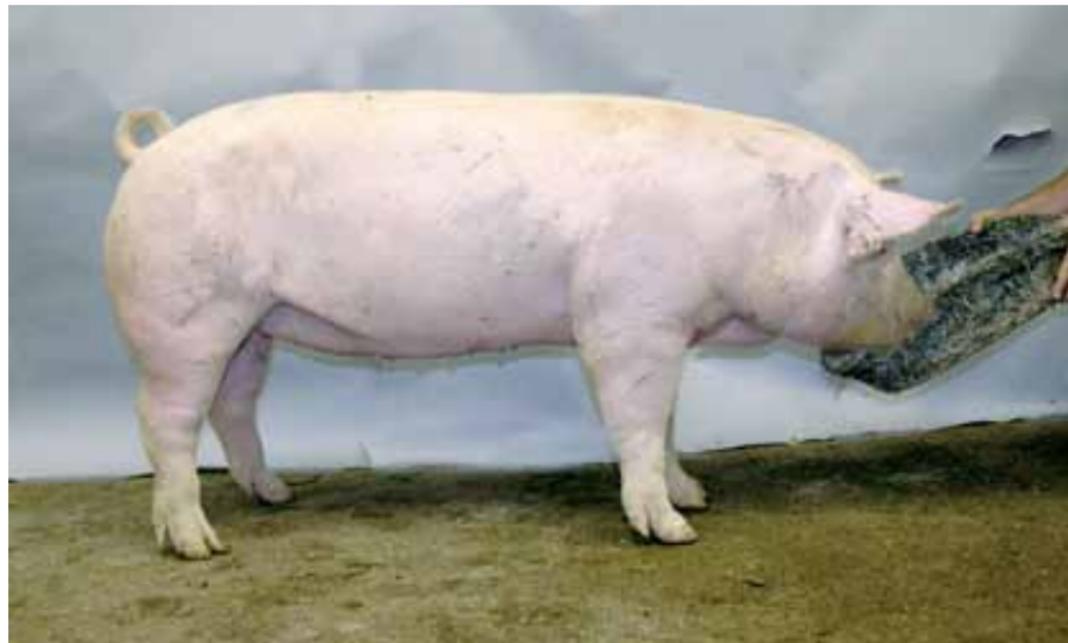
There are many criteria that can be used to evaluate a replacement gilt candidate. The diagram below shows the traits that are desirable in a replacement gilt.



## The “Ideal” Replacement Gilt

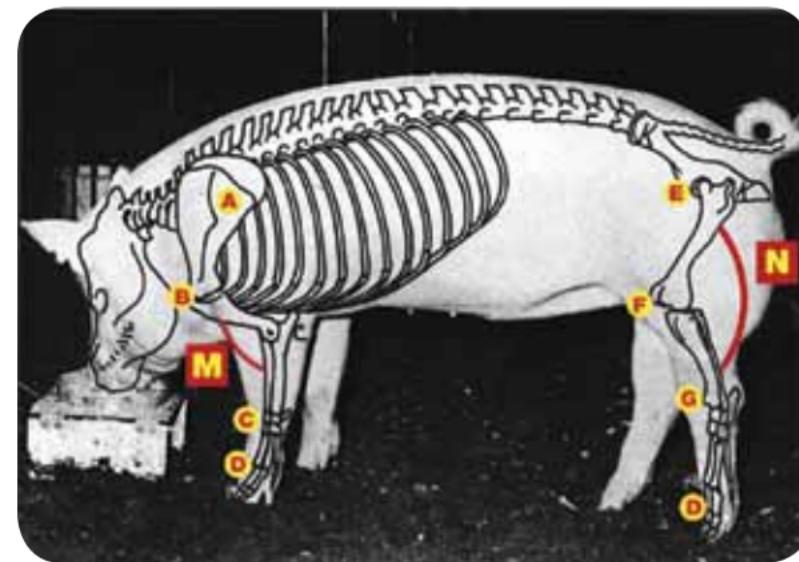
This replacement gilt is considered ideal because she has big feet, good flex to her pasterns on both her front and rear legs, and possesses adequate base width both front and rear. Additionally, she is ideal in her composition as she is long bodied, level in her top line, appears to be lean, and has the proper degree of muscling.

Also, this gilt has a high quality, evenly spaced underline, is correct in the size and placement of her vulva, and she performed in the top 50-60% of her contemporary group. Because of these attributes, this gilt is balanced and productive looking.



## What is desirable ?

- The ideal animal provides good cushion and flexion to the joints.
- These animals will have an easier time getting up and down.
- They will walk more fluidly and be less susceptible to stiff joints and arthritis as the result of constant stress on the joints.
- Ultimately, these females are likely to remain in the breeding herd for a longer period of time.



## Start by Evaluating the Feet of the Replacement Gilt



1. Large feet are desirable.
2. Feet should be out on all four corners with adequate width between them.
3. Individual toe size is important so pay close attention to small inside toes, especially on the rear feet.
4. Examine feet for cracked hooves, foot pad abrasions, and other injuries.

- It is critical to also evaluate toe size.
- Leg conformation tends to conform to the shape and size of the toes.
- Ideal toes are big, evenly sized, and spread apart.
- Correct size and placement of toes result in better weight distribution.

Ideal toe size and spacing (retain)

## Feet evaluation



## Feet evaluation



- If a difference of ½ inch or greater in toe size exists, the gilt should be culled.
- When toes are uneven, there is a greater risk of cracked hooves and foot pad lesions as the animal becomes older.
- Toe size will affect the mobility of the animal over time.

Uneven toe size and spacing (cull)

## Feet evaluation



- Small toes that have little if any spacing between them are undesirable.
- If toes are small, weight is concentrated on a smaller surface area and there is a greater risk of cracked hooves and foot pad lesions as the animal becomes older and matures to heavier weights.

Small foot size (cull)

## Feet evaluation



cracked hoof



foot pad abrasion

- Feet and leg injuries can be an issue. Examine all gilts for these conditions:
  - *Cracked hooves*
  - *Foot pad abrasions*
  - *Other injuries*
- Injuries can be difficult to identify.
- Treat these animals and see if the injury improves. If not, use caution if these females are retained in the breeding herd.



*Notice the crack on the hoof of this gilt.*

## Feet evaluation

Feet and leg injuries can be a costly issue.

- Cracked hooves
- Foot pad abrasions
- Toe injuries
- Dew claw injuries
- Swollen joints

Treat these animals and see if the injury improves. If not, use caution if these females are retained in the breeding herd. If retained, the problem will not be passed on to her offspring because it is not genetically related.



toe injuries



swollen joints



dew claw injuries

## Feet evaluation



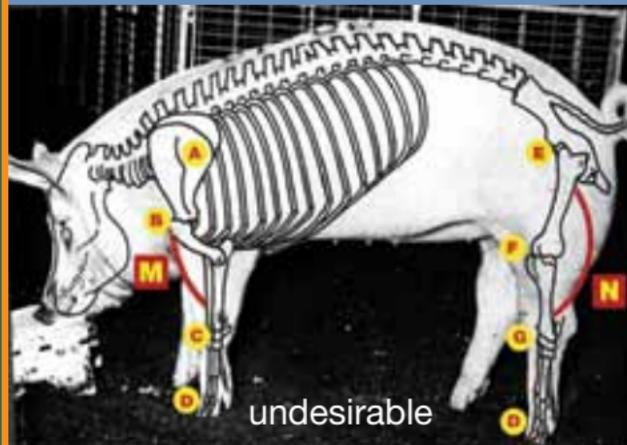
If gilts are not selected for proper feet development it can lead to problems such as excessive toe growth once they enter the breeding herd. Sows with these types of problems can lead to lameness and poor productivity and must be treated.

- Gilts should be culled if toe size differs greatly; focus on inside toes.
- If an obvious injury occurs that will impair timely mating or thriving in gestational environment, the gilt should be culled.
- Injuries that will reduce a gilt's productive herd life are another reason for culling.

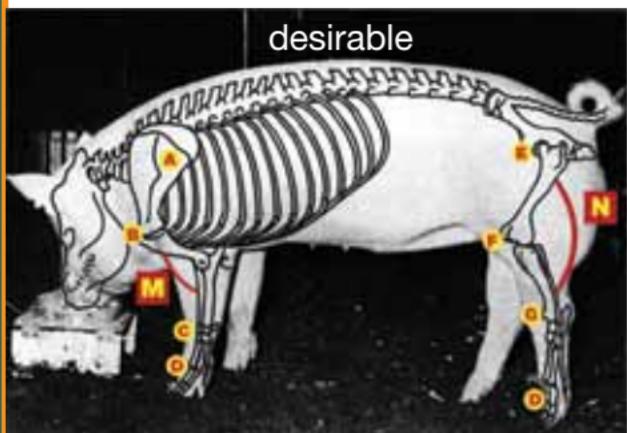
## Feet evaluation



## Front Leg Evaluation – What are we looking for?



undesirable



desirable

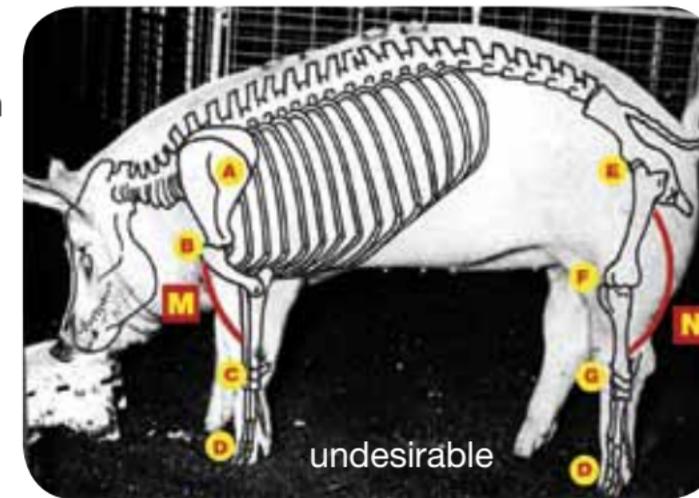
### What is desirable?

- Notice that angle “M” in the lower picture is less than 90°, providing a much more desirable angle to the front leg.
- The desirable angle provides more cushion when the animal is standing and walking.

## Front Leg Evaluation – What are we looking for?

### Avoid these conditions.

- Angle “M” is too large (greater than 90°) and makes the gilt straight fronted and appear to have her front shoulder (A) tipped too far forward.
- The gilt is much too upright from her shoulder (B) through her knee (C), which can cause abrasions to the front feet (D).



undesirable

## Front Leg Evaluation – What are we looking for?



buck-kneed front leg

Buck-kneed front legs are a condition known to negatively impact sow longevity.

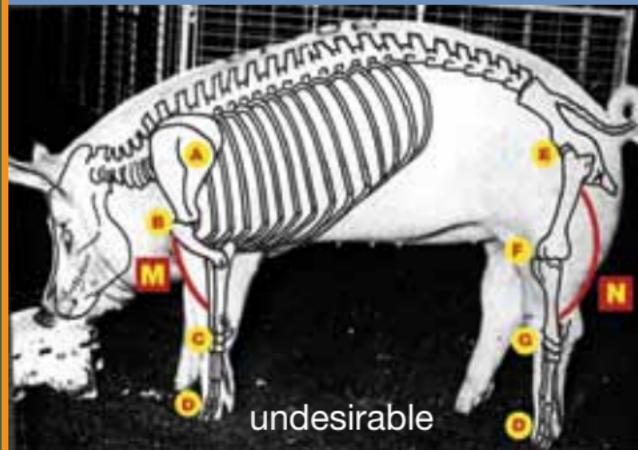
- Buck-kneed animals have a difficult time walking and getting up and down, particularly when housed in a crated environment.
- This trait is genetically influenced and a gilt retained for breeding purposes will pass the trait on to a portion of the offspring.
- Market animals with this condition will grow slower than their normal contemporaries.
- Replacement gilts that are buck-kneed should be culled.

## Front Leg Evaluation – What are we looking for?



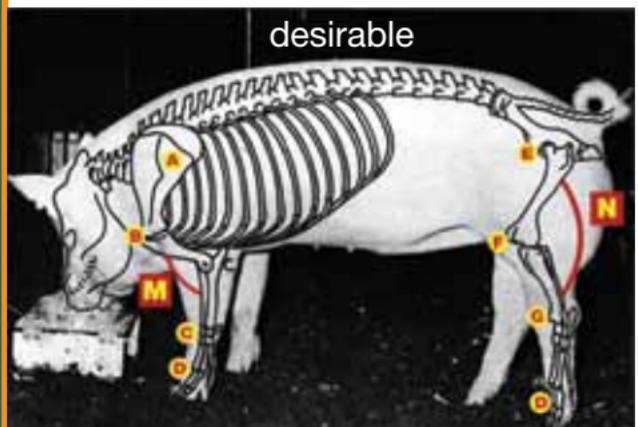
- Soft or weak front pasterns are known to positively impact sow longevity. This is likely due to the result of the shock absorbing effect that this type foot provides to the gilt.
- When choosing between animals with straight or weak front pasterns, you should choose the replacement gilt with weak pasterns.

## Rear Leg Evaluation – What are we looking for?



### What is desirable

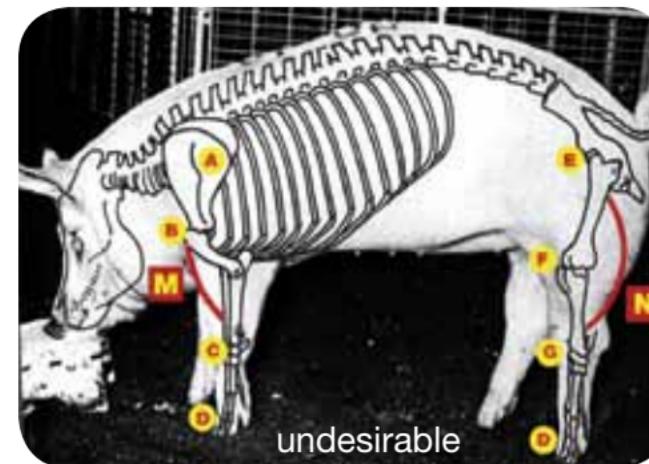
- Notice that angle “N” in the lower picture is smaller, providing a much more desirable angle to the hind leg.
- This angle more cushion when the animal is standing and walking
- This animal will be more functional in today’s production systems.



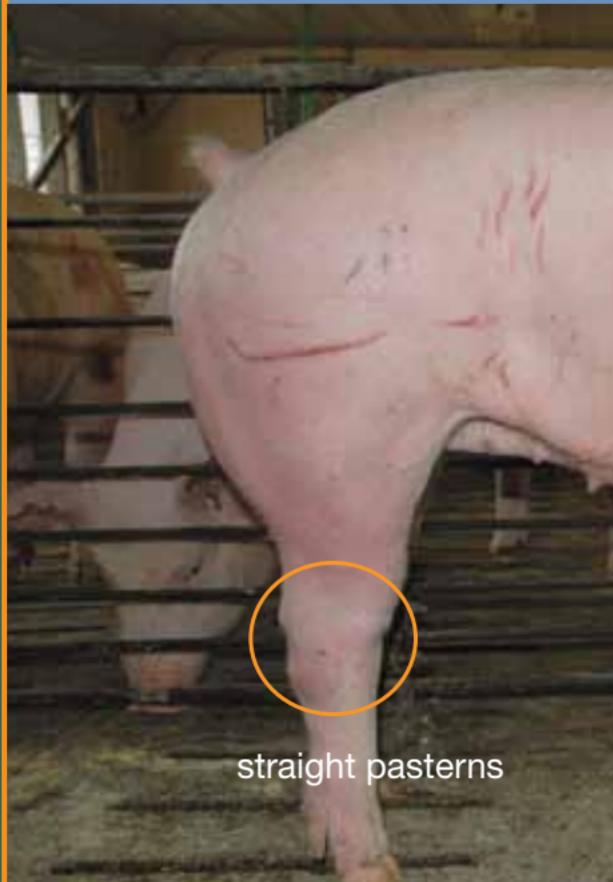
## Rear Leg Evaluation – What are we looking for?

### Avoid these conditions.

- Angle “N” is too large and makes the hip (E), stifle (F), and hock (G) joints lock in a straight line or post-legged position.
- Foot pad abrasions, swelling of the feet and joints, and lameness regularly occur in animals with these traits.
- This makes the animal appear steep in their hip and high topped (very curved top line).

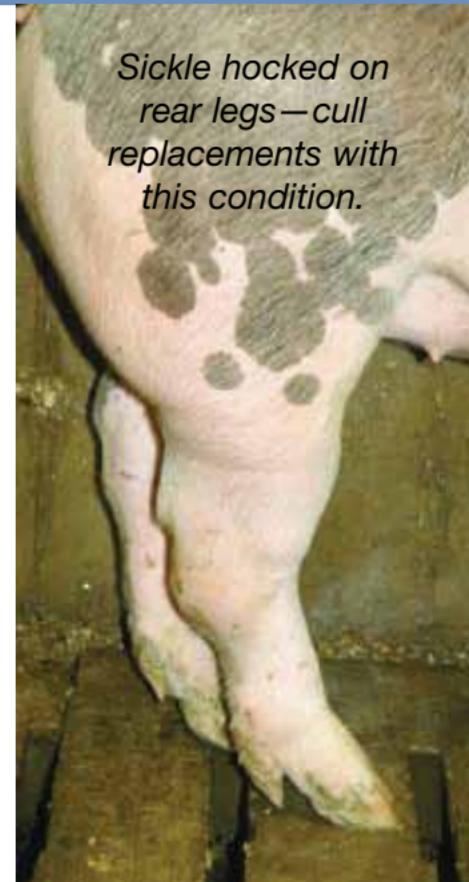


## Feet and Leg Evaluation



- Straight pasterns on the rear legs are a condition known to negatively impact sow longevity. They impact age at first farrowing, farrowing interval, total number born, and piglet mortality from birth to weaning.
- Sows with straight rear pasterns have a difficult time getting up and lying down in a crated environment.

These pictures illustrate two conditions that are relatively common in pigs. If you have to choose between animals with these conditions, choose the one with normal leg structure, but with soft pasterns. Females that are sickle hocked have difficulty getting up and down in a crated environment.



## Feet and Leg Evaluation

## Feet and Leg Evaluation

Replacement gilts should move freely with their legs stationed soundly at the corners with adequate width between them. They should have proper set to their hock and pasterns. Their feet should be big and their toes should be spread apart.

*Good base width*



*Good width of chest, proper set to the front leg and foot, and good foot size*



*Good length of body, proper set to the rear legs, and level bodied with good hip structure*



## Feet and Leg Evaluation

- Gilts that are “narrow based” should be culled.
- Likewise, gilts that are excessively muscled or “tight muscled” do not move free and easy and should be culled.

*Narrow based*



*Tight muscled – “goose steps” on her rear legs*



## System for evaluating feet and leg structure

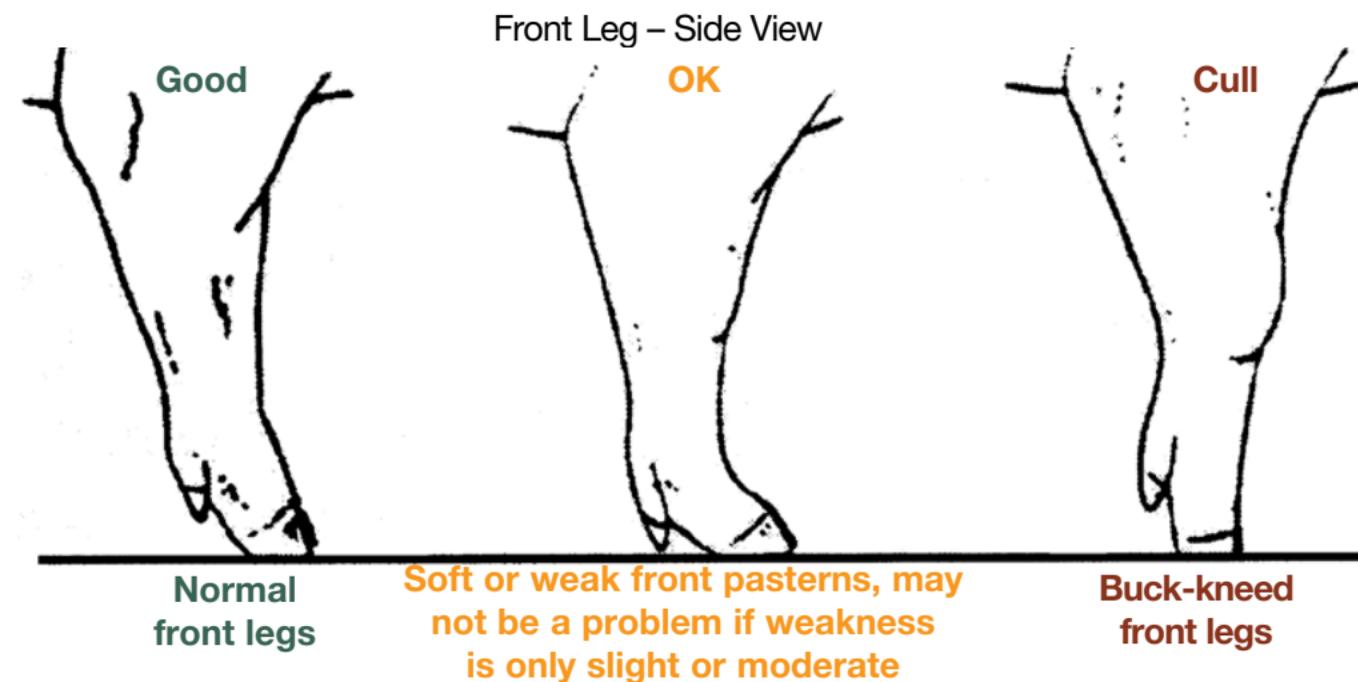
- Now that you have seen examples of feet and leg soundness, you understand the important role it plays in maintaining a productive breeding herd.
- You are ready to begin evaluating your replacement gilts for various traits.
- We will use a color coding system to help you make culling decisions on your replacement gilts.

**Cull replacements with these conditions.**

**Use caution when retaining replacements with these conditions.**

**Keep these replacements.**

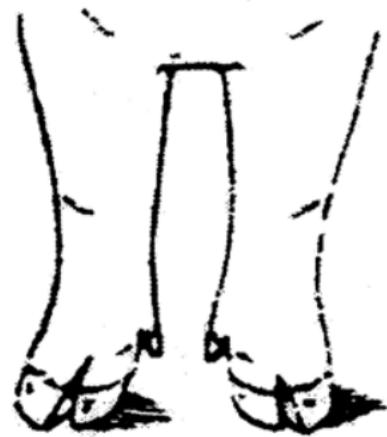
## System for Evaluating Feet and Leg Structure



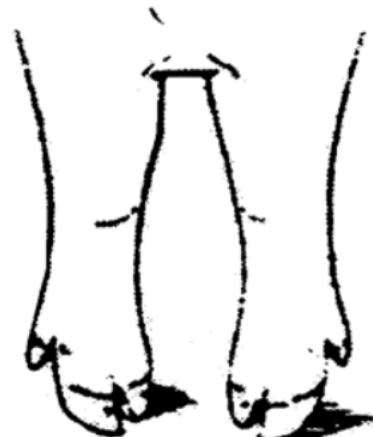
Which diagram comes closest to showing the leg structure of the replacement gilt you are evaluating?

## System for Evaluating Feet and Leg Structure

### Front Leg – Front View Abnormalities



**Splay footed**  
Toes pointed  
outwards

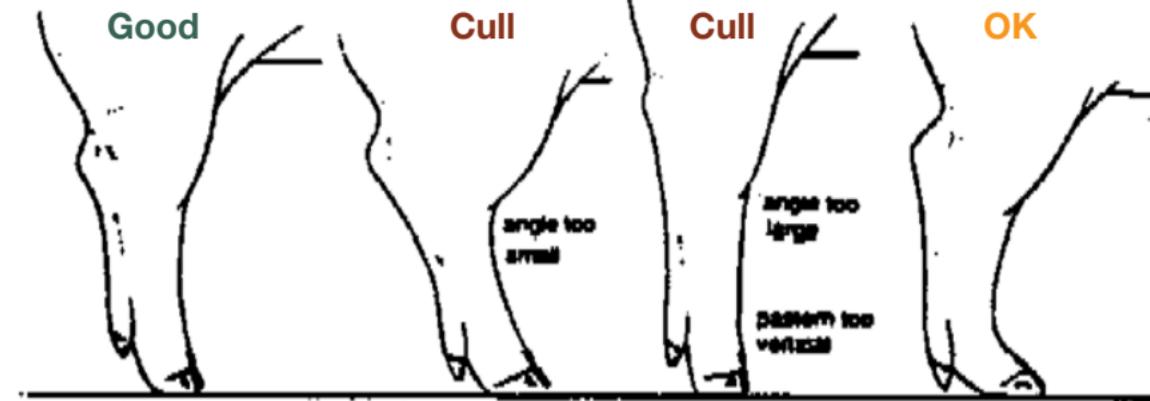


**Pigeon toed**  
Toes pointed  
inward

Does the replacement gilt that you are evaluating have front legs that look like either diagram? If so, you should cull them if you can.

## System for Evaluating Feet and Leg Structure

### Rear Leg – Side View



Normal rear  
leg structure

Sickle hocked  
rear legs

Post legged  
rear legs

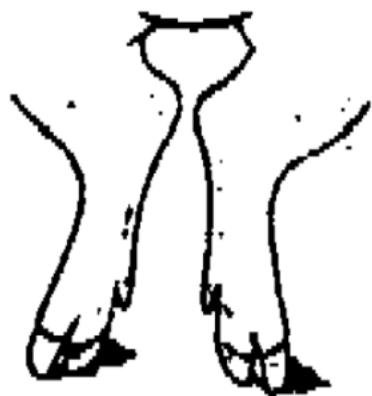
Soft pasterns  
on the rear legs

Which diagram comes closest to showing the leg structure of the replacement gilt you are evaluating?

## System for evaluating feet and leg structure



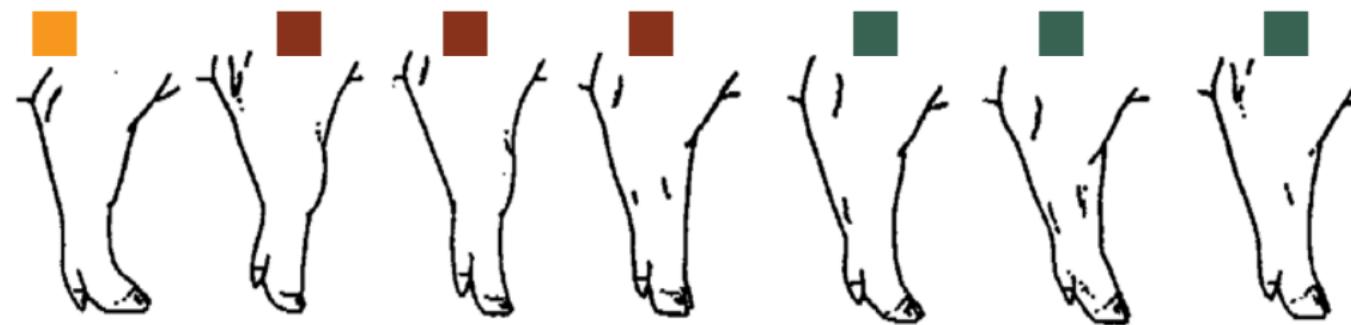
### Rear Leg Abnormality



#### Cow-Hocked

The diagram and picture illustrate a cow-hocked animal. These animals should be culled.

## System for Evaluating Soundness – Front Legs



■ Cull these animals

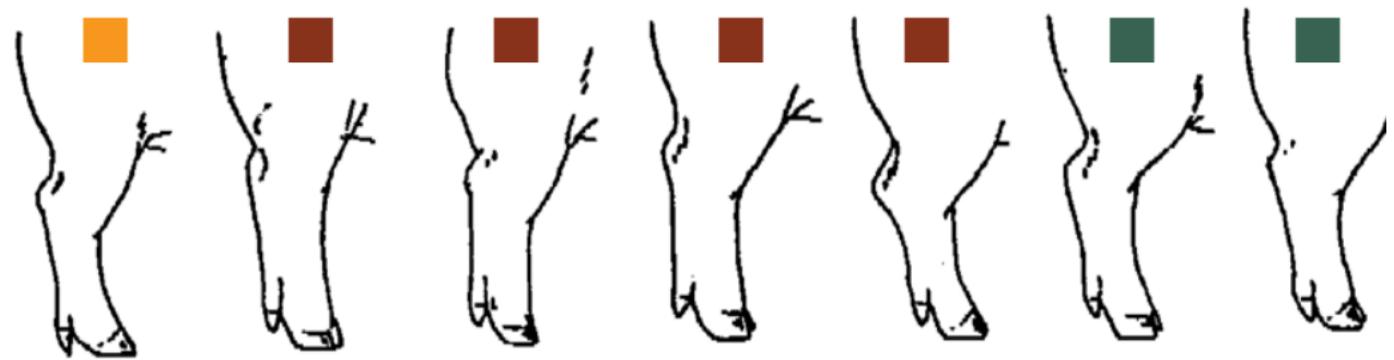
■ Use caution when retaining these animals

■ Keep these animals

- These diagrams are a system for evaluating front leg feet and leg structure (NSIF, 1998).
- Selection pressure within a given herd may vary.
- If selection pressure is weak, the soft pastern conditions are preferred over buck-kneed conditions.

## System for Evaluating Soundness – Rear Legs

## Other factors affecting soundness



- Cull these animals
- Use caution when retaining these animals
- Keep these animals

- These diagrams are a system for evaluating rear feet and leg structure (NSIF, 1996).
- Selection pressure within a given herd may vary.

### Disease – organisms causing arthritic conditions

- Streptococcus
- Mycoplasma
- Actinobacillus pleuropneumonia
- Etc.

### Floor surface

- Rough floors
- Slats with sharp edges
- Smooth wet floors

### Nutritional deficiencies

- Calcium
- Phosphorus
- Zinc
- Biotin
- Others



## Reproductive Soundness

- Underline evaluation is another critical step in the evaluation of replacement gilt candidates.
- Sows must have functional nipples to raise pigs.
- Both genetics and selection appear to play a role in determining the spacing, prominence, and location of teats.
- These traits do have a direct impact on production and it is recommended that all replacement gilts are evaluated for reproductive soundness.

## Reproductive Soundness - Underlines

- An ideal underline should have seven or more functional nipples on each side.
- The nipples should be well spaced and well developed.
- Blind or pin nipples should be not present.



## Reproductive Soundness - Underlines



### **Discrimination should be applied when:**

- Fewer than seven functional nipples are present on each side.
- Blind or pin nipples exist.
- Poor spacing and / or placement are present.
- Inverted nipples are present.



## Reproductive Soundness - Underlines

- Initial screening of teat number, spacing and quality can occur at birth, weaning or in the nursery.
- Final evaluation should be made when selection of breeding gilts occurs.



Evaluation	Score	Comments
Unacceptable	1-3 points	Fewer than six functional nipples on each side or presence of inverted nipples or poor spacing and prominence.
Good	4-7 points	Six or more functional nipples on each side with adequate spacing and prominence
Excellent	8-10 points	Seven or more functional nipples on each side, well-spaced and well-developed with no pin or blind nipples.

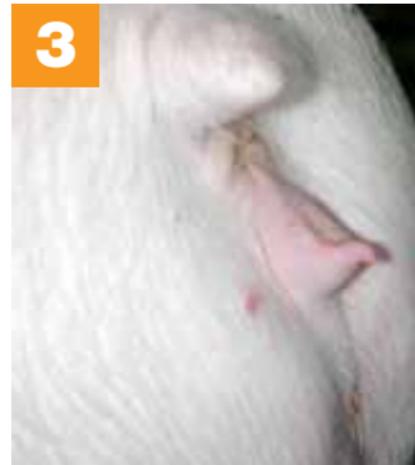
- The external genitalia should also be evaluated on all replacement gilt candidates.
- Gilts should have a well developed vulva that is not tipped up.

Example of a well developed, normal vulva



## Reproductive Soundness – External Genitalia

- 1** Cull gilts having an infantile vulva.
  - *These animals frequently have an under-developed reproductive tract.*
- 2** Gilts having a small vulva should be avoided.
  - *These gilts could have difficulty mating (particularly in a natural mating setting).*
  - *Once mated, these animals could have farrowing difficulties.*
- 3** Tipped vulvas should be avoided.
  - *Tipped vulvas may contribute to a higher incidence of metritis and cystitis.*



## Reproductive Soundness – External Genitalia

- Injured vulvas should be avoided as they may impair mating.
- Once it is healed, the scar tissue that develops from a vulva injury could also cause farrowing difficulties.
- You can let the injury heal and make an assessment at a later date.
- Use caution if you choose to let the injury heal and retain the gilt as a breeding herd female.



*Injuries to the vulva can result in impaired reproductive ability*

## Other genetic conditions to avoid

## Examples of Replacement Gilt Candidates That Should be Culled

**Gilts producing offspring with these traits or that are from litters with the following conditions should not be selected as replacements**

- Scrotal Hernia—commonly called a rupture.
- Atresia Ani—missing the anus.
- Cryptorchidism—has at least one testicle that has not descended.
- Hermaphrodite—has both female (vulva) and male (penis) reproductive organs.
- Tremors—uncontrolled shaking.
- Splayleg—at birth, legs are straddled to the sides and the animal cannot stand on its rear feet.
- Bent legs—pigs that have legs that have grown in an abnormal direction. Can be caused by genetics or nutrition.
- Polydactyly—pig is born with extra feet, legs, and/or dew claws.
- Syndactyly—(mule foot), pig is born with one or more of its toes fused together.
- Thickened forelegs—pig is born with one or both front legs that are unusually thick (approximately twice as thick as normal)

*This gilt has a steep rump and is shallow bodied.*



*This gilt has undesirable rear leg structure and is excessively muscled.*

*This gilt is straight fronted and is weak behind her shoulder (broken topped).*

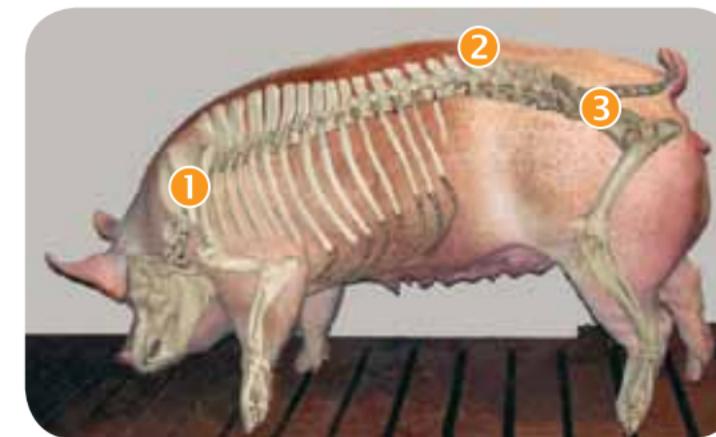


## Selection of Replacement Gilt Candidates

- Increasing the number of traits that are evaluated and used as selection criteria increases the number of potential candidates that are needed to achieve the desired number of replacements.
- If gilts are home-raised, the number of candidate females needed to supply replacement gilts to the herd determines the number of grandparent females needed in an internal multiplication system.
- Number of gilt candidates may not be a large problem if producers are purchasing their replacement females.
  - *Hopefully, most, if not all, of the culling has occurred prior to delivery of the replacement gilts to the commercial producer's farm.*
  - *However, purchased gilts should still be carefully scrutinized before a producer places them in the breeding herd.*

## Sow Body Condition Scoring

- Sows should be scored early in gestation. To distinguish between fat and muscle, begin by locating the shoulder blade (1), the spine (2) and the hips (3).
- Sow weight can be estimated using a cloth tape measure.
- Ultrasound can be used to obtain backfat estimates at the sow's last rib.
- Photos on the last page show a rear view of a sow as her body condition score (BCS) changes from BCS1 to BCS5. A body condition score of "3" is considered "ideal."



## Sow Body Condition Scoring



These photos present a visual reference to help train your eyes to determine differences in sow condition. Captions for each photo provide descriptions, explanations and backfat estimate ranges for each body condition score. The backfat recommendations for each BCS classification can differ slightly, depending on the genetic lines. Weight and backfat estimates, combined, should be used to estimate daily feeding requirements.

### Top: Ultrasound backfat estimation

### Bottom: Cloth tape measure

Flank-to-flank measurements using a cloth tape can be used to estimate body weight. The derived equation is:

$$\text{Sow weight (lb.)} = (26.85 \times \text{flank measure in inches}) - 626$$

Use weight and back-fat measurements to estimate feed intake requirements. (See Kansas State University Gestation Feeding Guidelines at [www.asi.ksu.edu](http://www.asi.ksu.edu))

## Estimating Sow Body Conditioning Scores



Excessively Thin Backfat: <10mm (<0.39 inches)	Moderately Thin Backfat: 10-15mm (0.39-0.59 inches)	Ideal Condition Backfat: 15-22mm (0.59-0.86 inches)	Moderately Fat Backfat: 23-29mm (0.90-1.13 inches)	Excessively Fat Backfat: >30mm (>1.17 inches)
Ribs, hips & spine are easily visible and palpable. Sow needs large amounts of muscle and fat gain to maintain productivity. Significantly increase feed allowance to this sow.	Ribs, hips & spine can be palpated with slight pressure. A moderate increase in feed intake is required before this sow farrows her next litter.	Ribs, hips & spine can be palpated with pressure, but cannot be observed visually. Monitor feed allowance to maintain this level of condition.	Ribs, hips & spine cannot be palpated. Reduce feed moderately for a more ideal body condition. Exceeding a sow's dietary requirements results in inefficient use of feed and increased manure.	Ribs, hips & spine cannot be palpated. Reduce feed substantially for a more ideal body condition. Sows at BCS 5 have lower feed intake and poorer lactation performance.



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