ELECTRONIC SOW FEEDING (ESF)
A Guide for Managing Sows
INTRODUCTION
Every animal caretaker has an ethical responsibility to provide proper care for pigs at each stage of their lives. Providing proper care and managing sows during gestation can be challenging, but is important for the well-being of the sow and her future litter. Poor management of sows in gestation can lead to injuries, reduced sow well-being, cause lower conception and farrowing rates, and contribute to smaller litter sizes. Understanding sow behavior, facility design, and how the two interact can help caretakers provide better care for the sows and a safer workplace for themselves.

Sows housed and fed via electronic sow feeding (ESF) are individually identified by a radio-frequency identification (RFID) tag. Sows enter a feed station one at a time where a computer-based control system identifies each animal and delivers the prescribed amount of feed specific to that animal for that day of gestation. ESF is classified as a non-competitive feeding system. Besides gestation stalls, it is the only gestation housing that provides individualized animal nutrition. Group size with ESF can range from 50 to more than 250 head, depending upon the type and number of feeders in the pen. The establishment of the social hierarchy and the associated aggression must be managed to prevent serious injuries to the animals. Electronic identification of individual sows allows for digital management of the herd, as most ESF systems provide computer-controlled spray marking, selection and animal sorting to facilitate management tasks.

This guide addresses current best practices for managing sows with ESF as learned through research and on-farm experience. The guide consists of three sections: 1) summary of management techniques and husbandry skills needed for successful sow management, 2) a checklist for daily barn inspections, and 3) troubleshooting scenarios designed to facilitate discussion and to encourage the sharing of ideas among caretakers in the barn.
# TABLE OF CONTENTS

**Equipment Maintenance** .......................... 4  
1. Feeding  
2. Watering  
3. Penning/Gating  
4. Flooring  
5. Cooling Systems

**Behavior at Mixing** .............................. 8  
1. What to expect at time of mixing  
2. How to minimize fighting

**Caretaker Safety** ................................. 10  
1. Daily observation and walking the pens  
2. Sow health care  
3. Heat checking and mating  
4. Pregnancy diagnosis  
5. Moving sows  
6. Euthanasia and sow mortality  
7. Equipment repair/maintenance

**Training Gilts and Sows** .......................... 12  
1. Training pens  
2. Training procedure

**Individual Sow Observation** .................... 14  
1. General observation  
2. Monitoring for sows off-feed

**Body Condition Scoring** .......................... 16  
1. How to perform body condition scoring  
2. When to monitor body condition  
3. What body condition scores mean  
4. Points to remember

**Identifying Lameness** ............................ 18  
1. Observation and scoring for lameness  
2. Treating lame sows

**Monitoring Animal Health** ...................... 20  
1. Identifying sick animals  
2. Diagnosing the problem  
3. Treatment  
4. Routine health maintenance practices

**Heat Detection and Artificial Insemination** .... 22  
1. General information about heat detection

**Pregnancy Detection** .............................. 24

**Handling Fall-out Sows** .......................... 25

**Managing Ventilation** ............................ 26  
1. Daily observations and actions  
2. Routine maintenance tasks

**Daily Guide** ........................................... 30

**Troubleshooting Scenarios** ........................ 32
Equipment maintenance should be performed on a regular basis to ensure that equipment functions properly. When performing maintenance, the following areas should be checked:

1. Feeding
   
   Be sure to follow the manufacturer's recommendations on maintenance of the feeder. Each manufacturer will provide suggested maintenance activities and the desired frequency of those activities to ensure proper functioning of the feeding equipment. ESF items requiring maintenance include:

   - ESF computer is reading and recording all sows in the pen.
     - Clean the face of the tag readers or motion detectors monthly to ensure proper operation.
   - All sows have RFID tags.
   - ESF entry and exit gates are opening and closing properly.
     - Observe sows daily entering and exiting the feeding station to ensure gates are operating at the proper speed so only one sow can enter and exit at a time.
   - Feed delivery system is operating correctly with each individual feeding event.
     - Check daily that feed is delivered to the bowl with the proper consistency; that the nipple drinker is working correctly if present in the feed bowl; that sows are consuming their entire allotment of feed; and that feed is not building up at the location where feed is delivered to the bowl.
   - Feed delivery to hoppers on ESF is operating correctly.
   - Feed trough in ESF is in good repair with no sharp protrusions in feeder.
     - Feeders do not have holes that will leak feed or sharp edges that will injure sows.
     - Cuts or abrasions on the sows' heads are a sign of sharp edges or protrusions.
     - If sharp edges are suspected, check all surfaces of the feeder (inside and outside) to find sharp edges or protrusions and make repairs.
   - No leaks in air or water lines to stations.
   - Calibration – Most ESF stations dispense feed based on volume, while we tend to feed sows based on measures of weight. Thus, it is important to take into account the density of the feed being fed. A known volume of feed should be collected and weighed. The ESF software should allow for corrections based on this measure of feed density. The calibration procedure should be repeated whenever feed ingredients and or formulations that will impact the density of the feed are changed.

2. Watering

   - Water flow rate for nipple or cup waterers is sufficient for sows.
     - Water flow rate should be at least one pint per 30 seconds (about 4 cups/min).
     - Waterers need to be checked daily and cleaned if necessary.
     - Some feed systems also have waterers in the feeding station; be sure they are clean and functioning correctly.
   - A sufficient number of watering locations are available for the number of animals in the pen.
     - There should be at least two waterers per pen located far enough apart so a dominant sow cannot control access to both waterers.
     - For groups larger than 10 sows, consider at least one water station for every 12 to 15 sows.
3. Penning/Gating

- Pen partitions are in good repair with no broken bars or sharp edges to injure sows.
  - Cuts or abrasions on the sows' bodies are a sign of sharp edges or protrusions.
  - If injuries are present, check all equipment exposed to sows to find sharp edges or protrusions and make repairs.
- Gate latches are in good working order.
  - Latches need to be secure and easy to operate without creating pinch points that may injure caretakers.
- Gating legs and feet are properly anchored to floor.

4. Flooring

- Slats are in good repair with no broken edges or holes to injure sows' feet or legs.
  - Inspect floors daily for broken slats or other breaches in the flooring material.
- Solid laying areas should be dry and clean. Dirty or wet areas may be a sign of a water leak or a ventilation issue.

5. Cooling systems

- Drip nozzles used for cooling sows in stalls during weaning and breeding are located to drip water onto the front shoulder area of the sow.
- Sprayer nozzles for cooling sows in pens are located in the proper area.
- Dripper or sprayer nozzles work properly and are not plugged.
  - Dry areas under some nozzles when nearby areas are wet suggest a nozzle is plugged.
- Controllers are set correctly and function properly.
  - The controller should correctly activate the drippers or sprayers at the desired temperature and interval. A hand-held digital thermometer is helpful when checking the controller settings.
- Evaporative cooling pads correctly function to cool air entering the gestation building.
  - Observe all areas of the cooling pads while operating to determine whether some areas of the pads are dry.
  - Openings in the water supply pipe provide an adequate flow of water to saturate the entire cooling pad. If needed, unplug clogged openings.
  - Allow cooling pad to dry for a minimum of 4 hours each night to reduce algae growth.
  - Check water filter at least monthly and remove sediment buildup.
  - Algae growth on cooling pads can be reduced by:
    - Adding a chemical for algae control.
    - Shading the pad from direct sunlight.
  - Mineral buildup on pads can be reduced by:
    - Ensuring water is uniformly distributed along the length of the pad.
    - Increasing water flow rate over the pad to wash the pad.
    - Periodically clean and flush the storage tank, pump, and water distribution system.
EQUIPMENT MAINTENANCE

Good Slatted Flooring

Evaporative Cooling Pad

Clean Solid Laying Area

Drip/sprayer Nozzle
BEHAVIOR AT MIXING

When sows are housed as a group, they are housed in either a static group or a dynamic group. Sows housed in a static group are all placed into the group on the same day. No additional sows are ever added to the group for the remainder of their gestation. Sows housed in a dynamic group have new sows added or removed either each week or every few weeks. Regardless of the group type, sows will fight at the time of mixing.

Minimizing fighting among sows is critical for maintaining their well-being and performance. Excessive fighting at mixing can cause severe injuries and reduce reproductive performance. Gestating sows are especially susceptible to stressors from 6 to 28 days after mating, so mixing during this period can result in pregnancy failure or smaller litter sizes. Fighting to establish a social order is an instinctive behavior in sows. Understanding this behavior, what to expect, and how to minimize fighting at mixing can minimize associated losses.

1. What to expect at time of mixing
   
   Sows generally begin fighting immediately after being mixed with unfamiliar sows. Fighting is intense during the first few hours, but reduces dramatically after 1 to 2 days. A stable group can be formed in one week. Wrestling and biting are the main forms of fighting. Dominant sows are more involved in fighting, but low-ranking sows usually sustain more injuries.

   Consequences of fighting may include:
   - Skin scratches or bleeding from bite marks;
   - Panting due to increased body temperature;
   - Lameness, especially if floors are slippery or if animals get toes caught in slats;
   - Reluctance of submissive sows to compete for food, water, or good resting areas;
   - Loss of pregnancy, smaller litter sizes, or no return to estrus.

2. How to minimize fighting
   
   - Sows can remember each other for up to 6 weeks, so whenever possible, group sows that were housed in the same pen during their previous gestation.
   - Mix sows after they have been fed to reduce fighting.
   - Observe sows frequently during the first few hours after mixing, when fighting is most intense. Fights usually last from 1 second to 2 minutes. Identify bully sows involved in prolonged fights longer than 5 minutes and consider removing them if aggression persists.
   - Scraping the pen and assuring floors are dry before mixing can help to reduce slipping. Sows that fall on slippery floors during fighting may injure their limbs and become lame.
   - Pay extra attention to sows that are badly beaten up to ensure they are not lame and that they get up to eat daily the first few days after mixing.
   - Check for vulva biting. High frequency of bitten vulvas suggests problems with feeders, drinkers, or overcrowding.
   - Make sure every sow has access to drinkers during the first few days after mixing, especially during hot weather. Dominant sows may block the drinkers so that other sows cannot get access to water.
   - If sows are repeatedly being injured during fighting due to protruding nipple drinkers, consider installing water cups.
   - Providing distractions (e.g. PVC pipe, chains etc.) also can reduce fighting.
BEHAVIOR AT MIXING

For static groups:
- Not every sow is involved in fighting in large groups. Fights typically involve dominant sows attacking low-ranking sows.
- Low-ranking sows are more likely to be injured during fighting and have more skin scratches. They tend to lie in less desirable areas, such as on wet slats with air drafts.
- Solid partitions or partial walls in the pen will provide hideouts for sows to escape and can reduce fighting and injuries.
- Sort sow groups by size and parity to reduce bullying of low-ranking sows.
- Gilts and first-parity sows are nearly always submissive to older sows, so place gilts and first-parity sows in a separate group from older parities.
- If sorting by weight and parity is not possible, maintain the number of young sows (parity 1) above 10% of the group to help protect young sows from being bullied and becoming injured.
- Move young sows into the pen before older sows to help young sows acclimate to their new environment and remain competitive.

For dynamic groups:
- Fighting will occur each time a new group of sows is introduced, so reducing the frequency of mixing will reduce fighting.
- Most fights involve new sows, and new sows usually receive more injuries from fighting than resident sows. To reduce injuries to the new group of sows:
  » Keep the size of a new group between 10 to 30% of the total dynamic group to help the new sows compete with resident sows.
  » When the size of a new group is larger than 40% of the total dynamic group, mix the new group of sows in a separate pen before introducing them to the dynamic pen.
- Dynamic group sizes of 100 sows or more provides an opportunity for timid animals to escape from aggressive sows because of increased pen size and number of animals in the pen.
- Removing sows from the dynamic pen usually does not trigger much fighting.
CARETAKER SAFETY

A safety risk to caretakers is getting hands, arms or legs pinched between a sow and the bars of a pen partition. Be aware of this risk and consider how to approach sows so that a sudden movement by the sow will not trap a part of your body and cause injury. Placing a sort board between you and the sow can provide some protection.

Consider working in pairs to accomplish management tasks whenever possible. If one person is injured, the other can provide assistance or seek additional help. Pay close attention to all sows in the pen, especially if someone else is working in the same pen. If working in pairs is not possible, let others know where you are working and carry an approved communication device such as a cell phone or two-way radio to call for help if needed.

Sows and heat-check boars can become aggressive. Have a readily accessible escape route should a boar or sow become aggressive. Avoid tight corners and always carry a sort board to provide some protection.

Routine animal care tasks can pose possible safety hazards to the caretaker.

1. Daily observation and walking the pens
   - Risk of being stepped on, knocked over, or tripped is greater just after sows are mixed compared to when stable groups have been established.
   - Be aware of fighting sows and other pen mates that may join the fight. Never attempt to interfere with sows during a fight.
   - Be aware of sows in heat or coming into heat because they are less predictable. They may injure caretakers as the sows try to mount other sows.
   - Sow activity increases the chances of caretaker trips, slips, and falls.
   - Wear protective footwear with steel-toe protection and non-slip soles to avoid injury from being stepped on and slipping.
   - Always carry a sorting board when entering a pen.

2. Sow health care
   - Be careful when vaccinating unrestrained sows because they may exhibit avoidance behavior.
   - Any injections or treatment of sows can agitate the sow and possibly pen mates (particularly if snout snares are used) and cause sows to become aggressive.
   - The process of replacing ear tags may agitate the group and cause sows to become aggressive.
   - Needle-sticks are a danger to caretakers when sows are mobile and unrestrained.

3. Heat checking and mating
   - Use a sorting board when moving sows and boars for heat checking. Some boars may aggressively attack a sorting board, so take extreme caution. If this occurs, the boar should be culled.
   - Sows can be persistent in mounting behaviors. If heat checking or mating sows in pens, be aware of other sows wanting to mount the sow being inseminated.
   - Be particularly cautious working around boars that have tusks.

4. Pregnancy diagnosis
   - Be aware of slip, trip and fall hazards around sows, especially when wearing ultrasound goggles.
   - Caretakers new to using ultrasound equipment need to take special care in adjusting their vision so they can move around the barn without tripping or falling.
   - When checking an individual sow, other sows in the pen may bump or push the caretaker.
CARETAKER SAFETY

5. Moving sows
- All movement of sows must be in accordance with the handling guidelines described in PQA Plus and TQA. All caretakers need to be certified in these programs for efficient and safe movement of sows.
- Always use a sort board to move sows. Sort boards provide a physical and visual barrier that is very useful in moving sows.
- Understand and use pig movement behaviors when sorting sows from a group.
- Be aware that sows showing extreme avoidance behavior have the potential to knock down people.
- Be cautious of caretaker legs getting pinched or injured as sows move down alleys, especially when multiple sows move side-by-side.

6. Euthanasia and sow mortality
- If possible, sows should be moved from the pen to an open area for euthanasia.
- If the sow is non-ambulatory, work in pairs to move sows safely and humanely to the euthanasia area. Do not drag conscious sows. Use a device such as a sled, cart or dolly to minimize the risk of injury to the caretaker and to maximize comfort of the sow.
- Use a mechanical device (cart/winch/dolly) to move dead sows and to avoid back strain.

7. Equipment repair/maintenance
- Many ESF stations have moving parts that are triggered by electronic eyes and actively powered. These components are designed for sows and have the potential to cause injury to a human. Be sure that the station is powered down, locked and tagged out if working inside it, and make sure sows cannot access the station during this time.
ESF feeders use gates to control access to the feeder. Gates will operate mechanically, electronically or pneumatically. Sows that are new to the system will not know how to use the gate and may be reluctant to enter the feeding station. To avoid fall-outs and production losses, gilts and new sows need to be trained on how to access the feeder, preferably before they are bred. Missed feedings during the learning period can affect productivity.

1. Training pens
   • Training should be done using a pen designed just for training, with pen dividers to separate fed and unfed sows as they move through the feeder.
   • The pen should be located in an area that is easily accessible by staff, as sows will need to be checked and encouraged to enter the feeder during the initial training period.
   • Ideally, the training group should contain a reduced number of pigs (e.g. 30 to 50 pigs per feeder) to allow sufficient time for all pigs to feed and less caretaker intervention.

2. Training procedure
   • Training should be completed before the sows are bred as feed interruptions can occur during training that could affect productivity of bred sows.
   • Assure that lighting above feeder in training area is sufficient to facilitate gilts being able to see easily where they are going.
   • Training will take from 7 to 14 days and requires regular caretaker attention. Some animals may take longer and some may fail to learn the system altogether. However, when training is performed correctly, these numbers are small.
   • The more careful and attentive you are to training during the first few days, the less work will be required in the later stages of training. Every animal should be observed as it enters the feeder, finds the feed source, and exits the feeder. Assistance may be needed for any of these steps.
   • The system is designed to reset at 24-hour intervals with the specific time determined by the user. Before the daily system reset, pigs are moved to the ‘entrance’ side of the pen and the gate is closed. For the initial days of training, if the ESF station does not actively open the entrance gate, this gate may need to be left open so that sows can freely access the feeder. This may require tying the gates open.
   • Evaluate reports to determine which sows did and did not eat.
   • Sows are naturally curious and will investigate the feeding station. Providing adequate lighting over the feeder and sprinkling feed at the entrance also will encourage them to enter. Some systems also provide a manual training button, which can be pressed to reward sows when they enter.
   • After the initial training sessions, pigs should be checked periodically throughout the day to ensure they are moving through the feeder and to encourage animals that are reluctant to enter the feeder. Before the end of the day, animals remaining on the ‘entrance’ side can be directed through the feeder, either using feed to attract them or by gentle handling.
   • The training of sows and gilts should be assigned to caretakers having a high level of skill and training in animal handling, as the future of the herd depends on sows successfully learning the system. If animals become stuck or have a negative experience when in the feeder, or do not successfully learn to access the feeder, their productive life in the herd will be limited.
   • Having a series of cross gates in the pen is useful for helping gilts and sows to move through the feeder, and also saves on pen space. As pigs move through the feeder each day, the use of different gates allows the ‘entrance’ pen to get smaller as the ‘exit’ pen expands (see Figure 1).
TRAINING GILTS AND SOWS

- Once sows are familiar with entering the station to access feed, less handling will be required and the entrance gate can be gradually closed if it was necessary to prop open.

- On some farms, multiple pens are used for training replacement gilts. An initial training pen is used without an ESF feeder, but contains gates similar to those used on the ESF. This allows the animals to become familiar with the use of gates more gradually, and without the added expense of an ESF station and with fewer missed feedings.

- Gilt training can be improved if replacement gilts are housed at a young age in large groups and required to pass through one-way gates to access feed.

**Figure 1.** Diagram of ESF training pen. Image A shows the pen setup early in the day. All gilts should be moved to the Entrance area, and gates should be positioned to allow more room near the Entrance. Image B shows the pen setup as the day progresses. Gilts will move through the feeder to the Exit side. Gates should be adjusted to allow more space in the Exit area and to crowd gilts on the Entrance side, encouraging them to pass through the feeder. (Images: Prairie Swine Centre)
INDIVIDUAL SOW OBSERVATION

Daily observation of individual sows is an important part of animal care and allows for early detection of problems. The easiest way to identify problems is by noticing changes in sow condition and behavior. Observations should be part of the daily routine.

1. General observation
   - To avoid missing sows, develop a consistent plan to walk through the barn and scan each pen. For example, scan the edges of each pen and then across the central areas to ensure all areas are examined.
   - Observe all pens twice each day, once during the morning and once during the afternoon. The observations could be combined with regular work tasks and completed when the sows are active.
   - Walk through each pen once each day thoroughly checking all sows. Visually check standing and walking sows for body condition, lameness, or injuries and mark those that will need subsequent attention.
   - Check for sows lying hidden behind solid pen partitions.
   - Note groups of sows in each area of the pen, including where and how they are lying. Observe if any sows are lying separated from the rest or are lying in muck, as this can indicate a problem due to sickness or injury.
   - Observe how sows are standing. Check for presence of discharge or blood on the floor or on sows, and scan for obvious injuries.
   - Observe that each sow has a tag present in her ear.
   - Record the number of animals with problems in each pen group. This will help build a database of the incidence of problems arising in the herd.
   - Initial a daily sow-monitoring record sheet for each room/pen group to document that sow observations are being performed.
   - Assign sow observation tasks to a designated individual to ensure consistency of checks. All observers should receive training on the monitoring routine.

2. Monitoring for sows off-feed
   - With sows accessing the ESF throughout the day for feeding, the ESF data program becomes an essential tool for monitoring sow health and well-being.
   - Data on individual sow feed consumption and movement through the ESF should be reviewed daily.
   - Utilize the ESF program to flag automatically any sows that have not entered the system and sows that have not consumed their entire feed ration.
   - Sows that do not feed for 24 hours should be physically checked for health, ear-tag retention, and to ensure they have learned how to access the feeder.
   - Sows not consuming their entire ration also should be checked for health and condition.
   - Poor-performing sows may require additional training on use of the feeder, or may need to be removed to a treatment pen for observation and treatment.
INDIVIDUAL SOW OBSERVATION

Pen Scanning Path

Review the ESF Eating Record Printout

RFID Ear Tag

Sows and Solid Pen Partitions

Keep a Daily Record
BODY CONDITION SCORING

Body condition is a critical factor affecting the reproductive success, health and longevity of sows. Both thin and fat sows contribute to reduced productivity and economic efficiency of the herd. Therefore, maintaining sows in an optimal weight range, with minimal fluctuations in body condition throughout the productive life of the sow, is an important management goal.

Body condition scoring is a simple management tool for accurately assessing the body condition of sows. Regular body condition scoring should be part of the routine management of the breeding herd, and can help determine whether the feeding management of sows is effective.

1. How to perform body condition scoring
   • Both a visual and a physical assessment of the sow is required. The spine, ribs, hips, and pin bones should not be visible but they should be easy to feel. (Figure 2).
   • Sows should be standing for the assessment. If lying down, urge the sow to stand.
     » If scoring when sows are in a stall, stand out of the stall and behind the sow.
     » When scoring loose sows, calmly and quietly approach the sow from her side, not head. Stand to one side of the sow facing the tail.
     » A good relationship between the sow and caretaker is important for loose sows to remain calm and to stand during condition scoring. Take time daily to walk the pens and interact with the sows to help them feel relaxed in your presence.
     » Approach nervous sows or gilts in a crouching position (Figure 3). This is less threatening and can allow you to get closer to the loose sows.
   • Begin with the physical assessment: using the fingertips or palms of both hands, reach over the sow to firmly press the hip bone, pin bones and top of spine (Figures 4, 5 & 6).
   • Stand back from the sow and visually assess her condition based on the appearance of her hindquarters in accordance with the 1 to 5 scale (Figure 7).
   • Based on the physical and visual assessment, assign individual sows a score of 1 to 5.
   • Half scores, such as 2.5, may be used if this helps to increase accuracy.
   • Record the condition on the sow’s record card or input into the ESF computer system. Some systems provide a handheld device to facilitate data entry in the pen.

2. When to monitor body condition
   • Score sows at breeding, at pregnancy checking and at least once during gestation, commonly at 80 days of gestation.
   • Allow sufficient time between scoring and farrowing for adjustments in the feed ration to affect condition before farrowing.
   • Condition scores should range between 2.5 and 3, with at least 80% of sows having a condition score of 3.
   • Combine the scoring with other routine jobs (such as breeding and pregnancy checking) to improve work efficiency.

3. What body condition scores mean
   • Large variations in body condition within a pen indicate there is a problem with feed distribution.
   • If sows are housed in breeding stalls for 4 to 5 weeks after service, the sows should be fed an appropriate amount of feed to get them in the correct body condition before entering the group pen environment.
   • Where sub-optimal body condition scores are seen, check the ESF records for the sow in question. For sows showing condition scores of 1 and 2 around 30 days post-breeding:
     » Check the amount of feed available to the sow each day.
     » Check frequency that the sow visits the feeder.
     » Check the quantity of feed being dropped each time. Is the sow eating the available amount per day?
   • Presence of large number of poor condition sows in ESF systems suggests a problem in the management of the system.
     » Are animals being assigned the appropriate amounts of feed?
     » Are all animals accessing the station and (or) has the feeder been overstocked?
BODY CONDITION SCORING

» Is the ESF station working properly? Is more than one animal entering the station at once? Is feed being dispensed properly?
• Sows with a condition score of 1 should be a rare occurrence (<1%). Sows with condition score 1 may need to be removed from the group for additional supplementary feeding to improve body condition.
• For sows indicating condition scores of 4 and 5:
  » Check the quantity of feed being provided.
  » Check the frequency of visits to the feeder; could the sow be consuming left-overs or stealing portions from other sows?

4. Points to remember
• When possible, perform body condition scoring with a second caretaker to develop consistency of scoring.
• Have a third party, such as the herd veterinarian, periodically check consistency of scoring.
• Periodically review the percentage of sows falling into each score category to help identify problems related to feed allowance.
• Both underfeeding and overfeeding are undesirable. Feed is the greatest production expense. Overfeeding sows is economically inefficient and also can lead to reduced sow productivity.
• Monitor regularly throughout gestation to ensure all sows are receiving sufficient feed.
• Promptly remove from the pen any sows that cannot compete and that are losing weight.
• ESF allows for individual feeding so body condition of the group should be uniform.

Figure 2. Sow Bone Structure. 1–spine, 2–ribs, 3–hip bone 4–pin bone
Figure 3. A technique for approaching nervous sows or gilts in loose housing.
Figure 4. Feeling for fat cover over the hip bones of the sow.
Figure 5. Feeling the top of the spine.

Figure 7. Body Condition Scoring

<table>
<thead>
<tr>
<th>Image</th>
<th>Score</th>
<th>Condition</th>
<th>Detection of Ribs, Back Bone, “H” Bones and Pin Bones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Emaciated</td>
<td>Obvious, easily detected with pressure</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Thin</td>
<td>Easily detected with firm pressure</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Ideal</td>
<td>Barely felt with firm pressure</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Fat</td>
<td>None</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Obese</td>
<td>None</td>
</tr>
</tbody>
</table>

Taken from “Assessing Sow Body Condition” by R.D. Coffey, G.R. Parker, and K.M. Laurent (ASC-158; 1999)
IDENTIFYING LAMENESS

Lameness is a concern because it usually involves a painful condition. Lameness can be more visible in group-housed sows than those in stalls because they are more active. Lameness also can be more prevalent in groups due to aggression among sows. Therefore, it is important to assess and treat sows for lameness and minimize the negative effects on productivity and longevity.

1. Observation and scoring for lameness

   • During daily walking of the pens, observe sows carefully to identify signs of lameness. Signs include shortened stride, swaggering of hindquarters while walking, reduced weight bearing on the affected limb, reluctance to move or get up, arched spine when walking or standing, and obvious head nods when walking.
   
   • Ideally, two people should be present. One to move the sow and one to observe and score movement.
   
   • Observe sows as they walk over an area with good flooring. Slatted floors may be used, but clean, solid floors are best.
   
   • Sows may be stiff from lying, so make sure the sow has walked several feet before beginning your assessment.
   
   • Walk the sow for a distance of 10-20 feet and observe her movement.
   
   • Evaluate the severity of lameness using a scale of 0 to 4 (Table 1).

2. Treating lame sows

   • When a lame sow is identified (score of 1 or greater), examine the affected limb(s) to determine the cause and appropriate treatment.

   • Common causes include cuts to the leg, abscesses, swollen joints, or hoof lesions. If no lesion is present, internal joint problems may be responsible.

   • The treatment of affected sows will depend on the cause and severity of lameness and the farm's Standard Operating Procedure (SOP).

       » Sows scoring 2 or 3 may benefit from removal to a treatment pen with the addition of rubber mats to promote recovery.

       » Sows scoring 3 or 4 should not be transported, but should be moved to a treatment pen if possible. All efforts should be made to avoid mixing sows in the lame pen to reduce fighting among these sows.

   • Depending on the sow's condition and treatment options, severely lame or non-ambulatory sows may need to be euthanized following protocols developed in consultation with the herd veterinarian.
## IDENTIFYING LAMENESS

### Table 1. Lameness score scale

<table>
<thead>
<tr>
<th>Lameness Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sow moves freely and uses all 4 limbs and feet evenly</td>
</tr>
<tr>
<td>1</td>
<td>Sow shows weight-shifting activities away from affected limb when standing but shows little or no lameness or limping when walking</td>
</tr>
<tr>
<td>2</td>
<td>Sow obviously shifts weight away from affected limb when standing and shows limping or adaptive behavior when walking (head bob, arched back, hindquarter swagger, quickened step on affected limb, or shortened stride)</td>
</tr>
<tr>
<td>3</td>
<td>Sow is reluctant to stand and/or walk, obvious limp and adaptive behaviors when walking (head bob, arched back, hindquarter swagger, quickened step on affected limb, or shortened stride)</td>
</tr>
<tr>
<td>4</td>
<td>Sow is non-weight bearing on the affected limb when standing or walking</td>
</tr>
</tbody>
</table>

Monitoring animal health is a key part of daily observations. Early identification of ill or injured sows is important for effective treatment and for maintaining good health in the herd.

1. Identifying sick animals
   - Animal behavior is typically the most cost effective and time efficient approach to identifying a sick animal.
   - Observation of changes from their normal behavior is the key to finding a sick animal.
   - Daily observation of all animals is required to understand what is normal and to be able to identify changes when they occur.
   - Identification of sick animals can be complicated because sows can move around within the pen or barn. However, animals often lay in similar locations from day to day.
   - Group size in ESF barns can range from 50 to more than 250 head, and thus careful attention must be paid to individual animals to ensure adequate individual animal care.
   - Marking of suspect or affected animals will help make repeated observations easier.
   - Most commonly observed behavior changes include:
     - Failure to eat part or all of their daily ration;
     - Failure to rise or walk, or an abnormal posture when standing;
     - Pilo-erection – fuzzy-pig look associated with fever;
     - Abnormal gait when walking;
     - Changes in laying posture or changes in the location within the pen where the animal normally lies. Also look for isolation from pen mates.
   - Systematic observation of many of these behaviors is complicated in ESF barns as animals do not feed at the same time, and typically only a few of the animals are active at one time. Look for compromised animals throughout the day.
   - Sick animals will be found often in the less desirable areas of the pen that are typically far from the feeder and wet or drafty.
   - The computer system controlling the electronic sow feeders can be used to identify animals that have not eaten.
     - These animals need to be found in the pens and examined to determine the cause of not eating.
     - Health problems such as illness or injury are common reasons a sow does not eat.
     - These animals need to be clearly identified so they can be readily found and monitored over the next few days.
     - Other reasons for a sow not eating that need to be addressed include:
       - lost or damaged RFID tag
       - poorly trained to the station, or
       - socially inhibited. This includes animals at the bottom of the social order that may know how to eat but are afraid to approach the feeder. Problems with socially inhibited animals are more commonly observed when the pens are overstocked.

2. Diagnosing the problem
   - Further diagnosis of a sow’s problem is critical to ensure that she receives the most appropriate care and treatment.
   - Lameness can be diagnosed by abnormal gait, failure to bear weight on a limb, or inability to rise (see Identifying Lameness section for more details).
   - Other conditions in sows tend to be much more sporadic in occurrence.
   - It is sometimes useful to take the sow's rectal temperature to see if the animal has a fever (normal temperature is 102°F) and to help identify animals with an infection.
   - Sneezing, coughing, or reddening about the eyes is often associated with disease of the respiratory tract.
   - Abnormal posture, head tilt or evidence of constant head banging is indicative of neurologic disease.
   - A pale animal often suggests there has been internal blood loss following a gastric ulcer or ileitis.
   - Blood, scratches, cuts, healing wounds and other injuries can result from aggression among sows.
   - Mucous discharge found on the slats behind the sow or coming from the animal’s vulva often indicates a reproductive tract infection.
MONITORING ANIMAL HEALTH

- Dry, hardened or pellet-like feces suggests the animal is not drinking enough water.
- Loose or poorly formed feces may be indicative of a sudden dietary change or the development of gastro-intestinal disease.
- Blood on the sow’s hind legs or afterbirth or fetuses in the pen reflect a recent abortion/pregnancy loss. Finding afterbirth or fetuses can be challenging because they may have been eaten by other sows, been stepped through the slats, or the aborting sow may have relocated.
- Dynamics of group-housed animals make it more difficult to associate discharges, abortions or changes in feces with specific animals.
- Veterinary consultation may be required for accurate diagnosis of some problems.

3. Treatment

- Treatment is an important step toward fixing the animal’s specific ailment and helping to ensure that she stays in the herd.
- Develop treatment plans for specific ailments in conjunction with the herd veterinarian.
- Record all treatments on a treatment sheet.
- Clearly identify individual animals receiving treatment.
- Mark withdrawal dates for all drugs administered to a sick sow on the treatment sheet to ensure she is not sent to slaughter prematurely.
- An animal may need to be moved to a treatment pen depending upon the severity of the ailment, whether the animal can remain competitive in the pen, or the required treatment.
- If an animal’s ailment can be managed in the existing pen it is best to do so.
- Administering treatments:
  » Treatments usually involve injections, or in rarer cases, oral administration.
  » Sows may need to be restrained for treatment and the administration of routine health care.
  » Repeated treatments are more likely to require restraint or immobilization. Corner the sick animal along a fence line with a sorting board or snare the sow.
  » Follow all basic good production practices as outlined in PQA Plus when administering injections. Take additional care to ensure caretaker safety.
  » Treat animals for the full treatment course as specified by the farm SOP to maximize her chance of recovery. Animals not responding to treatment will need to be euthanized.

4. Routine health maintenance practices

Most farms also carry out other basic health maintenance activities during gestation that include:

- Pre-farrowing immunization to improve colostrum quality at farrowing.
  » It is relatively easy to approach most sows to give a single injection in pens where the animals have regular, positive human interactions.
  » Static pens in ESF barns make it relatively easy to vaccinate whole pens of animals at a time. However, the situation is more complicated with a dynamic pen flow as typically only a subset of animals within a pen will require health maintenance activities. The ESF’s system can be used to color mark or automatically select these animals from the pen in advance of their individual animal care. Otherwise, mark sows prior to vaccination with one mark and use a second one to confirm she was treated.
- Non-invasive manipulations such as body condition scoring (see Body Condition Scoring section for more details).
- Pregnancy diagnosis (see Pregnancy Detection section for more details).
HEAT DETECTION AND ARTIFICIAL INSEMINATION

Detection of heat, or estrus, is important for determining the correct time to mate gilts or weaned sows and to reduce non-productive days in sows that return to estrus post-mating. Depending on the barn design and management of breeding within the herd, breeding may take place in stalls or in a pen specifically designed for estrus detection and insemination.

1. General information about heat detection
   • Be aware of sow behavior at all times as estrus may be identified when performing other tasks. Greatest success is achieved when sows are comfortable around people.
   • Perform heat detection at a set time daily.
   • Perform heat detection on recently weaned sows and on all sows 18 to 24 days post-mating to detect return to estrus. Many farms check for late returns (i.e. after 42 days) by walking the pens and observing sows’ physical appearance and behavior.
   • Sows show estrus more reliably if detection of estrus is performed in the morning with mature boars.
   • Sows display estrus in response to pheromones from the boar’s saliva. It is important to consider actions to enhance the likelihood of her being stimulated by his smell.
   • Ensure boar exposure is a novel event at the time of detection of estrus; muscle fatigue occurs when sows stand in estrus for prolonged periods (re refractoriness).
   • Best results occur if sows have not seen, heard or smelled a boar for 1-2 hours before detection of estrus.
   • Use mature heat-check boars that are at least 10 months of age. The best boars for heat checking actively chant, chomp and produce saliva.
   • Walk the boar ‘into the wind’ to avoid refractoriness. This is especially relevant in tunnel-ventilated barns.
   • Do not smoke during estrus detection.
   • Record observations and mark sows to assure each is checked daily.
   • Some farms mate sows at detection of estrus. If this is practiced, carry semen and catheters during estrus detection for the anticipated number of sows to be mated.
   • Use sorting boards, tethers, carts or robots when handling or moving boars to assure safety. Boars are capable of injuring people so remain vigilant in attention to the boar at all times and always use proper safety tools. Often, boars can be trained to signals.

2. Heat detection in stalls
   Some farms choose to heat check and inseminate in stalls prior to group housing sows.
   • Assure each sow has fence-line nose-to-nose contact with the boar. The time for a sow to exhibit a standing response is highly variable so duration of boar exposure should be two minutes.
   • Have at least one person located behind the sow during heat detection. While the boar is in front of the sow, this person will determine if the sow is receptive to boar stimuli by applying pressure to the sow’s back, massaging flanks, and checking the vulva for color and discharge.
   • If heat checking rows of sows facing each other, consider refractoriness. Either have people heat-checking behind each row simultaneously or check the second row 1 to 2 hours after the first.
   • When applying back pressure and flank massage be aware of stall bars to avoid crushing hands (see Caretaker Safety section for more details).

3. Heat detection in groups
   • Establish an insemination area where small groups of recently weaned sows are moved for estrus detection and insemination. The design of the insemination area will depend on the number of caretakers present. This area typically includes a heat checking/breeding area and a holding pen.
   • Artificial insemination of sows in their home pen can be difficult and places caretakers at risk of injury due to estrus activities by other sows (mounting sow, nosing sow’s flank).
     » If several sows in a large group are expressing estrus at the same time, some sows may become refractory to boar stimuli before the sow can be artificially inseminated.
     » Working with small groups of sows during mating allows for focus on the insemination process. Move sows into smaller pens or sort into the aisle.
   • The minimum number of caretakers needed to heat check in a group pen is the number of boars plus 1.
HEAT DETECTION AND ARTIFICIAL INSEMINATION

- At least one person will work with the sow to determine if she is receptive to boar stimuli by applying pressure to the sow’s back, massaging flanks, and checking the vulva for color and discharge.
- Allow fence-line access to boars or move boars into the sow pen to provide maximum exposure to sight, sound, and smell of boars and to assure nose-to-nose contact for each sow.
- Prevent the boar from actually mounting sows unless the intent is to allow natural mating or to collect the boar by hand. Heat-check boars should be collected once per week to help maintain their sexual behavior.
- If one boar is used instead of several, boar rotation needs to be more frequent (30 to 60 minutes maximum in most cases). Duration of boar use depends on sexual activity of the individual boar. Warm weather will fatigue boars quicker than cool weather.
- It may be more practical to check for estrus after or near the end of the feeding day when sows can focus on the boar and not the feed station.
- Some ESF systems have equipment available to record how often and how long a sow spends time next to a boar. This information can be used to suggest whether sows are in estrus. This requires daily attention, and in practice is often found most valuable for identifying late or irregular returns rather than relying on this approach for 18- to 24-day heat check, and is most reliable if used in combination with additional observation of behavior.
PREGNANCY DETECTION

Confirming pregnancy status is important for planning farrowing accommodations and eliminating or re-mating open sows to reduce non-productive days. Open sows normally show estrus 21 days post-mating if they did not conceive. Sows presumed pregnant are often confirmed pregnant via real-time ultrasound pregnancy diagnosis. To confirm pregnancy:

- Identify sows that are 24 to 30 days post mating.
- Have a plan for how to manage sows that are found not pregnant.
- Carry an adequate supply of gel and assure the ultrasound battery is fully charged.
- Real-time ultrasound machines have fragile elements. The crystals in the probe are the most sensitive to damage so take care to avoid damage. Some caretakers strap the probe to their wrist during use to prevent dropping it on the floor.
- Apply gel to the probe. Carefully place the probe on her flank, pointing forward toward the uterus and avoiding the urinary bladder. To confirm pregnancy, look for black circles corresponding to the fluid around developing fetuses.
- Record pregnancy status and mark sows accordingly.

1. Confirming pregnancy in stalls
   - Pregnancy diagnosis involves placing your hand between the sow and the side of the stall. Avoid injuries by talking to the sow and placing a hand on her rump so she knows you are there.
   - Step into stalls or lean over the back gate.
   - To avoid injury and the need to step into each stall, it is possible to create a guide for the probe. Tape the probe to a bent piece of PVC pipe so the probe can be pointed toward the uterus from outside the stall.

2. Confirming pregnancy in groups
   - Sows are able to move freely and can pose a risk to caretaker safety (see Caretaker Safety section for more details).
   - Greatest success is achieved when sows are comfortable with people so that sows are not trying to get away during the ultrasound process.
   - Consider having sorting pens available for open sows or sort open sows into the aisle to facilitate re-mating or culling.
   - If housed in dynamic groups, mark sows ahead of time for safety and to preserve ultrasound battery life.
   - If housed in static groups, ultrasound each sow and mark as pregnant or open. Once completed, sort and move all open sows from the pen.
HANDLING FALL-OUT SOWS

Sows identified as open either at the time of routine pregnancy diagnosis or sows that later abort are referred to as fall-outs. Some farms also use the term for sows that are unable to compete in a group or become lame, sick, injured or thin. Each farm will need to decide whether the sow is to be re-mated or culled, but in either case it is likely the sow will be moved to a new location in the barn.

Some ESF systems also have available sorting tools. In conjunction with correct facility design, the computer can be programmed to sort sows previously identified into a separate pen at feeding.

1. Removing sows from a static group
   • If very early or late in pregnancy, consider the potential impact of removal and associated aggression that occurs with re-establishment of social status. Aggression has the least impact during the middle trimester.
   • The removal of animals from static ESF pens seems to have little to no negative consequences as a result from disruption to the social hierarchy.
   • Update sow data in the computer and feeding system accordingly.

2. Removing sows from a dynamic group
   • Replace removed sows from the dynamic group if appropriate. If fewer than 10 animals need to be removed/added, consider waiting until the group size grows.
   • Update sow data in the computer and feeding system accordingly.

ESF with a Sort Gate

Update ESF Computer Data
MANAGING VENTILATION

Ventilation will have an immediate and long-term impact on sow well-being and performance. If signs of ventilation issues are identified, it is important to take corrective actions to solve the problems.

1. Daily observations and actions
   - Observe animals daily for signs of discomfort due to improper ventilation, heating or cooling.
     » Signs include animals that are huddling together, lying on their bellies, shivering, panting, are excessively sprawled out, or nosing water out of the trough for cooling.
   - Observe facility daily and look for signs of improper ventilation, heating or cooling. Look for:
     » Excessively cold drafts that can be felt while walking through pens and buildings.
     » During winter months, ice/frost on north walls due to air leaks.
     » Wet barn floors due to a lack of air movement.
     » Animals defecating in the wrong area of pen due to improper air distribution.
     » Wet or damp gating or water dripping off the ceiling due to high humidity in barn, insufficient air flow and improper air temperature.
     » High ammonia concentration (25 ppm or greater) due to low ventilation rate, mucky floors, pit fans that are not working, or a manure pit that is too full.
     » Rooms that are too hot or too cold.
     » Evaporative cooling pads that are dry or have dry spots when they should be wet.
     » An air leak allowing air to by-pass evaporative pad.
     » Curtains that have large holes due to a lack of rodent control.
   - Observe daily for signs that ventilation, heating or cooling components are not working correctly. Look for the following problems:
     » Fans are not running when set to be working.
     » Fan shutters are stuck closed when the fan is running or open when the fan is not running.
     » Floors or walls are wet.
     » Humidity in the air is higher than expected.
     » Soffit air inlets are plugged.
     » Air inlets in the ceiling or wall are improperly set and causing bad distribution of air.
     » Air inlets are open within five feet of a running fan.
     » Dead air spots are detected within the room.
     » Air outlets on a non-mechanical ventilated building are improperly set preventing exit of a proper quantity of air.
     » Inadequate water flow or a plugged water source is causing the evaporative pads to be completely dry or dry in spots.
     » Heaters are operating when a first-stage ventilation fan is running due to improper setting (need 1.5°F offset).
     » Air temperature within the building is wrong due to thermostats being dirty, set wrong, or the sensor placed in the wrong location. In addition to observing behavior of pigs, get a thermometer reading daily to check for appropriate temperature.
     » In mechanically ventilated buildings, check manometer for appropriate static pressure.
     » Spray cooling nozzles are plugged.
     » Intermittent spray cooling system is not operating at the desired temperatures.
Thermoregulatory Laying Postures of Swine

The images portray the normal thermoregulatory laying postures of pigs in an environment with three different air temperatures. Take note of the pigs in relation to each other, as well as the amount of free space within the pen. Image A depicts a pen of 10 pigs in an environment with cold air temperature. These pigs huddle very close together in a dense pile in one area of the pen. Image B depicts a pen of 10 pigs in an environment with ideal air temperature. These pigs have body contact with each other but do not pile excessively. Image C depicts a pen of 10 pigs in an environment with hot air temperature. These pigs spread out throughout the pen and avoid physical contact with other pigs in the pen.

Taken from Shao et al., 1997, in volume 40 of the Transactions of the American Society of Agricultural Engineers.
2. Routine maintenance tasks

- **Weekly**
  - Check that alarm systems are working correctly.
  - During the summer months, check all components of the evaporative pad cooling system for functionality.
  - Check rodent bait stations.

- **Quarterly**
  - Clean fan blades, shutters, grill, motors and controls of fans in animal areas.
  - Make sure all fans are working and shutters open and close freely.
  - Clean manure pit fan blades, shutters, motors, fan housing and controls.
  - Make sure all manure pit fans are working and shutters open and close freely.
  - Replace excessively worn fan belts on belt-driven fans.
  - Grease fan bearings as needed.
  - Clean attic/soffit air inlets that are partially plugged with debris.
  - Check that indoor air inlets are working.
  - Check that curtain controllers are working.
  - Check that the emergency drop system for curtains is working.
  - Check that curtains do not have holes due to rodents.
  - Check that curtains do not have air leaks due to the top of the curtain sagging or air leaks at curtain pockets.
  - Check the curtain cable for broken strands.
  - Check for other types of unplanned entry of air (i.e. leaks around doors and windows).
  - With respect to season of year, check that the heating and cooling system is working properly.
  - Check the entire building and ventilation system for air leaks when using air filters for disease control.
  - Check that the emergency generator is working correctly.
  - The person in-charge of the ventilation system should be informed when adjustment to ventilation settings are needed.

- **Yearly**
  - Clean and repaint chipped areas on fan blades, fan housing and shutters to prevent further corrosion.
MANAGING VENTILATION

Weekly Check: Rodent Bait Stations

Weekly Check: Evaporative Cooling Pad

Quarterly Check: Air Inlets

Quarterly Check: Curtains
This guide is intended to provide a list of items to evaluate during daily barn inspections. It is not intended to be a decision tree for diagnosing problems.

**General Approach:** The daily walk-through of sow barns will be most effective if you develop a pattern of observation that becomes routine. The pattern of observation for each sow or pen will be similar, but the starting point for the walk through the barn should vary from day to day. This allows you to see sows and facilities from a different angle and at a different time each day. The primary focus of the daily walk-through must be the condition, health, and behavior of the sows. This will help you to diagnose problems with other components of the housing system. Every animal must be inspected every day to accomplish complete and effective animal care.

1. **Sow Condition/Behavior** (These also apply to gilts and boars in the barn.)
   - Is the sow standing up and active around feeding time with an alert, bright appearance?
   - Is there excessive fighting at the entrance or exit of the feeder?
   - Do computer records show that all sows accessed the feeder in the previous 24 hours? Did they consume their total daily ration of feed? Are any sows visiting the feeder more than 5 times daily without consuming their complete daily ration of feed?
   - Are the sows in good body condition?
   - Are the sows behaving normally considering the time of day?
   - Are there any skin lesions or injuries that appear to be new compared to the previous day? Are vulva bites present?
   - Are there sows showing signs of lameness?
   - Are there any unusual discharges from the sow's vulva?
   - Are there sows in heat? Are there sows riding each other?
   - Are there aggressive sows coming into or going out of heat that are harassing other sows?
   - Are sows getting injured due to activities related to sows in heat?
   - Are sows squealing and acting restless?
   - Are there any sows that seem to be loners and not interacting with the group?
   - Are sows lying on top of each other or huddled together or sprawled out?
   - Are some sows dominating the waterers? (Especially important in hot weather.)
2. Equipment

- Are all waterers or drinkers clean and have an adequate water flow rate?
- Is the feed hopper on the feeding station filling properly?
- Is consistency of feed/water mixture in bowl correct?
- Is feed reaching the bowl without buildup of stale/spoiled feed?
- Are entry and exit gates on feeding station working properly?
- Do all sows have an electronic ear tag?
- Are there any damaged sections of flooring causing problems with animal well-being or caretaker safety?
- Are there damaged partitions or gates that could injure sows?
- Do cooling spray nozzles function properly and turn on/off at the proper temperatures? Are sows drying between periods of spray cooling?

3. Environmental management in rooms

- Is the air temperature in the room appropriate for the season?
- Are there any odd sounds from fans, augers, heaters, etc.?
- Are floors wet and drafty where sows lay? Are floors slippery?
- Does the air in the room smell fresh, or is it stuffy with high ammonia and dust levels?
- Are fans for minimum ventilation operating?
- Are shutters closed on non-operating fans?
- Are appropriate fans operating considering the time of day and season of the year?
- Is the heater running? Should it be running?
- Are air inlets functioning properly?
- Did the sidewall curtain(s) open when expected?
- Is the evaporative pad cooling system operating properly considering the time of day and season of the year?

4. Manure handling system

- How much capacity is left in under-floor pits?
- Are pits too full for pit ventilation to work properly?
- Do pull-plug pits need to be emptied?
- Are under-floor scrapers working properly?
Here are several real-life scenarios designed to foster thought and to facilitate discussion of issues facing caretakers of sows housed in pens with an ESF.

### Scenario 1:
According to today’s ESF computer printout, three sows did not eat yesterday. You visit the pen to find the three sows and observe the following:
- part of sow one’s ear tag is laying in the corner of the pen.
- sow two is a first-parity gilt that was placed in the pen two days ago.
- sow three is laying separate from the rest of the group.

- What are the possible reasons each of these animals did not eat?
- How would you correct each of these problems?

### Scenario 2:
As you enter the barn this morning, you notice the sows are unusually restless. More sows are standing up than normal for this time of the day and you notice more aggression at the feeder entrance.

- What are the possible reasons for this behavior?
- How would you correct this problem?
- What would you do to prevent the problem from reoccurring?

### Scenario 3:
Three days ago, you moved a group of sows into pen 3. This morning you observe several sows with bleeding toes and torn dew claws.

- Why is this problem occurring?
- How would you correct this problem?
### Scenario 4:
You observe that some sows in pen 2 appear to be losing body condition. They had a body condition score of 3 when they were moved into the pen three weeks ago. Now, they look more like a body condition score of 2.

- Identify reasons these sows are losing body condition.
- How would you correct this problem?

### Scenario 5:
While walking through the east end of the gestation building, you notice sows are starting to urinate and defecate on the solid part of the floor on the north side of the alley in pen 10.

- Why is this problem occurring?
- How would you correct this problem?
- What would you do to prevent the problem from reoccurring?

### Scenario 6:
The outdoor temperature is 90 degrees Fahrenheit and there are dry spots on the evaporative cooling pad.

- Why does the evaporative pad have dry spots?
- How would you correct this problem?
- What would you do to prevent the problem from reoccurring?