

Appendix 1:

Number of individually housed or large-group housed pigs to be observed per site.

Average number of pigs per site	Site size: Minimum number of individually housed or large group housed pigs for assessment	Approximately every ___ pig or sow
50	All	All
90	46	2 nd
150	53	3 rd
250	63	4 th
350	70	5 th
450	76	6 th
550	82	7 th
700	89	8 th
850	95	9 th
1000	100	10 th
2000	126	16 th
3000	144	21 st
4000	158	25 th
5000	170	29 th

Source: Swine Welfare Assurance Program

Appendix 2: Resources for Producers

National

Recommended code of practice for the care and handling of farm animals: Pigs
Recommended code of practice for the care and handling of farm animals: Pigs
Addendum Early Weaned Pigs
Recommended code of practice for the care and handling of farm animals: Transportation
Animal welfare database: www.prairieswine.com

Quebec

Le Transport des animaux fragilises: Evaluation des animaux a risqué
Arbre de decision : Transport des animaux fragilises
Euthanasie des porc a la ferme : Les options du producteur
Plan d'Action sur l'euthanasie

Ontario

Caring for Compromised Pigs : Assessment Animals at Risk
Should this pig be transported? (Decision tree)
Cold and warm weather loading charts for transporters
On-farm Euthanasia of Swine – Options for the Producer
On-Farm Euthanasia of Swine – Action Plan

Manitoba

How pigs are raised
Pigs in Transit
Humane Handling and Euthanasia of Swine: Standards for the care of unfit animals (and poster)

Alberta

Humane Handling of Swine: Standards for the Care of Unfit Animals
Humane Handling of Swine – poster
Hog Handling and Training course

Appendix 3: Optional Handling Assessment

Dr. Temple Grandin has developed an objective scoring system for assessing animal welfare in the processing industry. This scoring system is widely used in the US - it is easy to use and can identify problems that impede pig movement. When pigs balk, handlers tend to prod pigs. Handlers resort to using the prod because they don't understand why pigs are not moving forward. By identifying distractions and other impediments to movement, pigs will be less stressed and handlers will not have to use prods to load pigs.

Parts of this system can be used to identify problems which impede movement of pigs during handling on farm. The following is a short animal welfare assessment that you and your staff can use to score handling. If your score is below the prescribed level, you need to determine why and work together to remove distractions and improve understanding of animal behaviour.

Critical control points for objective scoring:

1. Percentage of pigs that vocalize (squeal) during handling:
 - 100 pigs should be observed at a specific point in the handling process (for example, at the room door or at the entrance to the truck).
 - Sites for observations should be varied over several days and sites should be located all along the route – this will show if the cause of the squealing is the prod, handler intervention or a problem with the facility (i.e., air blowing into the face of the pigs, poor lighting etc.)
 - A note is made as to whether or not the pig squeals (S) or doesn't squeal (X).
2. Percentage that fall during handling:
 - Again, observe 100 pigs. Pigs that fall or slip are given an "F" for falling and an "X" if no falling is observed.
 - A pig falls when part of its body touches the floor.
3. Percentage moved with electric prod (goad):
 - Observe 100 pigs and note which pigs are prodded with "P" and an "X" if no prod is used.

These critical control points are useful since they measure many problems. For example, pigs might squeal because they are prodded or they might squeal because they cannot see the way forward (due to bad lighting, distractions, changes in flooring type, etc.). Pigs will fall because of poor flooring, lameness or because they are being rushed. Both

measures (i.e., squealing and falling) can also tell us things about the stockmanship – pigs fall because stockpeople are rushing the pigs, are not tuned into the reason that pigs stop and are not examining individual pigs to isolate compromised animals.

If you score a high number of pigs being prodded (more than 25%) or more than 25% of the pigs falling, investigate the cause! Is there something in the facility that is stopping pigs from moving forward (i.e., bad lighting, change in flooring type, air in their faces etc.) or are staff over-using the prod because they have not been shown an alternative (i.e. pig boards) or they don't realize that pigs may be reluctant to leave their home pen? Are pigs falling because they are being forced to run or because floors are slippery?

Tip:

Is loading out difficult on your farm? Did you fall below the recommended scores in your audit? Try making a video of the loading out procedures and using this to identify spots where pigs are stopping and/or balking.

Use the video to analyze the behaviour of both pigs and handlers. Play the tape back for all staff involved and ask the following questions – use the answers to modify loading out procedures:

Are there identifiable areas where pigs stop to investigate changes in flooring or lighting? Is this the same spot where staff repeatedly used the prod?

Are pigs stopping because air is blowing in their faces as they move into the truck?

Is there a place for the truck driver to stand so that he/she is not impeding the forward motion of the truck?

Totals for Objective Numerical Percentage Scores

	Actual %	Min. Passing Score	Excellent	Final Score / Excellent / Pass/Fail
Percentage of pigs prodded with an electric prod	Animal # 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	25%	5%	
Percentage of pigs falling	Animal # 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	25%	5%	
Percentage of pigs squealing during handling in a specified area. The specified area was _____.	Animal # 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	50%	25%	

Reasons for scores that are not acceptable minimum passing score:

References:

Gonyou, Harold, 2005. Practical Approaches to Ensure Animal Welfare on Farms. In Proceedings of the 2005. London Swine Conference.

Grandin, Temple, 2004. <http://grandin.com/welfare.audit.using.haccp.html>

Appendix 4: Understanding Pig Behaviour

Attitude:

Pigs that are handled with a positive attitude perform better. The best stockpeople:

- Like their pigs
- Are determined to meet the pig's needs
- Have a good understanding of the requirements of their pigs, and
- Can translate this understanding through their handling practices into a high level of care which results in a high level of pig health, welfare and performance.

Sorting and Moving Pigs – Stay calm:

Calm pigs are easier to handle and move than excited animals. Animals that become agitated and excited bunch together and are more difficult to separate and sort. If animals become agitated or excited, allowing them to calm down for a few minutes will make them easier to handle.

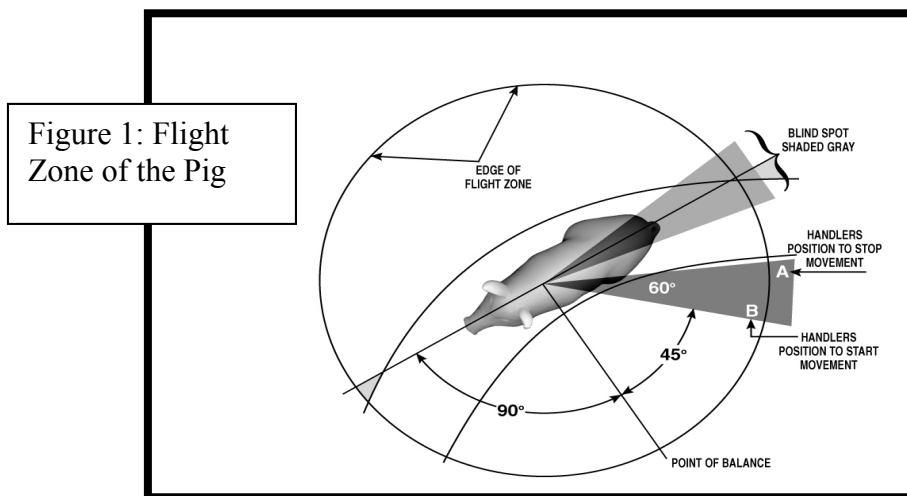
Pig Behaviour:

Many aspects of handling cause stress in pigs. Separation from familiar pen mates, mixing with new animals, new environments, exposure to new sounds and equipment, changes in temperature and ventilation cause stress.

Understanding pig behaviour will help you with your job and enable you to be able to move pigs quickly and efficiently while reducing the stress to the pigs during loading and unloading.

- Loading and unloading will be a novel (new) experience for many pigs. Novel experiences produce fear in pigs - especially if they have not experienced frequent human contact.

- Pigs **don't** like having to move up and down ramps; pigs **do** like to play follow the leader. If you can get the lead pig moving, the rest will follow if given time. Let the leader pig lead, don't try and force pigs up or down ramps.
- Like all animals (you included), pigs have a flight zone. If someone stands too close to you, you feel uncomfortable and will move away. The same principle applies to the pig – when handlers get into the flight zone, pigs will move away. Pigs that are not accustomed to humans will have a very large flight zone and will react (by squealing and trying to get away) when a handler reaches the perimeter of the flight zone. If you enter too quickly and deeply into the flight zone, the pig will turn back on you. A good handler understands the principles of the flight zone and will use this to guide pigs (Figure 1). **The edge of the flight zone is the best place to be to get pigs to move in the direction you want them to.**



- Pigs are herd animals and will try to stay with the herd. Move pigs in groups by gently encouraging the lead pig. A small, manageable (5 to 8) group of pigs is easier

to move than a large group (remember, the rest will follow the leader). Don't try to move an isolated pig – let the pig rejoin the group and then move the group.

- Pigs have 310° panoramic vision – what they see greatly influences how they behave.
- Pigs have good hearing – they react to loud noises such as yelling and slamming gates. Use your normal speaking voice when working with the pigs.
- Equipment should be designed to reduce noise. Clanging and banging metal parts should be silenced with rubber pads. Air operated equipment should be equipped with mufflers to reduce noise. Hissing air may cause animals to stop and refuse to walk through a facility.
- Hats or coats, hands or arms, chains, drains in the causeway will cause pigs to slow down or stop. Remove the distraction – don't goad the pigs!
- Pigs will want to move from dark to light – however, pigs will not move into bright light such as sunlight or headlights.
- Warm weather contributes to a special set of problems for pigs – a small increase in temperature, when combined with other stressors, can be fatal for pigs. Just like you, pigs will be reluctant to move in hot weather. Do not use bedding in hot weather. Similarly, pigs will be reluctant to leave a warm barn for a cold truck.
- Pigs will fight when mixed, leading to injury. If loading pigs from different farms, use gates to separate.

Slow is fast – be patient. Remember that pigs are not clued into your goal of getting them either on or off the truck – their objectives are different than yours.

Handling Devices:

- Handling devices are for guiding pigs - the use of the pig's behaviour and modifying or manipulating aiseways and loading ramps will make moving pigs less stressful and reduce the reliance on handling devices.
- If needed, handling the pig board is the least threatening device (when used correctly) for moving pigs.
- Handling devices can help move pigs – the improper use of these devices is unacceptable. Prodding wedged or jammed pigs will make things worse – when prodded a pig will attempt to get away, further increasing the jam. Stockpeople must be patient and considerate. Sometimes the best move is to step back and let both the pig and the attendant calm down. If pigs are spooked, it will take 30 minutes to calm them down.
- Electric prods should not be used on-farm for loading or sorting pigs - pigs find the electric prod aversive and will remember this negative experience next time they are moved.
- **Never prod a non-ambulatory/compromised pig.**
- If pigs get jammed in a bottle-neck (door way, etc.) don't prod the back pig. Use the flight zone of the lead pig to get the pigs going.
- Excessive vocalization can signal an overuse of the electric prod. If you have to use an electric prod, look for distractions and/or lighting problems that are causing pigs to balk. Figure 2 provides a list of common distractions which may cause pigs to balk.

- A small nylon flag on the end of a slender flexible stick can work for sorting pigs.

Animals can be easily turned with the flags. A small plastic bag on the end of a stick also works well.

Figure 2: Common distractions which may cause pigs to balk.

Common distractions that impede movement:

- sparkling reflections on puddles
- reflections on smooth metal
- chains that jingle metal clanging or banging
- high pitched noise
- air hissing
- air drafts blowing towards approaching animals
- clothing hung on the fence
- piece of plastic that is moving
- fan blade movement
- see people moving up ahead
- small object (coffee cup) on the floor
- changes in flooring and texture
- drain grate on the floor
- sudden changes in wall colour

- A Matador cape (Figure 3) can be used to move groups of pigs either out of a pen or down an alley. It is made from lightweight plastic cloth and measures 60 in (150cm) long by 30 in (76 cm) high. There is a short stiffener rod on each end of the top. A cape half as long with a single stiffener rod can also be used.

Figure 3: Home-made matador cape for moving pigs.



- A plastic paddle or a small flag can be used for quietly moving pigs.
- Hogs will stop when a solid barrier is placed in front of them because it prevents them from seeing an escape pathway. This is why a portable panel or board is efficient for moving hogs. Handling will be easier if you use a panel. A light aluminum panel with a hinge in the middle is recommended for separating hogs out of a pen. A large flag can be used in place of the panel.
- A slapper, used to make noise by hitting the board or fence, can also be used if pigs are not too excitable. Avoid hitting the animals. Modern, leaner hybrids are more susceptible to bruises and get too excited if they are hit with the slapper. Avoid excessive noise or shouting. Animals that remain calm will be easier to handle. Excited animals will bunch together and be harder to sort.

Compromised Pigs:

- The Recommended Code of Practice for the Care and Handling of Farm Animals – Transportation advises that all animals should be in good physical condition and optimum health prior to loading.
- A pig that is in distress makes loud, deep, gasping sounds. These pigs should be left alone and allowed to recover.
- Act quickly to cool an over-heated pig or it will die. Do not force the pig to run or climb ramps. If possible, move the pig to a cooler environment and wet it down with a fine spray of cool water. **Do not pour cold water on pigs because they could die of shock.**
- Animals that are sick, injured, disabled, fatigued or cannot be moved without causing them additional suffering are not fit for transport.

- Non-ambulatory animals – any animal that due to age, injury, metabolic or systemic disease, etc., is unable to stand or walk without assistance – are one class of compromised animals.
- It is a good idea to survey all animals for fitness to travel before starting to load. Refer to the decision tree “Should this pig be loaded” for detailed descriptions of conditions that require euthanasia and/or a delay in transport. Pigs must be evaluated as per the recommendations on the decision tree.

Appendix 5: Animal Care Checklist

Week Starting.....

	Weekly and Daily Checklist	Yes	No	If no, list action taken	Signed	Date
D A I L Y C H E C K S	Flooring and pens free from protrusions or other hazard areas that expose pigs to injury					
	Pigs observed to be comfortable and exhibiting normal behaviour					
	Ventilation rate efficient in minimising ammonia/dust					
	Water flowing to all drinkers (at least one per 10 – 15 pigs)					
	Pigs fed or have access to feed					
	Sick or injured pigs separated/treated/euthanized					
	Pigs have access to dry place in which to lie					
	Staff absences covered					
	Mortalities (number)					
W E E K L Y	Facility equipment operational (lighting, feeding and watering equipment, heating and cooling systems)					
	Drinker flow rate appropriate (COP pg 16)					
	Feed checked and feed supply planned					
	Sows in appropriately sized accommodation (COP pg 11)					
	Rodents and birds controlled					
	Alarms, back-up systems or contingency equipment/facilities available/operational					
6 MTH	Mortalities within targets					
	Rifles/captive bolts checked and maintained					
	Herd health plan documented					
	Feed Silos cleaned out					
1 YR	Surface water or suspect bore water tested					
	Review biosecurity program					

Appendix 6: Sample Standard Operating Procedure for the Care of Sick or Injured Pigs

1. Pain Control

Introduction:

It is important to minimize the pain and discomfort of the animals. Although often subjective, indications of pain may include:

1. Vocalization.
2. Lesions that are red, swollen, or hot.
3. Elevated heart and respiratory rate.
4. Inability to move, stand, rise, or use a limb.
5. Shaking

Standards:

Treatment protocols have been established to ensure sick animals are appropriately cared for. Individuals must be familiar with the barn protocol. Guidelines for pain control are outlined in these protocols (for example; recumbent non-ambulatory; down sows should be humanely euthanized). If there are any individual, exceptional cases (not outlined in the protocol), a veterinarian should be contacted the day the animal is noticed. A plan (or prescription drug) will be made for that animal to make it as comfortable as possible.

Procedure:

Follow treatment protocols. Contact herd health veterinarians with the specifics of exceptional cases. A plan will be given immediately.

Monitor:

Individual animals will be monitored by staff daily. Monitoring will be done frequently (2-3 times/day) during high risk outbreak situations. Treatment protocols will be reviewed and updated as necessary. Veterinarians will monitor regularly.

2. Treatment

Introduction:

Intensive livestock production requires the knowledge and treatment of disease. Your Veterinarian has developed a treatment protocol for your barn that outlines the disease, clinical signs, and treatment of common ailments. Other health considerations include sanitation and disinfection, biosecurity, disease monitoring protocols, vaccinations, and overall management. All staff must know current protocols, and where the reference is located.

Standards:

- See also:
- Barn Treatment Protocols
 - Biosecurity Protocols
 - Disinfection Protocols
 - Vaccination Protocols
 - Management SOP's
 - * Ventilation
 - * Heat
 - * Sanitation

Procedures:

Follow above protocols. Any exceptional cases a herd health veterinarian will be contacted immediately and a plan devised.

Monitor:

Barn workers will check animals a minimum once daily for abnormalities (disease, injury, or competitiveness). Managers and Veterinarians will monitor regularly.

3. Rectal Prolapses**Introduction:**

Rectal prolapses occur as a result of:

- piling caused by drafts or chilling
- increased coughing or sneezing
- diarrhea
- certain medications

Leaving prolapses unrepaired is inhumane and may result in a rectal stricture.

Standards:

Rectal prolapses where greater than two centimeters of mucosa (pink/red rectal inside) is protruding, and less than 12 - 24 hours old, must be surgically repaired. Prolapses less than 2 cm should be separated and allowed to return to normal; if it has not within 12 hours it should be surgically repaired. Prolapses older than 24 hours should be segregated in a sick/hospital pen and repaired with a Profix tube.

Profix tubes are plastic tubes that can be inserted into the rectum and secured with calf elastrator rings. This causes the prolapse to fall off and the tube to function as a rectum and prevent stricture (healing closed).

No animal can be transported until prolapse is healed.

Procedure:Nursery/Grower

- replace the day they occur.
- restrain between legs or hang over a board; sedate if necessary.
- wear gloves.
- use local anaesthetic injected around the anal area.
- wash the prolapse with warm water and disinfectant soap - gently reduce (place back in).
- use a double strand of 2.0 or 3.0 catgut and place a purse string suture around the rectum with a large cutting needle.
- tie the suture in 2 knots at the top under the tail and cut the ends short.
- you should be able to place 1 large finger in the rectum.
- wipe the pig so it is free of blood.
- the suture will dissolve.
- treat the underlying problem (scours, crowding, chilling).
- keep separated if possible.

Sows/Adult Animals

- replace the day they occur.
- sedate and restrain.
- use an anaesthetic ring block around the affected opening (rectum or vagina)
- wash with warm water and disinfectant soap.
- gently reduce.
- use umbilical tape to place a purse string suture around the affected opening.
- you should be able to pass 2 fingers into the opening.
- cull the animal as soon as possible.

Monitor:

Barn workers monitor daily. Managers and veterinarians monitor regularly.

Appendix 9: Sample Farrowing Standard Operating Procedure

Proper management during and post-farrowing requires keen observation skills, knowledge of the pig's behavior and environmental needs, patience, and attention to detail.

Pre-Farrowing:

The pre-farrowing period is the time to prepare the facilities and sows for the birth of piglets. Sufficient time must be provided in the production schedule to make these preparations thoroughly.

Prepare the farrowing quarters:

- Clean and disinfect the farrowing rooms thoroughly before placing sows, including floors, crates, feeders, walls, fans, and lights. Ideally, the room should stand idle for a day or two to allow complete drying before sows enter.
- Check for worn or sharp edges that may cause injury. Check to see that waterers are functioning properly. Adjust size of crates to accommodate the females that will be housed in them.
- Outdoor reared - pre-farrowing preparations involve moving farrowing huts to a new, dry location and providing ample bedding material for the sow to create a nest. Ample use of bedding provides a cleaner environment and allows sows and piglets to create a micro-environment.

Prepare the sow for farrowing:

- Allow sows time to become accustomed to the farrowing stall – four to five days is recommended. Gilts that have never before been exposed to the farrowing equipment can learn how to maneuver in the farrowing crate and operate feeders and waterers.
- Sows must always be handled gently with great patience. Use slow, deliberate movements around sows and minimize loud noises. Be certain that distractions like equipment, shadows, slick floors, spilled feed and drafts are removed before moving sows from one location to another. Never beat a sow to move her, rather use gentle persuasion and patience. NEVER USE AN ELECTRICAL PROD TO MOVE SOWS!
- Check heat lamps, heat pads, radiant heaters to ensure proper functioning beginning 24 hours before expected farrowing.

Farrowing:

- Frequent, attentive observation of sows is important to predict when farrowing will occur. Accurate predictions of the time of farrowing will help ensure that the environment is ready for arrival of the piglets.
- Signs of impending farrowing include: nest building; increased restlessness of the sow; a firm, swollen udder; milk that can be squeezed from teats; increased respiration rate from about 25 to 75 breaths per minute; twitching of the tail; and expulsion of blood-stained fluids. The most reliable and easily observed signs are milk in the teats, increased respiration rate, and expulsion of blood-stained fluids from the vulva. The decision to intervene in the farrowing process is often a difficult one to make.
- If farrowing process is not progressing smoothly, determine if the sow has not finished farrowing. Evaluate the “fullness” of the sow’s abdomen, the number of piglets she has, and the quantity of placenta produced in determining if the sow has completed farrowing. Assuming she is not done farrowing, three of the most common signs include: 1. One or more piglets are present but labor stops for 45 minutes or more; 2. The sow is laboring (straining) but no piglet has been born for at least 45 minutes; and 3. All piglets are dry and the attendant is quite certain that more pigs are to be born.
- Contact barn manager for instructions on how to proceed and refer to SOP on difficult farrowing.

Piglets:

- It is critical that newborn piglets suckle promptly to receive a healthy dose of colostrum. Colostrum contains the protective antibodies needed by the piglet. Piglets should receive colostrum within the first 12 hours of life.
- Observe piglets for signs of chilling.
- Piglets are usually processed during the first day of life (clipping teeth, docking tails, clipping the umbilical cord, identifying piglets, treating splay-legged pigs, and providing supplemental nutrients). Some producers choose to delay some of these practices until the piglet is older and stronger or they may not perform some practices at all.
- ***Clipping needle teeth:*** The newborn piglet has eight needle teeth located on the sides of the upper and lower jaws. Many producers clip these teeth within 24 hours after birth to reduce the chance piglets will lacerate each other and/or the sow’s udder. Teeth should be clipped using a sharp side cutter so that only one half of the exposed tooth is removed.
- ***Docking tails:*** Tails are docked to practically eliminate tailbiting. Most purchasers of weaned pigs and feeder pigs require tails to be docked. Tail docking should be done within 24 hours of birth when it is least stressful on the piglet for these reasons: the piglets are small and easy to hold; at this age littermates are less likely to investigate and bite a newly docked tail; the piglet

and farrowing quarters are still relatively clean; and the piglet is well protected with antibodies from the colostrum of the sow. Tails should be docked about one inch from the point where the tail joins the body. Docking too short might lead to rectal prolapses or rear leg paralysis in later life. Use a disinfected side cutter to dock tails. A specially designed, heated cutter that will cauterize the wound can also be used successfully. Very sharp instruments should be avoided because of their increased potential to cause excessive bleeding.

- **Supplemental iron:** Injection of iron is preferred over oral administration because iron is poorly absorbed from the piglet's digestive tract. Injectable iron products are available in both 100 and 200 mg of iron/cc concentrations. Iron dextran is one of the most common products used. A single injection of 200 mg of iron before three days of age is sufficient to prevent anemia. Iron injections should be administered in the neck muscle behind the ear. Iron should not be injected in the ham as damage to the sciatic nerve may occur or the muscle may be stained which will reduce quality of the ham at slaughter. Stretch the skin before injecting iron then release the skin after injection. This practice will help prevent the iron from leaking out of the injection site. Do not overdose with iron as too much iron can be very toxic to the piglet.
- **Identification:** Piglets may be identified in some way at processing. In commercial settings, identification usually takes the form of ear notches or ear tattoos. Animal care workers need to carefully identify piglets as poorly placed notches or tattoos are difficult to read when pigs get older.
- **Castration:** Castration is best done when the piglets are relatively small and before 14 days of age.
- **Creep feeding.** Creep feeding is recommended beginning at about 10 days of age for piglets weaned at three weeks of age and later.
- **Water:** Piglets should have access to a source of water.
- **Euthanasia:** Check with barn manager.

Appendix 10: Body Condition Scoring For Sows

Introduction:

Body Condition Scoring can contribute significantly to good management of sows in all settings. Body condition scoring provides a clear indication of both the appropriateness of the feed and the effectiveness of the feed delivery system.

The scoring technique provided below is simple and can be quickly learned. Body Condition Scoring requires that various areas of the sow's body be felt to determine fat covering.

Suggested scoring guide

A scale from 1 (emaciated) to 5 (obese) is used in the scoring system which combines both visual appraisal and feel. Visual appraisal alone is not good enough: handling the pig is essential to get an accurate assessment of condition.

Figure 4 shows the various locations on the pig's body which can be palpated to determine body condition (source: Queensland Government, Department of Primary Industries).

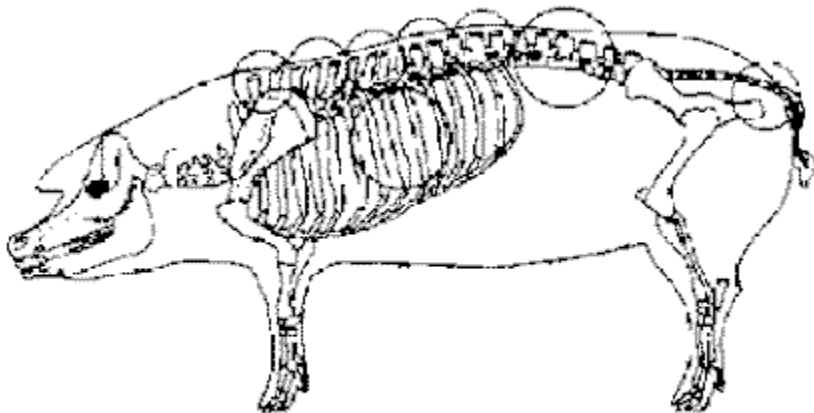


Figure 4: Palpation points for body condition scoring.

Table 1. Condition scoring guide

Score	Appearance	Pelvic Bones	Loin	Ribs
1	Emaciated	Very prominent. Deep cavity around tail head.	Vertebrae are prominent and sharp. Very narrow loin. Hollow flank.	Individual ribs are very prominent.
2	Thin	Obvious with slight cover.	Narrow loin. Flank rather hollow. Slight cover on spine, but prominent vertebrae.	Rib cage less apparent but individual ribs easily detected with slight pressure.
3	Ideal	Covered but felt with pressure.	Spine covered and rounded.	Ribs are covered but can be felt with pressure.
4	Fat	Only felt with firm pressure. No cavity around tail.	Difficult to feel vertebrae. Flank filled.	Rib cage not visible and difficult to feel.
5	Obese	Impossible to feel and huge fat deposits (hanging skin and fat).	Thick fat cover, impossible to feel bones. Flank full and rounded.	Thick fat cover, not possible to feel ribs.



Condition score 1:

The sow is visually thin, with hips and backbone very prominent and no fat cover over hips and backbone.



Condition score 2:

The hip bones and backbone are easily felt without any pressure on the palms.



Condition score 3:

It takes firm pressure with the palm to feel the hip bones and backbone.



Condition score 4:

It is impossible to feel the bones at all even with pressure on the palm of the hands.



Condition score 5:

The sow is carrying so much fat that it is impossible to feel the hip bones and backbone even by pushing down with a single finger.

In practice very few extreme (1 or 5) scores are found in well managed pig herds, while scores of 1 or 4 will be rarely seen. The majority of sows should fall into the middle

scoring range (2 or 3). To cover this middle range adequately, half scores may be used (1.5 to 3.5).

Sows should not enter the farrowing house with a condition of less than 3. Condition score of an individual sow may fall to 2.5 during lactation but a score of 2 or less is not acceptable and producers should take steps to avoid this problem.

Although each of the scale points has a definite description, the system still has an element of subjectivity as different stock-people may score the same sow slightly differently within the half-point system. However the important point is to arrive at a consistency of scoring on the unit. Then use an external visitor, your vet or consultant, to check your scores to ensure you are somewhere "in line" with common practice.

Timing:

Sows should be condition scored at weaning, at service, mid-gestation and at farrowing. Body condition lost during lactation needs to be regained during gestation.

Date: _____ **Body Condition Scores: 1 = emaciated 5 = fat**

1_ 2_ 3_ 4_ 5_ 6_ 7_ 8_ 9_ 10_ 11_ 12_ 13_ 14_ 15_ 16_ 17_ 18_ 19_ 20_ _
21_ 22_ 23_ 24_ 25_ 26_ 27_ 28_ 29_ 30_ 31_ 32_ 33_ 34_ 35_ 36_ _
37_ 38_ 39_ 40_ 41_ 42_ 43_ 44_ 45_ 46_ 47_ 48_ 49_ 50_ _

Date: _____ **Body Condition Scores: 1 = emaciated 5 = fat**

1_ 2_ 3_ 4_ 5_ 6_ 7_ 8_ 9_ 10_ 11_ 12_ 13_ 14_ 15_ 16_ 17_ 18_ 19_ 20_ _
21_ 22_ 23_ 24_ 25_ 26_ 27_ 28_ 29_ 30_ 31_ 32_ 33_ 34_ 35_ 36_ _
37_ 38_ 39_ 40_ 41_ 42_ 43_ 44_ 45_ 46_ 47_ 48_ 49_ 50_ _

Date: _____ **Body Condition Scores: 1 = emaciated 5 = fat**

1_ 2_ 3_ 4_ 5_ 6_ 7_ 8_ 9_ 10_ 11_ 12_ 13_ 14_ 15_ 16_ 17_ 18_ 19_ 20_ _
21_ 22_ 23_ 24_ 25_ 26_ 27_ 28_ 29_ 30_ 31_ 32_ 33_ 34_ 35_ 36_ _
37_ 38_ 39_ 40_ 41_ 42_ 43_ 44_ 45_ 46_ 47_ 48_ 49_ 50_ _

Date: _____ **Body Condition Scores: 1 = emaciated 5 = fat**

1_ 2_ 3_ 4_ 5_ 6_ 7_ 8_ 9_ 10_ 11_ 12_ 13_ 14_ 15_ 16_ 17_ 18_ 19_ 20_ _
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Appendix 11: Sample Equipment Repair Standard Operating Procedure

1. Animals should be observed daily for wounds and/or scratches caused by damaged or broken equipment, including feeders, feed troughs, gates, hardware and waterers.
2. Any evidence of animal injury from equipment should be reported to supervisor/operator as soon as possible.
3. Repairs should be made on the same day to prevent further injury.
4. If there will be a delay in making a repair, pigs should be moved to a pen/area where they will not be injured further.
5. Equipment damage and repair should be recorded - use the animal care checklist if no record keeping system is appropriate for collecting this information (optional).

Appendix 12: An Introduction to Managing Dry Sows in a Loose Housing System

Introduction:

European legislation banning the use of stalls and tethers for gestating sows, together with increasing concern among consumers in North America has led Ontario producers to consider the merits of alternative housing systems for gestating sows.

The most common alternative for gestating sows is to keep them in groups in a loose housing situation. However, there are many risk factors that need to be considered before sows are placed in a loose housing situation. These factors influence the behaviour of sows in groups and can contribute to fighting (aggression) which is detrimental to the individual sow, and to the group as a whole. Risk factors need to be audited on a regular basis in order to measure the success (or failure) of the loose housing facility.

The major risk factors associated with loose housing are:

- 1. Mixing**
- 2. Competition for Feed and Water**
- 3. Space Allowance and Pen design**

The key to the success of a loose housing system will be the ability of stockpeople to identify when risk factors are affecting the behaviour of sows in a group and the ability of stockpeople to take appropriate action to eliminate the risk. This booklet is intended as a guide for stockpeople in dealing with the successful management of sows in groups through a review of some of the recent published literature.

An Introduction to Sow Behaviour:

Establishing a Dominance Order:

Sows living in a group generally establish a dominance hierarchy based on the subordinate sow's avoidance of more dominant animals. The formation of the group order may take one to two days depending on group size, sow weight and sow parity. Aggressive behaviour is most commonly seen during the development of the dominance order, usually involving the extremely dominant and extremely subordinate sows.

Researchers have analyzed the behaviour of sows during the establishment of the dominance order and have described several definite behaviours which signal either dominance (fight) or submission (flight). "Head-to-body knock" by a dominant sow was shown to be slightly more aggressive than "head-to-head knock." Both behaviours will signal a retreat by a subordinate sow. A retreat or avoidance were signaled by a head tilt. "Nose-to-nose" was considered to be mildly aggressive for one of the pair, especially if there had been some prior interaction between the two sows.

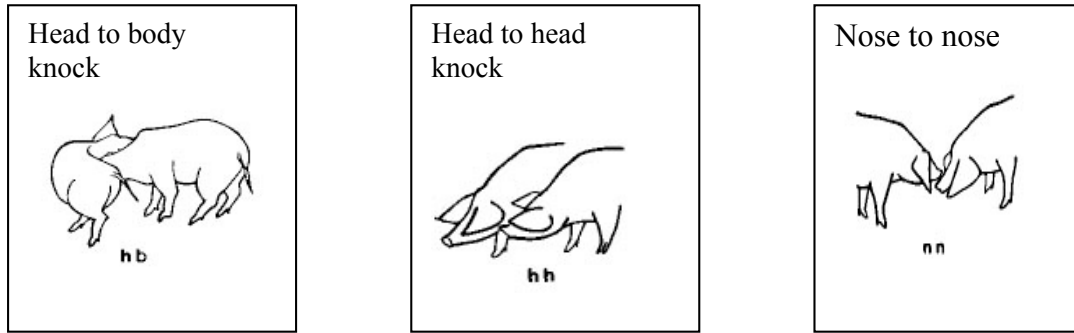


Figure 1: Behaviour patterns of sows (Jensen, 1980).

Once the dominance order is established, it is often easier to identify relative dominance rankings between sows in the group by observing subordinate sows' avoidance of more dominant animals, rather than by observing aggressive behaviour of more dominant individuals. Sows learn to recognize signs from more dominant sows and avoid or escape to a neutral or protected area.

Once established, the dominance order allows sows to avoid frequent bouts of aggressive interaction. The dominance order will be relatively unaffected by a separation period, i.e., farrowing. Sows may recognize each other after being housed in individual farrowing crates for up to 6 weeks (Arey, 1999).

In a loose housing system, pen design and space allowance can contribute to increased bouts of aggression, when sows are not provided with enough options to avoid more dominant animals. Flight distance (see below) is critical to reduce aggressive encounters.

Flight Distance:

Flight distance is defined as the distance required for an individual sow to get far enough away from a dominant sow to avoid injury. Research has shown that, in a straw bedded pen, the distance that subordinate sows were pursued by the dominant sow varied from 0 to 20 m (66'), with the majority of the encounters (75%) resulting in a chase by the dominant sow of less than 2.5 m (8'2") (Pig Welfare Advisory Group).

The amount of available flight distance can be shortened if physical barriers are provided. Sows can hide behind these barriers and thus avoid confrontation with the dominant sow. Ideally, barriers should be flexible or constructed with round edges to reduce the risk of injury.

Group Size and Composition

In the wild (wild boar, feral and free-ranging pigs), the primary social grouping of pigs consists of two to four sows, their most recent litters and young offspring from earlier litters (Gonyou, 2001). In these groups, sows are closely related, usually mothers and daughters and siblings.

In larger groups in a controlled environment, it is believed that sows will form smaller subgroups. It is more difficult for sows to form a stable hierarchy in larger groups; this can lead to increased aggressive behaviour (fighting, vulva biting) especially when resources (feed, water and space) are at a premium (Rizvi et al., 1998).

Signs of insufficient space allowance would include increased fighting, aggressive behaviours and the presence (lying) of new sows in dunging area at all times (Moore et al., 1993).

Risk Factors:

1. Mixing:

The most common source of injury in loose-housed sows arises from aggression when sows are mixed.

Producers can choose to keep sows in **stable groups**, moving these units through the production cycle (farrowing-breeding-gestation-farrowing) or sows can be kept in larger, **dynamic groups**, with sows being added and removed on a regular basis – usually weekly.

Both arrangements involve the mixing of unfamiliar sows, although a dynamic group system will involve mixing sows on a more regular basis. The introduction of new sows, or the initial formation of a stable group will result in increased levels of aggression while the sows establish a dominance hierarchy within the group. Producers and barn managers should always be present to oversee the mixing of new sows and should be familiar with the signs of sow aggression.

Sow to sow aggression and the establishment of a dominance hierarchy should abate within the first 24 hours after mixing. The causes of continued aggression within a group after 24 hours should be investigated. (Research has indicated that establishing a social hierarchy in a group of ten pigs takes 24 hrs.)

Below are some strategies that can be employed to reduce the level and interval of aggression when mixing sows.

Training of gilts:

Research in the Netherlands (van Putten and Buré, 1997) has shown that re-grouping and re-penning gilts before five or six months of age improved their social skills and reduced fighting when mixed later, at higher weights. The assumption was that this activity gave the gilts the opportunity to learn the signs of dominance in other pigs and to learn how to fight efficiently, to break off fights or to avoid fights altogether. The experiment took place over three years and involved mixing and re-penning groups of 8 gilts 2, 3 or 4 times. The number of fights recorded decreased with the increasing number of times animals were re-grouped; gilts re-grouped 4 times fought less than gilts re-grouped 3 times and gilts re-grouped 3 times fought less than gilts grouped 2 times.

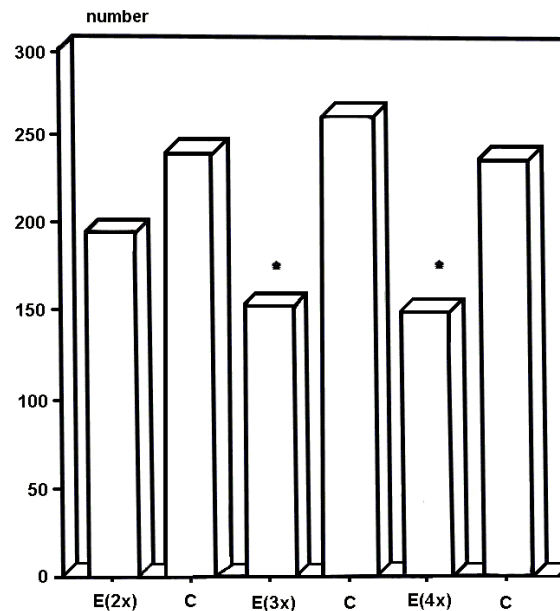


Figure 2: The average number of agonistic (aggressive or defensive social interactions) encounters during 24 hours of observation of experimental groups of pigs (E). The experimental groups were re-grouped either 2, 3 or 4 times. C represents the control group. (van Putten and Buré, 1997).

The handling and exercise involved with the re-grouping and re-penning (gilts had to walk some distance to their new pens) contributed to the overall experience of the gilts, making them easier to handle and less fearful of new situations (van Putten and Buré, 1997).

Introducing sub-groups into a larger, dynamic group:

When unfamiliar sows, known as the sub-group, are added to an already existing group of sows, there are several options that can help to reduce the fighting that can occur.

- The sub-group should not be smaller than 3 sows.
- Pre-mixing small groups of sows prior to their introduction into the larger group has been shown to strengthen sub-group behaviour and to reduce aggression between sub-group members (Durrell et al. 2003).

- Break up the laying area with divisions to form a specific area for the sub-group.
- The sub-group can be kept in a penned-in area within the main group. The pen should provide an area where sows can see each other and can establish nose to nose contact. This allows the sows to become familiar with the new sows through smell and touch across the barrier. Similarly, housing new sows in a pen adjacent to their new group, provides the same type of discovery.

The addition of fresh straw at mixing will only delay the establishment of a dominance hierarchy and, therefore, fighting among sows.

2. Competition for Feed and Water:

Social Facilitation of Eating:

In the wild, sows will spend most of their time rooting and looking for food. Subsequently, domesticated sows are motivated to eat throughout the day.

Sows are also stimulated to begin eating when adjacent sows begin to eat (Gonyou, 2001). This is known as social facilitation and can lead to fighting when feed resources are limited. Social facilitation is of critical concern in systems with electronic sow feeders, since there is the potential for one sow to be eating at any given time (Jensen et al., 2000). This means that the stimulus to eat is present for all the sows in the group throughout the day.

Sows also drink immediately after eating; lack of drinkers or available trough space can also lead to aggression.

Reducing Competition for Feed and Water:

One of the major challenges when group housing sows is to minimize the aggression that can occur at feeding time (Anderson, 1999). This is of critical importance since competition for food and/or water will lead to aggression in intensively kept sows. Aggression can reduce the feeding time of sows and therefore effect weight gains, etc.

Pens should be designed where all individuals are allowed access to food and may complete eating their ration without being displaced by others. Insufficient feed and water access places timid sows at risk.

Researchers in England conducted a survey of 211 farms which employed several loose housing designs and feeding regimes (Risvi et al. 1998). These researchers observed that

feeding sows once a day, rather than twice a day or ad libitum, increased the risk of vulva biting two-fold, whereas feeding twice a day reduced the risk three fold. Vulva biting occurred when a sow approached a pen mate from the rear or when the pen mate steps back towards the snout of a sow which leads to a bite. Vulva biting seldom ends in a fight, but vulva biting is recognized as an aggressive behaviour in sows.

Research indicates that the number of water (nipple) drinkers may be a cause of aggression among sows (Rizvi et al. 1998). Nipple drinkers should be checked regularly to ensure that they are functioning properly or water can be available from a trough. The recommended water flow rates for gestating sows range from 1.5 to 2 litres per minute and is dependent on the temperature.

The type of feed can also effect the level of aggression. Less aggression is seen with wet feed (Anderson, 1999).

Low ranking sows will spend less time at the trough; they avoid aggressive encounters at the expense of food intake. In the UK, it is recommended that low ranking sows be removed for individual feeding.

Electronic Sow Feeders:

The use of electronic sow feeders (esf's) poses a different type of risk, as mentioned above (social facilitation). The issue is not so much the number and location of the feeder, but controlling the behaviour of the sows that may be frustrated due to the sequential feeding. Groups with esf's should be closely monitored, especially in larger groups, when groups are first formed and when new animals are added. Dominant sows will eat first and often return to the feeder to remove any feed left by other sows (Gonyou, 2001).

The addition of un-chopped straw or other suitable roughage has been shown to reduce the levels of aggression where esf's are used (Jensen et al., 2000). Straw or roughage must be added in sufficient amounts so that it does not become the focal point of fighting between competing sows. Straw must be clean and of good quality to make it attractive to the sows.

The provision of two distinct meals of chopped corn silage on the floor has been shown to reduce the incidence of vulva biting (van Putten and van de Burgwal, 1990). The chopped corn silage allows the sows to eat simultaneously and therefore relieves some of the frustration due to social facilitation. van Putten and van de de Burgwal also found that vulva biting was reduced when gilts were trained to use the feeding station before they were introduced into the main group and when an area was reserved for them (see mixing below).

Jensen et al., (2000) found that starting the feeding cycle in the late evening for overnight feeding reduced the pressure at the electronic feeders and led to reduced levels of aggression, due to the sows choosing to rest versus waiting in line at the feeder. Night

feeding can only be successful if the barn is kept quiet and free of disturbance throughout the day. All maintenance and other work has to be done during the night, so the sows can rest during the day.

Socialization of gilts has been shown to reduce aggression and may be a useful strategy for systems with electronic sow feeders.

Trickle feeding:

This method is in use in Europe and research is underway in the US to evaluate this delivery system. In trickle feeding, all sows are fed simultaneously and receive the same amount of feed. Sows are fed in a slow manner; the feed delivery is timed to the rate of eating of the slowest-eating sow. Sows quickly learn there is nothing to be gained by stealing a neighbor's feed.

A supply auger fills a dispenser with feed for two sows. A second lower dispensing auger trickles the feed out into each feeding position. This slow method of feed delivery 'fixes' the sows in place, eliminating competition. Thus all sows in the group grow at an equal rate and maintain their condition

3. Space Allowance and Pen Design:

Pen design - providing sows with places to rest, places to hide from dominant sows and enough space to escape from aggressive sows – has more influence on the level of aggression in loose housed stalls than space allowance. Rectangular pens are recommended versus square pens of equal square footage and stocking density.

Flooring must be non-slip to provide suitable traction for sows, especially for submissive sows.

Feeding Stalls:

Anderson et al., (1999) found that full length body partitions reduced overall aggression at feeding time the most, while shoulder length partitions reduced aggression somewhat and was preferred over no partition. The length of the partition also influenced feeding time, with sows spending more time eating when a full length partition was used. However, the presence of full body partitions led to an increase in bites toward the vulva. This was offset with the installation of a gate across the back of the partitions, effectively isolating the sow for the duration of feeding.

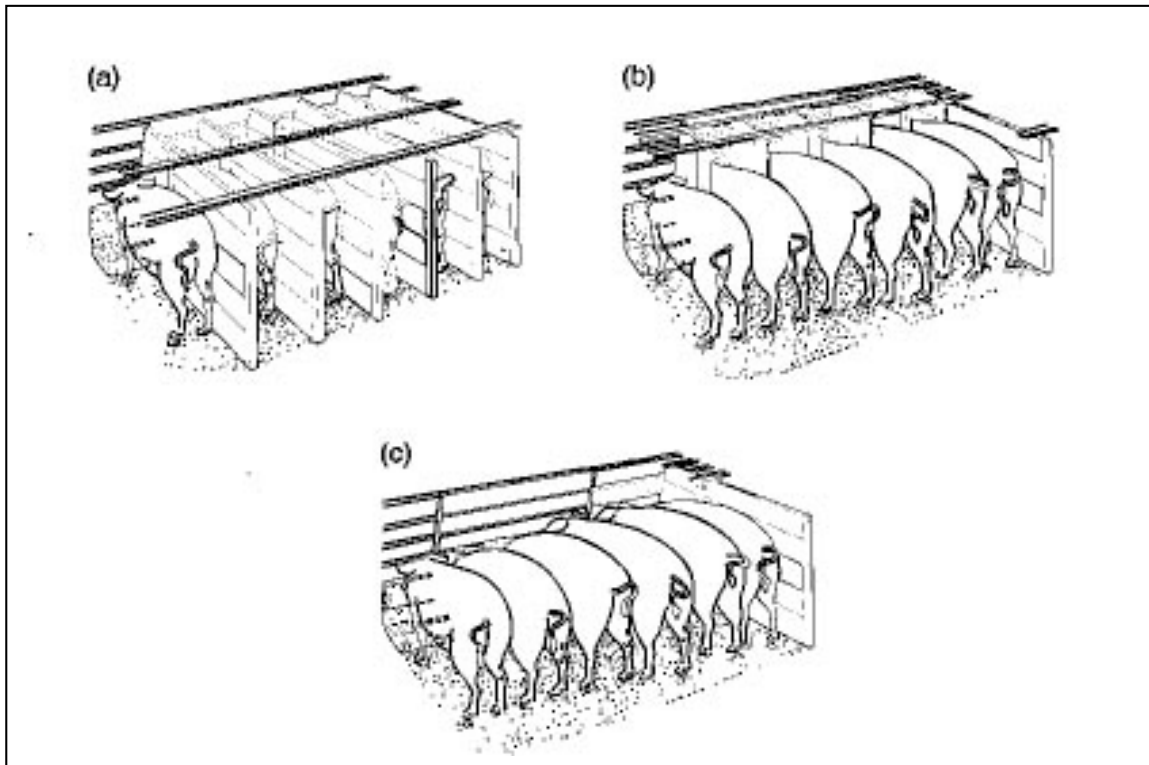


Figure 3: Diagram showing types of feeding stalls for loose housed sows: (a) full body, (b) shoulder partitions, (c) no partitions (Anderson, 1999).

Barnett et al., (1992) found that the provision of partial feeding stalls {(b) in Figure 3} reduced aggression during the first 90 minutes after aggression.

Space Allowance:

Although pen design may be considered to be the most critical factor influencing the level of aggression in the loose housing environment (by providing the sow with the opportunity to retreat from dominant sows) the provision of enough space allowance is still a major consideration. Recommended space allowance vary depending on the system used (i.e., with or without bedding, feeding stalls, type of flooring, etc.). The following table provides some examples of recommended space allowances.

Source	Recommended Space Allowance for a > 250 kg (> 550lb) sow	
	m ²	sq ft
Canadian Code of Practice	2.3	25
UK	3.5	37.5
New Zealand Code of Practice	1.4	15

Table 1: Some recommended space allowances for sows in groups.

Stocking densities should not be calculated based on space allowance entirely, but must be derived from considering the risk factors (mixing, competition for feed and water, space allowance and pen design) outlined in this guide.

Managing the Dominance Order - Body Condition Scoring:

Stockpeople need to learn to recognize and identify sows along the dominance spectrum – which sows advance and which chose to retreat. An effective way of managing the shifting dominance order is to establish an acceptable body score for sows in your groups, and take action (separate) sows which fall below the acceptable score.

The scoring technique provided below is simple and can be quickly learned. After a little practice, several people can independently condition score a group of sows and achieve a close measure of agreement.

Suggested scoring guide

A scale from 1 (emaciated) to 5 (obese) is used in the scoring system which combines both visual appraisal and feel. Visual appraisal alone is not good enough: handling the sow is essential to get an accurate assessment of condition.

Figure 4 shows the various locations on the sow's body which can be palpated to determine body condition (source: Queensland Government, Department of Primary Industries).

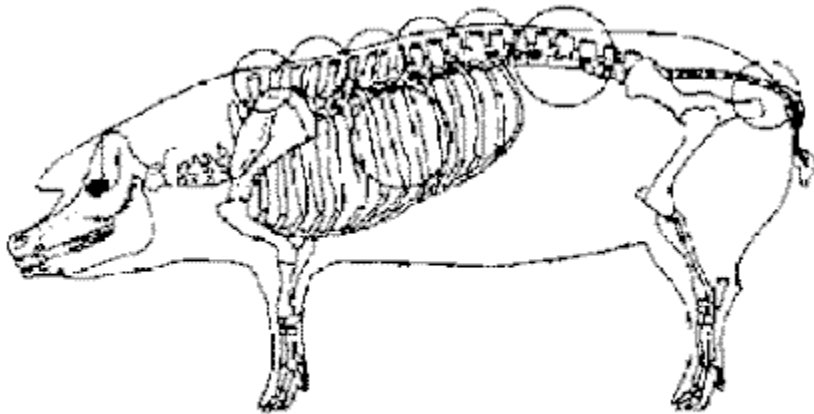


Figure 4: Palpation points for body condition scoring.

In practice very few extreme (1 or 5) scores are found in well managed pig herds, while scores of 1 or 4 will be rarely seen. The majority of sows should fall into the middle scoring range (2 or 3). To cover this middle range adequately, half scores may be used (1.5 to 3.5).

Table 1. Condition scoring guide

Score	Appearance	Pelvic Bones	Loin	Ribs
1	Emaciated	Very prominent. Deep cavity around tail head.	Vertebrae are prominent and sharp. Very narrow loin. Hollow flank.	Individual ribs are very prominent.
2	Thin	Obvious with slight cover.	Narrow loin. Flank rather hollow. Slight cover on spine, but prominent vertebrae.	Rib cage less apparent but individual ribs easily detected with slight pressure.
3	Ideal	Covered but felt with pressure.	Spine covered and rounded.	Ribs are covered but can be felt with pressure.
4	Fat	Only felt with firm pressure. No cavity around tail.	Difficult to feel vertebrae. Flank filled.	Rib cage not visible and difficult to feel.
5	Obese	Impossible to feel and huge fat deposits (hanging skin and fat).	Thick fat cover, impossible to feel bones. Flank full and rounded.	Thick fat cover, not possible to feel ribs.

If, for example, satisfactory performance is obtained when brood sows are in condition 2 or 2.5 at service and 3 at farrowing then they should be fed to maintain these standards.

This booklet provides an overview of the risks to sows involved when sows are kept in groups. There are, of course, other factors to consider when keeping sows in groups, including:

- Worker health and safety
- Reproductive performance
- Economic competitiveness
- Environmental impact
- Food safety risks.

A successful transition to keeping sows in groups will necessitate a careful study and review of all of these factors.

Research is currently being conducted in North America to investigate further the best methods and housing parameters to keep sows in groups. Producers are encouraged to contact their producer organization, agriculture department staff, veterinarian and university faculty to keep up to date on new findings relative to the keeping of sows in groups.

Further reading:

Pig Welfare Advisory Group:

<http://www.defra.gov.uk/animalh/welfare/publications/booklets/pb3084/pwag2toc.htm>

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Appendix 13: Sample Vices Protocol

Introduction:

Confinement rearing of hogs has resulted in removal of many of the pigs opportunities to root and chew. Periodically, these behaviors can be directed at other penmates resulting in tail, ear, and flank chewing. Many factors have been implicated in triggering the problem including crowding, temperature fluctuation/drafts, inadequate feed/water supplies and some nutritional deficiencies (eg. salt). Belly nosing/sucking of weaned pigs is also believed to result from reduced environmental stimulation and seems to be more frequent in early weaned pigs or smaller wean weight piglets.

Standards:

Target is to have < 1% of the chewing vices (tail, ear, or flank). Animals that are being injured by these activities are to be treated appropriately.

Preventive measures to minimize these vices should be incorporated into facility design, and are to be maintained and reviewed annually or more frequently if necessary. In outbreak situations, appropriate measures to determine and correct underlying cause will be taken. Belly sucking incidence should be targeted at <1%.

Procedures:

1.) Tail Chewing

Prevention

- tails will be properly docked in all piglets at an age less than 5 days.
- proper stocking density of pens
- maintenance of physical environment as stress free as possible (ambient temperature, freedom from drafts, adequate feed and water access).
- appropriately balanced nutrition.
- provision of diversions for the pigs need to root/chew in the form of chains or other objects from the ceilings to dangle to the pens, and/or regularly changed toys such as tires to be rotated between pens daily.

Treatment

- affected pigs must be protected from further on going injury by removal of the chewed or the chewing pig(s) to a separate treatment pen whenever possible. Antimicrobial treatment of affected pigs.
- humane euthanasia of severe cases in a timely manner; ie. very severely, and suddenly affected animals or where therapy/convalescence is obviously not being effective or freshly injured market weight pigs that cannot be held back before slaughter.

- when incidence is so high as to preclude removal to a separate sick pen:
 - i) affected animals must still be appropriately treated in a timely manner and approaches to pen control addressed more intensely; for example - use of water softener salt, additional toys/chains. Shipping of lighter weight animals to reduce stocking density may help. Movement of affected pigs into rooms of younger pigs can be considered on consultation with herd health veterinarians.
 - ii) Review and determination of any predisposing factors (physical, climatic, environmental, nutritional) in order to correct the problem
- barn with ongoing, recurrent problems must review basics of facility design, environment and nutrition to determine if larger scale, more permanent changes need be done.

2.) Belly Nosing

Prevention

- piglet wean weight and age will be maximized
- production guidelines to reduce light weight piglets at weaning.
- provide adequate and easy access to high quality fresh feed in a warm, draft free environment.

Treatment

- provide adequate stimulation in the environment of the nursery pen (toys, chains, etc.).
- extra feeder spaces and a variation in feed form (ie. wet feed with water or electrolytes) is to be made available for small wean weight pens or pens where the problem is developing.
- isolate the noser or, if it is beginning to fail as a result, euthanize it so it does not further injure other pen mates.

Monitoring:

- Barn staff to monitor daily and respond appropriately (management of pigs(s) or notify welfare committee).
- Herd health veterinarians and production managers will record/assess incidence on a monthly basis. Welfare committee audits will also assess the situation in the barns

Appendix 14: Animal Care Assessment Validator's Work Sheet

Space allowance:

Pen area = _____
 # of _____/pen = _____
 Space per animal = _____

Pen area = _____
 # of _____/pen = _____
 Space per animal = _____

Pen area = _____
 # of _____/pen = _____
 Space per animal = _____

Comments: _____

Body Condition Scores: 1 = emaciated 5 = fat

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Wounds/Scratches: √ = no wound/scratch X = wound or scratch

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Appendix 15: Slope Meter

Please also see the slope meter calculator in Appendix 15 (attachment).

Slope meter design:

