



Best Practices for Moving and Sorting Pigs to Improve Their Welfare

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TAKE HOME MESSAGE:

- Always be calm and touch animals gently.
- Know which handling equipment to use.
- Make sure all staff are properly trained.
- Understand the pig's vision and behavior

Globally Agreed Upon Animal Welfare Definition

One definition of animal welfare that has been agreed upon globally by members of the World Organization for Animal Health (WOAH) as follows *"the physical and mental state of an animal in relation to the conditions in which it lives and dies"* (WOAH, 2024).

What is the Difference Between Moving and Sorting?

Moving pigs refers to relocating pigs from one area to another. This would include moving pigs from the gestation barn to the farrowing room. Whereas sorting pigs is defined as choosing a specific pig(s) to move in one direction or to a designated area. This would include selecting sick pigs to take out of a regular pen and placing them in a designated sick pen within the same area of the farm.

Factors to Move a Pig

Three main factors must be considered with correct and humane pig movement and behavior, these are flight zone, blind spot, and point of balance, (Figure 1). The *flight zone*, as described by PQA Plus (2021), is the area of individual space around an animal. With positive human interactions like gentle contact, this zone will decrease. *Point of balance*, which is located at the pig's shoulders, helps determine which way the pig will move in relation to the handler. However, if there is limited space for the pig to move away, then this factor may not be easy to deploy with the desired results. There is a *forward* and *back blind spot*. The forward blind spot is directly in front of the pig and the back blind spot is directly behind it, (Pajor, 2012). These spots are not able to be seen by the pig unless they turn their head.

Who is the Pig?

Pigs have a great sense of smell and hearing. Heffner and Heffner (1990) concluded a pig has a hearing range from 42 Hz to 40.5 kHz with the most sensitivity between 9 dB at 8 kHz. In comparison, humans range between 20 Hz to 10 kHz (Purves et al., 1990). These differences mean that the pig can detect more sounds and at higher frequencies, while human hearing is more specialized to adhere to speech and communication. Limoges (2019) reported that the pig's sense of smell is 2,000 times more sensitive than humans. To account for this sensitivity, Brunjes et al., (2016) found that pig's olfactory bulb is ~7% of their brain size in contrast to 0.01% in humans. Pigs exhibit great long-term memory (Charbeneau, 2015). Minimizing negative experiences will allow for easier and safer handling. Pigs have poor depth perception and a 310-degree field of vision. Pigs are social animals and being isolated can make the pig stressed. Oftentimes, it is easier to move pigs in small groups. Shutske and Shermann (2012) recommended a group size of 1 to 5 pigs when moving breeding gilts and sows. Anything larger may result in the gilts and sows being harder to control and move.

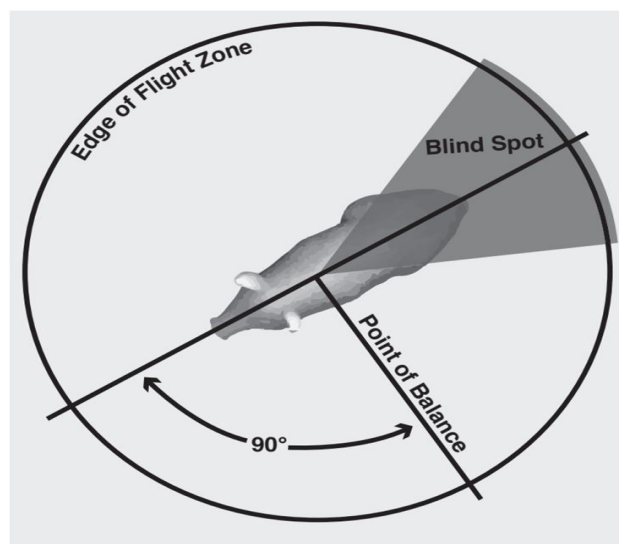


Figure 1. Flight zone, blind spot, and point of balance. (TQA, V8, NPB 2022).

Acute and Chronic Stress Response in Pigs

Stress is defined as a disruption of homeostasis that encompasses various forms: biological, psychological, and environmental disruptions (Lu et al., 2021). The implications for this can have both positive and negative effects (Lu et al., 2021). There are three forms of stress: Sustress, Dystress and Eustress. The stress that producers are most concerned about is Dystress which refers to bad stress (Lu et al., 2021).

Stress inflicts physiological alterations to the body and these internal changes result in changes in the outward expression of swine behavior. With acute stress, the pig perceives a real or perceived threat that activates fight, freeze or flight. This releases noradrenaline and adrenaline from the adrenal medulla (Cleveland Clinic, 2022). Alternatively, chronic stress results in the hypothalamic-pituitary-adrenal axis response which causes glucocorticoids to inhibit the release of luteinizing hormone from the pituitary, as well as estradiol and progesterone secretion by the ovary and testosterone from the testes (Martínez-Miró, 2016). This causes blood concentrations of these hormones to decrease.

Dystress and Effects on the Pig

These high stress levels can cause problems with pig performance, reproduction, behavior, immunity, and meat quality.

Immunity is impaired due to changes in numbers of blood leukocytes, mitogen-induced cell proliferation, natural killer cell cytotoxicity and circulating inflammatory factors, which increases the susceptibility to new infectious diseases (Martínez-Miró, 2016).

Hemsworth and Barnett (1990) found behavior issues from high stress included slowness to approach, fewer interactions, avoidance, and more time spent in the experimenter.

Meat incidence of pale, soft, and exudative (PSE) and dark, firm, and dry (DFD), become more common (Martínez-Miró, 2016).

Ejaculate volume and semen quality is reduced while sows farrow fewer piglets and have a reduced rebreeding rate (Martínez-Miró, 2016).

How Bad Handling and Stress Affect the Pig

The signs to determine if your pig has dystress during handling consist of: strained squealing, increased heart rate and body temperature, lower blood pH, stiffness, stumbling, open mouth breathing, muscle tremors, and blotchy skin. Strained squealing consists of a long, high-pitched sound that is often associated with pain or distress.

Heart rates and critical limits above or below the ranges shown in Table 1 are cause for concern.

Lower blood pH can result in faster muscle glycogen breakdown when the carcass temperature is high causing the meat to be a pale color with a soft texture (Lonergan, 2012).

Stiffness causes the muscles to tighten, joints to be inflamed, and make it difficult to move. Stumbling causes difficulty moving and standing upright.

Open mouth breathing often deviates from the normal respiratory rate, 32-58 breaths per minute. Muscle tremors cause shaking and blotchy skin results in a purple or red color.

What to do if your Pig is Showing Stress Behaviors?

If dystress is observed, it is important to release pressure. The PQA Plus program describes this as an action that reduces the level of threat posed to pig behavior by giving them more time and space. This often consists of letting pigs move away, softening handler responses (ex. gentle handling and calm behavior), avoiding physical contact with pigs, discontinuing handler noise, and reducing group size.

Age of pig	Rectal temperature (range \pm 0.30 °C, 0.5 °F)		Respiratory rate (breaths/min)	Heart rate (beats/min)
	°C	°F		
Newborn	39.0	102.2	50–60	200–250
1 hour	36.8	98.3		
12 hours	38.0	100.4		
24 hours	38.6	101.5		
Unweaned piglet	39.2	102.6		
Weaned piglet (20–40 lb) (9–18 kg)	39.3	102.7	25–40	90–100
Growing pig (60–100 lb) (27–45 kg)	39.0	102.3	30–40	80–90
Finishing pig (100–200 lb) (45–90 kg)	38.8	101.8	25–35	75–85
Sow in gestation	38.7	101.7	13–18	70–80
Sow				
24 hours' prepartum	38.7	101.7	35–45	
12 hours' prepartum	38.9	102.0	75–85	
6 hours' prepartum	39.0	102.2	95–105	
Birth of first pig	39.4	102.9	35–45	
12 hours' postpartum	39.7	103.5	20–30	
24 hours' postpartum	40.0	104.0	15–22	
1 week postpartum until weaning	39.3	102.7		
1 day post weaning	38.6	101.5		
Boar	38.4	101.1	13–18	70–80

Table 1. Temperature, respiration, and heart rate of pigs of different ages. (Zimmerman et al., 2019).

Recommended PPE to Move and Sort Pigs

It is recommended to wear knee pads, non-slip boots, hearing protection, eye protection, gloves, and a mask. Certain farms will require specific personal protective equipment (PPE). It is important to first check what your farm requires to make sure you are as safe as possible.

Enhance Moving and Sorting Pigs with Handling Equipment

Moving and sorting pigs can be done with many different handling equipment. These consist of, but are not limited to, flags or capes, shakers or rattle paddles, and sorting boards, (Table 2).

It is important to avoid the use of electrical prods as the primary handling tool. Gonyou (2008) compared three handling treatments: gentle handling without the use of the electrical prod, aggressive handling without the use of the electric prod, and aggressive handling with the use of the electric prod. Pigs were scored for breathing, blotchy skin, stumbling, and strained squealing. Findings indicated that over 40% of pigs exhibited severe stress when prodded and 4% stumbled and fell during handling and had to be euthanized (Gonyou, 2008).




Handling Equipment	How to Use	Handling Equipment Image
Flags or Capes	Visual stimulus that can be placed in front of a path to help prevent movement in any given direction.	
Shakers or Rattle Paddles	Auditory Stimulus that makes noise to assist with movement and gently tap pigs to get them up.	
Sorting Board	Physical barrier that is anchored to the ground, not the knees, and is in front of and away from the caretaker's body.	

Table 2. Handling equipment used to move and sort pigs (Shutske and Shermann, 2012).

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