Sow Body Condition Score and Survivability

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TAKE HOME MESSAGES

Monitor BCS of each sow, increase feed amount for a low BCS, and decrease for high BCS to achieve ideal BCS for parturition and lactation.

Sows with low or high BCS during gestation, and at the time of farrowing, are more likely to experience complications that could lead to a decrease in survivability of either the sow or piglets during the farrowing process or the subsequent lactation period.

Sow BCS affects birth and weaning weight as well as pre-weaning mortality.

Sows and body condition scores

Sows need to have an ideal body condition so their body can support not only the growth of fetal piglets and produce quality milk for the suckling pig, but also to maintain themselves during this energy and nutrient demanding time. A general method of feeding sows on farms is that a sow will receive an amount of feed based on her body condition score (BCS; Young et al., 2004). BCS can range from 1 to 5, where a 1 indicates a thin sow, 3 is an ideal sow, and 5 is an obese sow (Table 1). BCS of sows can be determined by assessing the sow's backfat using an ultrasound, caliper, or visually by trained farm staff. It should be noted that giving sows a BCS is very subjective, as it differs from each person scoring, and it is usually done visually. An objective tool, like the caliper, considers both fat and muscle mass of animals (Knauer and Baitinger, 2015). These tools can be preferred over visual assessments as the measurements are less subjective. However, visual scoring is commonly used for daily observations of a herd. Keeping a sow close to an ideal BCS is pertinent because there can be detrimental consequences for the sow and her piglets otherwise.

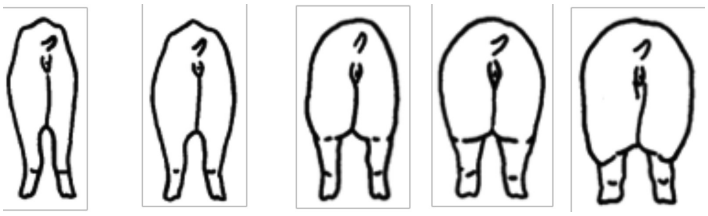

Table 1. Body Condition Score Descriptions

	1	2	3	4	5
CONDITION	Emaciated	Thin	Ideal	Fat	Obese
DESCRIPTION	Hips and spine are very visible to the eye	Hips and spine might be slightly visible, but can easily be felt with the hand with no pressure	Hips and spine can be felt with the hand when firm pressure is applied	Hips and spine cannot be felt when pressure from the hand is applied	Hips and spine are heavily covered

Adaptation from Coffey et al., 1999.

Managing BCS in a sow herd

The BCS of each sow should be evaluated at breeding and two additional times before farrowing (Coffey et al., 1999). Sows housed individually or in smaller groups are usually managed with more precision than large group housing facilities. Monitoring sows' BCS allows for adequate management decisions concerning the amount of feed sows should receive to maintain an ideal BCS. Limit feeding sows during gestation is a method used for keeping gestating sows at an ideal BCS (Lammers et al., 2007). An ideal BCS during gestation is crucial to ensure the sow is in good condition for farrowing and lactation. The base feeding level for gestating sows averages 4 to 5 lbs per day (Coffey et al., 1999). However, the amount of feed a sow receives is also dependent on the dietary energy level of the feed and the genetics of the sow. Sows below an ideal BCS should be fed additional feed, roughly 1 to 2 lbs more than the base feeding level until they reach ideal BCS; while sows over an ideal BCS should be provided less feed, roughly 0.5 to 1 lb than the base feeding level (Coffey et al., 1999).

Increasing feed intake of the sows during the end of gestation has been a method, referred to as bump feeding, explored to improve piglet birth weight. In theory, bump feeding provides the sow with additional nutrients to help support the rapid fetal growth rate that occurs at the end of gestation. However, there have been mixed results in the effectiveness of bump feeding. Bump feeding has consistently increased the bodyweight of the sow prior to farrowing (Goncalves et al., 2016; Shelton et al., 2009; Soto et al., 2011), specifically, for every 2.2 lbs/day increase in feed intake, the bodyweight of sows increases by roughly 15.4 lb from day 90 of gestation to farrowing (Goncalves et al., 2016). However, an increase in sow weight does not always translate to an increase in piglet weight at birth or weaning (Shelton et al., 2009). Soto et al. (2011) reported an increase in birth weights from bump fed gilts but not sows. This suggests that bump feeding may be more beneficial for growing gilts than mature sows. Some systems have moved entirely away from bump feeding as a result of not seeing any significant difference in pre-weaning mortality or litter weights (Goncalves et al., 2016). The minimal and varying impact on both sow performance and litter weights from bump feeding does not justify the increase in feed costs (Shelton et al.,

2009). Due to the increase in sow body weight, breeding sows who are ideal or over-conditioned should not be bump fed, as stillborn rates have increased when bump feeding gilts and sows in ideal condition (Mallmann et al., 2019).

BCS effects on the survivability of sows and piglets

Gestation and farrowing. Gestation is a time in which the sow's feed can be altered to help her reach an ideal BCS before her upcoming farrowing. Sows with lower backfat thickness, typically associated with a low BCS, at the end of gestation and at farrowing, tend to have a higher percentage of stillborn piglets (Maes et al., 2004). On the other hand, sows considered obese when farrowing have extra fat deposited in the birth canal, thus decreasing the diameter of the canal and limiting the space available for piglets to pass through (Cowart, 2007). This results in constriction of the birth canal and prolonged parturition. This can result in dystocia, which may lead to the loss of piglets because the sow was not able to farrow them, or even loss of the sow herself. Thus, sows with high BCS can also have a higher rate of stillborn piglets (Johnson, 2017).

Furthermore, sows that had an ideal BCS during gestation and at farrowing have been reported to have piglets with greater birth weights than sows with other BCS, and those piglets had greater survivability rates from birth to weaning than thin sows (Machebe et al., 2012). Having heavier piglets at birth is important to piglet survival as piglets that have a light birth weight, < 1.34 to 1.76 lb did not live past 24 hours, whereas heavier pigs had a viability of 90% (Quiniou et al., 2002). Birthweight is vital within the first 24 hours of life for piglet survivability; however, pre-weaning mortality occurs mainly throughout the first week of life, not just within the first 24 hours (Quiniou et al., 2002). Piglets that weigh 1.34 to 1.76 lb and 1.79 to 2.20 lb at birth had a 51% and 75%, respectively, survival rate at 7 days postpartum, whereas pigs weighing more than 2.20 lb have an ≥87% survival rate at 7 days postpartum (Quiniou et al., 2002). Thus, sows that have an ideal BCS during gestation and at the time of farrowing and are able to have heavier pigs, thus improving piglet survival rate.

Lactation. Milk production is an energy demanding process. Adipose tissues serve as a nutrient source to the sow during lactation (Lammers et al., 2007), so having a sufficient backfat thickness and BCS at farrowing is necessary to provide energy and nutrients to the sow during lactation. Rapid use of these stores results in weight loss in sows. Thus, sows that have a low BCS are at higher risk of mortality during lactation (Jensen et al., 2012) due to the already anticipated weight loss associated with lactation. This could be because it is believed that during lactation, the top priorities for nutrients go to mammary growth, colostrum production, or milk production at the expense of maternal growth/maintenance (Theil et al., 2014). Ad libitum access to feed during the lactation period is the current industry standard to help counteract this problem during lactation. If sows are being hand-fed, increasing the frequency of feeding from twice per day to three times per day is a way to increase BCS of poor conditioned sows during lactation (Poulopoulou et al., 2018).

Additionally, sows with low BCS have been reported to wean fewer piglets compared to sows that have a higher BCS (Machebe et al., 2012). This may be because it appears that thin sows have less nutrients available to use for milk production than ideal and fat sows, which may result in a reduction in milk yield (Machebe et al., 2012). A reduction in milk yield means there is less milk for piglet consumption. Sows that do not have a low BCS appear to have more nutrients available for milk production; therefore, better supporting the nutrient demands of growing piglets (Machebe et al., 2012). However, obese sows have also been reported to have reduced milk yield (Lammers et al., 2007), which could be because obese sows have consistently shown to have a low feed intake during lactation (Young et al., 2004). The decrease in feed intake during the lactation period can result in a decrease in BCS, and fewer nutrient stores available for milk production, consequently potentially leading to a decrease in milk production and litter weight gain. Additionally, obese sows have been reported to have a decrease in colostrum yield overall and per piglet (Decaluwé et al., 2014). A decrease in the intake of colostrum is a fundamental problem for piglets, as colostrum intake is a limiting factor on piglet survivability and growth performance (Theil et al., 2014). Piglets should consume high quantities of milk before weaning to maximize weaning weight, which is a critical factor for determining pig performance (Le Divinvh et al., 2015). Positive correlations have been reported between heavier weaning weights and average daily gain in the post-nursery periods (Cabrera et al., 2010).

Moreover, BCS can be a factor that determines the health of the sow. The likelihood that a sow will develop an infection such as mastitis metritis agalactia (MMA), a common disease in postpartum sows that is known to be disadvantageous to both sow longevity and piglet health, can be related to a sow's BCS (Karst et al., 2019). The development of MMA results in a decrease in milk production during lactation. Subsequently, this leads to an increase in piglet mortality, a decrease in the sow's productivity because fewer piglets will be weaned and could lead to sow mortality. High BCS sows are more likely to develop MMA, although low BCS sows are also at risk (Karst et al., 2019).

BCS and longevity

Maintaining an ideal BCS is a key component to sow longevity because BCS is considered a risk factor for sow mortality (Jenson et al., 2012). Sows that have low BCS are more susceptible to wounds and ulcers on different parts of their body as well as having lowered reproductive performance, which increases culling and mortality rates (Jenson et al., 2012, Tarrés et al., 2003). There is a significant association between a sow's BCS and reproductive failure (Stalder et al., 2004). Sows with a high BCS are also at risk of being culled; this could be due

to leg weakness (Tarrés et al., 2003). Keeping sows at an ideal body weight throughout their reproductive lifetime can result in decreased sow mortality, better replacement rates, improved reproductive performance in the subsequent litter, and higher economic value at the time of culling (Stalder et al., 2004).

Conclusion

Feeding sows to maintain an ideal BCS is essential. By maintaining a proper BCS, the survivability of both the sow and the piglet is increased. Gestation is a key time to monitor BCS and adjust feeding amounts accordingly. A sow with an ideal BCS at the end of gestation is more likely to remain healthy during farrowing and lactation, as well as having increased feed intake and raise heavier litters. Additionally, piglets from a sow with an ideal BCS are more likely to have a better survivability rate during the suckling period. Overall, management of BCS should be a goal for all breeding farms to help maximize the health and reproductive performance of the sow herd.

REVIEWERS

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