

Improving neonatal survivability in swine*

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Introduction

The swine industry in the United States is composed of approximately 6.01 million females that farrow more than 11.8 million times annually, producing 112 million piglets. Preweaning loss of piglets is a major problem confronting the swine producer. Approximately 15 to 25% of all piglets die during parturition and the first few weeks of life.¹ Many of these deaths occur during parturition and the first 72 hours of life.²

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Prepartum care of the sow and gilt

Efforts to improve neonatal survivability should begin with the pregnant sow (gilt). Preparturient females should be housed in a well-maintained environment of 18.5° C (65° F). Females exposed to environmental temperatures of 37.8° C (100° F) for 17 hours per day during the last week of gestation farrowed more stillborn piglets.³ The use of fans or drip-cooling systems for the sows may be necessary to provide relief from heat-related effects in sub-tropical environments, while heaters may be necessary to provide an adequate thermal environment in colder climates. Provision of appropriate nutritional requirements is imperative. In some cases, the feeding of energy-supplemented diets to sows during the latter stages of gestation has improved the survivability of piglets.⁴ Diets supplemented with animal fat during the last five days of gestation decreased the number of stillbirths.⁴ Many modern swine facilities are not designed to use liquid fats in the diet of sows. Dry fats are commercially available but may be expensive. The labor requirements of individual feeding of diets to sows during late gestation would not be unreasonable. However, excess energy in the diet can be detrimental. Fat sows can have an increase in stillbirths and greater mortality rate for piglets during the first three days after farrowing.⁵

Animals housed to allow exercise have lower stillbirth rates than animals that are tethered or confined in crates.⁶ Modern swine facilities are often not designed to allow exercise of animals during late gestation and lactation. The loss of piglets due to crushing and chilling during exercise periods, as well as the extra labor required to manage these systems, have been deterrents to their use in commercial swine ventures. However, animal welfare concerns may influence the type of sow housing.

Care at parturition

The length of gestation in swine is typically 114 to 116 days. Variations may be due to the breed of sow or boar involved. Large litter sizes may decrease gestation length.⁷ Physical appearance and behavioral changes signal impending parturition. Swelling and increased reddening of the vulvar lips occurs about four days prior to farrowing. The mammary glands will usually become swollen and turgid during the last seven to ten days of gestation. A serous secretion may be present up to 48 hours prepartum, changing to a milky fluid about 24 hours prepartum. An abundance of milk, which can be easily expressed from the teat, indicates farrowing is imminent and usually will commence within six hours. Rectal temperature will usually rise 0.5° C (1° F) during the last 12 hours prior to farrowing. Respiratory rates will

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increase substantially during the 12 to 24 hour period prior to parturition but return to a near-normal rate just prior to the birth of the first piglet. Frequency of defecation and urination are often increased during the 12 hour prepartum period.

Behavioral changes begin during the last 24 hours prepartum. Females will exhibit increased restlessness and will lie down and get up frequently. Animals will attempt “nest-building” by scraping bedding or food into a pile. Animals in crates will vigorously paw, root or chew on the bars of the crate. Periods of increased activity are interrupted occasionally by short periods of rest. This pattern of behavior continues until shortly (15 to 60 minutes) before birth of the first piglet at which time the sow becomes quiet and settles into lateral recumbency. Abdominal straining will begin, often accompanied by drawing the rear legs toward the abdomen. A small amount of viscous fluid, often blood-tinged and many times containing some meconium, will be passed from the vulva during this time, followed by the delivery of the first piglet within 15 to 20 minutes.

Parturition

Delivery of the piglets is accompanied by mild abdominal straining, a small amount of fluid and a very noticeable wiggling of the tail. The duration of the second stage of labor is usually one to five hours, but may be considerably longer without adverse effects on the piglets. The normal interval between piglets is about 15 to 20 minutes. The interval between stillborn piglets tends to be greater, as does the interval between the next to last and last piglet of the litter. Fetuses are most frequently (60%) born in anterior presentation. Posterior presentations usually create no problem and are considered normal. Fetuses born in anterior presentation have the snout delivered first, with the front legs positioned along the sides of the piglet, while the rear legs are extended and delivered first in posterior presentations.

Fetal membranes are usually passed after the completion of farrowing. Expulsion may occur anywhere from 20 minutes to ten hours after birth of the last piglet but normally occurs within a few hours. Individual fetal membranes may be expelled during parturition in the interval between piglets. Retained fetal membranes are rare in the pig; retained fetal membranes may be an indication that piglets are still present in the uterus.

Deaths during parturition due to stillbirths

Dystocia is a rare event in porcine parturition, but the losses due to stillbirths are severe and may account for 60% of all preweaning deaths. Most stillborn pigs (67%) are intra-partum rather than pre-partum deaths. Seventy percent of these intra-partum deaths show signs of viability at the time of their delivery, as evidenced by weak gasping respirations or a slow, faint heartbeat. Asphyxia, indicated by the presence of meconium-stained amniotic fluid, results in piglets that are severely depressed at birth due to profound acidosis and hypercapnia.⁸ The asphyxia may be related to the high incidence of ruptured umbilical cords (94%) observed in these piglets.

Delayed farrowing may also influence stillbirth rate. Highest stillbirth rates are seen in parturitions greater than four hours duration with 82% of all stillborn piglets occurring in the last third of the litter. The interval preceding stillborn piglets, while highly variable, tends to be longer than the interval preceding liveborn piglets.

Forty percent of females account for almost 100% of stillbirths.⁹ Sows predisposed to stillbirths can usually be predicted prior to farrowing. Sows at seventh parity or higher, sows that consistently farrow greater than ten piglets, and sows that have previously farrowed litters containing stillborn piglets are good candidates to produce stillborn piglets at subsequent parturitions.¹⁰

Assistance during parturition and the peripartum period

Indications for manual examination and intervention during farrowing have historically included the presence of a foul smelling vaginal discharge, cessation of abdominal straining following birth of only one or two piglets, active abdominal straining with an interval of greater than 30 minutes since the birth of the last piglet, and the presence of abdominal straining without the birth of the first piglet.

A farrowing house attendant can decrease both the stillbirth rate and the rate of preweaning mortality.¹¹ Current implementation includes assisted manual delivery on all sows beginning with the birth of the first piglet. Examinations are performed at intervals of five to ten minutes until farrowing is completed to prevent asphyxiated piglets. This is preferable to waiting 30 minutes before intervening and only recovering an expired piglet.

Immediately following birth, the attendant should remove any fetal membranes and mucus from the head and face of the piglet. Vigorous massaging of the piglet or swinging the piglet in a head-down position is helpful in clearing airways and stimulating respiration. It is recommended that the naval cord be dipped in disinfectant as a precaution to infection. Ligation of the umbilical cord is not routinely performed, but can be utilized in the occasional piglet in which hemorrhage from the umbilical cord is a problem. The attendant should help the neonates remain warm. First teat contact usually occurs within eight to nine minutes after birth with first successful suckling within 30 minutes after birth. Assistance should be provided to enable colostrum intake if the piglet has not done so within 30 minutes after birth.

Parturition induction

Commonly used methods of parturition induction for synchronized farrowing will result in greater than 70% of females farrowing during the next working day. However, better utilization of personnel and better results may be obtained by providing continuous assistance 48 hours immediately after induction since greater than 90% of treated females will farrow during this time. The use of prostaglandin followed by administration of five to ten units of oxytocin 20 to 24 hours later results in approximately 50% of females farrowing within three hours after oxytocin administration.¹²

Pregnant females should be at least 111 days or later in gestation when induced to avoid birth of small, lightweight piglets that are more likely to succumb. The ideal use of prostaglandin would be to calculate the length of gestation for each herd from on-farm records and induce parturition one to two days before the anticipated day of delivery.

Aftercare of the neonate

Feces should be removed from behind the sow to prevent contamination of the newborn. The newborn piglet should have a warm, dry environment. Heat lamps or heating pads are equally effective. Ideally, a heat source should be positioned at the rear of the sow and also on the sides of the sow to create the warm microenvironment desired. The heated area on the side of the sow should be maintained at approximately 35° C (95° F) to maintain the body temperature of the newborn piglet. Heating devices must be used with caution. Excessively high temperatures will actually induce piglets to lie away from heated areas.¹³ Additionally, the heating device should warm only the piglet area; the ambient room temperature should remain at or below 21° C (70° F) to maintain sow comfort.

The use of a farrowing crate or stall will prevent excessive movement of the sow and limit crushing of the newborns. The use of heat lamps or heating pads will provide a source of heat to induce piglets to rest in those warmed areas rather than lying in contact with the sow, thus reducing the risk of the sow crushing or injuring piglets. The use of crush bars will prevent the sow from rapidly becoming recumbent at the onset of nursing episodes and trapping piglets beneath her.

Piglets suffering from splayleg can be treated by taping the rear legs together to provide stability for the piglet when it attempts to stand. Cross-fostering of piglets to other sows should occur within the first day after farrowing.

Conclusions

Improving neonatal survivability is an achievable goal for swine producers. Prepartum care of the sow is necessary, as are personnel trained in assisting farrowing females. Pharmacological induction of parturition and familiarity with the signs associated with the onset of parturition will enable timely assistance for the neonate. A warm, dry environment protected from unintentional trauma by the sow is essential.

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