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Piglet Mortality and its Management

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ABSTRACT

Pigs produce more offspring in each litter but the higher mortality rate among piglets is an issue of concern. Piglets death during the perinatal and lactation period is responsible for reduced production efficiency in swine herds. It has been revealed that majority of the preweaning deaths are due to crushing by the sow. Other causes of death include respiratory problems, Scours, chilling, piglet anaemia and various fatal diseases. Preweaning mortality varies among herds between 12-25% depending on housing system. High mortality rates before weaning not only affect the economy but must also be looked at as both an animal welfare problem and an ethical issue. Understanding the various causes of piglet mortality and timely implementation of suitable operations and strategies helps to reduce piglet mortality.

Keywords: Piglet mortality, perinatal, preweaning, management

Pig rearing is one of the most important occupations of weaker sections of the society especially tribal masses and people of North Eastern region of the country. It has largely remained under a nomadic system of rearing. Pig is one of the most efficient food converting animals which yields a dressing percentage ranging from 75-80. Compared to other livestock species pigs have a greater potential to generate faster economic returns to the farmers with its shorter generation interval, more litter size and faster growth on lower inputs. According to 19th Livestock Census pigs in the country are 10.29 million numbers constituting 2.01% pigs of total livestock population. Despite shorter generation nterval and more litter size the total pigs in the country have decreased by 7.54% over the previous census. Among the Indian states, Assam has the maximum number of pigs, that is about 15.89% of total pig population. Currently, the Swine industry in India is in its early stages. It is in the hands of people having little or no awareness about pig diseases. High mortality is an important factor affecting the swine industry and hence a cause of concern for pig rearers. Survival of piglets/litters up to weaning determines the profitability of swine farm.

The overall mortality as well as morbidity of pigs depends on litter size, weight of litter, season, care and management during the preweaning stage (Mondal *et al.,* 2012). Compared to young ones of other livestock a piglet experiences more difficulties for its survival starting with adaptation to the external environment facing hypothermia to savaging and crushing by mother and trying to get proper nutrition competing with its own littermates and so on till it becomes

capable of self feeding. 10-35% of the newborn die within the first three weeks of age. (Tyler *et al.,* 1990). According to Dyek and Swierstra (1987) 50% of the deaths occur during the first three days afterbirth with crushing accounting for 70-80% of the deaths (English and Morrison, 1994). Sows have epitheliochorial placenta hence, piglet can't obtain antibodies through placental transfer during gestation therefore, it is born with very limited immune protection making survival depending on antibody transfer through colostrum. As the neonatal piglets have limited body reserves and poor immune status they are more prone to crushing and starvation and attack by various pathogens.

Various causes of mortality in piglets include Hypothermia, maternal overlay, savaging, starvation and various diseases.

Hypothermia

Unlike many mammals, piglets do not possess brown adipose fat which generates heat in a newborn animal to maintain body temperature and presence of sparse hair coat makes the young one difficult to cope up with the external environment (Shanker *et al.*, 2009). A newly born piglet experiences a sudden change in its surrounding temperature. At birth the lower critical ambient temperature of the piglet is 34 to 35°C. From the homeostatic temperature in the sow uterus which is usually 38 to 40°C, the piglets are born into the much cooler environment ranging from 20 to 22°C which causes a decrease in body temperature shortly after birth, known as postnatal hypothermia. The extent and duration of this postnatal hypothermia is negatively correlated to the chances of survival of the piglet (Kammersgaard, 2014). Hypothermia predisposes piglets to mortality by other causes including starvation, crushing and disease.

Crushing

Immediately after birth and for the next 3 days young piglets take shelter of dam's udder to overcome the problem of hypothermia. But by staying close to the sow the piglets are highly prone of getting trapped under the sow's body whenever it lies down or shifts position while lying. Small, weak, chilled and starving piglets are more at risk of being crushed than healthy and well nourished. More than 50% of piglet deaths occur within 4 days of birth. (Weary *et al.,* 1998). According to Morrow-Tesch and Mc Glone (1990) pigs have a highly developed sense of smell within 12 hours of birth hence majority of piglets move towards the udder after farrowing. Rhode Parfet and Gonyou (1991) found that piglets were more attracted to the odor of Sows's milk. Attraction of piglets towards the sow's udder also makes the piglets prone to crushing.

Savaging

Another major cause of pre-weaning piglet deaths is savaging of piglets by the sow. Savaging refers to mother animals attacking their new-born offspring, sometimes fatally. Factors predisposing the gilts to savaging include harsh treatment by the stockperson, hormonal changes, nutritional deficiencies and confinement of the animal. Gilts are more likely to savage their piglets than the sows, but sows that savaged as gilts have a higher probability of savaging during their second farrowing than do those that did not savage previously (Harris *et al.,* 2002). Strict vigilance is needed at all-gilt farms to protect piglets from savaging and producers should consider savaging behavior as a criterion for culling.

Problems during farrowing

Asphyxia is a condition a condition arising when the body is deprived of oxygen, causing unconsciousness or death. Rupture of the umbilical cord, detachment of the placenta or blockage umbilical cord either by being pressed between a piglet and the uterine or the vaginal wall during contractions can

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cause the piglet deficient of oxygen during parturition when the piglet is still connected to umbilical cord and dependent on it for oxygen (Sjaastad *et al.,* 2003a). Piglets are more susceptible to intrapartum anoxia. As the pigs are polytocous the piglets born at the end of the litter face asphyxiation to a greater degree due to cumulative effects of successive uterine contractions. These uterine contractions may cause umbilical occlusion, rupture the cord or premature placenta detachment leading to reduced or stoppage of oxygen supply to piglets (English and Wilkinson, 1982). According to Mota *et al.* (2002a) Prolonged farrowing and intrapartum still births are strongly related. Friend *et al.* (1962) noted that the rate of still borns increased from 2.4 to 10.5% when the farrowing time increased from 3 to 8 hours. Presence of a stillborn piglet increases the birth interval and the incidence of long intervals increases with the birth order leading to increased risk of asphyxia (Fraser *et al.,* 1997).

Piglet anaemia

Piglet anaemia is a hypochromic-microcytic anaemia. Newly born piglet has 12-13g/100ml of haemoglobin in the blood and this rapidly drops down to 6-7g by 10 to 14 days of age. Under natural conditions, piglets obtain iron from the soil, but piglets reared on concrete floors indoors have no access to soil and depend on sows' milk until it starts to eat creep feed but sows milk is deficient in iron containing 1mg/lt Fe. Neonatal pigs reared in confinement need supplementation of Fe in order to overcome the susceptibility to anaemia (Brady *et al.,* 1978). A shortage of iron results in lowered levels of haemoglobin in the red cells, a lowered capacity for the carriage of oxygen around the body and an increased susceptibility to disease (BSAS, 2003).

Nutrition

Genetic selection and various breeding programs have led to high prolificacy of sows. A sow currently gives birth to 10 to 16 piglets at birth. Lactation failure in sows is a common problem. Mortality in piglets due to malnourishment accounts for 6-17% of total pre weaning mortality. Causes of Lactation failure may high environmental temperature (Barb *et al.,* 1991), bacterial infections causing hypogalactia and primiparous sows reluctant to suckle their young ones (Quinlan, 2001). Colostrum is a rich source of immunoglobulins which can be absorbed intestinally by the piglets up to 36 hours after birth, prior to gut closure (De Passille *et al.,* 1988). Piglets with low birth weight compete with larger and heavier littermate and end up ingesting less colostrum (Miligan *et al.,* 2002) which is essential to provide energy and antibody protection necessary for survival.

Diseases related to sow and piglet

Mastitis, metritis and agalactia, commonly called as MMA, is caused by a bacterial infection of the mammary glands (udder) and/other urogenital tract. It is a complex syndrome seen in sow shortly (12 hours to three days) after farrowing. MMA leads to increased piglet mortality and reduced weaning weights (Roy *et al.,* 2014). Four Common conditions in piglets causing mortality are colibacillosis, Clostridial enteritis, Transmissible Gastroenteritis and diarrhoea. Colibacillosis is caused by Escherichia coli (ETEC) strains. Clostridial enteritis is a form of scours that affects young pigs and has been reported to cause diarrhoea in swine, as well as in most young animals including humans. Diarrhoea usually begins as watery yellow scours. After few hours faeces becomes bloody and the pigs may die within a few hours to two days. (Tucshscherer *et al.*, 2000). Transmissible Gastroenteritis (TGE) is a highly infectious disease caused by Coronavirus. 100% mortality is seen in piglets within 2-3 days under 7 days of age due to severe dehydration if the piglets are infected. In Rota virus infection profuse watery diarrhea is seen in younger animals which persists for 3-4 days. Pigs look hollow in abdomen and become dehydrated.

Measures to overcome piglet mortality

Behavioral adaptations like contact with udder of a sow by piglet enables heat influx from warmer objects. But this increases the chances of mortality of pigs due to crushing. So to avoid this close monitoring is important. In addition piglets that would be crushed should be placed in a safe spot under the heat lamp until they are able to compete for a teat. Colostrum has documented effects on the metabolic capacity for heat production (Herpin *et al.,* 1994). Colostrum is a rich source of energy and immunoglobulins. A piglet 12 hours after birth could withstand cold exposure more successfully if it had recently been suckled. If the piglet had not recently fed, its ability to withstand cold even at 48 h of age was not good. (Mount, 1969)

Use of farrowing rails along all the sides of the pen resulted in lower piglet mortality than when no rails were present. Provision of moderate or large amount of litter in the sow area at the time of farrowing significantly reduces piglet mortality (Andersen *et al.,* 2007). Observing certain behavioral traits in farrowed sow helps in understanding the maternal behavior which could be related to crushing activity. Wischner *et al.* (2010) observed that sows showing sniffing, looking around and nosing as components of pre-lying behavior showed no crushing of piglets.

Li *et al.* (2012) reported that Piglet mortality within litter increased with increasing parity hence, proper measures need to be taken during preweaning period with regard to older sows. It has been found that Males tended to suffer from crushing by the sow more than females and statistically significantly more males died from disease related causes though males were born on average heavier, with higher body mass index and ponderal index.

Along with the increase in litter size there should be an improvement in milk yield to ensure the survival of the large and fast growing litter. Conventional feeding program for gestating sows does not provide sufficient proteins and minerals during late gestation which leads to impaired milk production, reproductive performance, and finally longevity of sows. During late gestation and during lactation sows need increased amount of protein and amino acid hence, nutritional management is of utmost importance at this stage (Kim *et al.,* 2009). Age of sows, litter size, and health status should also be considered in determining nutrient needs for mammary gland growth and milk production. When feeding sows, consideration of phase feeding of gestating sows and parity feeding of lactating sows could enhance production longevity and health of sows. Use of selected nutrients and additives seems to help productivity and health of sows. When considering ideal protein concept, Leucine and Arginine have increased importance during late gestation, whereas Threonine has increased importance during early gestation. Piglets born from sows fed on high-fiber diet grew faster than other piglets. According to Baxter *et al.* (2012) Piglets that died before weaning were lighter at birth than weaned piglets. Increasing dietary fat of the sow during the late gestation and early lactation can increase the fat content of the colostrum and thus increase survival of low birth weight pigs as increased concentrations of colostral fat increases the piglets' energy intake and therefore fat deposition.

Prevention is better than cure. Hence, maintaining a good biosecurity is important to minimize disease incidence. In brief, proper attention, proper hygiene, Providing Thermal comfort to improve feed intake by both sow and piglet, nutritional management and observing behavior traits and following precautionary measures accordingly could definitely help overcome the problem of preweaning mortality.

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