

FETAL ABNORMALITIES IN SWINE: A STUDY UNDER FIELD AND ORGANIZED FARM CONDITIONS

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ABSTRACT

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Fetal abnormalities in pigs cause heavy loss to the farmer as it reduces the return from sale of piglets, reduction in availability of replacement stocks and the associated loss in the lifetime production and reproduction of sows. This article deals with different fetal abnormalities encountered over a period in pigs reared under field as well as organized farm conditions. The fetal abnormalities in pigs encountered in the present study were anophthalmos, ascites, anasarca, atresia ani, mummification, maceration, syndactyly like condition, splay leg, hemorrhagic fetus, leg malformations etc. The etiology and management options are also discussed.

Key words: Fetal abnormalities, swine

In India, pig keeping is an omnipresent activity, especially among the weaker section of the society. Though a considerable proportion of the rural people depend upon the income from pig for their livelihood, the pig rearing has not been given due recognition until recently (Bujarbaruah et al., 2008). The main component limiting the productive efficiency of swine is reproduction. Successful reproduction is the outcome of a series of closely linked events. The gilts must grow rapidly to attain sexual maturity, initiate estrous cycle, ovulate and be mated by a fertile boar or inseminated with fertile semen at proper time for conception, implantation and normal gestation leading to birth of viable piglets. When there is discontinuity in any one step in the above chain of events, the reproductive efficiency is adversely affected.

Fetal abnormalities or anomalies in fetal development may occur due to multifarious reasons

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including genetic defects due to hereditary or mutation, lack of some substances, presence of normal substance in subordinate amount or from extraneous factors such as teratogens and viruses which interfere with the biochemical reactions (Arthur et al., 1989). The total pre weaning loss in litters containing a malformed pig was higher (29.8%) than that in litters without malformations (17.4%) as reported by Muller and Edwards (2008). Thus, it is very clear that prevalence and types of fetal abnormalities in pig is an area that needs to be studied so that preventive measures could be evolved to reduce the mortality among piglets. The information on fetal abnormalities in pigs in India is very scanty. The present study documents the fetal abnormalities in pigs encountered at field as well as organized farm conditions in northeastern region.

The present study was conducted at ICAR Research Complex for NEH Region, Mizoram Centre, Kolasib, Mizoram and ICAR Research Complex for NEH Region, Barapani, Meghalaya based on the author's observation on the fetal abnormalities encountered in the field and organized farm conditions in Mizoram (2003-06) and Meghalaya (2006-09). As the northeastern region

is well known for pig production, each and every household in the hilly areas rear at least one or two pigs in their backyard mostly under intensive system (Kumaresan et al., 2009). Organized pig farms are very few in this region, mainly restricted to Central Government Institutes and State Government farms. Survey was carried out to study the fetal abnormalities and as and when some abnormalities were encountered they were noted. While in field conditions the possible etiology was identified based on the discussion with the farmer, the same was carried out based on the record and other relevant means in organized farms.

The fetal abnormalities in pigs encountered in the present study were anophthalmos, ascites, anasarca, atresia ani, mummification, maceration, syndactyly like condition, splay leg, hemorrhagic fetus and leg malformations. The prevalence of congenital defects in piglets in a large intensive piggery was reported earlier by Mulley and Edwards (2008). They reported that the prevalence of defects was estimated to be 2.9% of all piglets born, and at least one piglet with a congenital defect was found in 17.4% of litters and the most commonly encountered malformations were myofibrillar hypoplasia, cryptorchidism, anal atresia and skeletal defects.

Haemorrhagic fetuses were observed in an abortion case. The Hampshire sow was in her mid way of gestation and all of a sudden she aborted. While few fetuses were expelled when they were still covered with the fetal membranes, the others were expelled without fetal membranes (Figure 1). Different organs of the fetuses were developed normally but fetuses showed haemorrhagic lesions on their body. Situation analysis of the particular sow indicated that she might possibly be affected with Swine fever as the particular farm had episodes of this particular disease. In another case, a sow aborted in the third month of pregnancy and the fetuses showed sever hemorrhages in their body. The extent of haemorrhagic lesions varied with the piglet from severe in some piglets to mild in others (Figure 2). Haemorrhagic lesions in the skin of the pig have been reported to occur in Swine fever; however the occurrence

of the same lesions in aborted fetus could not be confirmed. Infectious agents may kill one or two embryos initially and then spread to other conceptuses as gestation progresses and may cause abortion.

Congenital Anophthalmos is the unilateral or bilateral absence of eye at birth and may be accompanied by other cranial abnormalities (Duplessis et al., 1982 and Sadler, 2004). In a case, it was observed that all the piglets in a litter had anophthalmos (Figure 3). History revealed that the Hampshire dam was mated with Large White Yorkshire dam and both the sire and dam had normal eyes. Congenital anophthalmos has been reported in pig, horse, goat, dog, cat, rat and guinea pig. In pig it is associated with maternal Vitamin A deficiency (Radostits et al., 2000; Jones et al., 1997). A litter of eyeless pig in Duroc-Jersey gilt was first time reported by Fred Hale (1933). He concluded that since both the sire and dam of this litter of pigs had normal eyes, this defect, if hereditary, would have to be the result of a recessive factor, and in which case both sire and dam must have been heterozygous.

Fetal ascites was noticed in a litter of pigs farrowed by a Hampshire sow. This condition has multifarious etiology. The piglet was subjected to autopsy and it was observed that peritoneal cavity was filled with fluid (Figure 4). The liver and kidneys of the affected fetus was enlarged. Dropsy of peritoneum is a common accompaniment of infectious diseases of fetus and of developmental defects such as achondroplasia. The fetus is often dropsical and may cause dystocia and is generally relieved by incising the fetal abdomen with a knife and removing the ascetic fluid.

Fetal Anasarca was noticed in a litter of pigs farrowed by a Hampshire sow mated with Large White Yorkshire. Not all the fetus in the litter had anasarca; only few fetuses were affected with this condition (Figure 5). There is increase in fetal volume due to accumulation of fluid in excess quantity in the subcutaneous tissues (Figure 6) particularly of the head and hind limbs. Fluid accumulation may also be seen in the pleural and peritoneal cavities. Deficiency of iodine also reported to cause hairless oedematous fetus.

Fetal mummification is an important cause of prenatal losses in swine. Higher incidence of this condition has been reported in Berkshire breed. In the present study, this condition was observed in Hampshire sow. The sow farrowed normally and the mummified fetus (Figure 7) was expelled along with other normal fetuses. Papyraceous type of mummification of fetuses has been observed in sow; in most cases a small proportion of fetuses are affected and the remaining fetuses are normal. Generally, the mummified fetus is expelled along with the normal piglets during farrowing (Roberts, 1971). The mummified fetus is surrounded by parchment like membranes and higher incidence of mummification is generally caused by viral diseases.

Fetal maceration is relatively rare in case of swine. In the present study, a case of macerated fetus was observed in Hampshire pig. The sow showed symptoms of abortion in the third month of pregnancy. When examined brownish discharge with fetid odour was observed from the vulva of the sow and the next day the sow expelled macerated fetus. The fetus was brownish black in colour and the bones were visible from outside especially in the head area (Figure 8). Fetal maceration may occur at any stage of pregnancy and is usually associated with infectious cause. In multiparous animals, maceration of fetus usually ends in absorption and rarely a macerated fetus is expelled along with normal fetus (Roberts, 1971). The prognosis is generally poor but in this case the sow was treated with antibiotics and it conceived and farrowed normally in the next farrowing.

Atresia ani is a condition in which the anus is not present in the piglet and death results within first few days after birth due to inability to void feces unless surgically corrected. This condition has a genetic basis but the exact mode of inheritance has not been determined. The present study reports a case of atresia ani in litter of Hampshire pig (Figure 9). Surgery was carried out to correct the condition and an artificial anal opening was made and the rectal blind sac was sutured along with the boundary of the artificial anal opening. But the piglet died after 3 days, which might be due to peritonitis.

Mal formed limbs involve peculiar malformation of hind legs and sacrum and are associated with a recessive gene. There are several types of malformation in limbs (Figure 10-12). Syndactyly is a condition, in which there is partial or complete fusion of one or more digits may have genetic origins but may also be caused by prenatal nutrient deficiencies. Splay leg is a congenital condition in which the affected animal cannot stand or walk due to splaying of legs (especially hind leg) sideways or forward. Deficiency of manganese causes knuckling of fetlock in the new born.

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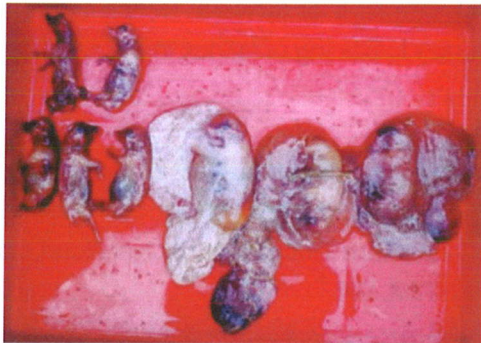


Figure 1: Haemorrhagic porcine-fetus:
Early abortion



Figure 2: Haemorrhagic porcine-fetus:
Late abortion



Figure 3: Congenital Anophthalmos

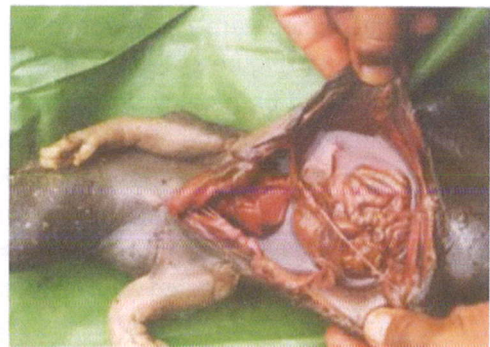


Figure 4: Fetal Ascites



Figure 5: Fetal Anasarca along with
normal fetus



Figure 6: Fetal Anasarca



Figure 7: Mummified fetus



Figure 8: Macerated fetus



Figure 9: Atresia ani



Figure 10: Knuckled fetlock



Figure 11: Syndactyly like condition



Figure 12: Leg abnormality