

Stillbirths in Swine Farm Associated with Some Bacterial Organisms in Napri/Abu Zaria, Nigeria- A Case Report

Oke-Egbodo, B. E.¹, Oke, P. O.², Hassan, R.³, Samuel, F. U.³. And Bello, T. K.³

^{1,3} National Animal Production Research Institute (Napri), Ahmadu Bello University, Zaria-Nigeria

² college Of Veterinary Medicine, Federal University Of Agriculture Makurdi-Nigeria

Abstract: The attention of the Animal Health team of Swine section of Swine and Rabbit Research Programme of NAPRI was drawn to three farrowing pens of swine unit on 5th of March, 2015 with a compliant of farrowing dead piglets. The condition was observed previously in another sow on the 1st of March, 2015. History revealed that the sows involved had been dewormed with ivermectin prior to breeding. The sows were Large white in their 3rd parities and average weight of 150kg with no prior clinical signs aside parturition signs that were observed. Microbiological survey identified *Staphylococci spp*, *Escherichia coli*, *Micrococcus spp*, *Corynebacterium diphtheriae* and *Niesseria spp* in the sows and fetal organs. Oxytetracycline LA 20mg/kg (total dosage 3000mg) was administered intramuscularly once before the lab results were obtained while the course of the treatment was changed to gentamicin at 5mg/kg (total dosage 750mg) intramuscularly for three days with respect to the sensitivity test.

Keywords: Swine; Still birth; Large white; Sensitivity test; NAPRI.

I. Introduction

In swine, pregnancy is established when the embryo starting at day 12 produces oestrogen which acts on the uterus preventing the release of the luteolytic factor (PGF_{2α}) into the uterine vein. The corpora lutea are saved from regression. Luteinizing hormone from the sow's pituitary gland is required to maintain the CL throughout pregnancy. The placenta of the sow converts all its produced progesterone to estrogen. Therefore, functional ovaries are the only source of progesterone and needed to prevent uterine contraction throughout pregnancy. Farrowing is a critical period in most polytocous mammalian species (Borges *et al.*, 2005).

Several factors have been associated with stillbirth like infectious diseases, gestation length, parity, litter size, farrowing length, birth interval, birth weight, dystocia, stress due to high environmental temperatures or transfer to the farrowing house, human interference on the assistance of parturition, body condition score and nutritional deficiencies (Tantasuparuk *et al.*, 2000; Lucia Jr. *et al.*, 2002). Foetal mummification and stillbirths have been associated with infectious diseases, parity, litter size, uterine capacity, environmental temperature and mycotoxins (Dial *et al.*, 1992; Mengeling *et al.*, 2000; Borges *et al.*, 2005). In pigs, up to 8% of newborns are stillborn (van der Lende *et al.*, 2000), predominantly as a result of perinatal asphyxiation experienced in utero or during delivery (Zaleski and Hacker, 1993).

Many agents that cause reproductive failure in sows produce a broad spectrum of sequelae, including abortions and weak neonates, as well as stillbirth, mummification, embryonic death, and infertility. Mummification is seen more frequently in swine than in many other species due to the large litter size. If only a few fetuses die, abortion rarely occurs; instead, mummies are delivered at term, along with live piglets or stillbirths (Cutler *et al.*, 1992).

Infectious causes of reproductive dysgenesis that compromise viability of domestic animals prior to parturition unlike reproductive pathogens in other species; porcine reproductive pathogens are predominantly viruses. This is hypothesized to be due to the density of the swine population within many production units (Givens and Marley, 2008). Embryo is defined as the part of the conceptus that gives rise to the neonate, from fertilization to completion of organogenesis; Fetus is defined as that part of the conceptus that gives rise to the live neonate from completion of organogenesis to completion of the second stage of parturition (Givens and Marley, 2008).

Bacterial infections are usually not involved in mummification and stillbirths however, viruses are a common cause of mummification in pigs. Fetal maceration results when abortion or parturition fails to occur following fetal death and CL regression. When multiple fetuses are present in utero, infectious pathogens may result in different outcomes in different fetuses. Sows physiologically terminate pregnancies comprised of less than four embryos and subsequently exhibit a regular interoestrus interval. Thus, litters of four or less liveborn piglets suggest embryonic or fetal death, even if stillbirths or mummified fetuses are not clinically observed (Givens and Marley, 2008).

Case History And Clinical Examination

The attention of the Animal Health team of Swine section of Swine and Rabbit Research Programme of NAPRI was drawn to three farrowing pens of swine unit on 5th of March, 2015 with a compliant of farrowing dead piglets. The condition was observed previously in another sow on the 1st of March, 2015. History revealed that the sows involved had been dewormed with ivermectin prior to breeding. The sows were Large white in their 3rd parity and average weight of 150kg with no prior clinical signs aside parturition signs that were observed. Clinical examination revealed enlarged vulva, distended abdomen, restlessness, inappettance and expulsion of dead piglets. Blood samples, vaginal swabs and fetal internal organs were taken to bacteriological laboratory for culture, isolation and sensitivity testing.

Result And Management

BACTERIAL ORG	SOW 1	SOW 2	SOW 3	SOW 4	FETUS 1	FETUS 2	FETUS 3
<i>Staph spp</i>	+	NI	+	+	+	+	+
<i>E. coli</i>	+	+	+	+	NI	NI	NI
<i>Micrococcus spp</i>	NI	+	+	NI	NI	+	+
<i>Corynebacterium diphtheria</i>	+	+	+	NI	+	+	+
<i>Neisseria spp</i>	NI	NI	NI	NI	+	NI	+

Key: + = present, NI = not isolated

Antibiogram

ANTIBIOTICS	<i>Staph spp</i>	<i>Coryn diphtheria</i>	<i>Neisseria spp</i>	<i>Micrococcus spp</i>	<i>E coli</i>			
Amoxicillin		R	R		R			
Nalidixic acid		R	++		+			
Nitrofurantoin		R	+		+			
Augmentin	R	R	R	R	R			
Tetracyclin	+	R	+	+	R			
Septrin	R	R	+++	R	++			
Ofloxacin		R	+		+++			
Gentamicin	R	++	++	++	++			
Streptomycin	R			R				
Chloramphenicol	R							
Erythromycin	R			R	R			
Cloxacillin	R	R		R				

The dead fetuses were properly discarded and the entire pen scrubbed with antiseptic, Oxytetracycline LA 20mg/kg (total dosage 3000mg) was administered intramuscularly once before the lab results were obtained while the course of the treatment was changed to gentamicin at 5mg/kg (total dosage 750mg) intramuscularly for three days with respect to the sensitivity test.

II. Discussion And Conclusion

Stillbirth as cause of embryonic mortality can be due to non-infectious causes such as lower birth weights and prolonged farrowing which contributes to increase in the risk of stillborns (Muirhead and Alexander, 1997; Borges *et al.*, 2005) more deaths occur at and around birth than between 1 week of age and weaning, embryonic losses are usually higher than perinatal losses (Borges *et al.*, 2005).

Anoxia is one the major non-infectious cause of stillbirths (Sprecher *et al.*, 1974) and the incidence of asphyxial problems are increased with litter size (Herpin *et al.*, 2001), oxygen deprivation is often associated with damage to the umbilical cord and probably stretching of the cord during expulsion of the piglet, especially for those located near the ovarian end of the uterus (Fraser *et al.*, 1995).The other major factor involved is the stage of farrowing, because almost all stillbirths occur in the last third of farrowing and 70% in the last three piglets (Borges *et al.*, 2005).Staphylococcus, hemolytic *Escherichia coli*, beta and alpha streptococci has been isolated in abortion cases in wine farm (Thorne and Wilson, 1961).

Staph. spp. and *E. coli*were most isolated across the sows and have been associated with abortion in swine farm, but *Coryn. diphtheriae* has no report to the best of my knowledge to cause abortion or stillbirth in pigs both have been isolated as a normal vaginal bacterium of sows. Bara *et al.*, 1993 isolated Streptococcus spp, *Escherichia coli*, *Staphylococcus spp*, and *Corynebacterium spp* from normal anterior vaginal of sows. In conclusion bacterial organism isolated from the fetal organs andsow vaginal swabs and blood are often associated with both normal and abnormal animal but stillbirth seen in four of these sows with these bacterial isolates indicates their possible roles in the fetal mortality through stillbirths.

References

- [1]. Bara, M. R., McGowan, M. R., O'Boyle, D. and Cameron, R. D. (1993). A Study of the Microbial Flora of the anterior Vaginal of normal Sows during Different stages of Reproductive Cycle. *Aust. Vet. J.*70(7):256-259. Abstract.
- [2]. Borges, V.F., Bernardi, M.C., Bortolozzo, F.P and Wentz, I. (2005). Risk Factors for Still birth and Fetal Mummification in four Brazilian Swine Herds. *Preventive Veterinary Medicine*70:165-176.
- [3]. Cutler, R.S., Fahy, V.A. and Spicer, E.M. (1992). Prewaning mortality. In: Leman, A.D., Straw, B.E., Mengeling, W.L., D'Allaire, S., Taylor, D.J. (Eds.), *Diseases of Swine*, seventh ed. Wolfe, pp. 847–860.
- [4]. Daniels, G.M and Marley, M.S.D (2008). Infectious causes of Embryonic and Fetal Mortality. *Theriogenology* 4(18):106-122.
- [5]. Dial, G.D., Marsh, W.E., Polson, D.D. and Vaillancourt, J.P. (1992). Reproductive failure: differential diagnosis. In: Leman, A.D., Straw, B.E., Mengeling, W.L., D'Allaire, S., Taylor, D.J. (Eds.), *Diseases of Swine*, seventh ed. Iowa State University Press, Ames, IA, pp. 88–137.
- [6]. Fraser, D., Phillips, P.A., Thompson, B.K., Pajor, E.A., Weary, D.M. and Braithwaite, L.A. (1995). Behavioural aspects of piglet survival and growth.. In: Varley, M.A. (Ed.), *The Neonatal Pig. Development and Survival*. Cab International, Guilford, pp. 287–312.
- [7]. Herpin, P., Hulin, J.C., Le Dividich, J. and Fillaut, M. (2001). Effect of oxygen inhalation at birth on the reduction of early postnatal mortality in pigs. *J. Anim. Sci.* 79:5–10.
- [8]. Lucia Jr., T., Corre[^]a, M.N., Deschamps, J.C., Bianchi, I., Donin, M.A., Machado, A.C., Meincke, W., Matheus, J.E.M., 2002. Risk factors for stillbirth in two swine farms in the south of Brazil. *Prev. Vet. Med.* 53, 285–292.
- [9]. Mengeling, W. L., Langer, K. M. and Vorwald, A. C. (2000). The effect of porcine parvovirus and porcine reproductive and respiratory syndrome virus on porcine reproductive performance. *Anim. Reprod. Sci.* 60–61, 199–210.
- [10]. Muirhead, M.R. and Alexander, T.J.L. (1997). *Managing Pig Health and the Treatment of Disease. A Reference for the Farm.* 5M Enterprises, Sheffield, pp. 133–226.
- [11]. Nietfeld, J.C. (2011). Abortions in Pigs: Abortion in Large Animals: Merck Veterinary Manual. www.merckvetmanual.com. Accessed 9:28A.M 6/3/2015.
- [12]. Sprecher, D.J., Leman, A.D., Dziuk, P.D., Cropper, M. and De Decker, M. (1974). Causes and control of swine stillbirths. *J. Am. Vet. Med. Assoc.* 165:698–701.
- [13]. Tantasuparuk, W., Lundeheim, N., Dalin, A.-M., Kunavongkrit, A., Einarsson, S., 2000. Reproductive performance of purebred landrace and yorkshire sows in Thailand with special reference to seasonal influence and parity number. *Theriogenology* 54, 481–496.
- [14]. Thorne, H. and Nilsson, P.O. (1961). *Staphylococuss aureus* as the Cause of Abortion in Swine. *Acta. Scand.* 3: 311.
- [15]. Zaleski, H. M., and Hacker, R. R. (1993). Effect of oxygen and neostigmine on stillbirth and pig viability. *J. Anim. Sci.* 71:298–305.