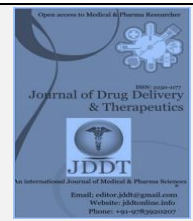


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Research Article

## Prevention and Management of Postpartum Complications in Sows: The Case of Matoto, Guinea

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### ABSTRACT

One of the most common diseases that affects sows after parturition is mastitis. In other cases, it is a swelling of the breasts or a case of vulvitis or vaginitis. The aim of this study is to determine the prevalence of postpartum complications in sows and establish treatment management and preventive measures. Bacteriology analysis showed that the prevalence of mastitis was significantly higher for mastitis. *Escherichia coli* and *Salmonella* spp have been identified as bacterial pathogens. Prevalence rates were significantly higher in primiparous sows (3.78% of mastitis; 1.4% to 0.7% of vaginitis and vulvitis) than in multiparous animals (0.72% of mastitis; 0.3% of vaginitis and 0, 06% of vulvitis). In the Matoto municipality, mastitis in sows manifests as edema of the breast and is known as one of the main pathologies affecting the females after giving birth. These data demonstrate the appearance of postpartum complications which should attract the attention of researchers and pig breeders for better exploitation of pig farming.

**Keywords:** complications, postpartum, sows, Guinea Conakry.

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### INTRODUCTION

Current evolution of the world characterized by an increased demographic growth and a shortage in animal proteins impose us the intensification of the breeding in general and the pig farming in particular <sup>1</sup>.

As in most developing countries, malnutrition is a known phenomenon in Guinea where the protein diet is almost in deficit. The country has great breeding potential and the edapho-climatic conditions are favorable for the breeding of several animal species <sup>2</sup>. In low-income countries, poor nutritional status, lack of easy access to treatment and inadequate intensive care and blood bank facilities are additional contributing factors that lead to high morbidity and mortality rates in these countries <sup>3,4</sup>. Pig farming plays an important role in the direct or indirect feeding of humans, especially since the current world trend is towards a higher consumption of white meat than red meat. The animal species produce meat without contributing to the deterioration of natural pastures unlike ruminants <sup>5</sup>. Indeed, because of its resistance, its productive capacity, its omnivorous character and the quality of its highly sought-after meat, pork is one of the animals most in demand in certain regions of Guinea and represents a tradition of long time.

Despite the advantages that pigs bring to human life, pig farming today faces enormous problems that hinder its development <sup>6</sup>. The cause of its hindrances is the postpartum complications that lead to enormous economic losses. These losses can be summarized by the decline in reproduction, the death of animals or their early reform

7. Because urogenital infections may involve one or more of several different organs, the presentation may be quite variable. The usual client complaint is vaginal discharge. The discharge is usually seen as a dried deposit in the perineal region or as a puddle on the floor. Discharges may be noted post-breeding, postparturient, or unassociated with a stage of reproduction. The nature, volume, and frequency of the discharge may be important in determining the source of the infection. Affected sows will often have a low grade fever, be inappetent and may even lose condition if the infection is severe and of long duration <sup>8</sup>. All the losses due to livestock diseases and other conditions have a negative influence on the income of the pig farming. Postpartum pathologies exist in many farms and pose heavy losses to breeders; Common features of the tropical climate's effect on the sows' reproductive performance include a decreased conception rate, an increased embryonic loss and a prolonged weaning-to-first-service interval <sup>9,10,11</sup>. Postpartum shivering is observed in 25 to 50 percent of subjects <sup>12</sup>. In recent study, dystocia has also been documented. The potential risk

factors for uterine infection was reported to cost between US \$96 to \$397 in most dairy farms in the US, depending on the level of assistance required<sup>13,14</sup>.

In the Municipality of Matoto, pig farming occupies an important place and provides the population with good quality meat and industrial by-products which constitute sources of income for breeders. However, this activity is faced with postpartum complications representing serious obstacles to its development. To reduce the losses caused by these complications in sows, it is necessary to determine their causes and frequency, apply therapeutic measures and establish an appropriate prophylactic plan. Thus, we focused on this work project which could allow researchers and public authorities to make decisions going in the direction of the prosperity of pig farming.

## MATERIAL AND METHODS

### Presentation of the urban municipality of Matoto

Matoto is one of the five communes of Conakry, the capital of Guinea. It has a wide seafront covered largely with mangroves. Located 11 km from the autonomous port of Conakry, it covers an area of 37square kilometers with a total population of 490,166 inhabitants and includes 31 districts.

The commune of Matoto is bounded to the east by the prefecture of Coyah, to the west by the commune of Matam, to the north by the commune of Ratoma and to the south by the Atlantic Ocean. Included in the southeast part of the capital, Matoto is located between 9 ° 34 'north latitude and 13 ° 37' west longitude.

The statements and localities to be planned are Dabompa, Sangoyah, Simbayah, Tomboliyah, Gbessia and Entag.

## METHODS

### a) - Contact with livestock management executives.

To understand the manifestations of postpartum complications, we contacted the officials of the Livestock Department in order to obtain information not only on the existence of postpartum pathologies, but also on their complications in the urban commune of Matoto .

### b) -Archival studies from the Department of Livestock.

The archive study was carried out with the aim of obtaining information on the postpartum complications of sows observed during the three years (2006-2008).

### c) - Contact with breeders.

This survey was carried out on the basis of a questionnaire. All these questions concerned breeders and related to knowledge of postpartum complications, history, the management made in the event of mortality.

### d) - Clinical examination

We focused our attention on the state of health of the animal or in a group. We also appreciated the volume and shape of the udder, the state of the vaginal mucosa, the presence or absence of secretions, ....

### e) - Pelvic exam

After washing the superficial part of the vulva, we introduced the speculum into the vagina to observe the state of the vaginal and cervical mucosa. We determined the degree of opening and / or enlargement of the cervix, the character of the mucus, as well as the appearance of

the vagina.

### f) - Collection of cervical mucus and milk

This was done using sterile swabs and test tubes labeled according to the number of animals. After washing the surface part of the vulva, we introduced the cotton swab (swab) into the vulva in a small rotational movement to collect the mucus. After each collection, the samples were put in the cooler. For the milk collection, we washed the udder, and squeezed a nipple in order to have drops in the tube. Cervical mucus and milk were kept in the cooler until the laboratory. This cold chain was ensured by the regular placing of ice on the samples.

### g) - Examination by bacteriology RAMBACH AGELOSE reaction

To assess the results of clinical and gynecological examinations, we performed a laboratory examination. The medium used was RAMBACH AGAR (differential means for the identification of salmonella in food and clinical samples). The reaction involved 60 samples, including 19 for cervico-vaginal mucus and 41 for milk at the Central Veterinary Diagnostic Laboratory in Conakry. For each sample, streaks were made on the culture media, in order to place them in the incubator for 24 hours for reading. The red color indicates salmonella, the blue color indicates Coliforms.

The cervical mucus smear and milk analysis were done to identify the bacteria causing the complications and to establish a treatment regimen.

### h) -Determination of prevalence

The frequency of postpartum complications was determined based on the duration of our surveys.

### i) -Treatments for observed postpartum complications.

In the context of treatment of sick animals, we have taken into account the specificity of each pathology.

Mastitis: we washed the udders with a solution 1% potassium permanganate (KMnO<sub>4</sub>), administered vitamin and streptomycin and used the veterinary vegetable rub on the udder.

Vulvitis: with a concentration of 1% Potassium permanganate (KMnO<sub>4</sub>), we washed the vulva then administered vitamins (stress vitam) and oxytetracycline 10% Vaginitis: the same mastitis treatment regimen, supplemented by the administration of oxytocin.

### i) -Proposal of a prophylactic plan.

We have proposed a prophylactic plan to reduce the negative impact of these postpartum complications.

## RESULTS

### a) - come into contact with managers of livestock management, breeders and archival studies

Contact with livestock management and herders revealed that postpartum complications in sows exist but are less common. This consultation showed that malnutrition and the lack of monitoring of the health of pregnant sows are the favorable causes of postpartum complications. Studies have provided archival information relating to postpartum complications in sows in Conakry over the years (2006-2008). The results found from breeders are presented in Table 1 and 2:

**Table 1: Situation of postpartum complications of sows in Conakry (2006-2008)**

Years	Number of females having given birth	Nature of postpartum complications	Number of sick animals	Intensive indices (%)			
				Number of dead animals	Morbidity	Mortality	lethality
2006	1026	Retained placenta	10	4	0.97	0.38	<b>40.00</b>
		Postpartum mastitis	47	11	4.58	1.07	<b>23.40</b>
		Postpartum vaginitis	58	21	5.65	2.04	<b>36.20</b>
		Postpartum Vulvitis	38	15	3.70	1.46	<b>39.47</b>
		Postpartum infection	4	3	0.38	0.29	<b>75.00</b>
2007	2430	Retained placenta	20	8	0.82	0.32	<b>40.00</b>
		Postpartum mastitis	57	15	2.34	0.61	<b>26.31</b>
		Postpartum vaginitis	43	11	1.76	0.45	<b>25.58</b>
		Postpartum Vulvitis	63	22	2.59	0.90	<b>34.92</b>
		Postpartum infection	3	1	0.29	0.04	<b>33.33</b>
2008	2958	retained placenta	22	9	0.74	0.30	<b>40.90</b>
		Postpartum mastitis	61	18	2.06	0.60	<b>29.50</b>
		Postpartum vaginitis	48	13	1.62	0.43	<b>27.08</b>
		Postpartum Vulvitis	70	25	2.36	0.84	<b>35.71</b>
		Postpartum infection	2	-	0.06	-	-
<b>Total</b>	<b>6414</b>	-	<b>544</b>	<b>176</b>	-	-	-

Source: Department of Livestock / Conakry / Guinea (2008)

**Table 2: Results of contact with breeders**

No.	Locations	Number of females	Number of females examined	Number of reported complications
1	Dabompa	145	57	25
2	Sangoyah	72	30	20
3	Simbaya station	20	5	5
4	Tomboliyah	156	84	12
5	Gbessia	272	85	28
6	Entag	206	58	21
Total		871	319	111

### b) Clinical and pelvic examination

To determine the causes and frequency of postpartum complications, we performed a clinical and pelvic exam. The data obtained during these surveys are presented in Table 3.

**Table 3: Results of clinical and pelvic examinations**

No.	Localities	Number of females examined	Number of suspects						Suspicion rate	Clinical signs
			Primiparous			Multiparous				
			Mastitis	Vaginitis	Vulvitis	Mastitis	Vaginitis	Vulvitis		
1	Dabompa	57	14	4	2	7	2	1	52.63	<b>-Weight loss,</b> <b>-Inappetence;</b> <b>-Enlarged udder;</b> <b>-Suckling difficulty;</b> <b>-Frequent, scanty and urination</b> <b>-Accumulation mucopurulent exudate in the vagina.</b>
2	Sangoyah	30	13	3	2	5	2	-	83.33	
3	Simbayah station	5	-	3	1	-	1	-	100	
4	Tomboliyah	10	3	2	1	2	1	1	100	
5	Gbessia	36	14	3	2	1	-	1	58.33	
6	Entag	17	5	2	1	2	1	1	70.58	
<b>SUB TOTAL</b>		<b>155</b>	<b>49</b>	<b>17</b>	<b>9</b>	<b>17</b>	<b>7</b>	<b>4</b>	<b>66.45</b>	
<b>Total</b>		155	75			28			-	-
			103							

### c) - Bacteriological Examination

The results of bacteriological examination revealed *Escherichia coli* and *Salmonella* spp as pathogenic bacteria (Table 4) involved in postpartum complications in pig farming in Matoto, Conakry.

**Table 4: Results of the bacteriological examination**

Locations	Number of samples collected	Nature of samples		Number of positive points		microorganisms identified
		Cervical mucus -vaginal	Milk	Cervico-vaginal mucus	Milk	
Dabompa	30	9	21	10	18	<i>Escherichia coli</i> and <i>Salmonella</i>
Sangoyah	25	7	18	4	15	
Simbaya station	5	5	0	3	0	
Tomboliyah	10	5	5	2	4	
Gbessia	21	6	15	2	11	
Entag	12	5	7	3	5	
<b>Total</b>	<b>103</b>	<b>37</b>	<b>66</b>	<b>24</b>	<b>53</b>	
				77		

**d) - Determination of prevalence**

The frequency of postpartum complications was determined and the results showed several frequencies according to Table 5.

**Table 5: Results of the frequency determination**

No.	Nature of complications	Rate per month							
		August CGF = 29		September Fmb = 24		October Fmb= 20		November Fmb = 19	
		NC	F (%)	NC	F (%)	NC	F (%)	NC	F (%)
1	Mastitis	22	41.50	12	22.64	14	26.41	5	9.43
2	Vaginitis	6	40	3	20	4	26.66	2	13.33
3	Vulvitis	4	44.44	2	22.22	2	22.22	1	11.11

**Legend: = Having given birth to Fmb female; NC = Number of cases; F (%) = percentage of the frequency.**

**e) -Treatment of postpartum complications observed****Table 6: Results of treatments for postpartum complications**

No	Nature of complications	Number of complications	Nature of bacteria	Treatment performed				
				Drugs and dosage	Duration of treatment	Number of animals cured	Recovery (%)	rate
1	Mastitis	53	<i>Escherichia coli</i>	-Washing udder with soapy water and Dakin. -Administration of streptomycin at a dose of 2 ml / 10 kg / IM. -Administration of stress vitamins at a dose of 2 ml / 10 kg / IM. - Udder massage with veterinary vegebun.	4 days	35	66.03	
2	Vaginitis	15	<i>Escherichia coli</i>	-Washing the vaginal mucosa with 1 % of potassium permanganate (KMnO4) -Administration of streptomycin at a dose of 2 ml / 10 kg / IM. -Administration of stress vitamins at a dose of 2 ml / 10 kg / IM. -Administration of the subcutaneous oxytocin ampoule.	4 days	10	66.66	
3	Vulvitis	9	<i>Salmonella</i>	vulva -Washing with potassium permanganate (KMnO4) -Administration of Oxytetracycline 10% at a dose of 1 ml / 10 kg / IM. -Administration of stress vitamins at a dose of 2 ml / 10 kg / IM.	4 days	3	33.33	
<b>Total</b>		77	-	-	-	48	-	



## DISCUSSION

Parturition represents a delicate phase for many female mammals<sup>15</sup>. The behavior of sows has a decisive influence on their reproductive performance. Excess weight and / or adiposity during parturition can indeed lead to locomotion problems and also dystocia can be complicated by mastitis, with negative repercussions on the survival rate of piglets and the longevity of the flock<sup>16</sup>. In the Municipality of Matoto, several postpartum complications exist and are repeated from year to year on farms in Conakry, among which mastitis, vaginitis and vulvitis are the most frequent with variable morbidity rates. The cases of mortalities observed are due to the lack of adequate treatment of sick animals,

In the sow, the prevalence of postpartum disorders is around 10-15% in many farms, including those in France<sup>15</sup>. Out of 155 females examined, 103 showed signs of postpartum complications. The main symptoms of the pathologies are located in the udder, vulva and vagina. We also found that primiparous sows are more affected with a total of 42 than multiparous (18). This could be due to the early mating of gilts, which during parturition suffer enough trauma and expose the organs genital to various ailments.

Often, genital complications in animals have an infectious origin only as a trigger, since the predisposing factors for this disease are numerous. They can appear in more or less obvious forms, often in a subclinical form. Of the 103 samples analyzed, there were 77 positive samples, including 24 from cervical mucus and 53 from milk. This fact shows that milk is more infected than vaginal mucus, which is a favorable condition for the proliferation of pathogenic microorganisms. The germs identified during this research were *Escherichia coli* and *Salmonella* spp.

Environmental health, the nature and humidity of the soil also participate in solving problems. Important associations between the pathologies of parturition and variables describing the sow or its environment highlight certain parameters such as risk factors. This is confirmed in our research locality and more generally in the whole country where the rainy months are the longest during the year. The highest frequencies were recorded in August and September corresponding to the rainy season, which creates humidity in the lodges and promotes the proliferation of pathogens. However, the number of animals cured is appreciable with a total of 48 out of 77 subjects. This fact is explained by the efficacy of veterinary care and management.

There are different factors that predispose sows to urogenital infections. These factors can be classified as relating to environment, management, or the animal itself. Consideration of a discharge problem in these three categories may help the practitioner locate the problem and make recommendations to solve it<sup>8</sup>. This observation would indicate that sows housed in tether barns or gestation stalls would have an increased rate of urogenital infections<sup>17</sup>. Sows housed in tether barns have the highest rates of infection followed by sows in gestation stalls and sows in pens with solid floors and gutters have higher rates of infection than sows housed in pens with slatted floors. The second basic area of housing and environment that predispose sows to urogenital infections is humidity. High humidity in a building results in accumulation of urine and moisture on the floor. This brings about a higher rate of urogenital infections than is seen in buildings with acceptable humidity levels<sup>18</sup>. The humidity in a swine facility is controlled by the ventilation system and the design and maintenance of the ventilation system are just as important as the ventilation rate in the control of humidity.

Therefore, the management of a breeding herd can have a large role in the prevalence of urogenital infections in the sow. Poor hygiene is probably the most important factor that predispose sows to infections. The floors of the breeding area and farrowing stalls should be cleaned. In other hand, perineal contamination by fecal material causes more urogenital infections than any other factor<sup>19</sup>. This accumulation of manure may be related to the design of the floor but more often is due to inadequate waste removal and improper cleaning of the perineum before breeding and farrowing. Other management related problems are assistance, by farm personnel, during farrowing and breeding. Swine unit workers often have fecally contaminated hands. When they assist the boar, perform artificial insemination, or intervene in the farrowing house, the contamination can easily find its way into the genital tract of the sow<sup>8</sup>. Therefore washing hands, using gloves, and cleaning artificial insemination equipment between sows may prevent other problems of infection. Authors have reported that it is necessary to breed animals (heifers for example) at 24 months of age, as by this time the pelvic diameter will have grown enough to minimize cases of dystocia and associated postpartum complications<sup>20, 21</sup>. Here we also suggest that nutrients giving energy to organisms are necessary to the lives of domestic animals.

## CONCLUSION

Postpartum complications remain a major challenge in cattle industry affecting fertility and overall reproductive performance of the animals. Thus, the need to look carefully into mitigating factors and thereby minimize losses is urgent. To overcome the postpartum complications in agricultural pigs in the urban municipality of Matoto, a prophylactic plan has been proposed. This plan was based on animal environment, husbandry, management and veterinary care.

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