



Incidence of Retained Placenta in Ruminants and its Treatment by Rural Farmers in Northern Ghana

KEYWORDS

Retained placenta, incidence, ethno-veterinary medicine, ruminants, season.

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ABSTRACT

A study was conducted to assess the level of incidence of retained placenta in ruminants and to identify how farmers treat retained placenta in affected animals in Northern Ghana. Data from 100 livestock keepers were collected through personal interviews. Focus group discussions were also held to obtain information on materials used in treating retained placenta by farmers. The data were tallied according to specie of animal and season of occurrence. A test of significance for differences in prevalence using t-test and chi-square of SPSS version 16.0 was used. Incidence of retained placenta was low in the study area (8.24% vrs. the normal of about 14%), but significantly higher in goats (11.01%) and sheep (10.45%) compared to cattle (7.06%). Season of birth had significant effects on incidence of retained placenta in cattle only with late dry season incidence of 67.5 %. This was significantly higher ($X^2 = 7.901$; $P = 0.048$) than the rest of the season. Sixteen ethno-veterinary medicines were identified by rural farmers and used in treating retained placenta. Twelve of these were of plant sources. The most used were *Vernonia amygdalina* (18.5%), *wissadula amphisma* (16.1%) and *Adansonia digitata* (7.4%). While four were none-plant sources with the most commonly used of them being common salt (NaCl). The plant parts utilized for treatment were mainly roots (42%) and leaves (34%). These results showed that Ethno-veterinary medicine is very important in the treatment of retained placenta in ruminants in the study area.

1. INTRODUCTION

Poor health in animal herds is an obstacle to animal production and development especially in rural and peri-urban communities (Martin, 1996). Reproductive diseases such as retained placenta contribute directly and indirectly to this threat. Retained placenta causes considerable economic losses in the herd due to decreased milk production, treatment cost and decreased market value of the animal (Ahmed et al, 2006) and this can be a serious setback to the progress of the herd. Retained placenta may cause additional economic losses to farmers as cows suffering from it may develop bacterial infection and become ill and thus reduce production and reproduction. Disorders occurring in early lactation have a negative impact on the performance of the animal later in lactation (Klerx and Smolders, 1997). Treatment cost for retained placenta and secondary infection contribute to in efficiency in production.

According to Taylor et al., (2010), retained placenta is failure of the placenta to be expelled within 12 hours post calving and 3 hours post foaling; while Swiefy, (2003), defines retained placenta as retention of fetal membranes from 6 to 24 hours post parturition. Guard (1999), defined retained placenta in respect of cattle as the failure to pass all or part of the placenta from the uterus within 24 hours of calving.

Ethno veterinary medicine is gaining recognition worldwide as an important component in the promotion of primary health care, especially in marginalized and poor communities (Turkson and Naandam 2002). Adedeji and Aiyedun (2013) reported that, Most of the developing countries rely partly on traditional herbal medicine for treatment and control of animal diseases. In the rural areas where modern medicine is inaccessible to farmers, ethno-veterinary medicine is often used to expel retained placenta in livestock (Moreki et al., 2012).

1.1. Objective of Study

There is paucity of information on prevalence of retained placenta among ruminants and the measures farmers adopt to treat it in northern Ghana yet, such information is necessary for improvements in animal health care and health delivery in rural and peri urban areas. This study was undertaken to contribute in filling these gaps.

2. MATERIALS AND METHODS

2.1 . Study Area

The study was carried out in the Savelugu-Nanton Municipality of the Northern Region of Ghana. The area receives an annual rainfall ranging between 600 and 1000 mm which comes in one rainy season. The rains start in late April or May, intensifying as the season advances and reaching a peak by August or September and terminates by October ending. In recent years the rains are becoming a more unreliable. They may start later or end earlier. On the average, temperatures are high with a mean of 34 °C. The maximum temperature could rise to a 42 °C high especially in the months of March and April while the minimum is about 16 °C. The low temperatures are experienced from December to early February. This is the period of the cold harmattan winds. The vegetation of the area is Guinea Savanna and supports both livestock and crop production.

2.1. Data Collection

A total of 100 questionnaires were administered to livestock keepers in five selected villages (20 respondents per village). The villages were selected based on livestock concentration and level of co-operation of farmers with MoFA and NGOs. The district MoFA directorate guided this process. Five focus group discussions were held with the farmers in each village including some elderly people. The group discussions ended with a walk around during which a collection of samples of local materials used in the treatment of retained placenta was made. Field identification and collection was led by the focus group members. Sam-

ples of other materials that were in homes were brought by volunteers. Plant samples collected were identified by the University for Development Studies herbarium. Data on gender, incidence of retained placenta in ruminants in the area and materials or remedies used by the rural people were collected.

2.2. Statistical Analysis

Data were, tallied according to animal species and season of occurrence. Proportions of occurrence were calculated. A test of significance for differences in occurrences using t-test and chi-square of SPSS version 16.0 was used. Materials used in the treatment of retained placenta were grouped according sources and species. Results were presented in tabula form.

3. .RESULTS

3.1. Gender and Socio-Economic Distribution of Respondents

Demographic characteristics of farmers are shown in Table 1. Males highly dominated females in livestock production in the study area. It was observed by Bacho (2012) that men tended to be producers of livestock more than women in northern Ghana. Also, even in female headed households, the elder son still takes responsibility for livestock.

Table 1: Distribution of respondents by age, sex, occupation, years of experience and educational level

Cat-egory	Class Level	Fre-quency	%	Chi-Square	P-value
Sex	Male	94	94	77.440	0.00
	Female	6	6		
Age	16 – 40	64	64	47.180	0.00
	41 – 60	27	27		
	60+	9	9		
Occupation	Ruminant production only	6	6	139.460	0.00
	Ruminant and crop production	89	89		
	Ruminant and trading	5	5		
Years of experience	Below 5	3	3	90.140	0.00
	5 – 10	20	20		
	10+	77	77		
Educa-tional level	Illiterate	94	94	165.680	0.00
	Primary	4	4		
	JSS/JSH	2	2		

Majority (64 %) of the farmers were between the active ages of 16 and 40 years while those above 60 years were the least (9 %). ($X^2 = 47.180$; $P < 0.01$). A high proportion (89 %) of farmers engaged in both ruminant and crop production as a way of earning a living, ($X^2 = 138.460$; $P < 0.01$). Bacho (2012) observed that in northern Ghana, livestock production is not aimed primarily as an economic activity but more for household security. Farmers who engaged in only ruminant production were 6%. Most livestock farmers (77 %) were not new in the business since they have been keeping ruminants for over 10 years ($X^2=90.140$; $P < 0.01$). A significant proportion (94 %) were illiterate ($X^2=165.680$; $P < 0.01$).

3.1. Incidence of Retained Placenta (RP)

Table 2: Birth-linked reproductive diseases identified by farmers on their farms

Category	N _o of farms	% of farms	X ²	P- value
Retained Placenta	46	46	7.220	0.027
Dystocia	27	27		
Premature birth	27	27		

The birth-linked reproductive diseases identified by farmers on their farms as most important were three (Table 2). Retained placenta occurred on 46 % of the farms. (Chi-square= 7.220; $P = 0.027$). The other two had lower prevalence.

3.2. Distribution of Retained Placenta According to Animal Species

The incidence and distribution of retained placenta among goats and sheep was very close. However, goats had the highest (11.01 %) incidence while cattle had the least (7.06 %) in the study area.

Table 3: Incidence of retained placenta in cattle, sheep and goats for a one year period (2014).

Animal species	N _o of farmers	N _o of animals	N _o of females that gave birth	N _o of Retained Placenta cases	Average incidence (%)
Cattle	75	4615	1842	130	7.06
Sheep	63	829	421	44	10.45
Goats	58	880	454	50	11.01
All		6324	2717	224	8.24

A paired t-test (Table 4) comparing the incidence of retained placenta animal species showed significant difference between pair 1 and 3 ($P < 0.01$), between cattle, sheep and goats. Specie had effect on incidence of retained placenta.

Table 4: A paired t-test comparing the incidence of retained placenta among species.

Pair	Species	N	Group Means	Std. deviation	T	Sig. Level
1	Cattle + Sheep	47	1.085	1.599	4.651	0.00
2	Sheep + Goat	42	-0.095	0.983	-0.628	0.54
3	Cattle + Goat	38	1.105	1.673	4.072	0.00

3.3. Seasonal effects on incidence of retained placenta

The incidence of retained placenta as a percentage of births was highest in the late dry season, 39.8 % for all species. About 67.5 % of the cattle (27 out of 40) that gave birth in this season suffered from retained placenta (Table 5). The lowest incidence of retained placenta of 5.9 % for all species occurred in the early dry season (80 out of 1346).

Table 5. Incidence of Retained Placenta (RP) according to Season of Birth.

Animal species	Season of birth									
	Early rains		Late rains		Early dry		Late dry		Total	
	Births	RP	Births	RP	Births	RP	Births	RP	Births	RP
Cattle	633	41	157	10	1012	52	40	27	1842	130
Sheep	200	18	22	6	173	12	29	8	424	44
Goats	212	20	42	6	161	16	39	8	454	50
Total	1045	79	221	22	1346	80	108	43	2720	224
% incidence	-	7.6	-	9.8	-	5.9	-	39.8	-	8.2

Early rains – April to June; Late rains – July to September; Early dry season – October to December; Late dry season – January to March.

Season of birth therefore had significant effect on the incidence of retained placenta in cattle ($X^2=7.901$; $P=0.048$).

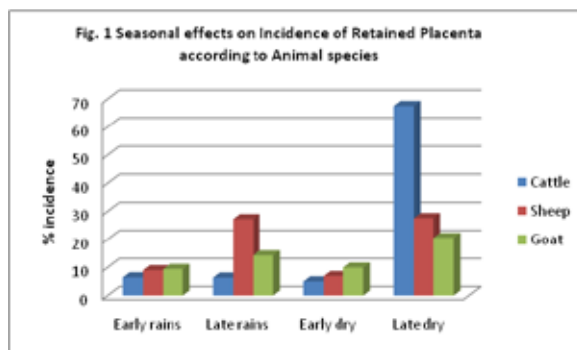


Table 6: Incidence of retained placenta according to season of birth using Chi-square analysis.

	Cattle	Sheep	Goats
Means	1.30	0.50	0.44
Chi-square value	7.901	4.574	4.482
Sig. level	0.048	0.206	0.214

3.4. Treatment of retained placenta by farmers in the study area.

Farmers mainly used ethno-veterinary medicine to treat retained placenta in affected animals. Materials used were basically from three sources (plant, animal and mineral sources.) Materials of plant sources were 13 in number (82.4 %). Of these, Vernonia amygdalina (called Yieliga in the local language) was the most used in treating retained placenta. This was closely followed by Wissadula amphissima (also called Bieni in the local language).

Table 7a: Plant source materials used by farmers in the treatment of retained placenta.

Ser. №	Common name	Scientific name	Local name	Re-spon-ses (№)	Re-sponses (%)	Parts used	Preparation Method
1		Vernonia amygdalina	Yieliga	30	18.5	Bark Roots	Pound mix it with water and drench animal.
2		Wissadula amphissima	Bieni	26	16.1	Bark Roots	Pound mix it with water and drench animal.

Ser. №	Common name	Scientific name	Local name	Re-spon-ses (№)	Re-sponses (%)	Parts used	Preparation Method
3		-	Zolima	12	7.4	Roots Leaves	Pound mix it with water and drench animal.
4	Bao-bab tree	Adansonia digitata	Tuwa	12	7.4	Leaves	Dry, pound, mix with water and drench animal.
5		Balanites aegyptiaca	Gabila	11	6.8	Leaves	Macerate in water then drench animal
6		Tamarindus indica	Puhuga	9	5.6	Leaves	Macerate in water then drench animal.
7		Lanea fruticosa	Mu-mual-inga	8	4.9	Roots	Pound, dry and mix it with water then drench the animal.
8	Okra	Abelmoschus esculentus	Maa Doogu	8	4.9	Stalk	Pound, mix it with water and drench animal.
9		-	Gbelugu tutugu	8	4.9	Roots	Pound mix it with water and drench animal.
10	Fig tree	Ficus thonningii	Gampriqa	7	4.3	Leaves	Feed animal with leaves.
11			Bungu saligu	6	3.2	Leaves	Dry, pound and macerate in water then drench animal
12		Entada Africana	Zunguli kukwa	5	3.1	Roots	Pound mix it with water and drench animal with extract.
13	False mushroom	-	Doo Mabiligu	6	3.7	Whole	Roast, grind and mix with water as a drench.

The local language spoken in the area is Dagbani

Table 7b: Materials of mineral and animal sources used by farmers in treating retained placenta.

Ser. №	Common name	Local name	Re-spon-ses (№)	Re-sponses (%)	Parts used	Preparation Method
Mineral Source						
1	Common salt	Yelim	7	4.3	-	-
2	Salt-peter	Kanwa	2	1.2		-
Animal Source						
1	Donkey placenta	Bunga Zoligu	5	3.1	Whole	-

The local language spoken in the area is Dagbani

Table 7a and b present the various ethno-veterinary treatments for retained placenta in the study area. In all, 16 alternatives were identified with only one of these as an animal source medicine and two from a mineral source.

3.5. Proportions of respondents who adopted the various types of treatments.

From Table 8, no farmer adopted orthodox treatment only. While 85 % adopted ethno-veterinary treatment only the

rest of the 15 % used both methods of treatment.

Table 8: Proportions of respondents adopting various types of treatment interventions

Type of treatment	No. of respondents	Proportion (%)	X ²	P-value
Ethno-veterinary only	85	85	49.00	0.00
Ethno-veterinary and Orthodox	15	15		0.00

4.0. DISCUSSION

4.1 Gender and Socio-Economic Distribution of Respondents

Ruminant production is dominated by males in the study area with males taking 94 % of the sub sector ($X^2 = 77.440$; $p < 0.01$). Inheritance is a major means of acquisition of ruminants for production and this is patrilineal in the study area. Feeding and management of ruminants is generally time and energy consuming. Females are the sole managers of household chores. They also engage in crop farming and processing as a result, they may not find enough time to tend to animals especially herding of cattle. These could have minimized female ownership and production of livestock. Majority (64%) of respondents were between the ages of 16 to 40 years while the least (9%) were 60 and above. Rajesh and Alenyorege (2008) reported that cattle were generally owned by households in northern Ghana and cared for daily by the younger members of the household.

Most (89 %) of the respondents were into both crop and ruminant production. Data from MoFA (2008) indicated that 73.8 % of farmers were engaged in both crop and livestock production in the Guinea savanna of Ghana within which the study area is located. Integration of crop and livestock production is on the increase in Ghana especially in the guinea savanna zone where crop production only is becoming more risky due to an unreliable weather. Under such circumstances, farmers are more compelled to care for each sub sector better for overall minimization of losses and increased productivity. Those engaged in both livestock production and trading were 5%. Some of the traders were females. Probably they were more economically empowered to buy the initial stock as well as hire or induce the males to care for their (the females') animals. This can be a potential commercial ruminant production group.

A high number (77 %) of farmers had many (10 +) years of experience in ruminant production; indicating a probable good level of experience in ruminant disease control and ethno-veterinary medicine.

A significantly large proportion (94%) of farmers were illiterate. This will negatively affect documentation of incidence of diseases (including retained placenta) and their treatment. The main way of knowledge transfer from older generation to the younger ones is by word of mouth as earlier noted by (Moreki et al., 2012).

4.2. Incidence of Retained Placenta in Ruminants

Forty six percent of the farms experienced retained placenta (Table 2). However, 8.24% of animals that gave birth within the study period of one year had retained placenta (Table 3). Compared to the mean prevalence of 14% for eleven (European and north American) countries (Arthur 1977) and 13.4% in Bangladesh (Islam et al 2012). There is therefore a low prevalence of retained placenta among

ruminants in the current study area. Retained placenta had a wide occurrence on farms in the study area this made it known by most farmers. Among the three ruminant species, cattle had a lower incidence of retained placenta than sheep and goats. Zahraddeen et al. (2010) also observed a similar trend. Probably, reproductive problems such as retained placenta may inherently occur more in some species of animals than others. The incidence of retained placenta observed in this study ranged between 7.06 and 11.01 %. This is within the ranges (4 0 – 18 %) recorded by Noakes et. al., (2001) and (4.0 - 16.1 %) observed by Mohamed and Amer (2009). To further ascertain that specie of ruminants had effects on the incidence of retained placenta; a paired t-test was employed in the current study and this was confirmed ($P < 0.01$). Alawa et al., (2002) had earlier observed that season of birth had effect on cattle but not sheep and goats ($P = 0.048$). On the other hand Zahraddeen et. al., (2010) found no significant difference between season of birth and species. According to Islam et al (2012), incidence of retained placenta in animals is affected by several factors including body condition score and nutritional deficiencies. Season of birth is likely to have effects on feed and water availability and for that matter on the nutritional status of animals and their body condition score, especially cattle that require more feed daily yet were not supplemented in the current study. Interestingly, Islam et al (2012), also observed that poor body condition gave the least (3.1 %) incidence of retained placenta among cattle followed by fair body condition (3.2 % incidence) and good body condition score (7.1 % incidence). Unfortunately, body condition scoring was not done in the current study. The observed situation in the current study where late dry season recorded higher incidence of retained placenta, may be due to some of the several other factors mentioned by these researchers; such as dietary deficiencies including carotene and vitamin A, poor balance of hormones and health status of cows .

4.3. Treatment of Retained Placenta by Farmers

A high proportion (85 %) of farmers used ethno-veterinary medicines as the sole treatment for retained placenta. Chah et. al., (2009), Naandam and Ididrisu, (2010). and Moreki et al., (2012); observed similar trends and explained that a high proportion of farmers use ethno-veterinary medicines because they were more available and cheaper than orthodox medicines. Rivire-Cinnamon, (2005) noted that the ability of rural farmers to pay for orthodox veterinary medicines even when they were readily available was low. In the view of Iqbal et al, (2005), rural farmers believe and trust the efficacy of ethno-veterinary medicine. In the current study, all farmers alluded to both scarcity and high cost of orthodox veterinary medicines. The remaining 15 % of the farmers used both ethno-veterinary and orthodox medicines. None used orthodox medicines only.

4.4. Types of Materials used in the Treatment of Retained Placenta

Ethno-veterinary medicines used by livestock farmers in the Savelugu-Nantong Municipality as presented in Table 7a are largely from plant sources. The most used plant was Vernonia amygdalina (18.5 % of respondents) followed by wissadula amphissima (16.1 %) and Adansonia digitata (7.4 %). The least used was Entada africana (5 %). Among the non plant sources salt was the most used material. However, the proportion (4.3 %) of farmers that used salt in the current study was much lower than that (19.05 %) reported by Moreki et al., (2012). According to the previous researchers, salt was used in combination with several

other materials, but in the current study it was mainly used alone. Quite a number of plants used in treating retained placenta in northern Ghana are slimy in nature (Yidana et al 2009) thus giving them lubricating properties. *Vernonia amygdalina*, *Adansonia digitata*, *Ficus thonningii*, *Abelmoschus esculentus* and *Bungu saligu* (not identified scientifically) are slimy plants used in treating retained placenta in the Savelugu-Nanton Municipality.

Verma and Singh (2009); concluded that medicinal herbs as potential sources of therapeutics aids have attained a significant role in the health system all over the world for both humans and animals not only in the diseased condition but also as potential material for maintaining proper health.

It has been known for some time now that primary uterine inertia is the immediate cause of retained placenta. (Arthur 1977). Any effective agent or means that activates uterine contractions is therefore useful in treating retained placenta. The use of oxytocin and prostaglandins that stimulate uterine contractions is therefore important in the treatment of retained placenta, (MERCK Animal Health. 1998). Homeopathic products that contain pulsatilla and other ergots enhance myometrium contraction in the uterous. Minerals such as calcium help activate uterine contractions. Good flow of blood after parturition enhances detachment of the placenta from the uterous. Common salt may also be involved in regulating body homeostasis and consequently affecting the flow of blood into the uterous. It is likely that these ethno-veterinary materials used by the farmers contain some of these active ingredients that induce uterine contractions and/or enhance blood flow to the endometrium. Salleh and Ahmad (2013) indicated that plants such as the *Ficus deltoidea* contain oxytocin at levels that enhanced uterine contractions in rats. In the current study donkey placenta was used to treat retained placenta.. It is commonly observed that donkeys have easy parturition. The placenta of animals is commonly known to contribute positively during parturition through its supply of hormones that enhance uterine contractions. After parturition, the placenta of the donkey may have reasonable levels of residual hormones such as oxytocin.

In the present study, the common plant parts used for treatment of retained placenta were: roots (42 %) and leaves (34 %). Finch et al. (2003) also reported a similar trend. On the other hand, Moreki et. al. (2012) observed that plant barks were the most used for treatment of retained placenta. Balaji and Chakravarthi (2010) added that parts and products of animals such as skins/hides, bones, milk, butter and even urine and dung are ingredients of Ethno-veterinary Medicine.

5.0 CONCLUSION AND RECOMMENDATIONS

Incidence of retained placenta was low in all the ruminant species. Farmers basically used ethno-veterinary medicine to treat retained placenta and the main ethno-veterinary medicines are of plant origin.

Similar studies should be carried out in livestock producing ecological zones in the country to document the prevalence of retained placenta and ethno-veterinary medicines used in the treatment of retained placenta in the country. By this, good ethno-veterinary medicine and practices will be preserved. Research should be conducted on the efficacy of the ethno-veterinary medicines widely used by rural farmers in the treatment of retained placenta.

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