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Prevalence and Risk Factors for Retention of Fetal Membranes in HF Dairy Cows

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Abstract: ***A retrospective study was carried out to analyze the risk factors associated with the prevalence of RFM. The results of the present study revealed that a total of 1260 calvings had occurred between January, 2006 and December, 2013. Out of these 1260 calvings, 112 calvings had followed by the cows retaining their fetal membranes Thus, the overall prevalence of RFM in HF cows was determined as 8.80 per cent. One hundred and twelve cows in which the calvings were followed by RFM were categorized to be between 2-4, 4-6, 6-8, and over 8 years of age it was observed that the prevalence of RFM progressively and significantly increased with the advancing age. The prevalence of RFM in cows aged 2-4, 4-6, 6-8, and over 8 years were recorded as 13.39, 19.64, 25.89 and 41.07 respectively. Reccurance of the same condition was also recorded in 9 (8.03%) cows subsequent to next calving. Further, 2 of these cows again had RFM even after their next calving. Subsequent history was not available as these cows were culled.***

Keywords: Retention of fetal membranes, prevalence, risk factors

1. Introduction

One of the most common postpartum disorders encountered in cows is retention of fetal membranes (RFM) (Wetherillt, 1965). There is a considerable difference of opinion among different authors regarding the time taken for the spontaneous expulsion of the fetal membranes and when to consider a cow to have their membranes retained. Roberts (1971) stated that the fetal membranes should be considered if it is not expelled during the first 8 hrs after parturition.

Fertility after parturition of dairy cows is considered as the principal economic factor of milk producing dairy units. The postpartum period has been recognized as a critical event in reproductive performance of dairy cattle (Le Blanc, 2008). Events, during and immediately after parturition is considered as the most important risk factor influencing the fertility of the dairy cattle post partum. Retention of fetal membranes has been recognized in several studies as a major factor for reduced fertility of dairy cattle postpartum. Markesfeld (1984) reported that practically all cases of retention of fetal membranes which are more than 24 hrs terminate in secondary metritis. In view of the high incidence of endometritis in animals with Retention of fetal membranes and its impact on subsequent reproductive performance, it becomes necessary to identify animals with endometritis at an early date after parturition so as to plan the treatment protocol and to prevent further deleterious effects on fertility (Sheldon *et al*., 2006). In the light of the aforesaid background, a need was felt to critically evaluate the outcome of retention of fetal membrane in dairy cattle.

2. Materials and Methods

2.1 Prevalence and risk factors for retention of fetal membrane

The prevalence and risk factors for retention of fetal membranes in dairy cattle was studied by analyzing the reproductive health records of Holstein Friesien (HF) cows maintained at dairy unit of Main Research Station (MRS) University of agricultural sciences Bangalore. The reproductive health records of individual cows for a period of 8 years (January 2006 to December 2013) maintained on these farms was analyzed and data generated were combined to assess the overall prevalence of RFM in HF cows and the risk factors associated with RFM.

The farm maintained data sheets which incorporated information regarding weight charts from birth to maturity, age and weight at puberty, age at fertile heat, number of conception and all data concerning accidents of gestation, parturition and post parturient complications and other relevant details including daily milk yield. The animals in the herd were being regularly screened for tuberculosis and brucellosis to eliminate the reactors and keep the herd free of infection, in addition to being periodically vaccinated against foot and mouth disease, hemorrhagic septicemia, black quarter and anthrax. All animals in the herd were under constant veterinary supervision, fed on balanced ration and under identical managerial practices. The ration consisted of green and dry fodder and concentrates with mineral mixture. The animals were fed according to standard recommendations to meet the requirements of growth, maintenance, pregnancy, and lactation.

2.1.1 Prevalence of retention of fetal membranes

The records of the individual animals which delivered from 2006 to 2013 were analyzed and the prevalence of RFM was calculated as follows

$$\text{Prevalence of RFM (\%)} = \frac{\text{Number of animals with RFM after delivery}}{\text{Number of animals which delivered between 2006 -2013}} \times 100$$

2.1.2 Risk factors for RFM

2.1.2.1 Age
The age of the animals exhibiting RFM were obtained from the records of animals with RFM and the basis of their age, animals with RFM grouped as between 2-4 years , 4-6 years, 6-8 years, >8 years and the data was analyzed to assess the influence of the age on the incidence of RFM.

2.1.2.2 Parity
On the basis of number of calvings, animals with RFM were categorized as either primiparous (animals exhibiting RFM after 1st calving) or pluriparous (animals exhibiting RFM after subsequent calvings) and the data was analyzed to assess the influence of parity as a risk factor for RFM.

2.1.2.3 Repeatability
The reproductive record of the individual animal exhibiting RFM were analyzed to study if an animal with an incidence of RFM after calving exhibited a tendency for a repeat incidence after the next or subsequent calving.

3. Results and Discussion

3.1 Prevalence of RFM

The analysis of the records revealed that a total of 1260 calvings had occurred between January, 2006 and December, 2013. Out of these 1260 calvings, 112 calvings had followed by the cows retaining their fetal membranes Thus, the overall prevalence of RFM in HF cows was determined as 8.80 per cent (Table 1). In the present study, the overall prevalence of RFM in HF dairy cows was determined as 8.80 per cent (Table.1) in a total of 1260 calvings.

The reported incidence of RFM is quite variable, with morbidity estimates ranging from 1.96 percent to 55 percent (Paisley *et al*., 1986; Noaks *et al*., 2001). However, except in circumstances such as brucella affected herd, dystocia or nutritional deficiency, the range is reported to be only 3-12 percent with an average of 7 per cent (Arthur, 1979). The most extensive survey on the incidence of RFM was by Erb *et al*. (1958) who reported an incidence of 10.3 per cent of RFM out of a total of 7387 calvings. There is, however, an inherent difficulty in comparing the incidence reported by different authors, primarily because of the differences in the criteria used for defining a case as RFM. While some authors consider failure of expulsion of the fetal membrane by 6 h postpartum as pathological (Youngquist and Threfall, 2007; Majeed *et al*., 2009) , others have waited for 12 h or even upto 24 hr before considering the case as abnormal (De Bois, 1961; Kay 1978; Arthur , 1979).

Table 1: Prevalence of Retained Fetal Membranes

No. of deliveries analyzed	No. of deliveries with RFM	Prevalence of RFM (%)
1260	112	8.80

3.1.2 Risk factors for RFM
The present study also analyzed the risk factors which were associated with the RFM in 112 cases of RFM recorded during the retrospective analysis. The risk factors analyzed were the influence of age, parity, dystocia and the repeatability of its occurrence.

3.1.2.1 Age
Table.2 presents the prevalence of RFM in dairy cows of different age groups. One hundred and twelve cows in which the calvings were followed by RFM were categorized to be between 2-4, 4-6, 6-8, and over 8 years of age it was observed that the prevalence of RFM progressively and significantly increased with the advancing age. The prevalence of RFM in cows aged 2-4, 4-6, 6-8, and over 8 years were recorded as 13.39, 19.64, 25.89 and 41.07 respectively.

Table 2: Influence of age on the prevalence of RFM in dairy cows (N=112)

Age group(years)	No of cows with RFM	Percentage incidence (%)
2-4	15	13.39 [a]
4-6	22	19.64[b]
6-8	29	25.89[c]
>8	46	41.07[d]
Total	112	100

*Superscripts in column: abcd
*Figures bearing common superscript in column are not significantly different with each other

3.1.2.2 Parity
The analysis of clinical records of 112 cows with RFM revealed that 87.5 per cent of cows with RFM were pluriparous (Table.3). Further, the prevalence of RFM showed a linear increase with advancing parity. the prevalence of RFM following 1st calving, 2nd calving, 3 rd calving, 4rth calving and in cows which had calved 5 or more times were recorded as 12.5 per cent, 14.28 per cent, 15.17 per cent, 24.10 per cent and 33.92 per cent respectively.

Table 3: Influence of parity on the prevalence of RFM in dairy cows (N=112)

Parity		No of cows with RFM	Percentage incidence (%)
Primiparous		14	12.5
Pluripara	2nd parity	16	14.28
	3rd parity	17	15.17
	4th parity	27	24.10
	5 or more parity	38	33.92
Total		**112**	**100**

3.2.2.3 Reccurance of RFM during subsequent calvings
In the present study, out of 112 cows which had experienced RFM , a reccurance of the same condition was recorded in 9 (8.03%) cows subsequent to next calving. (Table .5) Further, 2 of these cows again had RFM even after their next calving. Subsequent history was not available as these cows were culled.

Table 5: Repeatability of the occurance RFM during subsequent calvings in dairy cows (N=112)

No of cows with RFM	Number of cows with reccurance of RFM during subsequent calvings (%)	Percentage reccurance
112	9	8.03

The recurrence of retention of fetal membranes in dairy cows is 1.2 percent (Markusfeld, 1990). An increased recurrence risk ratio for retention of fetal membranes is seen in second, third and fourth calvings for Swedish Red and White Breed and in second and third calvings for Swedish Friesian Breed (Bendixen *et al*., 1995). Calavas *et al*., 1996 reported that the associations between diseases of a given lactation and diseases of the previous lactation in which placental retention among other diseases of postpartum is more reoccurred and highlighted, this confirms the main role of placental retention in associations among diseases.

Rowlands *et al*., 1986 studied the association between occurrences of pairs of diseases (hypocalcaemia, ketosis, hypomagnesaemia, dystocia, retained placenta, endometritis, mastitis and lameness) in 2109 lactations over 6 years in 894 British Friesian cows and reported that cows with retained placenta, dystocia or endometritis in one lactation showed no increased likelihood of having the same disease in the next lactation.

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