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Causes of delayed conception in cattle and buffalo in Tamil Nadu

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Abstract

The study was undertaken to analyse the causes of delayed conception in cattle and buffaloes in Tamil Nadu. Primary data were collected from two districts with the help of a structured interview schedule by personally interviewing the farmers during the year 2022-2023 and Garrett's Ranking Technique was used to draw conclusions regarding the farmers perception about delayed conception. In non-descript cows, the major reason for delayed conception was farmer's negligence, while in case of crossbred cows lactational anoestrus was the major cause. Peripartum disorders like dystocia, retained placenta, etc. and metabolic disorders like milk fever, ketosis, etc. were also considered to be major causes of delayed conception among crossbred cows. The major causes of delayed conception in buffaloes in the study area were seasonal anoestrus and silent heat. The major causes of delayed conception were malnutrition and farmer's negligence in non-descript and crossbred heifers, while silent heat as found to be a major cause of delayed conception among buffalo heifers. Improper heat detection, disease conditions and nutritional deficiency, poor insemination technique, poor genetic merit, and unavailability of timely veterinary and insemination services were perceived as the most important reasons for delayed conception.

Keywords: Delayed conception, farmer's perception, Garrett's ranking, Tamil Nadu

Introduction

Livestock rearing is major source of livelihood for over 70% of rural households in India, with a significant proportion being small and marginal farmers and landless labourers (BAHS, 2024) ^[5]. It is a vital source of balanced, nutrient rich protein diet in the form of milk, meat, eggs, and value-added goods. They are also directly related to the region's cultural and social values. Total milk production in the country is 239.3 million tonnes during 2023-24, which has increased by 3.78 per cent over the previous year. In 2023-24, the per-capita availability of milk reached 471 grams per day (BAHS, 2024) ^[5]. Nearly 31.94 per cent of the total milk production was contributed by indigenous buffaloes followed by 29.81 per cent by crossbred cattle, 12.87 per cent by non-descript buffaloes, 9.51 per cent by non-descript cattle, and only 10.73 per cent by indigenous cattle (BAHS, 2023) ^[4]. The average yield per animal per day for exotic/crossbred cattle is 8.12 Kg/day/animal and for indigenous/non-descript cow is 4.01 Kg/day/animal (BAHS, 2023) ^[4].

The dairy farming sector in India is characterized by a large number of animals and low productivity. In order to maintain a productive dairy farm, the cow should produce one calf every year. Probable reasons for low productivity are genetic factors like breed and non-genetic factors like inadequate nutrition, management, environment, poor health status and reproductive inefficiency of the animal. Dairy farmers focus mainly on animal selection, feeding, and management to improve productivity, rather than focusing

on reproductive efficiency of the animal so as to maintain a sustained production throughout the lactation and thus preventing significant economic losses. Late maturity in most of the native cattle breeds, ineffective heat detection, extended calving interval, failure of timely breeding are serious hurdles to the reproductive efficiency of the animal which results in delay in conception and thus affecting the profitability of the farm. An extension of the calving interval raises the yield in current longer lactation but it decreases the annual yield by delaying the next lactation (Olds *et al.*, 1979; Kafi *et al.*, 2006) ^[13, 9]. On average, an animal lacks one or two lactations due to delay in conception which leads to reduced milk production over the productive age. In order to maintain optimum economic benefits, it is generally accepted that the calving interval should be around one year that is, around 12-14 months in case of cattle and 13-15 months in buffaloes (Falvey and Chantalakhana, 1999) ^[7]. Therefore, the study on causes of delayed conception provides information for implementing targeted interventions for improvement of dairy farming practices.

Materials and Methods

The study on causes of delayed conception was conducted in Tamil Nadu during 2022-2023. Tamil Nadu has the highest exotic/crossbred cattle population (7.72 million) and ranks first in milk production (8.84 million tonnes) from exotic/crossbred cattle among all states of India (BAHS 2021) ^[3]. For the present study, two districts were selected

based on bovine population density index, one from the northern part of Tamil Nadu, namely, Tiruvannamalai with high bovine population density index and other from the southern part of the state, Thoothukudi with low bovine population density index. A multistage random sampling technique was adopted for the selection of taluks, villages and households. Two taluks were selected from each district, five villages were selected from each taluk and from each village 10 dairy farmers rearing at least 2 breedable bovines were selected randomly. Thus, a total of 200 households were covered in the survey from a total of 20 villages in 4 taluks from 2 districts of the state Tamil Nadu. Various causes of delayed conception were assessed for different breeds and categories (parous animal and heifer) of animals in the study area and the results were expressed in percentages.

Farmer's perception about delayed conception was analysed using Henry Garrett's Ranking Technique. A checklist on reasons for delayed conception was created based on farmer's perception and the respondents were asked to rank in order of significance with highest ranks given to the most significant reasons, followed by other progressively less significant ones.

To workout score, following formula was used

$$\text{Percentage position} = 100 (R_i - 0.5) / N_j$$

Where,

R_i = Rank given for i^{th} factor by j^{th} individual.

N_j = Number of factors ranked by j^{th} individual.

The scores of individual participants were added together and divided by the total number of participants for whom the scores were added. Based on mean score value, ranks were assigned to each cause.

Results and Discussion

Causes of delayed conception in parous animals

Table 1 represents the causes of delayed conception in non-descript cows. In non-descript cows, the major reason for delayed conception was farmers negligence (36.84%) which includes, improper heat detection, lack of timely AI and intentional omission of AI and malnutrition (32.90%). It was commonly observed that the owners of non-descript cows intentionally missed their estrus cycle without inseminating them because farmers believed that breeding during early lactation might lower the milk yields. The same was reported by Kumar *et al.* (2013) [12] but in buffaloes in Jabalpur. The other major causes of delayed conception in non-descript cows included lactational anoestrus, followed by peripartum disorders, midcycle estrus, repeat breeding and endometritis.

One of the major causes of delayed conception was lactational anoestrus (20.20%) in case of crossbred cows as mentioned in table 2. Peripartum disorders like dystocia, retained placenta, etc. and metabolic disorders like milk fever, ketosis, etc. were also considered to be major causes of delayed conception among crossbred cows (i.e., 19.54%) in the study area. The findings were similar to the report of Ranganath *et al.* (2022) [14], who reported that crossbred cows with higher production capacity were at higher risk of developing reproductive disorders in comparison to

indigenous cattle and buffaloes. The other causes included repeat breeding, followed by malnutrition, farmers negligence, mid-cycle estrus, endometritis and silent heat. Grohn and Rajala-Schultz (2000) [8]; Kim and Kang (2006) [11] reported similar findings that ovarian cysts, metritis and retained placenta were potential causes of delayed conception. The finding was similar to the previous reports of Ali (2011) [1], that failure to notice animals in estrus and incorrect estrus detection increased the calving to conception interval.

It was revealed from table 3 that the major causes of delayed conception in buffaloes were seasonal anoestrus (34.56%) and silent heat (26.18%). Similar finding was reported by Deka *et al.* (2018) [6]; Singh *et al.* (2000) [15] that silent heat was considered as a major obstacle in reproductive performance of buffaloes. Peripartum disorders (16.75%) was also common in buffaloes in the study area. The findings were supported by the reports of Khan *et al.* (2009) [10] that the buffaloes which suffered from dystocia, prolapse, abortion, endometritis had longer calving interval, service period, days to first service and required a greater number of services. Other causes of delayed conception were farmers negligence, followed by malnutrition, repeat breeding and endometritis. The findings were in accordance with the previous report that seasonality of calving, prolonged postpartum anoestrus (Kumar *et al.*, 2013; Barile, 2005) [12, 2], repeat breeding (Khan *et al.*, 2009) [10] affects the reproductive performance in buffaloes.

Causes of delayed conception in heifers

It was revealed from table 4 that the major causes of delayed conception were malnutrition (70%), followed by farmers negligence (30%) in non-descript heifers. The findings were similar to the results as reported earlier in a study that incorrect estrus detection, poor and underfeeding, leads to delayed conception in heifers (Ali, 2011) [1].

Figure 5 depicts the major causes of delayed conception in crossbred heifers. It included malnutrition (66.67%), followed by farmers negligence (29.63%) and congenital abnormalities. The similar findings were also reported by Ali, 2011 [1] in a study conducted in Pakistan.

Silent heat (52.5%) was found to be a major cause of delayed conception among buffalo heifers in the study area, followed by malnutrition (35%), farmers negligence (10%) and congenital abnormalities. Similar findings were reported by Singh *et al.* (2000) [15]; Deka *et al.* (2018) [6] that silent heat constitutes the single largest factor responsible for poor reproductive performance in buffaloes.

Farmers' perception about delayed conception

The data presented in table 3 reveals that majority of the farmers ranked improper heat detection with mean score (61.15) as the most important reason for delayed conception. Ali, 2011 [1] also reported that incorrect estrus detection leads to delayed conception. Disease conditions and nutritional deficiency was another major cause of delayed conception as reported by farmers with mean score (60.15). These results were supported by the reports of Khan *et al.* (2009) [10] that the buffaloes which suffered from dystocia, prolapse, abortion, endometritis had longer calving interval and required a greater number of services. Poor insemination technique was ranked 3rd by the farmers,

followed by poor genetic merit of the animal, unavailability of timely veterinary and insemination services. Other least significant reasons were improper feeding and managerial practices, lack of knowledge on animal management and negligence of farmers, according to dairy farmers in the study area.

Table 1: Causes of delayed conception in non-descript cows

| Causes | No. of animals affected | Percentage (%) |
|-----------------------|-------------------------|----------------|
| Farmers negligence | 28 | 36.84 |
| Malnutrition | 25 | 32.90 |
| Lactational anoestrus | 11 | 14.47 |
| Peripartum disorders | 4 | 5.26 |
| Repeat breeders | 3 | 3.95 |
| Endometritis | 2 | 2.63 |
| Mid cycle estrus | 3 | 3.95 |
| Total | 76 | 100 |

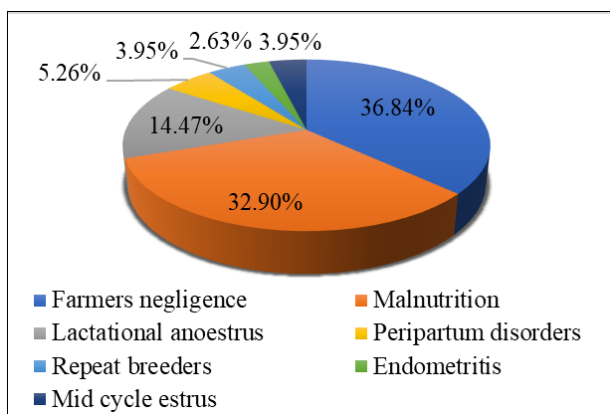


Fig 1: Causes of delayed conception in non-descript cows

Table 2: Causes of delayed conception in crossbred cows

| Causes | No. of animals affected | Percentage (%) |
|----------------------------------|-------------------------|----------------|
| Farmers negligence | 48 | 15.89 |
| Malnutrition | 52 | 17.22 |
| Lactational anoestrus | 61 | 20.20 |
| Peripartum & metabolic disorders | 59 | 19.54 |
| Repeat breeders | 57 | 18.87 |
| Endometritis | 9 | 2.98 |
| Mid cycle estrus | 11 | 3.64 |
| Silent heat | 5 | 1.66 |
| Total | 302 | 100 |

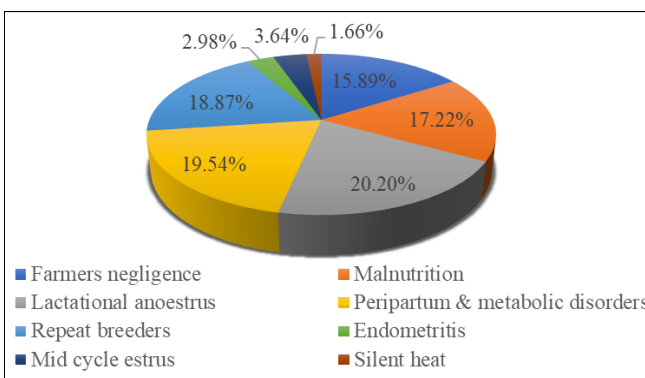


Fig 2: Causes of delayed conception in crossbred cows

Table 3: Causes of delayed conception in buffaloes

| Causes | No. of animals affected | Percentage (%) |
|----------------------|-------------------------|----------------|
| Farmers negligence | 14 | 7.33 |
| Malnutrition | 12 | 6.28 |
| Seasonal anoestrus | 66 | 34.56 |
| Peripartum disorders | 32 | 16.75 |
| Repeat breeders | 11 | 5.76 |
| Endometritis | 6 | 3.14 |
| Silent heat | 50 | 26.18 |
| Total | 191 | 100 |

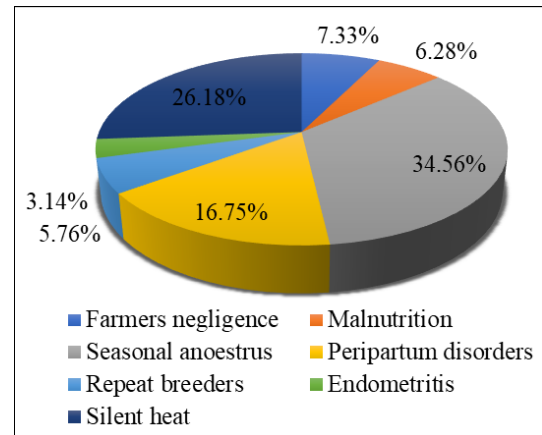


Fig 3: Causes of delayed conception in buffaloes

Table 4: Causes of delayed conception in non-descript heifers

| Causes | No. of animals affected | Percentage (%) |
|--------------------------|-------------------------|----------------|
| Farmers negligence | 3 | 30 |
| Malnutrition | 7 | 70 |
| Congenital abnormalities | 0 | 0 |
| Total | 10 | 100 |

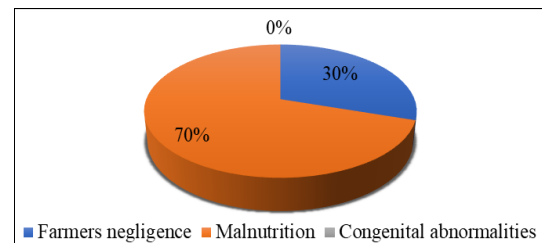


Fig 4: Causes of delayed conception in non-descript heifers

Table 5: Causes of delayed conception in crossbred heifers

| Causes | No. of animals affected | Percentage (%) |
|--------------------------|-------------------------|----------------|
| Farmers negligence | 8 | 29.63 |
| Malnutrition | 18 | 66.67 |
| Congenital abnormalities | 1 | 3.70 |
| Total | 27 | 100 |

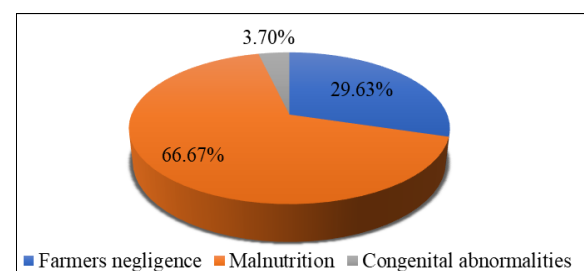


Fig 5: Causes of delayed conception in crossbred heifers

Table 6: Causes of delayed conception in buffalo heifers

| Causes | No. of animals affected | Percentage (%) |
|--------------------------|-------------------------|----------------|
| Farmers negligence | 4 | 10 |
| Malnutrition | 14 | 35 |
| Congenital abnormalities | 1 | 2.5 |
| Silent heat | 21 | 52.5 |
| Total | 40 | 100 |

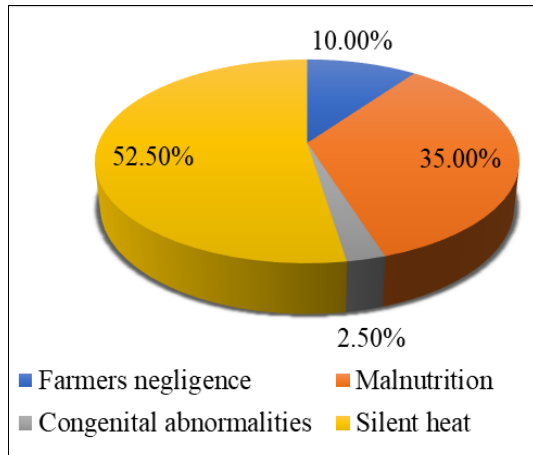


Fig 6: Causes of delayed conception in buffalo heifers

Table 7: Farmer’s perception about delayed conception

| S. No. | Particulars | Mean score | Rank |
|--------|---|------------|------|
| 1 | Improper heat detection | 61.15 | I |
| 2 | Disease conditions and nutritional deficiency | 60.15 | II |
| 3 | Poor insemination techniques | 51.23 | III |
| 4 | Poor genetic merit of the animal | 50.06 | IV |
| 5 | Unavailability of timely veterinary and insemination services | 49.39 | V |
| 6 | Improper feeding and managerial practices | 44.02 | VI |
| 7 | Lack of knowledge on animal management | 42.16 | VII |
| 8 | Negligence of farmers | 41.83 | VIII |

Conclusion

The major reason for delayed conception in non-descript cows was farmer's negligence, while in case of crossbred cows lactational anoestrus was the major cause. As farmer’s negligence and malnutrition were considered to be major causes of delayed conception, farmers must be educated on the importance of balanced ration and mineral supplementation in order to improve productivity and fertility of dairy animals. Peripartum disorders like dystocia, retained placenta, etc. as well as metabolic disorders like milk fever, ketosis, etc. were also considered to be major causes of delayed conception among crossbred cows. The most common reasons of delayed conception in buffaloes in the study area were seasonal anoestrus and silent heat. The major causes of delayed conception were malnutrition and farmer’s negligence in non-descript and crossbred heifers, while silent heat as found to be a major cause of delayed conception among buffalo heifers. Improper heat detection, disease conditions and nutritional deficiency, poor insemination technique and poor genetic merit of the animal were perceived as the most important reason for delayed conception. Reproductive performance of the animal can be enhanced by improving management systems and utilising controlled breeding techniques. Furthermore, farmers should

be educated to detect heat and inseminate the animal at appropriate time.

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