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Incidence of delayed puberty in buffalo heifers in and around Jabalpur

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Abstract

Age at puberty has an influence on the lifetime productivity of the animal. The heifer which has attained puberty earlier will also have its first conception earlier and a greater number of calving can be obtained during the lifetime of the animal. The incidence of delayed puberty was studied in 117 buffalo heifers in and around Jabalpur. The age, approximate body weight, the first sign of oestrus and body condition score was recorded during the study. The suspected delayed pubertal heifers were examined per rectally to ascertain the ovarian function *i.e.* the presence of follicles or corpus luteum. The buffalo heifers with smooth ovaries (without follicle or corpus luteum) were considered as delayed pubertal. The overall incidence of delayed puberty was found to be 60.68 percent. The age-wise incidence of delayed puberty was recorded 76.00%, 45.00% and 55.55% in 2-3, 3-4 and more than 4 years of age, respectively which was higher (53.52%) in poor BCS (below 2) than above 2 (46.47%).

Keywords: Buffalo heifers, incidence, delayed puberty, age

1. Introduction

Buffalo is a premier milk-producing animal known as a "black diamond" due to its prominent place among dairy animals. However, buffalo also has poor reproductive efficiency, primarily caused by delayed pubertal anoestrus or sub-oestrus which is a major cause of economic losses in terms of milk yield, net calf crop and additional rearing expenses (Purkayastha *et al.*, 2015) [8]. Delayed puberty increases the age at first calving and thus lowers the overall number of lactations and offspring. Puberty is an age when a female reaches a developmental stage that supports normal ovarian cyclicity and the capacity to become pregnant (Chaudhari *et al.*, 2012) [2]. The gonadotropic hormones *viz.* luteinizing hormone (LH) and follicle-stimulating hormone (FSH), which are stimulated by the hypothalamic neurohormone gonadotropin-releasing hormone (GnRH), help dairy animals to reach puberty by promoting ovarian follicle maturation and determining the dehiscence of mature follicles as well as ovulation of pre-ovulatory follicles (Terzano *et al.*, 2012) [10]. First ovulation and plasma progesterone levels above 1 ng/ml are indicators of puberty in heifers (Gupta *et al.*, 2016) [3]. There are several factors *viz.* genotype, nutrition, management, the role of various hormones, and climate affect puberty. Poor feeding and management in the field could be a major factor in delayed puberty (Warriach *et al.*, 2015) [12]. The present study was conducted to find out the incidence of delayed puberty in buffalo heifers in and around Jabalpur.

2. Materials and Methods

The work was carried out at Livestock farm, Adhartal, farmers door step situated in Jamtara and Barela villages, Anmol dairy, Janta dairy etc. in and around Jabalpur. The analytical work was conducted in the Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, NDVSU, Jabalpur (M.P.). The incidence of delayed puberty was studied in 117 buffalo heifers in villages and different dairy farms of Jabalpur, Madhya Pradesh. The detailed information of buffalo heifers provided by the owners and findings of gynaecological examination were recorded during the study. The age, body weight, first sign of oestrus and body condition score were recorded. The suspected delayed pubertal heifers were examined per rectally for ascertaining the ovarian function, *i.e.*, the

presence of follicles or corpus luteum. The heifers with a history of non-exhibition of oestrus since birth and smooth ovaries (without follicles or corpus luteum) in two consecutive gynaecological examinations at 10 days apart were considered as delayed pubertal. The incidence of delayed puberty was studied age-wise and data were also

correlated with body condition score (BCS).

3. Results and Discussion

The incidence of delayed puberty in different age groups was recorded which was found 76.00% in 2-3 years, 45.00% in 3-4 years and 55.55% in greater than 4 years of age (Table 01).

Table 1: Age-wise incidence of delayed puberty in buffalo heifers

Age of delayed puberty (Years)	Animals surveyed (n)	Delayed pubertal animals (n)	Delayed puberty (%)
2-3	50	38	76.00
3-4	40	18	45.00
>4	27	15	55.55
Total	117	71	60.68

Almost similar incidence (56.00%) of anoestrus in buffalo heifers was reported by Baitule *et al.* (2016) [1], (12.37 to 64.66%) of anoestrus in heifers (Luktuke and Sharma, 1978; Naidu and Rao, 1981) [4, 6]. However, a lower incidence (28.9 to 35.53%) of anoestrus in buffalo heifers was reported by Srinivas *et al.* (2007) [9] in Andhra Pradesh. In the present study, a higher incidence of delayed puberty had been

observed in Murrah buffalo heifers of age group 2-3 years which may be due to variation in geographical and climatic conditions as Murrah is native to the Haryana and adjoining area of the country. The incidence of delayed puberty in the organized and unorganized sectors was 52.85 percent and 72.34 percent, respectively (Table 02).

Table 2: Incidence of delayed puberty in organized and unorganized sector in buffalo heifers

Sector	Area/Farm	Incidence (%)		
		Area wise	Sector-wise	Overall
Organized (70)	LSF, Adhartal (41)	51.21 (21)	52.85 (37)	60.68 (71)
	Anmol Dairy (7)	42.85 (3)		
	Janta Dairy (22)	59.09 (13)		
Unorganized (47)	Jamtara (26)	76.92 (20)	72.34 (34)	
	Barela (21)	66.66 (14)		

Figures in the parenthesis are the no. of animals

The higher incidence in the unorganized sector as compared to the organized sector might be due to poor managerial practices, especially nutrition management. The data on the age-wise analysis of delayed puberty was also classified based

on the body condition score of heifers (Table 03) and the result revealed a higher incidence of delayed puberty (53.52%) in heifers with a body condition score below 2 as compared to BCS more than 2 (46.47%).

Table 3: Incidence of delayed puberty in buffalo heifers based on body condition score (BCS)

Body condition score (BCS)	Delayed pubertal animals (n=71)	Delayed puberty (%)
Less than 2	38	53.52
2-4	33	46.47

Higher incidence (68.92%) with a body condition score below 2 and lower incidence (31.08%) with a body condition score above 2, of delayed puberty in cattle heifers in and around Jabalpur was reported by Patel *et al.* (2020) [7]. No literature could be found to compare the incidence of delayed puberty in buffalo heifers in relation to body condition score in Madhya Pradesh. However, the present finding supports the reports of Maina *et al.* (2008) [5] who concluded that the incidence of anoestrus and abnormal ovarian activity is negatively correlated to body condition score. Vacek *et al.* (2015) [11] reported that the heifers with good body condition scores have more average daily gain and early age at first insemination.

4. Conclusion

It can be concluded that delayed puberty is one of the causes of anoestrus and thus prolonged calving interval. Further, a higher incidence of delayed puberty persists in buffalo heifers especially with poor body condition scores which may be due to malnutrition.

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