

ANALYSIS OF INCIDENCE OF INFERTILITY IN CATTLE OF HOWRAH DISTRICT IN WEST BENGAL, INDIA

Asit Kumar Maji^{1*} and Arindam Samanta²

ABSTRACT: A total of 823 numbers of cattle (342 Crossbred Jersey and 481 Non-descript) were presented for gynaeco-clinical examination after considering specific history of cattle at 26 fertility camps during January 2006 to December 2008 in flood prone rural areas of Howrah district of West Bengal, India. Statistical analysis of the data pointed out that among overall infertility problem incidence of anestrus and repeat breeding were 67.68 % and 32.32 % respectively. Incidence of anestrus was higher in Non-descript cattle (53.86 %) than that Crossbred Jersey cattle (46.14 %) and incidence of repeat breeding was also significantly ($P < 0.001$) higher in non-descript cattle (68.05%) than that of crossbred (31.95%) animal. Irrespective of breeds the incidence of true anestrus, subestrus, anestrus due to pyometra with persistent corpus leuteum and infantile genitalia with other congenital disorders were 81.51 %, 9.34%, 1.44% and 7.71% respectively. It also revealed that incidence of repeat breeding due to anovulatory estrus, follicular cyst and uterine infection were 43.61%, 46.24%, and 10.15% respectively which were also significantly higher ($P < 0.001$) in Non-descript cattle in comparison with Crossbred Jersey (72.4 vs. 27.0 %, 59.34 vs. 40.65% and 88.89 vs. 11.11% respectively for ND vs. CBJ).

KEY WORDS: Infertility, Cattle, Incidence, Anoestrus, Repeat Breeding.

INTRODUCTION

Cattle become infertile when they are neither fertile nor completely sterile and are delayed or irregular for production of annual live calf. Although causes of infertility are many and may be complex, anestrus and repeat breeding have been identified as the main factors responsible for this malady (Parkinson 2001). It was reported that 10 to 30 % of lactation yield may be affected by infertility and reproductive disorders and 3 to 6 % of the herd is culled

every year in developed countries for these reasons (Erb and Martin 1980). Although authentic information regarding the economic losses of infertility under Indian condition is not readily available, the extent of the problem is likely to be greater in tropical countries. As per the reports of ICAR (2002) 18 – 40 % cattle are culled every year in India due to infertility or sterility.

Every missed heat leads to a loss of Rs. 500/- in case of lactating cows and the loss

¹ Ex- Block Livestock Development Officer, Amta-I, Howrah, West Bengal, India.

² Ex- Veterinary Officer, Amta-II, Howrah – 711401, West Bengal, India.

*Corresponding author.

is almost double in case of heifers of the poor farmers under Indian condition (Kutty 2000). Anestrus, repeat breeding, cystic ovarian degeneration, uterine and tubal disorders have been observed as the most common gynaecological problems in cattle and buffaloes in India as per reports from different states (Agarwal *et al.* 2005). This report may be first of the above type from the state of West Bengal, India.

The present field study was undertaken to analyze the occurrence of anoestrus and repeat breeding among the mostly stall fed Crossbred Jersey (CBJ) and semi-intensively reared local Non-descript (ND) cattle in flood prone areas in Amta-I, Amta-II and Udaynarapur blocks of Howrah district of West Bengal in lower gangetic Damoder riverine plain.

MATERIALS AND METHODS

A total of 823 numbers of cattle (342 Crossbred Jersey and 481 Non-descript) with infertility problems were subjected to per-rectal gynecological examination after considering specific history of the cattle at 26 numbers of fertility camps organized at randomly selected villages during January 2006 to December 2008 under supervision of Paschim Banga Go Sampad Bikash Sanstha (PBGSBS). The various conditions responsible for infertility were primarily classified as anoestrus and repeat breeding (Enkhia *et al.* 1983). Anoestrus cases were further sub-divided as: a) true anoestrus – cattle with smooth and nonfunctional ovaries, b) sub-estrus or silent estrus – cattle with ovaries having Corpus Leutium (C.L) examined clinically by per rectal examination), c) anoestrus due to infantile genitalia and other congenital disorders like ovarian hypoplasia or rudimentary ovaries and unilateral agenesis of

uterine horn etc. and d) anoestrus due to pyometra with persistent Corpus Leutium. Pregnancy as a cause of anoestrus was left out of the study. Similarly repeat breeding cases were also sub-divided as: a) Repeat breeding due to anovulatory estrus without ovarian cyst, b) Repeat breeding with ovarian cyst and c) Repeat breeding due to uterine infection (Roberts 1986) respectively. Differences between heifer and cow and between types of anoestrus/repeat breeding conditions within breed were determined using Pearson's chi-square test, whereas Fisher's exact test along with Pearson's chi-square test was used to test relationship between type of anoestrus/repeat breeding and age as 20% of the cells had expected frequency of less than 5. Statistical analyses were performed as per Snedacor and Cochran (1994) and by using SAS software version 8.1 (SAS institute, Cary, North Carolina).

RESULTS AND DISCUSSIONS

Incidence of anoestrus and repeat breeding with their different forms are presented in Table 1.

Out of 823 infertile cattle examined, incidence of anoestrus and repeat breeding was found in 557 number of cattle (67.68%) and 266 number of cattle (32.32%) respectively where the former is slightly higher than that (> 50%) found by Kodagali (1974), Barr and Hushim (1968), Chauhan and Singh (1979), Kumar and Kumar (1993). The incidence rate of repeat breeding was also higher in present study than that of Kaikani *et al.* 1983 (21.9% in Holstein and Gir crosses) and Singh *et al.* 1983 (7.4 – 18.6 % in Holstein, Danish and Sahiwal crosses), but similar with the findings of Pandit *et al.* (1982) *i.e.* 10-35% in India.

Table1: Analysis of incidence of anestrus and repeat breeding according to gynaecological examination.

	Non-descript					Crossbred Jersey					Total (%)
	Heifer	Cow	Total (%)	χ^2 value	P-value	Heifer	Cow	Total (%)	χ^2 value	P-value	
Anestrus*											
a. True anestrus	140	111	251 (55.2)	3.35	0.067	165	38	203 (44.8)	79.5	<0.011	454 (81.51)
b. Sub/silent estrus	14	8	22 (42.3)	1.64	0.20	22	8	30 (57.7)	6.53	0.011	51 (9.34)
c. Infantile genitalia	11	8	19 (44.2)	0.47	0.49	16	8	24 (55.8)	2.67	0.10	43 (7.71)
d. Pyometra and PCL	5	3	8 (100.0)	0.5	0.48	0	0	0 (00.0)	-	-	16 (1.44)
Total (%)	170 (56.67)	130 (43.33)	300 (53.86)	5.33	0.021	203 (79.0)	54 (21.0)	257 (46.14)	86.4	<0.001	557 (67.68)
χ^2 value	299.2	253.3	552.1			348.0	62.4				
P-value	<0.001	<0.001	<0.001			<0.001	<0.001				
Repeat breeding**											
a. Anovulatory estrus without ovarian cyst	22	62	84 (72.4)	19.0	<0.001	24	8	32 (27.6)	8.0	0.005	116 (43.61)
b. With ovarian cyst	16	57	73 (59.3)	23.0	<0.001	16	34	50 (40.7)	6.48	0.011	123 (46.24)
c. Uterine infaction	5	19	24 (88.9)	8.17	0.004	3	0	3 (11.1)	3	0.083	27 (10.15)
Total (%)	43 (23.72)	138 (76.28)	181 (68.05)	49.9	<0.001	43 (50.6)	42 (49.4)	85 (31.95)	0.012	0.91	266 (32.32)
χ^2 value	10.4	14.04	33.8			15.7	45.1	39.7			
P-value	0.006	<0.001	<0.001			<0.001	<0.001	<0.001			

*The relationship between age and anoestrus type within non-descript $\chi^2 = 0.638$, and P- value = 0.88; Fisher's exact test P- value = 0.89) and between age and anoestrus type within crossbred Jersey $\chi^2 = 3.43$, and P- value = 0.16; Fisher's exact test P- value = 0.18).

**The relationship between age and repeat breeding type within non-descript $\chi^2 = 0.52$ and P- value = 0.77; Fisher's exact test P- value = 0.82) and between age and anoestrus type within crossbred Jersey $\chi^2 = 17.5$, and P- value = <0.001; Fisher's exact test P- value = <0.001).

Incidence of anestrus was 53.86% and 46.14% in Non-descript and Crossbred Jersey cattle where as the incidence of repeat breeding were 68.05% and 31.95% respectively. Incidence of repeat breeding was significantly ($P < 0.001$) higher in Non-descript cattle than CBJ and agreed with the findings (anestrus vs. repeat breeding: 25 – 67% vs. 2 – 20%) of Singh *et al.*(2003) and Pandit (2004).

Classification of 557 cases of anestrus cases revealed that occurrence of true anestrus, sub-estrus or silent heat, anestrus due to infantile genitalia and that due to pyometra with persistent C.L or luteal cyst were 81.51%, 9.34%, 7.71% and 1.44% respectively. However, it was found that incidence of anestrus was significantly ($P < 0.001$) higher among CBJ heifers (79%) than CBJ cows (21%). It was also found that true anestrus (81.51%) was the major factor responsible for the condition among cattle probably for malnutrition and heavy parasitic infestation in the study area as reported by Samanta and Santra (2007) which was flooded every year. Agarwal *et al.*(2005) also reported that the incidence of true anestrus in cattle and buffalo varied widely depending upon the level of feeding and management.

Analysis of data of 266 number of repeater revealed that the occurrence of repeat breeding due to anovulatory estrus without ovarian cyst, ovarian cyst and uterine infection were 43.61%, 46.24%, and 10.15% respectively which were significantly higher ($P < 0.001$) in Non-descript cattle in comparison with CBJ (72.4 vs. 27.0 %, 59.34 vs. 40.65% and 88.89 vs. 11.11% respectively for ND vs. CBJ). It was also found that occurrence of repeat breeding was also significantly higher among ND cows than ND heifers probably due to lactation stress and low

plane of nutrition. Incidence of uterine infection was higher in ND cattle as the majority of these animals were under natural service.

To conclude, true anestrus was the major problem among all infertile cattle in the study area and this study can be extended on hormonal assay, macro and micro mineral estimation in blood as well as soil etc. to find out the pin point cause of infertility in this region to adopt economic managemental practices.

ACKNOWLEDGEMENT

The authors are thankful to the Chief Executive Officer, Paschim Banga Go Sampad Bikash Sanstha and Director of Animal Husbandry and Veterinary Services, West Bengal for providing necessary facilities to conduct the study. The workers express their gratitude to Dr. Swarup Mandal, Dr. Subhas Ch. Patra and other colleagues for their co-operation during the study. The authors are grateful to Dr. Amlan Patra, Assistant Professor, Deptt. of Animal Nutrition, WBUAFS, Kolkata, for statistical calculation.

REFERENCES

- Agarwal SK, Singh SK and Rajkumar R.(2005). Reproductive disorders and their management in cattle and buffaloes : A review. *Indian J. Anim. Sci.* 75(7): 858-873.
- Barr AM and Hushim EL.(1968). Incidence of ovarian hypofunction in buffaloes. *Zuchtlya* 9(3): 206.
- Chauhan FS and Singh M.(1979). Incidence of anestrus in buffaloes. *Indian. Vet. J.* 56 (7): 587-589.

- Enkhia KL, Kohli IS and Bhatia JS.(1983).** Electrolytes of cervico-vaginal mucus and blood during oestrus in normal and repeat-breeding Rathi cows. *Indian J. Anim. Sci.* 53: 66-68.
- Erb HN and Martin SW.(1980).** Interrelationships between production and reproduction diseases in Holstein cows. *J. Dairy Sci.* Vol. 63: 1911-1917.
- ICAR.(2002).** Handbook of Animal Husbandry. 3rd revised edn. ICAR. New Delhi. 692.
- Kaikini AS, Chikalikar GK and Dindorkar CV.(1983).** Reproductive disorders in Holstein-Friesian x Gir F₁ crossbred cows. *Indian J. Ani. Sci.* 53: 556-558.
- Kodagali SB.(1974).** Report on study of infertility in cattle 1965-69. *Vet. Bullet.* 45: 1285 (Animal Breeding Abstracts 43: 3369).
- Kumar S and Kumar H.(1993).** Clinical analysis of anestrus in rural bovines. *Indian J. Dairy Sci.* 46(2): 80-84.
- Kutty CI.(2000).** How economic is milk production in Kerala situation. *J. Indian Vet. Asso.* 1: 11-14.
- Pandit RK, Gupta SK and Raman SRP.(1982).** Incidence of various reproductive disorders in cattle and buffaloes. *Livestock Advisor.* 7(2): 51 -53.
- Pandit RK.(2004).** Incidence of different kinds of reproductive disorders in livestock. *Indian J. Anim. Repro.* 25:35-36.
- Parkinson TJ.(2001).** Infertility in cow. In: Arther's Veterinary Reproduction and obstetrics. Noakes DE, Parkinson TJ and England GCW, 8th edn. W.B. Saunders company. Philadelphia. p.415-556.
- Roberts SJ.(1986).** Veterinary obstetrics and genital diseases. 3rd edn. Indian reprint. CBS Publishers and distributors. p. 436.
- Samanta A and Santra S.(2007).** Prevalence of GI helminthes in hot and humid zone of West Bengal. *J. Vet. Parasitol.* 23 (1): 73 -76.
- Singh A, Taylor CM and Singh BN.(1983).** Factors affecting calving interval in Malvi cattle. *Livestock Advis.* 8: 9-11.
- Singh R, Shankar H and Arora RM.(2003).** A retrospective study on periparturient disorders in crossbred cows at organized farms in UP. *Indian J. Anim. Repro.* 24: 165-67.
- Snedacor GW and Cochran WG.(1994).** Statistical Methods. Oxford and IBH Publishing Co. 6th Indian edn. New Delhi.

*Cite the article as: Maji AK and Samanta A.(2013). Analysis of incidence of infertility in cattle of Howrah district in West Bengal, India. *Explor. Anim. Med. Res.* 3(2): 154-158.