Categorization of anestrus in bovines belonging to marginal dairy farmers of Malwa region of Punjab

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ABSTRACT

A field-oriented study was conducted to have an insight of various etiological factors of anestrus and their occurrence in cattle and buffalo of Malwa region of Punjab. A total of 116 animals (Cattle-58; Buffalo-58) with the history of anestrus were subjected to gynaecological examination and diagnosis was made on the basis of history, clinical signs, rectal findings, body condition scores (BCS) and plasma progesterone profiles. Repeated clinico-gynaecological examinations were made and plasma samples taken at 3-5 days interval for 21 days. Out of the total 58 cows presented, 37 (63.79%) were in true anestrus, 6 (10.34%) in subestrus, 1 (1.72%) had persistent corpus luteum and 14 (24.13%) were found pregnant, whereas the number of buffaloes in the respective categories were 12 (20.69%), 15 (25.86%), 2 (3.45%) and 29 (50.00%). The higher number of buffaloes diagnosed to have subestrus reflects the inadequacy of farming community to detect estrus properly as they consider the vocalization as sole criteria of estrus. Also the percentage of animals (both cattle and buffalo) diagnosed as pregnant (although presented to be of anestrus) point towards the poor managerial skills of the farmers. Most of cows [20/37 (54.05%)] and buffaloes [10/12 (83.33%)] in true anestrus were postpubertal heifers having a BCS ranging from 2.0-2.5.

Key words: Anestrus, bovines, progesterone

Anestrus in dairy animals adversely affects the economics of dairy industry through the cost of rearing, increased dry period, cost of replacement heifer and cost of treatment and professional services. Anestrus or absence of visible heat signs can be as a result of complete ovarian inactivity (true anestrus) or with corpus luteum (pregnancy or persistent corpus luteum) and/or follicle in the ovary (silent estrus). Categorization of anestrus according to the reproductive stage of an animal aides to understand the managerial skill of the farmers and to point out the corrective measures to be taken thereof. It is presumed that an early attainment of puberty in heifers and postpartum resumption of cyclicity is limited by deficiency in hypothalamus and pituitary hormones, which are responsible for initiation of ovarian activity, the predisposing cause of which may be nutritional, genetic or lactational stress. In the present study, a total of 116 animals (Cattle-58 and Buffalo-58) were included in order to have an insight of various etiological factors of anestrus and their occurrence in cattle and buffaloes of Malwa region of Punjab.

MATERIALS AND METHODS

A total of 116 animals (58-cattle and 58-buffaloes) belonging to marginal dairy farmers were selected from different villages around Ludhiana on the basis of them being acyclic (no exhibition of behavioural signs of estrus as observed by owner) for at least 60 days prior to the start of investigation. Prior to the commencement of the study animals were subjected to deworming and spraying (Butox) for the control of endoparasites and ectoparasites, respectively. Animals were fed with locally available conventional feed. The body condition scores of the animals were made as described by Edmondson *et al.* (1989).

Examination of animals : The genitalia of all the animals were examined for any discharge, abnormality and ovarian

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structures (corpus luteum and follicles). The examination were performed at 3-5 days interval during 21 days of study. Blood samples were also collected on each day of examination for estimation of plasma progesterone concentrations.

Collection of blood samples : Blood samples were harvested via jugular venipuncture from all the cows on each occasion of rectal examination and were placed immediately in ice. Blood plasma was separated by centrifugation at 3000 rpm for 15 minutes and stored at -20°C until concentrations of progesterone were determined by radioimmunoassay (RIA).

Radioimmunoassay: Plasma progesterone concentrations were estimated by radioimmunoassay precoated tube method with the help of RIA kits supplied by FAO/IAEA, Agricultural Laboratory at Seibersdorf. The sensitivity of the assay was 0.032 ng/ml. The mean intra and inter assay coefficient of variation were 6.71% and 10.08% respectively.

Categorization of anestrus : Animals were said to be in true anestrus if they did not exhibit behavioural estrus, no ovarian structures were palpable and the plasma progesterone concentration did not rise > 0.5 ng/ml during the study. If the animals did not exhibit behavioural estrus but had either a palpable CL or follicle and the progesterone value rose >1.0 ng/ml during the study, they were said to be in subestrus. Animals were said to have anestrus due to persistent CL if, they did not exhibit behavioural estrus but had palpable CL and progesterone values >1.0 ng/ml through out the study. Animals if found pregnant, no further examinations and blood sampling were performed.

Statistical analysis : The mean of progesterone values on different days of examination was calculated as per standard methods (Gupta, 1997).

RESULTS AND DISCUSSION

Out of the total 116 animals studied, the categorization into true anestrus, subestrus, anestrus due to persistent CL and anestrus due to pregnancy are given in Table 1.

On the basis of rectal palpation and progesterone profiles 37 cows were categorized to be in true anoestrum, out of which 20 (54.1%) were heifers between 2.5-5 years of age with BCS ranging from 2.0-2.5 and the remaining 17 (45.9%) were pleuriparous cows (1st-5th parity) with BCS 3.0-3.5 and date of last calving

Table 1. Classification of anestrus in cattle and buffalo on the basis of rectal palpation and progesterone profiles

Category	Cattle (n = 58)	Buffalo (n = 58)
True anestrus	37 (63.8%)	12 (20.7%)
Subestrus	6 (10.3%)	15 (25.9%)
Anestrus due to persistent CL	1 (1.7%)	2 (3.4%)
Anestrus due to pregnancy	14 (24.2%)	29 (50.0%)

5m-2years. All the cows in subestrum (n=6) were postpartum cows, with date of last calving 8 m -2 years and BCS 3-3.5. In a study (Kutty and Ramachandran, 2003) on 178 true anestrum cases, 123 (69%) were heifers and 55 (31%) were in pleuriparous cows (postpartum). Luktuke and Sharma (1978) reported the incidence of true anestrum in 47 heifers and 86 cows as 36.16% and 47 % respectively and, that of subestrum as 28.5% in heifers and 30.2% in cows. It is known that the first postpartum estrous cycle are mostly silent heats (King *et al.* 1976), the incidence of which varies from 23.7-27.3% in cattle (Labhsetwar *et al.* 1963). This silent heat may also be due to the partially regressed CL pregnancy in postpartum cows, leading to a state of subestrus till the CL regresses (Singal *et al.* 1980)

Amongst the true anestrus buffaloes (n=12), 10 (83.3%) were buffalo heifers (BCS 2.0-2.5) and 2 (16.7%) were buffaloes (BCS 3.0-3.5). Out of the 15 subestrus buffaloes, 12 (80.0%) were postpartum buffaloes and 3 (20.0%) were buffalo heifers. Analysis of 20,000 records of subfertile buffaloes revealed incidence of 56.4% ovarian quiescence (Rao and Sreemannarayana, 1982). High incidence of postpartum anestrus due to subestrus (60.0%) and true anestrus (30.5%) has been reported in buffaloes (Chauhan and Singh, 1979). Incidence of postpartum anestrus in buffloes due to subestrus, true anestrus, persistent CL, follicular cyst and luteal cyst have been reported as 73.0%, 8.9%, 7.8%, 8.5% and 3.4%, respectively (Shah *et al.* 1990). In buffaloes the silent heat incidence ranges 10-11% in organized farms and 30-60% in villages (Bhattacharya *et al.* 1974). It has been suggested that subestrus may also be due to lack of sensitization to progesterone in first cycle of heifers and subsequently as CL forms, overt signs might be shown.

Table 2. Plasma progesterone concentrations (ng/ml) in different categories of anestrus animals on different days of examination

Categories	Progesterone concentrations on different days of examination				
	Day 0	Day 5	Day 10	Day 15	Day 20
Cattle (N=58)					
True anestrus (N = 37)	0.113±0.021	0.172±0.045	0.159±0.044	0.178± 0.036	0.196±0.058
Persistent CL (N=1)	4.980	4.284	4.616	4.020	5.429
Subestrus (N=6)	0.106±0.044	1.673±0.290	2.207±0.192	2.51±0.287	0.208±0.078
Buffalo (N=58)					
True anestrus (N = 37)	0.156±0.04	0.183±0.037	0.127±0.043	0.241± 0.063	0.253±0.07
Persistent CL (N=2)	1.034±0.264	5.055±0.357	5.458±0.610	2.332±0.175	2.458±0.225
Subestrus (N=6)	0.152±0.045	1.827±0.326	3.427±0.613	3.015±0.663	0.230±0.060

The poor BCS of both cattle and buffalo (below 3.0 score) of different categories, in the pesent study, indicate the below par nutritional management in the field. Even though some of the farmers do feed adequate quantity of concentrates to these animals but they fail to meet required quality levels. High proportions of anestrum and subestrum cases are indicative of overall deficiency of nutrients. While the postpartum anestrum is reflection of energy deficiency (Rao and Naidu, 2000). Cows on good nutrition assumes early ovarian activity postpartum as compared to those with poor nutrition (Mantegomery et al. 1980)

The two buffalo and one cattle diagnosed to be in anestrum due to persistent CL were heifers. Roberts (1986) found few heifers that failed to show estrum, with corpora lutea on either of the ovaries and normal non-pregnant uterus revealed an absence of endometrial glands on slaughter.

The number of animals diagnosed pregnant (Cattle - 14/58 and Buffalo 29/58) on examination indicate the poor managerial skills with regard to estrus detection and time farmers spend on the animal husbandry and negligence for pregnancy diagnosis.

The present field study on the categorization of anestrus in cattle and buffalo point out the poor management practices of marginal farmers while raising dairy cattle and buffalo as indicated by the poor body condition score and inability to detect heat and pregnant animals in time.

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