MONTHLY PATTERN OF INSEMINATIONS AND REPRODUCTIVE HEALTH DISORDERS IN DAIRY BOVINES OF MIDDLE GUJARAT

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ABSTRACT

A total of 2281 and 8872 inseminations, and 1907 and 13568 sexual health control cases attended in cattle and buffaloes, respectively, over last 14 years at College Gynaecology Clinic in Anand were evaluated to know the monthly pattern of breeding and reproductive health disorders faced by these dairy animals in the agro-climatic conditions of middle Gujarat together with yearly trend of these dual services being offered to the dairy farmers of the region at the College. The monthly trends of both insemination and reproductive health control (RHC) cases in cattle were almost consistent throughout the year, except a slight decline in March-April, whereas buffaloes showed clear seasonality in both inseminations and RHC cases, with maximum 70.65 % and 62.20 % being attended between September and February months of the year (peak being December-January, 30.32 and 24.18 %), and the least 6.80 and 10.16 % during May-June. Further, the yearly trends of annual AI and RHC cases worked out for the past 14 years clearly revealed a gradual and consistent decline in number/per cent of the total cases (AI 13.25% to 1.95%; RHC 14.40% to 1.73%) being attended at College from 1999 to 2012, the decline being drastic overall last 5 years. The overall distribution of pooled RHC cases showed the incidence of functional ovaries (suboestrum) as 24.90 %, inactive ovaries (true anoestrum) 25.76 %, pregnancy diagnosis 13.89 %, uterine infections (endometritis, metritis, pyometra) 18.45 %, repeat breeding 5.35 %, infantile genitalia 4.65 %, ovarian disorders 1.20 %, cervical disorders 2.33 %, abortion, mummification, maceration etc 1.29 %, and genital prolapse, torsion, dystocia, retained placenta, etc together 2.18 %. The occurrence of suboestrum and anoestrum was more common during summer due to malnutrition, heat stress and seasonality of breeding. Similarly, uterine infections were more common during peak seasons of breeding and calving due to unhygienic conditions. Further, the major reasons for the decline in number of cases at College Clinic are; rapid and extensive urbanization, depletion of large animal population from the surrounding pockets for miles due to conversion of agricultural lands into built up societies, development of fast track roads /circles and increased traffic problems in bringing large animals to the college on foot, and even prompt availability of doorstep services for AI and health coverage by private as well as co-operative sectors, together with increased awareness among dairy animal keepers.

INTRODUCTION

The seasonality of reproduction in buffaloes has been well documented from various parts of the globe (Kodagali *et al.,* 1973 a; Bhavsar *et al.,* 1989; Jainuideen, 1989; Dhami *et al.,* 1993; Islam *et al.,* 2012). Reproductive failure in bovine is one of the major economically important problems affecting dairy industry. A large proportion of breedable bovine population remains unsettled annually for multiple reasons. Minimizing these losses is, therefore, a boon to the farmers' and national economy. Incidence of various reproductive disorders among cattle and buffaloes have

been documented from various parts of the country (Kodagali *et al.,* 1973[ab]; Singh *et al.*, 1981; Pandit *et al.*, 1982; Kumar *et al.*, 1986; Rahumthulla *et al.*, 1986; Hussain, 1987; Patil, 1989; Dhami *et al.*, 1993) in an effort to augment production and reproduction efficiency in dairy animals under the varying conditions of climate, nutrition, management and disease control. Reproductive problems go hand in hand with the breeding and calving frequency perhpase due to greater awareness and reporting by the animal owners (Pandit *et al.*, 1982; Dhami *et al.*, 1993). In the present study, an attempt was made to know the relationship between breeding patterns and the incidence of various sexual health problems as met with at college clinic among dairy cattle and buffaloes and reasons for alteration in their trends, if any, in middle Gujarat.

MATERIALS AND METHODS

A total of 2281 and 8872 inseminations, and 1907 and 13568 sexual health control cases were attended in cattle and buffaloes, respectively, over the period of 14 years (1999 to 2012) at Gynaecology Clinic of Veterinary College, Anand. These were analyzed to study the monthly and seasonal pattern of breeding and reproductive health disorders faced by these dairy animals in the agro-climatic conditions of middle Gujarat. Efforts were also made to see the yearly trend of these dual services being offered to the dairy farmers of the region at the College over last one and a half decade. All these reported cases were examined gynaeco-clinically, those found in oestrus were bred by AI, those with reproductive disorders/infertility were treated suitably, and the findings were recorded in the set proforma. All the 14 years' breeding as well as RHC cases were pooled to calculate monthly patterns of breeding and reproductive health in cows and buffaloes. Further, the year-wise pooled data of different RHC cases attended in cattle and buffaloes were pooled, irrespective of species, for periods of 1999-2003, 2004-08 and 2009-12, and overall from 1999-2012 to know the frequency of various reproductive health disorders being attended at the clinic, their probable causes and thereby to think for measures of ameliorating them.

RESULTS AND DISCUSSION

The frequency of occurrence of oestrus/breeding and the reproductive health control cases as attended month/season-wise and year/period-wise in cattle and buffaloes are shown in Table 1 and 2, respectively. The period-wise incidence of various types of reproductive disorders recorded is shown in Table 3.

As evident from Table 1 and 2, the monthly trends of both inseminations and reproductive health control (RHC) cases in cattle were almost consistent throughout the year with a slight decline in the months of March-April of the year, whereas buffaloes showed marked seasonality in oestrus/ inseminations and reproductive disorders, both being maximum 70.65 % and 62.20 % during high breeding season from September to February months of the year (peak being December-January, 30.32 and 24.18 %), and the least 6.80 and 10.16 % during May-June (Tables 1 and 2). These findings are in accordance with those reported by Kodagali *et al.* (1973[a]), Bhavsar *et al.* (1989) and Dhami *et al.* (1993) in Surti buffaloes and cattle in their home tract. There was a significant positive association between the monthly frequency of oestrus/ breeding and the RHC cases probably due to coincidential observance and reporting by the animal owners. These findings clearly indicate that the buffalo breeding be given a careful strict and timely attention to minimize or ameliorate the losses due to reproductive failure especially during high breeding season, before they evince summer infertility in low breeding season.

Further, the yearly trends of annual AI and RHC cases worked out for the past 14 years revealed a gradual and consistent decline in number/per cent of the total cases (AI 13.25% to 1.95%; RHC 14.40% to 1.73%) being attended at College clinic from 1999 to 2012. Dhami *et al.* (1993) analyzed similar kind of data from the same clinic for the period of 1983-89, and found a gradual increasing trend over the six years period due to increased awareness among the farmers towards better

Table 1: Monthly/Seasonal pattern of breeding and reproductive health control (RHC) cases attended at College Clinic, Anand (pooled data from 1999-2012)

Months	Cattle				Buffalo				Overall			
	AI	%	RHC	%	AI	%	RHC	%	Total AI	%	Total RHC	%
Mar	135	5.92	115	6.03	622	7.00	973	7.17	757	6.78	1088	7.03
Apr	139	6.09	137	7.18	342	3.85	734	5.41	481	4.31	871	5.05
May	152	6.66	147	7.71	244	2.75	602	4.44	396	3.55	749	4.84
Jun	207	9.07	152	7.97	360	4.05	777	5.72	567	5.08	929	6.00
Jul	233	10.21	188	9.85	494	5.56	1115	8.22	727	6.51	1303	8.42
Aug	207	9.07	157	8.23	545	6.14	1063	7.83	752	6.74	1220	7.88
Low BS	**1073**	**47.04**	**896**	**46.99**	**2607**	**29.35**	**5264**	**37.80**	**3680**	**32.97**	**6160**	**39.81**
Sept	173	7.58	180	9.44	800	9.00	1456	10.73	973	8.72	1636	10.57
Oct	186	8.15	145	7.1	907	10.21	1031	7.6	1093	9.79	1176	7.60
Nov	191	8.37	143	7.5	1002	11.24	1283	9.45	1193	10.7	1426	9.28
Dec	228	10	185	9.7	1297	14.6	1590	11.72	1525	13.7	1775	11.47
Jan	241	10.58	186	9.75	1396	15.72	1691	12.46	1637	14.7	1877	12.13
Feb	189	8.28	172	9.02	872	9.82	1253	9.23	1061	9.5	1425	9.21
High BS	**1208**	**52.96**	**1011**	**53.01**	**6274**	**70.65**	**8304**	**62.20**	**7482**	**67.03**	**9315**	**60.19**
Total	**2281**	**100**	**1907**	**100**	**8881**	**100**	**13568**	**100**	**11162**	**100**	**15475**	**100**

BS = breeding season.

Table 2: Yearly pattern of breeding and reproductive health control (RHC) cases attended at College Clinic, Anand over past 14 years (1999-2012)

Year	Sub-Total								Grand Total			
	Insemination				RHC				AI	%	RHC	%
	Cattle	%	Buff	%	Cattle	%	Buff	%				
1999	250	10.96	1229	13.84	156	8.18	2073	15.28	1479	13.25	2229	14.40
2000	210	10.96	1183	13.32	190	9.96	1840	13.56	1393	12.48	2030	13.12
2001	224	9.82	1012	11.40	195	10.23	2222	16.38	1236	11.07	2417	15.62
2002	156	6.84	503	5.66	126	6.61	1180	8.70	659	5.904	1306	8.44
2003	116	5.09	556	6.26	99	5.19	1086	8.00	672	6.02	1185	7.66
99-03	**956**	**41.91**	**7783**	**50.48**	**766**	**40.17**	**8401**	**61.92**	**5439**	**48.73**	**9167**	**59.24**
2004	210	9.21	772	8.69	183	9.60	971	7.16	982	8.798	1154	7.46
2005	188	8.24	791	8.91	127	6.66	1018	7.50	979	8.771	1145	7.40
2006	219	9.60	764	8.60	173	9.07	874	6.44	983	8.807	1047	6.77
2007	182	7.98	648	7.30	114	5.98	443	3.27	830	7.436	557	3.60
2008	177	7.76	507	5.71	171	8.97	709	5.23	684	6.128	880	5.69
04-08	**976**	**42.79**	**3482**	**39.21**	**768**	**40.27**	**4015**	**29.59**	**4458**	**39.94**	**4783**	**30.91**
2009	138	6.05	321	3.61	123	6.45	449	3.31	459	4.112	572	3.70
2010	70	3.07	234	2.63	94	4.93	273	2.01	304	2.724	367	2.37
2011	82	3.59	202	2.27	92	4.82	227	1.67	284	2.544	319	2.06
2012	59	2.59	159	1.79	64	3.36	203	1.50	218	1.953	267	1.73
09-12	**349**	**15.30**	**916**	**10.31**	**373**	**19.56**	**1152**	**8.49**	**1265**	**11.33**	**1525**	**9.85**
Total	**2281**	**100.00**	**8881**	**100.00**	**1907**	**100.00**	**13568**	**100.00**	**11162**	**100**	**15475**	**100.00**

sexual health and productivity of their animals, and the AI/RHC facilities being provided by the out scuirtly located College clinic to the farmers on all 7 days of a week round the year, without any holiday, in those days. However, the trend has been inversed over the last one and a half decade and the rate of cases coming to the college clinic being declined drastically over last 4-5 years compared to previous phases (Table 2). The major reasons for the decline in number of cases being presented at College Clinic (a practical boon for UG/PG teaching and research) over the past 14 years in our opinion are; rapid and extensive urbanization, depletion of large animal population from the surrounding pockets for miles due to conversion of agricultural lands into built up societies, development of fast track roads /circles and increased traffic problems around college clinic in bringing large animals on foot, and even prompt availability of doorstep services for AI and health coverage by private as well as co-operative sectors, together with increased awareness among dairy animal keepers. These trends appear to warn the College Hospital management authorities to think for alternate facilities for giving practical exposure in developing clinical competence among the veterinary graduates and post-graduate scholars, before being released for public services in the society.

The incidence of various types of reproductive disorders varied between different periods of years (Table 3). The overall frequency distribution of pooled RHC cases was functional ovaries (suboestrum) 24.90 %, inactive ovaries (true anoestrum) 25.76 %, pregnancy diagnosis 13.89 %, uterine infections (endometritis, metritis, pyometra) 18.45 %, repeat breeding 5.35 %, infantile genitalia 4.65 %, ovarian disorders 1.20 %, cervical disorders 2.33 %, abortion, mummification, maceration etc 1.29 %, and genital prolapse, torsion, dystocia, retained placenta, etc together 2.18

Table 3: Period-wise trend of various types of reproductive disorders in dairy animals

Types of disorders	1999-2003		2004-08		2009-12		Overall	
	No	%	No	%	No	%	No	%
Functional ovaries (suboestrum)	2467	26.91	1042	21.79	345	22.62	3854	24.90
Smooth inactive ovaries (true anoestrum)	2404	26.22	1206	25.21	377	24.72	3987	25.76
Pregnancy diagnosis	1043	11.71	807	16.87	269	17.64	2149	13.89
Repeat breeding	618	6.74	176	3.68	34	2.23	828	5.35
Uterine infection (endometritis, metritis, pyometra)	1695	18.49	845	17.67	315	20.66	2855	18.45
Infantile genitalia	458	5.00	179	3.74	82	5.38	719	4.65
Ovarian hypoplasia, cysts, adhesion etc	93	1.01	75	1.57	17	1.11	185	1.20
Vaginitis, cervicitis, kinked cervix etc	129	1.41	201	4.20	30	1.97	360	2.33
Abortion, mummification, maceration etc	85	0.93	92	1.92	23	1.51	200	1.29
Obstetrical problems (torsion, prolapse, dystocia, ROP etc)	145	1.58	160	3.35	33	2.16	338	2.18
Total	**9167**	**100**	**4783**	**100**	**1525**	**100**	**15475**	**100**

%. The period-wise trend remained more or less same over the past 14 years, except that there was slight reduction in incidence of suboestrus and repeat breeders, and increase in frequency of cases for pregnancy diagnosis, pathological pregnancy and cervical disorders (Table 3). The pregnancy confirmation, suboestrus, anoestrus and uterine infections were the major areas dealt with each year, apart from AI. The occurrence of suboestrum and anoestrum was more common during summer due to malnutrition, heat stress and seasonality of breeding. Similarly, uterine infections were more common during peak seasons of breeding and calving due to unhygienic conditions.

These findings support the observations of earlier workers referred above. In general, the functional causes contributed about 3 times more than the infectious and anatomical causes, which is in agreement with the earlier reports (Kodagsali *et al.,* 1973[b]; Pandit *et al.*, 1982; Rahumthulla *et al.,* 1986; Hussain, 1987; Dhami *et al.*, 1993). However, the incidence of anoestrus observed was lower than that reported by some of these workers perhaps due to different agro-climatic, nutritional and managerial conditions. Sarder *et al.* (2010) and Islam *et al.* (2012) reported the incidence of anoestrus as 20.4 and 14.7 % respectively, in crossbred cows in Bangladesh, although the incidence of uterine infection was much less and repeat breeding much higher than the present observations mainly in buffaloes. The present high incidence of cyclic/suboestrus cases is chiefly suggestive of error in oestrus detection as pointed out by Kumaresan (2001). The higher incidence of suboestrum and anoestrum during low breeding season in buffaloes indicates the problem of heat detection, adverse climatic stress and malnutrition. Similarly, higher incidence of uterine infections during high breeding/calving seasons from September to February months is attributed to repeated genital insults, trauma and unhygienic conditions at breeding and calving, besides lactational stress. Lower incidence of repeat breeding, infantile genitalia and obstetrical problems recorded in present meta-analysis as compared to those reported by Pandit *et al.* (1982), Hussain (1987) and Dhami *et al.* (1993) was mainly due to better husbandry followed, comparatively larger population of buffaloes covered over cattle, and the fact the emergency services for obstetrical cases, and even breeding services, are now made available at the owners' door by dairy co-operatives, NGOs and private practioners, and hence non-reporting of such cases to the college clinic. Thus, it is felt that in-depth analysis in this direction should be undertaken for deciding the priority areas of buffalo and cow breeding in relation to their breeding behaviour so as to economize dairy animal breeding in the improved environment at the same time providing hands on training to the graduate and post-graduate scholars of the profession for expecting quality services in future from them.

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