

Herd Strength, Calving Pattern and Causes of Mortality at Nili Ravi Buffalo Farm of ICAR-CIRB, Sub Campus, Bir Dosanjh, Nabha (Punjab) During the Year 2017-18

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Abstract

The present study was undertaken to study the calving pattern and causes of mortality at Nili Ravi Buffalo farm of CIRB sub campus, Nabha, during the year 2017-18. The opening balance (Total number of animals) on dated 1st April, 2017 was 507 heads comprising 370 females and 137 males. The number of female and male animals on the closing date (31st March, 2018) were 351 and 113, respectively. Of the 191 total animals, disposed off during the study period, 140 were surplus, 20 were below farm production standard, 05 were having reproductive problems, 02 were weak and old; and 24 deaths were reported. Eight cases of abortions (5.12%), seven cases of retention of placenta (ROP) (4.48%) and three cases of prolapse (1.92%) were reported. The study reported high incidences (5.12%) of abortions, followed by retained placenta (4.48%) and prolapse (1.92%) in the herd. The sex ratio added in the herd (Male: Female) was 54.49:40.38. Of the total 24 mortalities, highest number (10) occurred during the third quarter followed by fourth (07), second (05) and first (01) quarters of the year. In the present study, the highest mortality percentage occurred in the case of calves of 0-3 month's age group. Between female and male, the higher mortality occurred in male calves (6.00%) as compared to that of female calves (3.85%). Total 148 calves added due to birth during the year (2017-18) out of which 85 were males and 63 were females. Calf mortality (0-3 months) was 5.06 %. During winter (November to January) 28, spring (February to April) 31, summer (May to July) 35 and autumn (August to October) 54 calves were born. It was concluded that the study reported high incidences (5.12%) of abortions, followed by retained placenta (4.48%) and prolapse (1.92%) in the herd. The highest mortality percentage occurred in the case of calves of 0-3 month's age group. Between female and male, the higher mortality occurred in male calves (6.00%) as compared to that of female calves (3.85%). Here, it is noticeable that despite the animals found negative for Brucellosis, eight number of abortions occurred in the herd.

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1. Introduction

Nili-Ravi is also known as Panch Kalyani. The home tract of Nili-Ravi buffaloes is the belt between the Sutluj and Ravi rivers of the undivided Punjab Province. Actually Nili and Ravi were two different breeds long before, but due to the passage of time and with intensive crossbreeding, the two breeds converted into single breed named Nili-Ravi. Nili-Ravi buffaloes are found in almost all the districts, with major concentration in Amritsar, Gurdaspur and Ferozepur districts of Indian Punjab and in Lahore, Sheikhpura, Faizabad, Okora, Sahiwal, Multan, Bohawalpur and Bahwalnagar districts of Pakistan Punjab. The name Nili is supposed to have been derived from the blue water of river Sutluj. It is very easy to identify the

animals of this breed. Animals have walled eyes and white markings on forehead, face, muzzle, legs and tail. The buffaloes can utilize poorer quality roughages, adapt to harsher environments and are more resistant to several bovine tropical diseases. Despite these merits, buffaloes have relatively poor reproductive efficiency irrespective of their location throughout the world. Buffaloes exhibit many of the known reproductive disorders including delayed onset of puberty, poor oestrus expression, longer postpartum ovarian quiescence, and most importantly lowered conception rates particularly when bred artificially (Gordon, 1996). Furthermore, tying up the animals as per normal husbandry practices in many developing countries restricts the ability of buffalo farmers to observe heat

signs (Warriach *et al.*, 2012). Buffaloes also tend to show heat signs during the night when farmers are not observing their animals. Season is another extrinsic factors that influences the characteristics of oestrous behaviour. In the tropics, high ambient temperature reduces sexual activity during the day (Jainudeen, 1977) and shortens the oestrous period (Gill *et al.*, 1973) with the incidence of silent oestrous more common during the hot summer season. These adverse effects of heat stress make oestrous detection much more difficult in buffalo. Oestrous detection could be significantly improved through the introduction of a teaser bull or an androgenized female (Chohan *et al.*, 1992). However, higher fertility could be achieved through better feeding and management (Perera, 1987; Usmani *et al.*, 1990; Qureshi *et al.*, 2007). Short lactation periods, long calving intervals, long dry periods and a large number of days open are characteristics typical of buffalo cows. These traits have low heritabilities, and means are associated with a large degree of variation due to numerous environmental factors (Mourad *et al.*, 1989; Parakash *et al.*, 1989; Khalil *et al.*, 1991; Afifi *et al.*, 1992; Ibrahim, 1998; Khan and Akhtar, 1998; Penchev, 1998; Suhail *et al.*, 1998; Tiwana and Dhillon, 1998; Vasconcellos and Tonhati, 1998; Tonhati *et al.*, 2000). It appears that because buffalo are located mostly in developing countries with meager resources, there is limited quality research in the area of basic physiology, health, management, nutrition and applied reproduction. The present study was focused on some of the activities performed at Nili Ravi Buffalo Farm of ICAR-CIRB, Sub Campus, Bir Dosanjh, Nabha (Punjab), during the year 2017-18.

2. Materials and Methods

The Nili-Ravi is one of the important buffalo breeds of India with its home tract in Gurdaspur, Amritsar and Ferozepur districts of Punjab i.e. along with the international border of Pakistan. Due to the non-availability of pure and superior breeding bulls in the tract, farmers face constraint in breeding their Buffaloes. To preserve the important germplasm of Nili-Ravi buffalo in India, Sub-campus of Central Institute for Research on Buffaloes was established on 1st December, 1987 at Bir Dosanjh, Nabha in Punjab by acquiring land and other facilities from the Government of Punjab for research on improvement of Nili-Ravi buffalo. The CIRB, sub campus, Nabha was identified as one of the centers for research work under the Network Programme on buffaloes for Nili-Ravi breed. As the only organized farm of Nili-Ravi breed in India, Central Institute for Research on Buffaloes, sub-Campus, Nabha is contributing to conservation and improvement of this fine breed of buffalo. The present investigation was undertaken to study some of the activities performed at Nili Ravi Buffalo Farm of ICAR-CIRB, Sub Campus, Bir Dosanjh, Nabha (Punjab), during the Period from 1st April 2017 to 31st

March, 2018. The study was carried out utilizing all animals housed at the ICAR-Central Institute for Research on Buffaloes, sub campus located at Bir Dosanjh, Nabha (Punjab); project code:18-3/97 ASR-II Dated 29/03/2001; Project title: Network project on improvement of Nili-Ravi buffaloes; date of start 11.10.2002 and the objective of the project is to envisage and undertake progeny testing for improvement of Nili Ravi breed of buffaloes with the priority and emphasis on performance recording and improvement of the breed and on semen quality testing laboratory. Standard concentrate mixture containing 20% crude protein and 70% TDN was prepared from available feed ingredients and was used during the study period as the concentrate supplement for the buffalo herd across the Institute. All animals were managed by practicing group feeding throughout the experimental period. Fresh water was made available to every animal round the clock. The quality of water was monitored regularly as water needs, if not adequately fulfilled, can lead to rapid deterioration of animal health and welfare. With regard to temperature of drinking water, the temperature of drinking water has only a slight effect on drinking behavior and animal performance. All possible efforts were made to provide fresh drinking water to the animals. As far as a choice of water temperature is concerned, the dairy animals prefer to drink water with moderate temperatures (17-28°C) rather than cold or hot water (Andersson, 1987; Lanham *et al.*, 1986; Wilks *et al.*, 1990). The lactating buffaloes were fed at regular intervals (twice daily) to maintain a continuous fermentation in the rumen. The calving pattern during the year was divided into four seasons namely, winter (November to January), spring (February to April), summer (May to July) and autumn (August to October). Various reproductive problems like still birth, abortion, dystokia, retained placenta and prolapse were monitored during the period under report.

3. Results and Discussion

The data with respect to herd strength pertaining to various categories of animals indicating opening balance on dated 1st April, 2017 to closing balance on dated 31st March, 2018 is given in Table 1.

3.1 Herd Strength During the Study Period

The opening balance (Total number of animals) on dated 1st April, 2017 was 507 heads comprising 370 females and 137 males. A total of 148 animals (63 females and 84 males) were added on account of birth to the herd strength. Seventy one females consisting of 07 (above two years), 36 (buffaloes in milk) and 28 (dry pregnant or non-pregnant buffaloes) were sold during the year. Similarly, ninety six males consisting of 03 (below three months of age), 42 (3-12 months of age), 16 (1-2 years of age), 31 (above 2 years of age) and 04 (breeding bulls) were sold during the study period. The opening balance (490) at the same farm in

Table 1: Herd strength during the period 1st April 2017 to 31st March, 2018

Sr. No.	Category	Additions			Disposal			Closing Balance	
		Opening Balance as on 1 st April, 2017	Birth/Purchase	Transfer	Death	Transfer	Sale	Closing balance as on 31 st March, 2018	
Females									
1.	Below 3 months	15	63		03	53		22	
2.	3-12 months	48		102	02	112		36	
3.	1-2 years	64		63	02	64		61	
4.	Above 2 years	93		177	01	165	07	97	
5.	Buffaloes in Milk	106		148	01	114	36	103	
6.	Buffaloes Dry P/NP	44		114	02	96	28	32	
Sub Total		370	63	604	11	604	71	351	
Males									
1.	Below 3 months	15	85		06	78	03	13	
2.	3-12 months	51		154	04	110	42	49	
3.	1-2 years	35		34	03	32	16	18	
4.	Above 2 years	30		46	-	16	31	29	
5.	Breeding bulls	05		02	-	-	04	03	
6.	Teasers/ Bullocks/ Others	01		-	-	-	-	01	
Sub Total		137	85	236	13	236	96	113	
Grand Total		507	148	840	24	840	167	464	

the previous year (2016-17) was almost similar to the present year (CIRB-Annual Report, 2016-17). The closing balance (herd strength) as on 31st march, 2018, at the buffalo farm was 464 including 232 breedable buffaloes (>2.0 years). Number of young males (>1.0 year) and breeding bulls was 47 and 3, respectively. The number of female and male animals on the closing date (31st March, 2018) were 351 and 113, respectively. The closing balance (507) at the same farm in the previous year (2016-17) was higher than that of the closing balance of present year (CIRB-Annual Report, 2017-18).

3.2 Disposal of Animals During the Study Period

The data pertaining to disposal of animals at the Nili Ravi Buffalo Farm of ICAR-CIRB, Sub Campus, Nabha, during the period 1st April 2017 to 31st March 2018 is given in Table 2. Of the total 191 animals disposed off during the study period consisted of 82 females and 109 males. Among 82 female animals, 56 were surplus, 08 were below farm production standard, 02 were having reproductive problems, 02 were weak and old; and 11 deaths were reported. Among 109 male animals, 84 were surplus, 12 were below farm production standard, and 13 deaths were reported. Among 191 total animals, 140 were surplus, 20 were below farm production standard, 05 were having reproductive problems, 02 were weak and old; and 24 deaths were reported.

3.3 Calving Pattern and Reproductive Ailments

The data pertaining to monthly calving pattern and various reproductive ailments like still birth, abortion, dystokia, retained placenta and prolapse, monitored during the study period is given in Table 3. Total 148 calves added due to birth during the year (2017-18) out of which 85 were males and 63 were females. Calf mortality (0-3 months) was 5.06%. During winter (November to January) 28, spring (February to April) 31, summer (May to July) 35 and autumn (August to October) 54 calves were born. Seasonally, the highest number of calving took place during autumn (54), followed by summer (35), spring (31) and winter (28). The present study further revealed that there are considerable monthly and seasonal variations in calving pattern of buffaloes. The calving distribution can be controlled by estrous synchronization technique, however, inducing calving may cause retained placenta, lower milk production and other problems (Mansell *et al.*, 2006; Peters and Poole, 1992). In the present study, no still birth or dystokia case was reported. Eight cases of abortions (5.12%), seven cases of retention of placenta (ROP) (4.48%) and three cases of prolapsed (1.92%) were reported during the period under study. The study reported high incidences (5.12%) of abortions, followed by retained placenta (4.48%) and prolapse (1.92%) in the herd. The sex ratio added in the herd (Male:Female) was 54.49:40.38.

Table 2: Disposal of animals during the period 1st April 17 to 31st March 18

Category		Surplus	Below farm production standard	Reproduction problem	Weak and old	Death	Total
Female							
Calves	0 to 3 months					03	02
	3 to 12 months					03	02
Heifers	1-2 years					02	02
	>2 years			05	02	01	08
Buffaloes	Milch	32	04			01	37
	Dry	24	04			02	30
Sub Total		56	08	05	02	11	82
Male							
Calves	0-3 months	02	01			06	09
	3-12 months	42				04	46
	1-2 Years	13	03			03	19
	>2 years	26	05			-	31
Breeding Bulls		01	03			-	04
Sub Total		84	12			13	109
Grand Total		140	20	05	02	24	191

Table 3: Calving Statistics including abnormalities

Month	Male	Female	Still Birth	Abortion	Dystokia	ROP	Prolapse	Overall
April	07	02	-	-	-	02		
May	01	01	-	-	-	-		
June	06	03	-	02	-	-		
July	19	05	-	-	-	-		
August	17	08	-	-	-	03		
September	07	08	-	-	-	-		
October	06	08	-	02	-	-	01	
November	03	04	-	02	-	-	-	
December	05	02	-	-	-	01	01	
January	06	08	-	-	-	-	-	
February	02	06	-	01	-	01	01	
March	06	08	-	01	-	-	-	
Overall	85	63	-	08	-	-	-	156

3.4 Herd Mortality

The data pertaining to overall herd mortality reported as and when occurred during the study period is given in Table 4. In the case of female (433) animals, the highest mortality occurred in case of female calves during 0-3 months, wherein out of 78, 3 (3.85%) animals died. In the case of various age categories of female animals i.e., 3-12 months, 1-2 years, above 2 years, milking + dry animals and overall female herd mortality, the mortality percentage was 1.33, 1.57, 0.37, 2.22 and 2.54 percent. In the case of male (222) animals, the highest mortality occurred in case of male calves of 0-3 months old, wherein out of 100, 6(6.00%) animals died. In the case of various age categories of male animals i.e., 3-12 months, 1-2 years, above 2 years and overall male herd mortality, the mortality percentage was 1.96, 4.35, 0.00 and 5.86 percent. In the overall herd (M 222+F 433) of 655, 24 (3.66%) animals died during the study period. In the present study, the

highest mortality percentage occurred in the case of calves of 0-3 month's age group. Between female and male, the higher mortality occurred in male calves (6.00%) as compared to that of female calves (3.85%). In the present study, nine cases of mortality upto 3 months of age were reported during the year. Significant basic risk factors associated with PM (Perinatal mortality) following all calving include genetic variables such as calf sire, sire breed, dam breed, inbreeding and gestation length (Mee, 2004; Johanson and Berger, 2003, Heins *et al.*, 2003, Kindahl *et al.*, 2002; Meyer, 2001; McNeil *et al.*, 1989). The primary determinant of whether a herd had high or low PM is not management factors before calving, but rather calving management (Drew, 1988). Simple nursing techniques such as warming, drying, provision of extra colostrums, shelter, stimulation, and extra mothering attention increase calf survival rate (Garry, 2004; Mee, 2004).

Table 4: Mortality during the period 1st April 2017 to 31st March, 2018

	Female						Male					Overall herd
	0-3 months	3-12 months	1-2 years	Above 2 years	Milk + Dry	Overall female	0-3 months	3-12 months	1-2 years	>2 years	Overall male	
No.	78	150	127	270	135	433	100	205	69	89	222	655
Died	03	02	02	01	03	11	06	04	03	-	13	24
%	3.85	1.33	1.57	0.37	2.22	2.54	6.0	1.96	4.35	-	5.86	3.66

Table 5: Causes of mortality (quarter wise) during the period April 2017 to March 2018

Particulars	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter
A. Respiratory System:				
1. Bronchopneumonia	01		04	04
2. Acute Resp. failure			01	
3. Pheumoenteritis				01
B. Digestive system				
1. Enteritis		04	02	
2. Impaction			01	
3. Peritonitis			01	
4. Hepatitis				01
5. Tympanites	01			01
C. Urogenital System				
1. Pyelonephritis			01	
2. Urathral obstruction				
E. Others				
1. Premature birth				
2. Neurologied disorder		01		
3. Miscellaneous and Others				
Total	02	05	10	07

Table 6: Prophylactic Measures undertaken during the study period

Vaccination	No. of Animals		Screening	No. of Animals		No. of Animals Treated for Parasitism
	Available	Inoculated		Tested	Results	
FMD	595	595	TB	340	-Ve*	250
HS	595	595	JD	340	-Ve*	
BQ	-	-	Brucellosis	195	-Ve**	
RP	-	-	Mastitis	205	35+Ve***	
Brucellosis	140	140				

3.5 Causes of Mortality

The animal herd was kept under observation to establish the causes of mortality and monitored for various respiratory, digestive, urogenital and other ailments. The observations recorded quarter wise during the study period (April, 2017 to March, 2018) are presented in Table 5. During the study period, in first quarter, one case of each bronchopneumonia and tympanites were reported. During second quarter, four cases of enteritis one case of neurological disorder were recorded. During third quarter of the year, four cases of bronchopneumonia, two cases of enteritis and each case of acute respiratory failure, impaction, peritonitis, and pyelonephritis were reported. Similarly, during fourth quarter of the year, four cases of bronchopneumonia and each case of pheumoenteritis, hepatitis and tympanites were reported. Of the total 24 mortalities, highest number (10) occurred during the third quarter

followed by fourth (07), second (05) and first (01) quarter.



Fig 1: A view of Nili Ravi farm at CIRB, Nabha.

3.6 Prophylactic Measures

The data pertaining to various prophylactic measures undertaken during the study period is given in Table 6. A total of 595 animals were vaccinated for FMD and HS; and 140 animals were vaccinated for brucellosis. The 340 animals were tested for Tuberculosis and Johnin Disease (JD) and were found negative for both the diseases. Also, 195 animals for Brucellosis and 205 animals for Mastitis were screened. All the animals were found negative for Brucellosis and 35 animals were found positive for Mastitis. The total number of animals treated for Parasitism was 250. Here, it is noticeable that despite the animals found

negative for Brucellosis, eight number of abortions occurred in the herd.

4. Conclusion

It was concluded that there were high incidences (5.12%) of abortions, followed by retained placenta (4.48%) and prolapse (1.92%) in the herd. The highest mortality percentage occurred in the case of calves of 0-3 month's age group. Between female and male, the higher mortality occurred in male calves (6.00%) as compared to that of female calves (3.85%). Here, it is noticeable that despite the animals found negative for Brucellosis, eight number of abortions occurred in the herd.

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