HERD LIFE TRAITS OF MEHSANA BUFFALO DISPOSED OFF AT ORGANIZED FARM

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ABSTRACT

The study was made on herd life traits of Mehsana buffalo disposed off at organized farm Livestock Research Station, S.D. Agricultural University, Sardarkrushinagar for the period of 5 years from 2009 to 2013. The least squares means for various life time traits like Herd Life (HL), Herd Productive Life (HPL), Herd Unproductive Life (HUNPL), Life Time Milk Yield (LTMY), Total Number of Lactations Completed (LN), Milk Yield Per Day of Productive Life (MYPDPL), Age at First Calving (AFC) and Milk Yield Per Day of Herd Life (MYPDHL) in Mehsana buffalo were 2909.10±131.49 days, 1574.19±129.41 days, 1915.96±56.86 days, 6913.21±646.92 kg, 3.56±0.30 nos., 4.33±0.20 kg, 2.04±0.13 kg and 1334.91±22.32 days, respectively at Sardarkrushinagar. The effect of reasons for disposal was found significant (P≤0.05) for all the traits except age of first calving.

Keywords: sold, buffalo, *Bubalus bubalis*, reason, parity, herd life traits

INTRODUCTION

There are about 155.5 millions of buffaloes in the world, of which 96.6% are found in Asia (Cruz, 2009) and 57% of the world in India. For the total livestock of India, 105.34 million buffaloes contribute 52.5% milk, whereas 199.08 million cattle contributes 43.4% milk share to the total milk production of India. Hence buffalo plays vital role in Indian dairy industry and truly can be entitled as the "Black gold" of the livestock.

India possesses best buffalo breeds of the world like Murrah, Jaffarabadi, Nili-ravi, Surti, Mehsana, Banni etc. Gujarat is one of the states of India where majority of buffalo breed resides and were originated. Gujarat had 8.8 millions buffaloes, of which 38.41% (3.4 million) were belongs to Mehsana breed (Anonymous, 2011).

Culling and mortality together constitute disposal pattern among animals. Culling is the removal of undesirable animals from the herd for replacement of heifers for improving the herd performance or to keep the herd size constant. Culling could be voluntary (farmer has complete

freedom of choice over the removal of buffalo/cow from the herd) on the basis of low milk production or involuntary (no choice but it is necessary to remove the animal from the herd),

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for the reason such as reproductive problems, teat and udder disorders, infectious diseases and poor growth etc. (Grohn *et al.*, 1998). Voluntary culling usually leads to increased profits while involuntary culling causes economic losses. Optimum herd profitability is attained by increasing the number of animals culled by voluntary reasons and reducing the number of involuntary culls.

Livestock Research Station is an organized farm under S.D. Agricultural University, Sardarkrushinagar having Mehsana buffalo breed for the breed conservation and related various objectives. Having herd of Mehsana breed since 1978, regular disposal and culling practices are practiced every year. Looking to these last five years data of disposal and culling have been analyzed.

MATERIALS AND METHODS

The herd registers, birth and death registers and disposal registers were studied critically in order to find out the exact reasons for disposal of milch buffaloes from the herds. Data of each buffalo, from L.R.S., Sardarkrushinagar were taken for the duration of 2009 to 2013. Data like date of birth, date of first calving, lactating days of all lactations, total milk produced in all lactations, number of parity and date of auctioned or disposed of the buffaloes were collected and on the basis of which various attributes like Herd Life (HL), Herd Productive Life (HPL), Herd Unproductive Life (HUNPL), Life Time Milk Yield (LTMY), Total Number of Lactations Completed (LN), Milk Yield Per Day of Productive Life (MYPDPL), Age at First Calving (AFC) and Milk Yield Per Day of Herd Life (MYPDHL) was calculated.

The data used in this study comprised of different normal production records of the cows of different herds. The records for first to maximum twelve lactations were considered for calculation of herd life performance traits. Records considered abnormal owing to one or more of the following were not considered for calculation of the herd life performance traits.

* Short lactation (Less than 200 days).

* Lactations following abortion or dystocia.

The herd life (HL) was considered as the period from date of birth to the date of disposal, whereas herd productive life (HPL) was considered as the date of first calving to the date of disposal. The explanations for other herd life traits are as under (Pundir and Raheja, 1997).

1. Herd Unproductive Life (HUNPL) = Herd life (HL) - Total Lactation Days (TLD)

2. Life Time Milk Yield = Amount of milk produced over herd life

3. Total number of lactations completed (LN) over herd life.

4. Milk yield per day of productive life (MYPDPL) = $\frac{\text{LTMY}}{\text{HPL}}$

5. Milk yield per day of herd life (MYPDHL) = $\frac{\text{LTMY}}{\text{HL}}$

6. Age at first calving (AFC) = Date of first calving - Date of birth

Data with any recorded abnormality were excluded from the analysis. The data collected on the various attributes like Herd Life (HL), Herd Productive Life (HPL), Herd Unproductive Life (HUNPL), Life Time Milk Yield (LTMY), Total Number of Lactations Completed (LN), Milk Yield Per Day of Productive Life (MYPDPL), Age at First Calving (AFC) and Milk Yield Per Day of Herd Life (MYPDHL) were subjected General Linear Model (GLM) procedure in the SPSS statistical software

(version 20.0) to analyze the non orthogonal data. Significance of the various factors was tested using Duncan's Multiple Range Test.

Results were considered statistically significant for 0.05≥P≥0.01, whereas P-values less than 0.01 were considered highly significant. To determine the fixed effect of pattern and reason on various attributes like Herd Life (HL), Herd Productive Life (HPL), Herd Unproductive Life (HUNPL), Life Time Milk Yield (LTMY), Total Number of Lactations Completed (LN), Milk Yield Per Day of Productive Life (MYPDPL), Age at First Calving (AFC) and Milk Yield Per Day of Herd Life (MYPDHL), following two linear model was used:

$$W = \mu+Rj+ej$$

Where,

W is the individual observation subjected to effect of reasons for disposal (Rj),

μ is mean of population,

Rj is the effect of reason of culling, where j = 1,2,3,4,5,6 and

ej is the error associated with each observation.

RESULTS AND DISCUSSION

The range for Least square means of AFC varies from 1178 to 1396 and for parity, total lactation days (TLD), lifetime milk yield (LMY), herd life (HL), herd productive life (HPL), herd unproductive life (HUPL) and milk yield per day of herd life (MYPDHL) was 02.80 to 10.00, Total lactation days 755.55 to 1436.60 days, 5344.63 to 12826.00 litres, 2598.60 to 5172.00 days, 1202.60 to 3994.00 days, 1775.00 to 2504.50 days, 3.66 to 6.29 days, and 1.63 to 3.69 days. While the least squares means for respective life time traits for Mehsana buffalo were 1334.91±22.32 days, 2909.10±131.49 days, 1915.96±56.86 days, 1574.19±129.41 days, 6913.21±646.92 litres, 3.56±0.30 nos., 4.33±0.20 litres, and 2.04±0.13 litres at Sardarkrushinagar.

Result predicted in Table 1. revealed that buffaloes sold due to old age has significance difference (P≤0.05) with other reasons for disposal related to parity, total lactation days (TLD), lifetime milk yield (LMY), herd life (HL), herd productive life (HPL) and milk yield per day of herd life (MYPDHL). Whereas, buffaloes sold due to R2, R3, R4 and R5 had no significant (P≤0.05) relationship for parity, total lactation days (TLD), lifetime milk yield (LMY), herd life (HL), herd productive life (HPL) and milk yield per day of herd life (MYPDHL). Herd unproductive lives (HUNPL) of buffaloes died due to death have significant difference with old age, whereas other reasons for the disposal have non-significant difference. Milk yield per day of herd life (MYPDHL) of buffaloes disposed due to low milk production had significant difference (P≤0.05) with the animals disposed due to udder problems while in between other reasons have non significant difference. The buffalo disposed due to various reasons was found non-significant (P≤0.05) for age of first calving herd life trait.

The age of first calving has considerable economic significance to the farmers because the cost of rearing heifers from birth to calving and consequently the milk yield are strongly influenced by this character. The age of first calving is governed by age of maturity, conception rate, gestation length, etc. By proper feeding and management, the age at first calving can be reduced and economy could be attained in rearing heifer from birth to calving. Age of first calving in Mehsana buffaloes

Table 1. Herd life traits of Buffaloes disposed due to various reasons.

Reasons	No. of buffaloes disposed	AFC (Days)	Parity (No.)	TLD (Days)	LTMY (Litres)	Herd Life (Days)	HPL (Days)	HUPL (Days)	MYPDPL (Litres)	MYPDHL (litres)
Old Age	02	1178.0± 4.00^{a}	10.00±1.00^{a}	2667.5± 295.50^{a}	19422.44 ±866.90^{a}	5172.00 ±369.00^{a}	3994.00 ±365.0^{a}	2504.50 ±73.50^{a}	4.88±0.2^{ab}	3.76±0.10^{a}
Low milk production/ Low Pedigree	22	1329.09±45.68^{a}	3.00±0.45^{b}	755.55 ±119.05^{b}	4962.12± 944.86^{c}	2604.36 ±203.54^{b}	1275.27 ±200.2^{b}	1848.82 ±92.40^{ab}	3.66±0.26^{b}	1.63±0.19^{b}
Udder problems	05	1363.00±74.58^{a}	5.00±0.95^{b}	1436.60± 198.62^{b}	12823.00± 2863.51^{b}	3652.40 ±433.07^{b}	2289.40 ±398.8^{b}	2215.80 ±258.4^{ab}	6.29±2.16^{a}	3.69±1.09^{a}
Reproductive disorders	38	1328.58±33.80^{a}	3.26±0.41^{b}	958.34 ±109.17^{b}	6431.76 ±815.57^{bc}	2846.11 ±185.13^{b}	1517.53 ±179.5^{b}	1887.76 ±86.40^{ab}	4.27±0.19^{ab}	1.96±0.15^{b}
Miscellaneous	05	1382.20±52.82^{a}	5.00±1.58^{b}	1359.40 ±425.71^{b}	9812.08± 3181.83^{bc}	3390.80 ±598.02^{b}	2008.60 ±623.1^{b}	2031.40 ±182.08^{ab}	5.35±0.87^{ab}	2.51±0.57^{a}
Death	05	1396.00±68.32^{a}	2.80±1.11^{b}	823.60 ±319.14^{b}	5344.63± 2224.86^{c}	2598.60 ±539.70^{b}	1202.60 ±498.0^{b}	1775.00 ±227.0^{b}	4.57±0.40^{ab}	1.70±0.44^{b}
Overall	77	1334.91±22.32	3.56±0.30	993.14 ±81.24	6913.21 ±646.92	2909.10 ±131.49	1574.19 ±129.41	1915.96 ±56.86	4.33±0.20	2.04±0.13

The means bearing similar superscript do not differ significantly (P≤0.05).

AFC : Age of First Calving

TLD : Total Lactation Days

LTMY : Life Time Milk Yield

HPL : Herd Productive Life

HUPL : Herd Unproductive Life

MYPDPL : Milk Yield Per Day of Productive Life

MYPDHL : Milk Yield Per Day of Herd Life

Miscellaneous : Vices, diseases, inferior growth, off breed, transfer

ranged from 1178 to 1396 days (38.73 to 45.90 months). The results are in accordance with reports of NBAGR where age of first calving for Mehsana buffalo is 42.83 months (22 to 54 months). Whereas age of first calving for Banni, Jaffarabadi, Murrah, Surti and Nili-ravi reported were 40.3, 45 (41 to 55), 43.4 (39.9 to 54.2) and 44.9 (35 to 58) and 45 (40 to 53) months, respectively. Results of Roshanfekr H. (2005) revealed lesser age of first calving (38.20±0.29 month) in Khuzestani buffaloes belonging to animal production research institute in province of Khuzestan. The average age at first calving of Murrah buffaloes in Hisar district was 48.14 months whereas in Karnal district it was 47.34 months (Nirmal Kumar *et al*., 2011).

CONCLUSION

The present study reveled that buffaloes auctioned due to old age had significance difference with other reasons for disposal related to parity, total lactation days (TLD), lifetime milk yield (LMY), herd life (HL), herd productive life (HPL) and milk yield per day of herd life (MYPDHL). Herd unproductive life (HUNPL) of buffaloes died due to death had significant difference with old age. Milk yield per day of herd life (MYPDHL) of buffaloes disposed due to low milk production had significant difference with the animals disposed due to udder. The buffalo disposed due to various reasons was found non-significant ($P \leq 0.05$) for age of first calving herd life trait.

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