

Advances in Murrah Breed Clean A2 Milk Production Technologies and Study of Economics at Private Dairy Farms in India

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Abstract

The opening balance (herd strength of murrah buffaloes as on 01/04/2012) was 150 heads (32 males and 118 females). The weight at first calving during current the current year was 535.71 kg. Buffaloes produced 82098 kg milk. Overall wet and herd averages were 5.66 and 3.59 kg, respectively. On an average 62.92% of the total females were in milk. The milk analysis of 872 samples revealed fat, SNF and total solids per cent as 7.88, 9.81 and 17.75, respectively. Herd strength for next year was maintained. The opening herd strength of Murrah buffaloes as on 01/04/2013 was 165 heads (38 males and 127 females). In all, 47 animals were deleted from the herd due to various reasons, whereas 57 animals were added due to new births (23 female and 34 male). The new calvings were well distributed over all the months of year, except April 2013 and March 2014 when no calvings took place. The male:female ratio of new calvings was 1.48:1.00. The closing balance of the buffalo herd as on 31/03/2013 was 175 (129 females and 46 males).

Keywords: Murrah, milk, dairy, economics

1. Introduction

Traditional, cultural and religious beliefs have also contributed in the continuance of these activities. They also play a significant role in generating gainful employment in the rural sector, particularly among the landless, small and marginal farmers and women, besides providing cheap and nutritious food to millions of people. Livestock production and agriculture are intrinsically linked, each being dependent on the other, and both crucial for overall food security. Livestock sector is an important sub-sector of the agriculture of Indian economy. It forms an important livelihood activity for most of the farmers, supporting agriculture in the form of critical inputs, contributing to the health and nutrition of the household, supplementing incomes, offering employment opportunities, and finally being a dependable “bank on hooves” in times of need. It acts as a supplementary and complementary enterprise. According to NSSO 66th Round Survey (July 2009-June 2010) on Employment and Unemployment, 15.60 million workers as per usual status (Principal status plus subsidiaries status) were engaged in farming of animals, mixed farming and fishing. Whereas as per estimate of NSS 68th Round (July 2011-June 2012) survey on Employment and Unemployment, 16.44 million workers as per usual status (Principal status plus subsidiaries status) were engaged in the activities of farming of animals, mixed farming and fishing. Animal Husbandry and Dairying activities, along with agriculture, continue to be an integral part of human life since the process of civilization started. These activities have contributed not only to the food basket and draught animal power but also by maintaining ecological balance. Owing to conducive climate and topography, Animal husbandry and Dairying Sectors have played prominent socio-economic role in India. Also reported by Sinha et al. (2010).

2. Methods and Materials

Under ICAR-IVRI Research Projects various experiments have been conducted on Cattle and Buffalo farm. There are more than 1100 animals on the C&B farm. Under animal nutrition Fodder farm and Feed plant are main source of green and dry feed, concentrate supply to these animals. A team of animal breeders, animal nutrition expert, reproduction scientists, medicine-surgery scientists and livestock production scientists and including one Agronomy Scientist work together under the Vridawani, Tharparkar cattle improvement and Murrah buffalo improvement net work project under ICAR-IVRI funded research projects. The projects are in

long term basis. During 2009-10 and 2011-12 major finding have been observed which may bring advancement in dairy farming and milk industry.

3. Result and Discussion

Advancement in Dairy farming Technology: The finding were observed in experimental C&B farm as are given below.

Herd Strength of Murrah Buffalo: Herd Management (Head on 01-04-2012): In all, 38 animals were deleted from the herd due to various reasons, whereas 54 animals were added due to new births. The new calvings were well distributed over all the months of year, except during April-May-2012 when no calving took place. The male-female ratio of new calvings was 1.00:0.83. The closing balance of the buffalo herd as on 31/03/2013 was 165 heads (127 females and 38 males).

Mortality Observations: The overall mortality was 3.45% (female-2.11%, male-6.56%). Mortality rate was found higher on private dairy farms (Bharti et al., 2013).

Conception Rate: Improved: Reproduction Health Management Effect: The conception rate was 60.42% (heifer-47.05%, adults-67.74%). The overall calving abnormalities were 22.64%, which included 3.77% abortions, 3.77% unseen abortions, 3.77% dystocia, 3.77% retention of placenta, 5.66% prolapse and 1.89% premature births and still births. The age at first calving service period, dry period and calving interval were 39.69 ± 2.82 months, 213.49 ± 26.37 days, 232.93 ± 21.36 days and 479.29 ± 22.88 days, respectively.

Herd Average Milk Yield Increased: Overall Management Effect: Buffaloes produced 82098 kg milk. Overall wet and herd averages were 5.66 and 3.59 kg, respectively. On an average, 62.92% of the total adult females were in milk. The total lactation milk yield, average lactation length, average 305 days' yield, and peak yield were 2249.40 ± 108.05 kg, 316.43 ± 08.41 days, 2242.31 ± 108.05 kg and 11.01 ± 0.34 kg, respectively, also reported by Vijay Kumar et al. (2011).

Milk Quality Improved: Feeding Management Effect: The milk analysis of 872 samples revealed fat, SNF and total solids per cent as 7.88, 9.81 and 17.75, respectively.

Advancement in Milk Production Technologies: It is observed that private dairy farms are aware of milk production technologies. The data gathered from survey indicates that dairy enterprise may be in profit if factors affecting animal milk yield performance and farm management factors are under control.

Private Dairy Farms Management: Bharti (2012) worked at Cattle and Buffalo farm.

A study on 70 private dairy farms of 14 blocks of Muzaffarnagar district of UP indicated that dairying is an economically viable activity with an average monthly net economic gain of Rs. 36,366/- per month with medium average herd size of 33 animals (13 cattle and 20 buffaloes: 7 milch cows and 10 milch buffaloes).

Family Economics Status of Dairy Farming: The farms were managed by individual owners with fair-good socio-economic status. Majority (77%) belonged to Hindus followed by Muslims (19%) and Sikhs (4%).

Housing Management at private Farms: The average plot size was 502 m² with good infrastructural facilities including paved brick floors, good sheds, cement brick walls, fencing, stores, chaff cutters etc. The longer axis of these sheds were oriented in N-S direction made up of RCC tin sheds with an average cost of 2.97 lakhs.

Shed Ventilation Man Power Engaged: The sheds were having adequate floor space, shed ventilation and natural lighting. The average man power engaged was 1-2.

Advancement in Feed and Fodder Technologies: The feeds and fodders were purchased from open market and the milk was sold to cooperatives/milkmen/open market. Hand milking was usually practiced.

No Adverse Effect of Weaning on Growth of Calves: Based on observations of Hanah (2009), that mortality rates are very high in suckling calves groups of Tharparkar and Murrah calves, weaning (at birth) experiment in Tharparkar calves was conducted and was successfully done with no adverse effect on growth of calves or mortality.

Tharparkar Cows With 4 BCS at Pre-Calving Stage Expressed Highest Peak Yield: Worked in dairy farm and findings were reported. Tharparkar cows with ≥ 4 BCS at pre calving stage expressed highest peak yield, calf birth weights and days to attain peak yield, while postpartum interval to estrus was lowest at pre-calving BCS of 3.5-4.0.

Body Conformation Traits Expressed Scope for Further Improvement: Most of the body conformation traits were of intermediate nature and of desirable type, except stature, body depth, angularity, central ligament, rear udder

height, udder depth, rear udder width and teat thickness, which expressed scope for further improvement. Similar findings by Vijay Kumar et al. (2010).

Phenotypic Correlation of Growth and Reproduction Traits With Milk Production Traits: The phenotypic correlations between body conformation and reproductive traits with milk production traits were weak and negative or positive. The phenotypic correlations of growth and reproductive traits with milk production traits were in desirable direction with low magnitude.



Photo 1. Pure Murrah buffalo breed at CBFarm and local Murrah dairy farm

Table 1. Dairy farm cattle and buffalo herd, milk yield (kg) performance during 2012-13

Breed (Cattle/Buffalo)	Herd/Head	Female Nos.	Conception %	Milk Yield (Kg)	Mean Wet (kg)	Mean Herd (kg)	Fat %	SNF %	Total Solid %
Vrindavani	358	312	53.80	475242	9.21	7.80	4.14	8.85	13.01
Tharparkar	98	83	48.35	28927	3.55	2.11	4.24	8.88	13.13
Murrah	150	118	60.42	82098	5.66	3.59	7.88	9.81	17.75

Table 2. Dairy farm cattle and buffalo herd milk yield (kg) performance during 2013-14

Breed (Cattle/Buffalo)	Herd/Head	Female Nos.	Conception %	Milk Yield (Kg)	Mean Wet (kg)	Mean Herd (kg)	Fat %	SNF %	Total Solid %
Vrindavani	384	340	54.60	52047	9.64	8.12	4.11	8.91	13.02
Tharparkar	129	103	59.25	34582	3.90	2.01	4.18	8.97	13.15
Murrah	165	127	54.13	97999	5.85	3.91	7.62	9.00	16.62

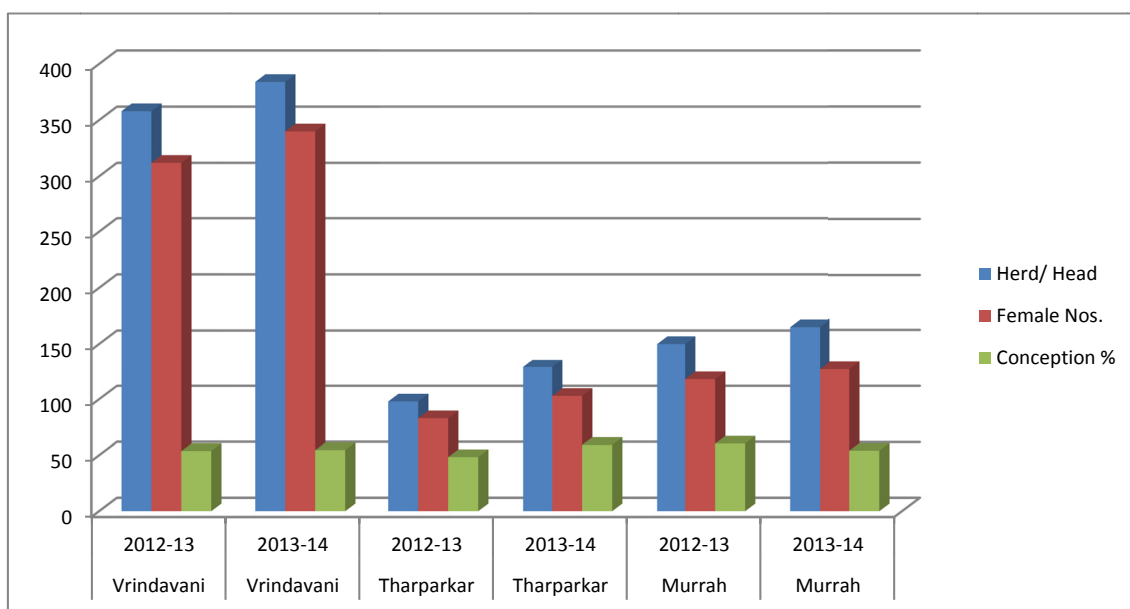


Figure 1. Herd (head) as on 01-04-2012 and 01-04-2013, females and conception % at CBF

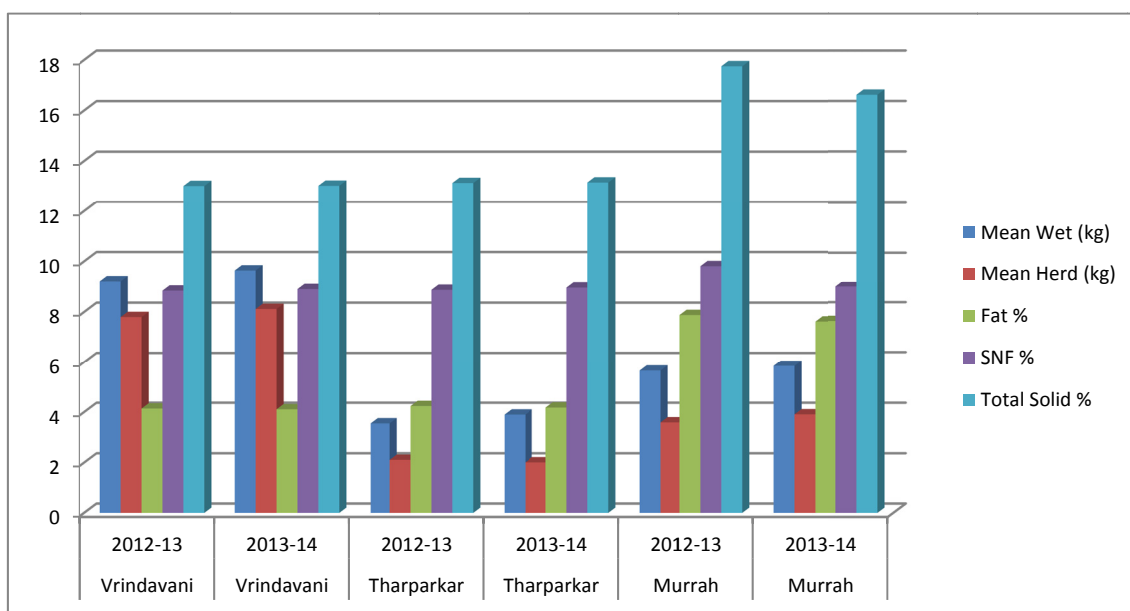


Figure 2. Overall mean wet milk yield (kg), herd mean milk (kg), fat%, SNF %, total solid %

Advances in Fodder and Feed Development Technologies: under dairy farming 60-70% expenditure comes on feed and fodder management. At institute there is advancement in green, dry and concentrate technologies as well. The fodder farm of the Institute comprises 330 acres (132 hectares) of cultivated fertile land. The farm is divided into 18 plots inter-connected with underground irrigation channels and concrete roads. The farm section produces high quality green fodder of high yielding varieties (HYVs) released under different fodder crops time to time. Sorghum eir (single and multi-cut), maize, cowpea, oat and berseem fodder crops are grown at the farm around the year. The green fodder supplied daily to the Institute's Cattle & Buffalo farms (LPM) and to more than 20 experimental animal sheds of various Divisions. The surplus green fodder is preserved at the farm in the form of "Hay" and "Silage" for its utilization during lean period. During last two years period following changes were observed. Same results were observed by Singh et al. (2013) (Table 3).

i. Fodder Production Advances (2012-13): Crops, Varieties and Crop Rotations:

Fodder Crops grown	Area covered (acres)	Fodder Produced (q.)
Green Fodder	-	-
Oat & Oat + Chinese Cabbage	103.0	13898.4
Berseem & Berseem + Chinese Cabbage	62.0	16484.8
Maize & Maize + Cowpea/Makchari	339.0	33659.0
Jowar & Jowar + Cowpea	57.0	9247.4
Makchari	6.0	1128.9
Cowpea	6.0	682.9
Total	573.0	75101.4
Dry Fodder	-	-
Oat Straw	110.0	888.0
Grand Total	683.0	75989.4

ii. Agronomic Advancement in Cropping Systems-Efficiency (2012-13):

Net Cultivated Area: 319.0 Acres;

Total Cropped Area: 683.0 Acres;

Cropping Intensity: 214.1%;

Average Green Fodder Supply (q/day): 205.75.

Seed Production and Revenue Generation: Low Cost Inputs: The farm has produced 696.50 quintals oat seed (kent variety) during 2012-13. The farm section has generated an amount of Rs. 16,83,110.00 (Rs. sixteen lakhs eighty three thousand one hundred ten only) through the sale of oat seed (616.50 quintals), green fodder and farm services rendered to the campus employees of the Institute during this period (AR, 2012, 13).

The farm has a small workshop to look after the repair and maintenance of farm machinery, tractors, tube-wells etc. Farm is equipped with 11 tractors, 09 deep irrigation tube-wells and adequate agricultural machineries. All the irrigation tube-wells are inter-connected by underground irrigation channels (Hume pipes) spread throughout the farm area for better application and utilization of available irrigation potential.

Seed Production: High Yielding Crops: Truthful Level Seeds (2012-13):

Name of Seed crop	Area (Acres)	Quantity (q.)	Sale of oat seed (q.)	Farm Sowing (q.)
Oat seeds	110	1050.0	980.0	70.0

Revenue Generation: The fodder farm has generated a revenue of Rs 8,56,900.0 (Rupees eight lakhs fifty six thousands nine hundred) through the sales of oat seeds and services rendered to the campus employees of the institute for the year 2010-11.

Revenue Generation (2012-13):

Sale of Oat Seed: 13,39,660.0;

Sale of Tender Forms: 2500.0;

Sale of green fodder to ELENCO Project: 1,62,878.0;

Services provided by the section: 9500.0;

Total Rs: 15,14,538.0.

Feed Technology and Area Specific Mineral Mixture: Health Management: The Feed Technology Unit prepares and supplies about 16,000 quintals of animal feed required for animals like cows and buffaloes, sheep and goats, pigs and laboratory animals used for research experiments in Izatnagar and Mukteshwar Campuses. The unit has automatic feed ingredient loading and lifting unit, grinding unit (Hammer mill), mixing unit, conveyor elevator unit, dust separation and collection unit, go-downs and office-cum-feed plant building, Singh Om et al. (2013) found same results.

4. Conclusion

The overall conception rate was 54.13%. The respective figures in heifer and adult groups were 57.14%. The least squares means (LSM) for overall live body weights at birth, 3, 6, 12, 18 and 24 months of age were 33.37 ± 0.72 , 70.98 ± 1.79 , 125.15 ± 3.06 , 247.27 ± 8.80 , 330.45 ± 7.97 and 409.69 ± 10.64 kg, respectively. Buffaloes produced 97999 kg milk. Overall wet and herd averages were 5.85 kg and 3.91 kg, respectively. Private dairy owners have learnt the skills of profitable dairy farm management. They can procure wheat straw farmers in lieu of dung in a crop season.

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