

Original Research Article

Production Performance of Cows and Buffaloes at the Gowshala, (Dairy Farm) Banaras Hindu University

Bhimraj Jakhar¹, R. K. Pandey¹, Dheeraj Kumar^{1*}, Tushar Rajendra Bhosale²,
Vishal Kumar¹ and Shilpa Kumari³

¹Department of Animal Husbandry and Dairying, Banaras Hindu University,
Varanasi-221005, Uttar Pradesh, India

²Department of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth,
Rahuri- 413722, Maharashtra, India

³Senior Research Fellow, DEE, Jodhpur, Rajasthan, India

**Corresponding author*

ABSTRACT

Keywords

Crossbreed, milk
yield and
crossbreed cows

The secondary data were collected from the year 2012 to 2017 in farm inventory of dairy farm Banaras Hindu University. The study revealed that the farm crossbreed cows was contribute highest in milk production in the year 2012 to 2017 and the highest average milk production per animal per day and lowest was by Haryana cows.

Introduction

India is predominantly an agriculture country with about for over 70 percent of rural Indian households, agriculture, including livestock, still remains the principal source of livelihood (FAO). Livestock is an integral part of the Agriculture production system in India and plays an important role in the national economy as well as in the socio-economic development of millions of rural households. Livestock is an important source of farm animal protein for farm families through the consumption of milk, dairy products, eggs, and meat. In addition to their use as a source of food, livestock is also used for draught power in Agriculture and transport and their dung is used to help enrich soil fertility. Sales of livestock and livestock products make up a considerable proportion

of the rural farmer's cash income. Mainly contribution in milk production is done by Cattle, Buffalo and Goat. The analysis shows nearly 36 percent of the milk production is contributed by Indigenous Buffaloes followed by 26 percent by crossbred cattle.

The Indigenous cattle contribute 12 percent of the total milk production in the country whereas nondescript cattle contribute 9 percent milk production and non-descript buffaloes contribute 13 percent milk production.

Under normal situations, milk production increases during the first six weeks of lactation and then gradually decreases. The actual amount of milk produced during the lactation Period is affected by several factors eg. Breed, age, dry period and climate etc.

Materials and Methods

Characteristics and Ownership of Concerned Dairy

The Dairy Farm, Institute of Agriculture Science, Banaras Hindu University, is a research and educational farms where various categories of animals are kept. The herd maintained in a line so that they provide a much relevant idea about the dairy farming to the student about feeding, breeding, and other managerial practices that how dairy units could run under the scientific condition to get maximum output.

Management Practice at the Concerned Unit

Considering the role of routine management practices in influencing production and thus accuracy of observations, it was considered worthwhile to state at least the salient management practices carried out daily at the dairy for the upkeep of animals and at the meteorological observatory for taking and recording of observations during the period covered under this study.

Routine management practice at Dairy farm

Feeding

All animals were maintained under identical conditions. Rations were given to the cows according to their body weight and milk production. While the roughages were given adlib, the concentrates were given in regulated doses according to a ration schedule. Concentrate mixture contains 16-18 percent DCP and 75-78 percent TDN and was either procured from compound feed manufacturing companies but during the period under reference they were prepared out of the ingredient procured on the open

market. This mixture usually contained Linseed/ground nut/ rapeseed cake(s), ground barley, arhar or gram chuni and wheat or Rice bran mixed in the ratio of; oil cakes 40 percent chunies 25 percent, brans 25 percent and 10 percent molasses. Amongst dry roughages wheat bhusa constitutes the major share of fodder throughout the year. Green forage supplies are rather erratic. Only a limited quantity of any one of the other green forage, depending on its availability, is made available. This too varies from season to season. While during summers and the rainy season the management makes efforts to raise Napier grass. Jawar Chari, N.P. Chari, green maize and cowpea, during the winters berseem and oats predominate constituting the bulk of green forage. Besides, the animals are provided with liberal quantities of common salt and trace mineral mixtures as per recommendations. Most of the ration is provided to the animals through stall feeding. The animals however, one allowed grazing on scanty grass covers during monsoon and thereafter. The places of a called grazing are not any defined grazing grounds but mostly comprise campus playfields or roadsides where they hardly nibble vegetal cover except during the rainy season when the grass is more abundant and luxuriant. All efforts are being made by the management to provide the animals with balanced feeds. Non- abundance and no sustained supply of greens is a big bottleneck. Adequate supply of fresh, cool drinking water is available to the animals ad libitum with access at all times throughout the year.

Housing system followed

Housing system of dairy animals at the Banaras Hindu University is somewhat improved and scientifically planned. The sheds are covered by an asbestos sheet on both the sides with central rafts with half walls all round. At the dairy farm, Institute of

Agriculture Sciences, Banaras Hindu University, however, scant facilities i.e. fans, cooler etc. do exist.

Paddock and Grazing

The dairy farm building, which has taken under the study by the author, had brick wall paddocks for animals to move freely thereby getting the needful exercise to maintain their health.

Further, it was observed that most of the animals of this dairy allowed for grazing but not in the pasture which was found to be almost non-existent.

A major part of the ration is being provided at the stalls. The cows and buffaloes were mostly seen grazing by the roadside, where they could nibble scratchily grassed excepts during the monsoon season when access to green luxuriant grasses was ample. The cows and buffaloes especially those in milk were given balanced feed at most the farms including common salts.

Milking Method

Milking at the Dairy Farm, Institute of Agricultural Sciences, Banaras Hindu University, was seen to be carried out twice a day i.e. morning and evening. Before milking the milkers usually cleaned and disinfected their hands thoroughly using KMnO₄ solution kept in the milking parlour.

Regarding the milking methods, mostly two methods were observed (a) Knuckling and (b) Fisting. Full hand milking considered as the most scientific method is seldom followed. Besides the aforesaid method of hand milking at the Dairy Farm, Institute of Agricultural Sciences, Banaras Hindu University a part of the milking is done through a portable machine.

Maintenance of Various Records

All the cows and buffaloes at the dairy had their identification marks viz. the brand numbers of which were used for purpose of keeping records pertaining to these. Milk yield from each time first in the daily milk sheet and then entered in the milk record register against the brand number of cow/buffalo and total of the day's milk yield from cows buffaloes were computed and entered from the aforesaid record. After milking and recording both during morning and evening the milk is supplied to campus customers; whereas can supply is made by milkers against coupon system at the BHU campus. It is obvious that the system of management followed at the dairy were standard based on scientific pattern.

Collection of Data

The data were collected are based on the authentic records maintained at the Gowshala, (Dairy Farm), Institute of Agriculture Science, Banaras Hindu University. The month-wise data were collected comprised of various parameters viz. monthly dairy herd statistics, quantity and quality of feeds and their cost, type of concentrate mixture including their brand name with cost, labour development practices and their remuneration, milk performance and the total milk production during investigation some information were also recorded with regards to the management practice followed at the dairy equipments, rearing and calves, grazing and paddock facilities method of breeding. The data were collected by manual by a direct visit to the farm.

Analysis of data

The data were analysed using the statistical methods and mathematical operation.

Results and Discussion

Production performance of lactating cows at Gowshala, (Dairy farm)

The data of milk production, feeding cost, labour cost and income of farm from the different source were collected from dairy farm according to year and month wise of different breeds of cattle and buffalo. The milk production data were collected from the year 2012 to 2017. The milk production of a dairy farm is recorded per day in the morning 5 A.M. and in the evening 5 P.M., The milk production in 2012 to 2017 were 238449, 213159, 228199, 250589, 216725 and 191622 liters respectively which contributed by different breeds of cattle and buffalo.

Milk Production during the year 2012

Appendix 1: shows the milk production of cattle and buffalo during the year 2012. The total milk production of different breeds of cattle and buffalo *viz.* Sahiwal, Haryana and crossbreed and Murrah buffalo produce 11767, 13292, 209950 and 3440 liters respectively the highest milk production is contributed by crossbreed and lowest by Murrah buffalo. The average milk production per day per animal was highest of crossbreed cows was 9.96 liters and lowest by Haryana breed was 6.04 liters because of their genetics characters. The average milk production per day per animal of different breeds *viz.* Sahiwal, Haryana, crossbreed, and Murrah in different months were different sahiwal produce highest average milk production in the month of January was 8.63 liter and lowest in the month of July was 5.45 liter, Haryana breed produce highest average milk production in the month of November was 7.80 liter and the lowest in the month of May was 4.35 liter, crossbreed produce highest average milk in the month of January was

12.41 liter and lowest in the month of May was 8.72 liter, Murrah produce the highest milk in the month of December was 8.77 liter and lowest in the month of March was 6.69 liter.

The appendix 1: shows that is in the month of high temperature and management factor and availability of feeds all breeds of cattle and buffalo produce low milk per day.

Milk Production during the year 2013

Appendix 2: shows the milk production of cattle and buffalo during the year 2013 the total milk production of different breeds of cattle and buffalo *viz.* Sahiwal, Haryana and crossbreed and Murrah buffalo produce 13082, 10658, 178663 and 10756 liters respectively the highest milk production was contributed by crossbreed and lowest by Haryana breeds. The average milk production per day per animal was highest of crossbreed cows was 8.99 liters and lowest by Haryana breed is 5.39 because of their genetics characters. The average milk production per day per animal of different breeds *viz.* Sahiwal, Haryana, crossbreed, and Murrah in different months are different sahiwal produce highest average milk production in the month of August was 6.36 liter and lowest in the month of June was 4.28 liter, Haryana produce highest average milk production in the month of December was 6.62 liter and the lowest in the month of May was 2.98 liter, crossbreed produce highest average milk in the month of November was 10.41 liter and lowest in the month of July was 8.53 liter, Murrah produce the highest milk in the month of January was 10.38 liter and lowest in the month of May was 4.58 liter.

The appendix 2: shows that are in the month of high temperature all breeds of cattle and buffalo produce low milk per day.

Table.1 Milk Production during the year 2012

ANOVA

Sourceof Variation	DF	SS	Mean Square	F Value	Table Value
Breed	3	163.93			
Month	11	85.59	7.78	2.39*	3.58
Error	33	107.39	3.25		
Total	47	356.92			

Note: * Highly significant at 5% level of significance.

Table.2 Milk Production during the year 2013

ANOVA

Source of Variation	DF	SS	Mean Square	F Value	Table Value
Breed	3	105.19			
Month	11	17.87	1.62	1.80*	3.58
Error	33	29.70	0.90		
Total	47	152.77			

Note: * Highly significant at 5% level of significance.

Table.3 Milk Production during the year 2014

ANOVA

Source of Variation	DF	SS	Mean Square	F Value	Table Value
Breed	3	53.71			
Month	11	43.26	3.93	2.57*	3.58
Error	33	50.49	1.53		
Total	47	147.47			

Note: *Highly significant at 5% level of significance.

Table.4 Milk Production during the year 2015

ANOVA

Sourceof Variation	DF	SS	Mean Square	F Value	Table Value
Breed	3	73.06			
Month	11	31.08	2.82	0.77*	3.58
Error	33	120.41	3.64		
Total	47	224.55			

Note: *Highly significant at 5% level of significance.

Table.5 Milk Production during the year 2016

					ANOVA
Source of Variation	DF	SS	Mean Square	F Value	Table Value
Breed	3	136.54			
Month	11	20.61	1.87	0.47*	3.58
Error	33	130.99	3.96		
Total	47	288.14			

*Highly significant at 5% level of significance.

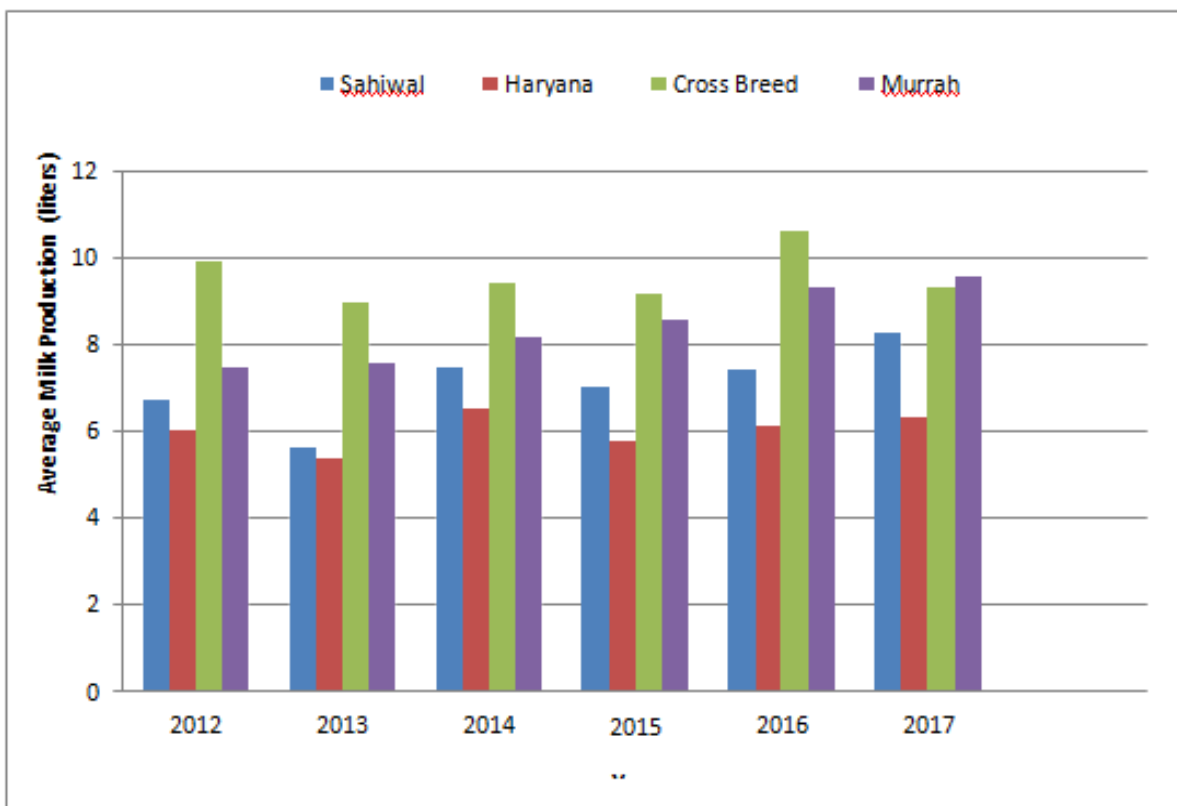
Table.6 Milk Production during the year 2017

					ANOVA
Source of Variation	DF	SS	Mean Square	F Value	Table Value
Breed	3	77.57			
Month	11	54.55	4.96	3.66**	6.21
Error	33	44.71	1.35		
Total	47	176.84			

Note: *Highly significant at 5% level of significance.

** Highly significant at 1% level of significance.

Fig.1 Average Milk Production of different Breeds of Cattle and Buffalo.

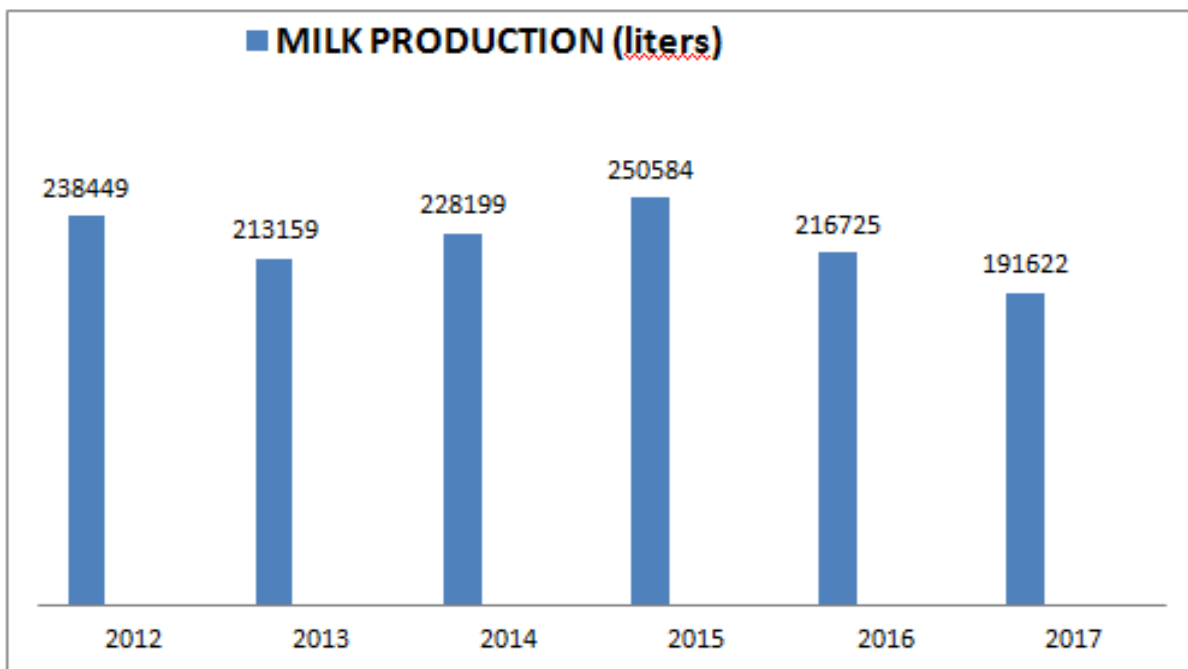


The graph shows the average milk production of different breeds of cattle and buffalo in different year. The highest average milk production was crossbred cows and lowest average milk production was Haryana breeds.

Table.7 Total milk production of different breeds during the year 2012 to 2017

Year	Cattle			Buffalo
	Sahiwal	Haryana	Crossbreed	Murrah
2012	11767	13292	209950	3440
2013	13082	10658	178663	10756
2014	13988	12721	193411	8079
2015	13146	10772	219900	6771
2016	11611	13177	185900	6037
2017	12224	13895	155200	10303

Fig.2 Milk Production in different years



The graph shows the highest milk production in the year 2015 and lowest in the year 2017 at Dairy farm, Institute of Agriculture Sciences, Banaras Hindu University, Varanasi.

Milk Production during the year 2014

Appendix 3: shows the milk production of cattle and buffalo during the year 2014 the total milk production of different breeds of cattle and buffalo viz. Sahiwal, Haryana and crossbreed and Murrah buffalo produce 13988, 12721, 193411 and 8079 liters respectively the highest milk production was contributed by crossbreed and lowest by Murrah buffalo. The average milk production per day per animal was highest of crossbreed

cows was 9.44 liters and lowest by Haryana breed was 6.54 because of their genetics characters. The average milk production per day per animal of different breeds viz. Sahiwal, Haryana, crossbreed, and Murrah in different months are different sahiwal produce highest average milk production in the month of October was 9.67 liters and lowest in the month of June was 6.11 liter, Haryana produce highest average milk production in the month of July was 7.49 liter and the lowest in the month of May was 3.68

liter, crossbreed produce highest average milk in the month of November was 10.32 liter and lowest in the month of March was 8.83 liter, Murrah produce the highest milk in the month of December was 12.25 liter and lowest in the month of July was 4.9 liter. The appendix 3: shows that are in the month of high temperature all breeds of cattle and buffalo produce low milk per day.

Milk Production during the year 2015

Appendix 4: shows the milk production of cattle and buffalo during the year 2015 the total milk production of different breeds of cattle and buffalo *viz.* Sahiwal, Haryana and crossbreed and Murrah buffalo produce 13146, 10772, 219900 and 6771 liters respectively the highest milk production was contributed by crossbreed and lowest by Murrah buffalo. The average milk production per day per animal was highest of crossbreed cows was 9.18 liters and lowest by Haryana breed was 5.80 because of their genetics characters. The average milk production per day per animal of different breeds *viz.* Sahiwal, Haryana, crossbreed, and Murrah in different months are different sahiwal produce highest average milk production in the month of December was 8.06 liters and lowest in the month of April was 8.06 liter, Haryana produce highest average milk production in the month of November was 7.08 liter and the lowest in the month of March was 4.48 liter, crossbreed produce highest average milk in the month of October was 10.37 liter and lowest in the month of March was 8.17 liter, Murrah produce the highest milk in the month of September was 11.7 liter and lowest in the month of June was 4.16 liter.

Milk Production during the year 2016

Appendix 5: shows the milk production of cattle and buffalo during the year 2016 the

total milk production of different breeds of cattle and buffalo *viz.* Sahiwal, Haryana and crossbreed and Murrah buffalo produce 11611, 13177, 185900 and 6037 liters respectively the highest milk production was contributed by crossbreed and lowest by Murrah buffalo. The average milk production per day per animal was highest of crossbreed cows was 10.62 liters and lowest by Haryana breed was 6.17 because of their genetics characters. The average milk production per day per animal of different breeds *viz.* Sahiwal, Haryana, crossbreed, and Murrah in different months are different sahiwal produce highest average milk production in the month of February was 10 liters and lowest in the month of May was 5.09 liter, Haryana produce highest average milk production in the month of April was 7.08 liter and the lowest in the month of June was 5.0 liter, crossbreed produce highest average milk in the month of August was 12.31 liter and lowest in the month of May was 9.0 liter, Murrah produce the highest milk in the month of December was 12.49 liter and lowest in the month of January was 4.12 liter. The appendix 5 shows that are in the month of high temperature all breeds of cattle and buffalo produce low milk per day.

Milk Production during the year 2017

Appendix 6: Shows the milk production of cattle and buffalo during the year 2017 the total milk production of different breeds of cattle and buffalo *viz.* Sahiwal, Haryana and crossbreed and Murrah buffalo produce 12224, 13895, 155200 and 10303 liters respectively the highest milk production was contributed by crossbreed and lowest by Murrah buffalo. The average milk production per day per animal was highest of Murrah buffalo was 9.58 liters and lowest by Haryana breed was 6.35 liters because of their genetics characters. The average milk production per day per animal of different breeds *viz.*

Sahiwal, Haryana, crossbreed, and Murrah in different months are different Sahiwal produce highest average milk production in the month of April was 9.67 liters and lowest in the month of May was 6.21 liter, Haryana produce highest average milk production in the month of October was 7.41 liter and the lowest in the month of March was 4.83 liter, crossbreed produce highest average milk in the month of January was 10.68 liter and lowest in the month of May was 6.79 liter, Murrah produce the highest milk in the month of September was 12.11 liter and lowest in the month of May was 3.22 liter. The appendix shows that are in the month of high temperature all breeds of cattle and buffalo produce low milk per day.

The findings from this study the farm milk production was highest in the year 2015 and lowest in the year 2017. Because in the year 2015 highest milking animal in the year. At the farm crossbreed cows was contribute highest in milk production in the year 2012 to 2017 and the highest average milk production per animal per day also. The highest average milk production per day per animal of sahiwal in the year 2017 and lowest in the year 2013 and highest average milk production per day per animal of Haryana breed is highest in the year 2017 and lowest in the year 2013. Highest average milk production per animal per day per animal of Crossbreed cows in the year 2016 and lowest in the year 2013. Murrah breed of buffalo produce highest average milk production per

animal per day in the year 2017 and lowest in the year 2012.

References

- Annual Report 2016-17. Department of Animal Husbandry, Dairying & Fisheries Ministry of Agriculture & Farmers Welfare Government of India.
- Basic animal husbandry and fisheries and statistics 2017 Government of India Ministry of Agriculture Department of Animal Husbandry, Dairying & Fisheries Krishi Bhawan.
- International Journal of Science, Environment ISSN 2278-3687 (O) and Technology, Vol. 5, No 3, 2016, 956 – 965 scenario of livestock and poultry in India and their contribution to national economy.
- Gangasagare, P. T. and L. M. Karanjkar (2009) Status of Milk Production and Economic profile of dairy farmers in the Marathwada region of Maharashtra. Indian journal of Dairy Science, 42(12),508-518.
- Yoshiaki Hayashi, Keshav Lal Maharajan and Hajime Kumagai (2006) Feeding Traits, Nutritional Status and Milk Production of Dairy Cattle and buffalo in Small-scale Farms in Terai, Nepal. Asian-Aust. Journal of Animal Science, Vol-19, No. 2: 189-197