

*Original Research***Influence of Season on Quality of Cow Milk of Organized and Unorganized Dairy Farms of Allahabad, Uttar Pradesh****Deepak Kumar Verma* , Ram Pal Singh and Neeraj**

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Abstract

The present study was undertaken on “Influence of season on quality of cow milk produced of organized & unorganized dairy farms of Allahabad” on healthy cows 20 (H.F Crosses) each from organized (SHIATS) & unorganized (Kushwaha) dairy farm Allahabad. All cows were housed in tail to tail barn under similar management conditions. All sanitary precautions were undertaken to produce clean milk by dry full hand method of milking. Representative samples of 200 ml milk were collected in different season's viz. summer, rainy and winter season. Samples of fresh milk drawn from the udder were analyzed for fat, protein, lactose, ash, solid not fat (SNF), total solid (T.S.), water, acidity percent and sp.gr. It was summed up that the season had significant effect on Fat, Lactose, Ash, TS, Sp.gr, Acidity and the percentage of water at scientific (organized) dairy farm and non-significant effect on Protein and SNF. Similarly season has a significant effect on Fat, Ash, Specific gravity and Acidity percentage at Un-organized dairy farm and non-significant effect on SNF, Protein, Lactose, T.S, and Water.

Key words: H.F. Crosses, Milk Quality, Season of Milk

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Introduction

Milk and its products are excellent source of vital nutrients. It is described as nature's nearly perfect food. Milk proteins offer a high quality animal protein in diet. Milk fat fractions are now being recognized to possess interesting anti cancer properties. Minerals and vitamins contents of milk contribute significantly to human nutrition. Calcium is needed for protection against brittle bones in the latter part of life. It is now considered to play a vital role in controlling blood pressure in protecting colon from cancer. Milk and milk products from dairy animals are palatable and easy to digest therefore important human food. Milk, according to the prevention of food adulteration (PFA) rules, is the normal mammary secretion derived from the complete milking of a healthy milch animal without either addition there to or extraction

there from. Free from colostrums, contains all the nutrients essential for growth i.e. water, fat, proteins, lactose, minerals vitamins and ash and has been recognized as a vegetarian food since ancient times and all Indians consume milk and milk products without reticence. It is especially beneficial for young ones as it contains nutrients for growth and development particularly a sufficient concentration of quality protein, mineral and vitamins. Especially vitamin A, riboflavin and vitamin B12 are also the richest natural source of calcium in the best available form (Pathak, 2003).

Materials and Methods

The present experiment entitled “Influence of season on quality of cow milk of organized (SHIATS) and unorganized (KUSHWAHA) dairy farms of Allahabad was carried out. The period of experiment was of one year from (July 2013 to June 2014). The cows at organized & unorganized dairy farms were subjected to Californian mastitis test and 20 cows (HF Crosses) from each organized & unorganized dairy farm with negative test were selected for the study. All experimental animals were housed in a tail to tail barn and managed under more or less similar managemental conditions. Sanitary precautions like clipping of long hair at udder and flank, grooming, washing of hind quarters, wiping udder with towel soaked in 2% Dettol solution, tying tail with legs etc. were taken care prior to collection of milk samples. Cows were milked by full and dry hand method of milking. Two streams of fore milk from each quarter of udder were discarded and a sample of 200 ml milk was collected directly into sterilized conical flasks and plugged immediately. Milk sample were brought to laboratory for chemical analysis and the fat, protein, lactose, water, ash, solid not fat (SNF), total solid (TS), Sp. gr. and acidity percent was determined as per AOAC (1995).

Factor for Study

Season of Milk

- a) Winter season (Nov-Feb)
- b) Summer season (March-June)
- c) Rainy season (July-Oct)

Parameters of Study

Parameters determined in milk were as follows-

- a) Fat percent
- b) Protein percent
- c) Lactose percent
- d) Ash percent
- e) Solid not fat(SNF) percent
- f) Total solid(TS) percent
- g) Water percent
- h) Acidity percent
- i) Specific gravity (sp. gr.) percent

Results and Discussion

Fat Percent in Milk at Organized & Unorganized Dairy Farms

The highest mean fat percent was recorded as 3.83 in milk of winter season followed by 3.68 in summer milk and 3.64 in rainy season milk at organized dairy farm .The highest mean fat 3.29 was recorded in milk of winter season followed by 3.20 in milk of summer season and 3.09 in milk of rainy season at unorganized dairy farm. The highest fat percent 3.83 and 3.29 was recorded at both organized and unorganized dairy farm fallowed by 3.68 and 3.20 in summer, 3.64 and 3.09 in rainy season respectively. The differences in these were significant at both dairy farms. Similar results were also reported by Yadav *et al.* (1989) and Prasad (2009).

Protein Percent in Milk at Organized & Unorganized Dairy Farms

The highest mean fat percent was recorded as 3.40 in milk of summer season followed by 3.38 winter season milk and 3.37 in rainy season milk at organized dairy farm .The highest mean fat 3.29 was recorded in milk of rainy season followed by 3.27 in milk of summer season and 3.09 in milk of rainy season at unorganized dairy farm. The highest protein percent 3.40 and 3.29 was recorded in summer and rainy season milk at organized at unorganized dairy farm fallowed by 3.38 in winter season at organized and 3.27 in summer season milk at unorganized dairy farm, 3.37 in rainy season at organized and 3.24 in winter season at unorganized dairy farm respectively. The differences in these were non-significant at both dairy farms.

Lactose Percent in Milk at Organized & Unorganized Dairy Farms

The highest mean lactose percent was recorded as 4.77 in milk of cows of winter season followed by 4.76 in milk of cows in summer season and 4.72 in milk of cows in rainy season at organized dairy farm .The highest mean of 4.65 in milk of winter season followed by 4.64 in milk of cows of summer season and 4.63 in milk of cows in rainy season at unorganized dairy farm. The highest lactose percent 4.77 and 4.65 was recorded in winter season milk at both organized at unorganized dairy farm fallowed by 4.76 in summer season at organized and 4.64 in summer season milk at unorganized dairy farm, 4.72 in rainy season at organized and 4.63 in rainy season at unorganized dairy farm respectively. The differences in these were significant at organized and non significant at unorganized dairy farms. Similar results were also reported by BernadinB. (1972).

Ash Percent in Milk at Organized & Unorganized Dairy Farms

The highest mean ash percent was recorded as 0.69 in milk of cows of winter season followed by 0.68 in milk of cows in summer season and 0.67 in milk of cows in rainy season at organized dairy farm. The highest mean of 0.673 in milk of winter season followed by 0.66 in milk of cows of summer season and

0.654 in milk of cows in rainy season at unorganized dairy farms. The highest Ash percent 0.69 and 0.673 was recorded in winter season at both organized and unorganized dairy farm followed by 0.68 and 0.66 in summer, 0.67 and 0.654 in rainy season respectively. The differences in these were significant at both dairy farms.

T.S Percent in Milk at Organized & Unorganized Dairy Farms

The highest mean T.S percent was recorded as 12.67 in milk of cows of winter season followed by 12.52 in milk of cows in summer season and 12.41 in milk of cows in rainy season at organized dairy farm. The highest mean 11.85 in milk of winter season followed by 11.77 in milk of summer season and 11.67 in milk of rainy season at unorganized dairy farm. The highest T.S. percent 12.67 and 11.85 was recorded in winter season at both organized and unorganized dairy farm followed by 12.52 and 11.77 in summer, 12.41 and 11.67 in rainy season respectively, The differences in these were significant at organized and non significant at unorganized dairy farms. Similar result was also reported by Sharma *et al.* (2001).

S.N.F. Percent in Milk at Organized & Unorganized Dairy Farms

The highest mean S.N.F percent was recorded as 8.84 in milk of cows of winter seasons followed by 8.84 in milk of cows in summer seasons and 8.78 in milk of cows in rainy seasons at organized dairy farm. The highest mean 8.58 in milk of rainy seasons followed by 8.57 in milk of cows of summer seasons and 8.56 in milk of cows in rainy seasons at unorganized dairy farms. The highest S.N.F percent 8.84 and 8.58 was recorded in winter season milk at organized and rainy season milk at unorganized dairy farm followed by 8.84 in summer season at organized and 8.57 in summer season milk at unorganized dairy farm, 8.78 in rainy season at organized and 8.56 in rainy season at unorganized dairy farm respectively. The differences in these values were non-significant at both organized and unorganized dairy farms.

Water Percent in Milk at Organized & Unorganized Dairy Farms

The highest mean water percent was recorded as 87.59 in milk of cows of rainy season followed by 87.48 in milk of summer season and 87.33 in milk of cows in winter season at organized dairy farm. The highest mean 88.33 in milk of rainy season followed by 88.23 in milk of summer season and 88.15 in milk of cows in winter season at unorganized dairy farm. The highest water percent 87.59 and 88.33 was recorded in rainy season at both organized and unorganized dairy farm followed by 87.48 and 88.23 in summer, 87.33 and 88.15 in winter season respectively. The differences in these were significant at organized and non significant at unorganized dairy farm.

Acidity Percent in Milk at Organized & Unorganized Dairy Farms

The highest mean acidity percent was recorded as 0.174 in milk of cows of rainy season followed by 0.169 in milk of cows in summer season and 0.133 in milk of cows in winter season at organized dairy farm. The highest 0.185 in milk of summer season followed by 0.164 in milk of cows of rainy season and 0.157 in milk of cows in winter season at unorganized dairy farms. The highest S.N.F percent 0.174 and 0.185 was recorded in winter season milk at organized and rainy season milk at unorganized dairy farm followed by 0.169 in summer season at organized and 0.164 in rainy season milk at unorganized dairy farm, 0.133 in winter season at organized and 0.157 in winter season at unorganized dairy farm respectively, The differences in these were significant at both dairy farms.

Specific Gravity in Milk at Organized & Unorganized Dairy Farms

Highest mean specific gravity was recorded as 1.030 in milk of cows of winter seasons followed by 1.029 in milk of cows in summer seasons and 1.028 in milk of cows in rainy seasons at organized dairy farms. The highest mean 1.029 in milk of winter seasons followed by 1.028 in milk of cows of summer seasons and 1.027 in milk of cows in rainy seasons at unorganized dairy farms. The highest specific gravity 1.030 and 1.029 was recorded in winter season at both organized and unorganized dairy farm followed by 1.029 and 1.028 in summer, 1.028 and 1.027 in rainy season respectively. The differences in these values were significant at both organized and unorganized dairy farms.

Table 1: Mean values of parameters in milk in different seasons at organized and unorganized dairy farms

Parameters	Organized Dairy Farms					Unorganized Dairy Farms				
	Summer	Rainy	Winter	Results	Over all value	Summer	Rainy	Winter	Results	Over all value
Chemical										
Fat percent	3.68	3.64	3.83	S	3.72	3.2	3.09	3.29	S	3.2
Protein percent	3.4	3.37	3.38	NS	3.38	3.27	3.29	3.24	NS	3.26
Lactose percent	4.76	4.72	4.77	S	4.75	4.64	4.63	4.65	NS	4.64
Ash percent	0.68	0.67	0.69	S	0.68	0.66	0.65	0.67	S	0.66
TS percent	12.52	12.41	12.67	S	12.55	11.77	11.67	11.85	NS	11.76
SNF percent	8.84	8.78	8.84	NS	8.82	8.57	8.58	8.56	NS	8.57
Water percent	87.48	87.59	87.33	S	87.46	88.23	88.33	88.15	NS	88.23
Others										
Sp. gr.	1.029	1.028	1.03	S	1.029	1.028	1.027	1.029	S	1.028
Acidity percent	0.169	0.174	0.133	S	0.158	0.185	0.164	0.157	S	0.168

Conclusion

The makeup quality of crossbred cow's milk was better at scientific (organized) dairy farm compared to unorganized dairy farm. It was summed up that the season had significant effect on fat, lactose, ash, TS, Sp.gr, acidity and the percentage of water at scientific (organized) dairy farm and non-significant effect

on protein and SNF. Similarly season has a significant effect on fat, ash, specific gravity and acidity percentage at un-organized dairy farm and non-significant effect on SNF, protein, lactose, T.S and water. Hence, to improve the compositional quality of milk, awareness at unorganized dairy farms is needed with regard to scientific feeding and management practices as per season, age and live weight of animals to make a dairy business profitable.

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