



RESEARCH PAPER

The chemical properties of murrah, jaffarabadi, surti and marathwadi buffalo milk under Satna region

U.K. Shukla* and Rashmi Mishra

Department of N.R.M., Faculty of Agriculture, Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot, Satna, (M.P.) India

Abstract : The present work was under taken to know the chemical properties of Murrah, Jaffarabadi, surti and Marathwadi buffalo milk under Satna region. In all 40 milk buffaloes were selected for collection of milk samples. The buffaloes were selected from Bhalla Dairy Farm Satna, work place of the study is Livestock Production and Management (Unit), Department of Natural resource management (NRM), Faculty of Agriculture, Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot – Satna (Madhya Pradesh). The individual animals was milked completely in milking pail carefully till last strips. Then milk was mixed well and after mixing samples were taken in sample bottles. As soon as samples collected, they were transferred to the laboratory of Department of NRM and kept in refrigerator till analysis is over. All tests were conducted within 5 to 6 hours. Samples were collected from month of March to May 2022. In all three samples from 10 selected Marathwadi buffalo breed. It is concluded that the physical properties of Marathwadi, Murrah, Jaffarabadi and Surti buffalo milk not differ significantly under the condition of Marathwada region in respect of it's breed averages.

Key Words : Chemical properties, Different buffalo breeds

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INTRODUCTION

Buffalo milk is also one of the richest milks from a compositional point of view, particularly; fat which constitutes the main buffalo milk solids and is responsible for its high energy and nutritive value (A.O.A.C. 1995).

The buffalo represents a fundamental and irreplaceable resource for tropical countries. The increase in the number of buffalo heads is mainly due to the increase of River buffaloes (50 n), utilized for milk and meat production, while the Swamp buffaloes (48 n),

mainly used as draught animal power, has decreased by 26.69% (Cruz, 2007). especially in South-Eastern Asia. The Swamp buffalo in many countries is crossbred with the river type, due to an increase in milk demand. In fact, it is true that the dairy cow is not always able to totally exploit its genetic merit for many months in the tropical areas, due to the high temperatures and high humidity rate. On the contrary, under the same conditions, the River buffalo can still support an optimal production, although, it retains a sensitivity to such environmental conditions. In fact, if nutritive requirements are satisfied,

buffaloes are characterized by similar milk productions in both tropical and temperate areas, In the last years, world's buffalo milk percentage has increased from 5 to 14.8%, but such values can bounce from 8.3 to 21.6%, when we consider that buffalo milk is 58% higher in energy than its cattle counterpart (Misra, 2007).

Dairy buffalo rearing is one of the most important occupations. It contributes more than 50% of the total milk production in India. Murrah buffalo cow is the finest breed of milk producing buffalo. Introduction of high yielding breed like Murrah buffalo in milk deficient state can bridge the gap of milk requirement in India. There is a huge gap in their rearing or managerial practices, production and reproduction performances and efficient/economical output of their produce in different parts of India. Agro-climatic condition of the regions affects the production and reproduction performances of dairy animals such as the finest breed, Murrah Buffalo. Performance traits like 305- days, peak milk yield, lactation length, dry period, birth weight, calf mortality rate, age at first calving, service period, calving interval, number of services per conception and conception rate of Murrah buffalo were reported as 2147.6 ± 87.06 kg (Pawar, 2012).

Jaffarabadi buffaloes are good milkers and thrive well on natural grazing. These buffaloes characteristically differ from other breeds mainly in terms of production, with good genetic potential to produce more in terms of kilo fat. They are very efficient in the conversion of roughages into milk with a high butter fat content. Males are good draught animals for hauling Beats loads, (Basu, 1985).

The Surti is one of the well-defined buffalo breeds of India. The home tract of this breed is Central and South-Western part of Gujarat state. The breed is generally found in the Middle Gujarat, the South Gujarat medium rain fall and the South Gujarat heavy rain fall agro-climatic zones of Gujarat state. The breed is known for its sickle shaped horns. The animals of this breed are of medium size. Estimation of genetic parameters is important for elucidating the genetic basis of the trait. Detailed genetic analysis of body weight traits in Surti buffalo maintained on an organized farm help us in identifying various factors affecting the growth of animals. Estimation of genetic parameters for various body weight traits also helps the breeder in identification of various selection criteria and the planning of breeding programmes for genetic improvement in Surti buffalo

for growth and indirectly for production traits also. As limited information is available on the growth performance of Surti animals on organized farms, the present study was planned with the objective to carry out genetic analysis of birth weight and body weight at different ages up to 12 months and various genetic and non-genetic factors affecting it, (Krishnamoorthy, 1979).

Marathwadi buffaloes constitute a major section of buffalo breeds of Marathwada region of the State of Maharashtra. A sizable buffalo population in Parbhani, Jalna, Beed, Osmanabad, Latur, Nanded and some parts of Buldhana and Akola districts of Vidarbha contribute significantly to the farmers economy. It has not been recognized as a distinct breed and is considered as a local buffalo (Gavaran) in its home tract. In this paper, an attempt has been made to know and establish the legal standards for some physico-chemical parameters of Marathwadi buffalo milk. The comparison is also done between Marathwadi buffalo milk with the milk of other improved breeds in respect of these parameters, (Dubey, 1998).

MATERIAL AND METHODS

Duration and place of study :

The present work was under taken to know the chemical properties of Murrah, Jaffarabadi, surti and Marathwadi buffalo milk under Satna region. In all 40 milk buffaloes were selected for collection of milk samples. The buffaloes were selected from Bhalla Dairy Farm Satna, work place of study Livestock Production and Management (Unit), Department of Natural resource management (NRM), Faculty of Agriculture, Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot – Satna (Madhya Pradesh).

Collection of milk samples :

The milk samples were collected @ of 5-10 samples daily in the morning and evening milking from Bhalla Dairy Farm Satna The particular buffalo was identified on the basis of morphological characters and then milk samples were collected from each and every animal which were in milk during the period of investigation. The individual anima was milked completely in milking pail carefully till last strips. Then milk was mixed well and after mixing samples were taken in sample bottles. As soon as samples collected, they were transferred to the laboratory of Department of NRM and kept in refrigerator till analysis is over. All tests were conducted

within 5 to 6 hours. Samples were collected from month of March to May 2022. In all three samples from 10 selected Marathwadi buffalo breed.

Analysis :

Collected with samples were analysed for chemical properties as indicated blow:

Methodology for analysis of milk samples :

Chemical properties :

Fat :

Fat content of milk was determined as per the procedure IS- 1 2 24 Part-I (1977).

Protein :

Protein content of milk was determined as per procedure BIS : Part.

XI (1981) by digestion and distillation method. The per cent total nitrogen was estimated which was multiplied by 6.38 to obtain protein content in milk .

Lactose :

Lactose content of milk was determined by procedure given in BIS: Part XI (1981).

Total solids :

Total solids content of milk was determined by gravimetric methods as per procedure given in IS- 1 479

(Part-II) 1961.

SNF :

Solids not fat of milk was determined by subtracting the fat from total solids.

Ash :

The ash content of milk was determined as per the procedure described in IS 1479 (Part II) 1961.

Statistical analysis of data :

The data recorded during the course of investigation was subjected to statistical analysis by Analysis of variance technique. The significant and non-significant treatment effects were judged with the help of F‘ (variance ratio) table. The significant differences between the means were tested against the critical difference at 5% probability level.

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Fat content :

The higher average fat content observed in milk of Surti buffalo (8.14) followed by Murathwadi, (7.66) and

Table 1 : Fat content of milk of different buffalo breeds

Replication		Marathwadi	Murrah	Jaffarabadi	Surti	Mean
R1		7.63	7.53	7.33	8.23	7.68
R2		7.83	7.43	7.63	8.43	7.83
R3		7.73	7.53	7.23	7.73	7.56
R4		7.33	6.93	7.33	8.43	7.51
R5		7.43	7.73	7.63	7.83	7.66
R6		8.13	7.33	7.53	8.23	7.81
R7		7.53	7.43	7.23	8.13	7.58
R8		7.83	7.23	7.73	8.33	7.78
R9		7.93	7.73	7.13	8.43	7.81
R10		7.23	7.13	7.83	7.63	7.46
Range	Max	8.13	7.73	7.83	8.43	7.83
	Min	7.23	6.93	7.13	7.63	7.46
	Mean	7.66	7.40	7.46	8.14	7.67
		Result	S. E. ±	C.D. (P=0.05)		
Replication		NS	0.121	0.248		
buffalo		S	0.191	0.392		

NS= Non-significant

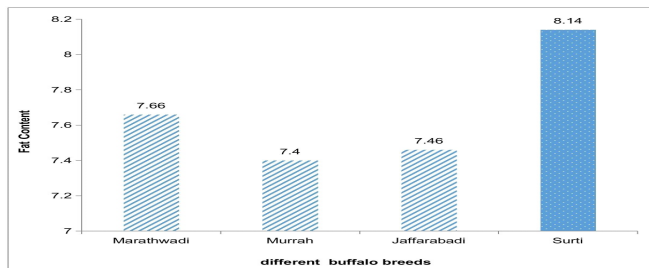


Fig. 1 : Fat content of milk of different buffalo milk

Jaffarabadi (7.46) and lower in Murrah (7.40). The differences observed in the fat content in milk of these four breeds were significant ($P < 0.05$). It indicated that fat percentage of Surti buffalo milk was significantly ($P < 0.05$) higher than other three breeds.

Protein :

The higher average protein observed in milk of Murrah buffalo (4.00) followed by Surti (3.91) and

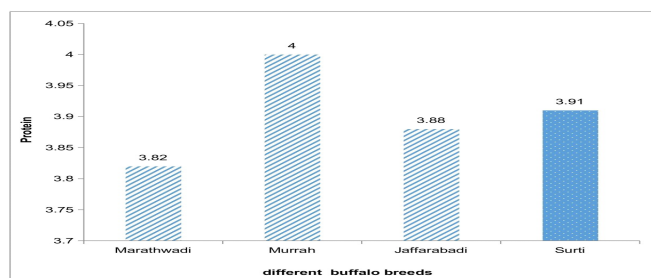


Fig. 2 : Protein of milk of different buffalo milk

Jaffarabadi (3.88) and lower in Murathwadi (3.82). The differences observed in the protein of milk of these four breeds were non-significant. It indicated that the protein of these four breeds was nearly close to each other.

Lactose :

The higher average lactose observed in milk of Murathwadi buffalo (4.96) followed by Surti (4.87) and Jaffarabad (4.86) and lower in Murrah (4.82). The differences observed in the lactose of milk of these four breeds were non-significant. It indicated that the lactose of these four breeds was nearly close to each other.

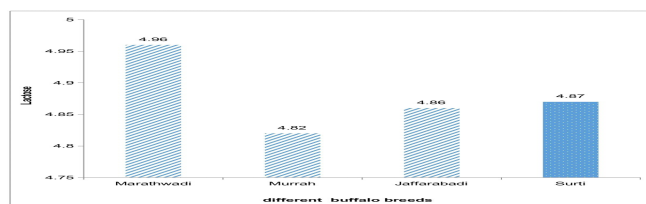


Fig. 3: Lactose of milk of different buffalo milk

Total solid content :

The higher average total solid content observed in milk of Surti buffalo (17.89) followed by Murathwadi (17.29) and Murrah (17.01) and lower in Jaffarabadi (16.96). The differences observed in total solids content of milk of these four breeds of buffaloes were significant ($P < 0.05$). The value of total solids content of Surti buffalo milk was significantly higher than other three breeds.

Table 2 : Protein of milk of different buffalo breeds

Replication		Marathwadi	Murrah	Jaffarabadi	Surti	Mean
R1		3.95	4.26	3.74	3.84	3.95
R2		4.14	3.92	3.84	4.24	4.04
R3		3.74	4.02	3.72	3.95	3.86
R4		3.84	3.84	3.94	3.46	3.77
R5		3.97	3.76	3.80	3.79	3.83
R6		3.07	3.93	4.12	3.84	3.74
R7		4.01	3.92	3.72	3.99	3.91
R8		4.15	3.68	4.01	3.82	3.92
R9		3.68	4.20	3.89	4.24	4.00
R10		3.68	4.42	4.04	3.95	4.02
Range	Max	4.15	4.42	4.12	4.24	4.04
	Min	3.07	3.68	3.72	3.46	3.74
	Mean	3.82	4.00	3.88	3.91	3.90
	Result		S. E. ±	C.D. (P=0.05)		
Replication		NS	0.110	0.227		
buffalo		NS	0.175	0.358		

NS= Non-significant

Table 3 : Lactose content of milk of different buffalo breeds

Replication		Marathwadi	Murrah	Jaffarabadi	Surti	Mean
R1		4.95	4.83	4.79	5.03	4.90
R2		5.16	4.93	4.94	4.79	4.96
R3		4.90	4.83	4.85	4.71	4.82
R4		5.12	4.97	4.80	4.78	4.92
R5		4.89	4.72	4.74	4.96	4.83
R6		4.95	4.83	4.92	4.59	4.82
R7		4.69	4.93	4.85	4.94	4.85
R8		5.04	4.66	4.74	4.74	4.80
R9		5.06	4.72	4.95	4.96	4.92
R10		4.86	4.82	4.97	5.21	4.97
Range	Max	5.16	4.97	4.97	5.21	4.97
	Min	4.69	4.66	4.74	4.59	4.80
	Mean	4.96	4.82	4.86	4.87	4.88
		Result	S.E. ±	C.D. (P=0.05)		
Replication		NS	0.061	0.124		
buffalo		NS	0.096	0.197		

NS= Non-significant

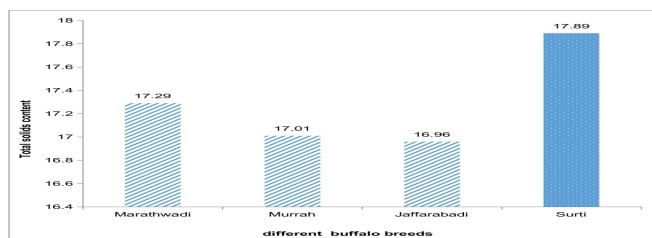


Fig. 4 : Total solids content of milk of different buffalo milk

Solid not fat (SNF) :

The higher average solid not fat (SNF) observed in milk of Murathwadi buffalo (9.73) followed by Surti (9.70) and Jaffarabadi (9.54) and lower in Murrah (9.48). The differences observed in the Solid not fat (SNF) of milk of these four breeds were non-significant. It indicated that the Solid not fat (SNF) of these four breeds was nearly close to each other.

Table 4 : Total solids content of milk of different buffalo breeds

Replication		Marathwadi	Murrah	Jaffarabadi	Surti	Mean
R1		17.61	17.30	16.95	17.91	17.44
R2		18.07	17.09	17.14	18.51	17.70
R3		17.08	17.48	16.56	17.22	17.09
R4		17.10	16.97	16.87	18.31	17.31
R5		17.33	17.05	17.04	17.35	17.19
R6		16.81	17.08	17.30	17.47	17.17
R7		17.19	17.09	16.56	17.84	17.17
R8		17.69	16.28	17.22	17.80	17.25
R9		17.83	17.04	16.04	18.68	17.40
R10		16.16	16.69	17.90	17.81	17.14
Range	Max	18.07	17.48	17.90	18.68	17.70
	Min	16.16	16.28	16.04	17.22	17.09
	Mean	17.29	17.01	16.96	17.89	17.29
		Result	S. E. ±	C.D. (P=0.05)		
Replication		NS	0.226	0.463		
buffalo		S	0.357	0.732		

NS= Non-significant

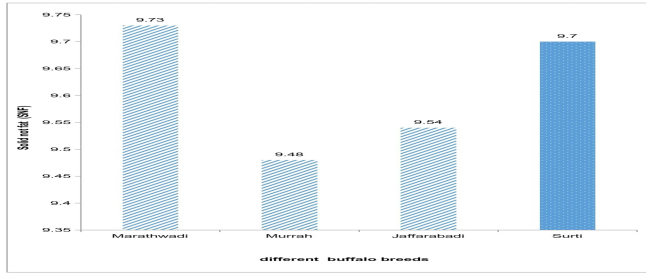


Fig. 5 : Solid not fat (SNF) of milk of different buffalo milk

Ash content :

The higher average Ash content observed in milk of Murathwadi buffalo (1.00) followed by Surti (0.97)

and Jaffarabadi (0.88) and lower in Murrah (0.86). The differences observed in the Ash content of milk of these

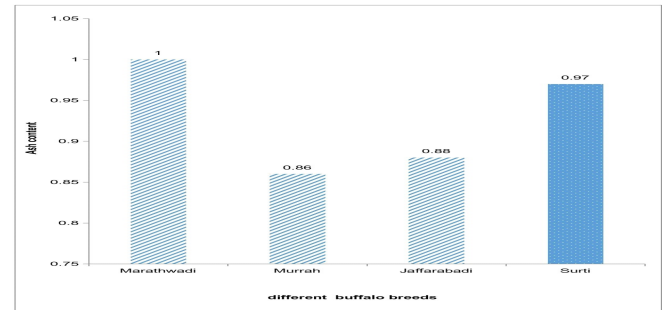


Fig. 6 : Specific gravity of milk of different buffalo milk

Table 5 : Solid not fat (SNF) of milk of different buffalo breeds

Replication		Marathwadi	Murrah	Jaffarabadi	Surti	Mean
R1		10.01	9.35	9.25	9.71	9.58
R2		10.27	9.65	9.54	10.11	9.89
R3		9.38	9.74	9.36	9.52	9.50
R4		9.90	9.54	9.47	9.91	9.71
R5		9.93	9.28	9.34	9.55	9.53
R6		8.69	9.75	9.80	9.27	9.38
R7		9.79	9.66	9.40	9.74	9.65
R8		10.15	9.04	9.35	9.50	9.51
R9		9.93	9.28	9.74	10.28	9.81
R10		9.22	9.55	10.10	9.40	9.57
Range	Max	10.27	9.75	10.10	10.28	9.89
	Min	8.69	9.04	9.25	9.27	9.38
	Mean	9.73	9.48	9.54	9.70	9.61
		Result	S. E. ±	C.D. (P=0.05)		
Replication		NS	0.157	0.322		
buffalo		NS	0.248	0.509		

NS=Non-significant

Table 6 : Ash content of milk of different buffalo breeds

Replication		Marathwadi	Murrah	Jaffarabadi	Surti	Mean
R1		1.17	0.77	0.77	0.90	0.90
R2		1.03	0.86	0.82	1.14	0.96
R3		0.80	0.95	0.84	0.92	0.88
R4		1.00	0.79	0.79	1.05	0.91
R5		1.13	0.86	0.86	0.86	0.93
R6		0.75	1.04	0.90	0.90	0.90
R7		1.15	0.86	0.84	0.80	0.91
R8		1.02	0.76	0.85	1.00	0.91
R9		0.94	0.84	0.95	1.16	0.97
R10		0.97	0.86	1.15	0.92	0.98
Range	Max	1.17	1.04	1.15	1.16	0.98
	Min	0.75	0.76	0.77	0.80	0.88
	Mean	1.00	0.86	0.88	0.97	0.92
		Result	S. E. ±	C.D. (P=0.05)		
Replication		NS	0.057	0.116		
buffalo		NS	0.090	0.184		

NS= Non-significant

four breeds were non-significant. It indicated that the Ash content of these four breeds was nearly close to each other.

Conclusion from result obtained during present investigation, following conclusions were drawn.

– The Marathwadi buffalo milk has higher average SNF, and ash content than Murrah, Jaffarabadi and Surti buffalo milk.

– The Surti buffalo milk was higher in total solids content and lactose than the Marathwadi, Murrah and Surti buffalo milk.

– The Surti buffalo milk was higher in content of fat and total solids than Marathwadi, Murrah and Jaffarabadi buffalo milk.

Conclusion :

It is concluded that the chemical properties of Marathwadi, Murrah, Jaffarabadi and Surti buffalo milk not differ result were found significantly under the condition of Satna region in respect of it's breed averages.

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