

## **Quantification of immediate and subsequent responses in milk production, its components and body weight of Gangatiri cows at SHUATS dairy farm**

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**Abstract:** A study was conducted to analyze variability in milk yield, milk constituents and body weight of cows with management and the feed supplied. Milk recording was carried out in morning and in evening. A total of 12 months milk recordings were made at monthly intervals from 19 cows. The cows were milked twice a day in the morning and evening. The utensils and udder were washed with plain water. Hand milking was practiced. The calves were used not only for let-down of milk but were also allowed to consume milk before milking. But before milking the calves were allowed to suckle only for few minutes. During milking roughages and concentrates were put before the cows for easy milking without struggle. Calves up to 6 months of age were grown on milk and leafy feed. The study suggests possibility of improving their daily production by feeding and management. The actual milk production capacity of Gangatiri cows might be higher than that estimated in this study. Since, it is based on partial milk yield data. The major cause for variability in Fat, TS and SNF % might be due to variability in feeding and stage of lactation.

**Key words:** Gangatiri cows, Milk yield, Fat, SNF, TS, Body weight.

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### **I. Introduction**

The sustainability of the breed and milk production of Gangatiri cows in Eastern Uttar Pradesh have been known by very few NGO's such as Surabhi Shodh Sansthan etc. The importance of the breed is almost not known by the local farmers of the surrounding area of river Ganga. The importance of this study lies in the fact that there is a scope and need for increase in per capita availability of milk production in our country. Further the dairy farming is balanced and protective type of farming which fits well with integrated farming system, a need of today as per national policy of ICAR. It provides self-employment for unemployed youth with remunerative income round the year. Dairy farming in existing pattern of agriculture in the country is well suited for adoption, which offers better use of land, labour and capital. It helps to maintain soil fertility by use of organic manure. It provides regular and quick income and involves less risk for, it is balanced and protective type of farming. It also ensures opportunity for complete use of by-products of agriculture.

Gangatiri is an important dual-purpose cattle breed of Uttar Pradesh state of India. The breed is significantly contributing the livelihood of the people due to its good draft ability and average daily milk yield of Gangatiri cow ranged between 4-6 liters/day with a lactation length of 150-250 days and the Intercalving period between 14-24 months. The average fat is 4.33% (range 3.1-6.0%) and SNF content 8.2% (Range 7.87-8.42%). The average body length, height at withers, chest girth, is 110,124,153 cm, in cows and 121,142,146 cm in bullocks under field conditions, respectively.

- The breed has acquired by natural selection certain adaptation traits viz. high degree of heat tolerance
- Resistant to certain diseases and ability to survive on low feed and fodder resources.
- It is dual purpose well known for average milk and draft ability
- The habitat of Gangatiri Cow is Balia, Ghazipur of Eastern Uttar Pradesh, which is well adapted to eastern U.P. agro climatic conditions.

## II. Materials and methods

Milk recording was carried out in morning and in evening. A total of 12 months milk recordings were made at monthly intervals from 19 cows. The cows were milked twice a day in the morning and evening.

Morning milking was done around 3 a.m. and evening milking at 2 p.m. The utensils and udder were washed with plain water. Hand milking was practiced. The calves were used not only for let-down but were also allowed to consume milk before milking. Before and after milking, the calf was allowed to suckle milk. But before milking the calves were allowed to suckle only for few minutes. Buckets made up of stainless steel were used for collection of milk. During milking roughage and concentrate were put before the cow for easy milking without struggle. Calves up to 6 months of age were grown on milk and leafy feed.

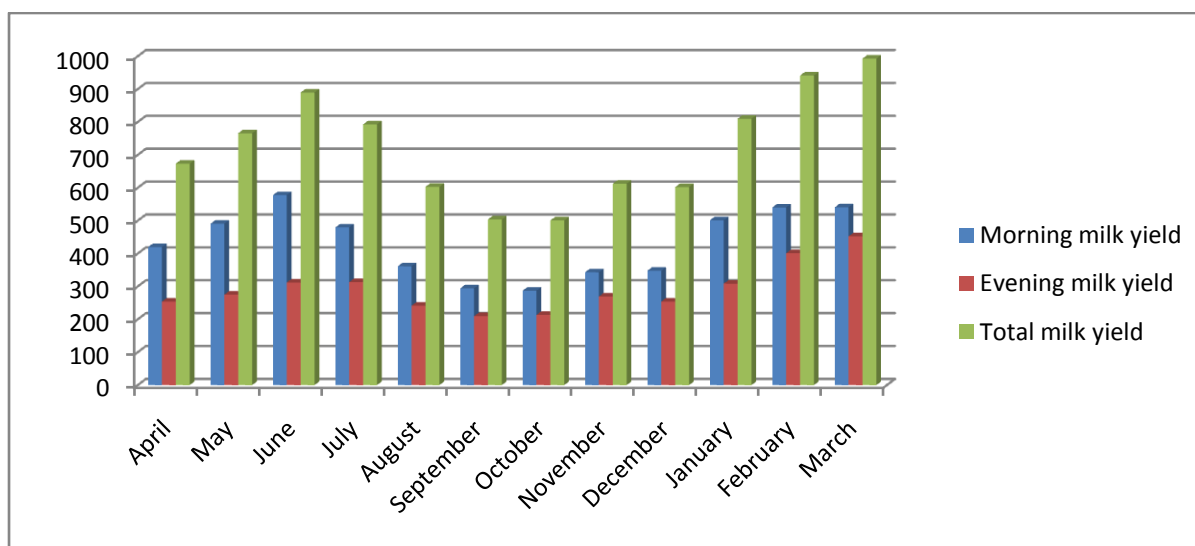
In addition, milk samples were collected in the evening for estimation of milk constituents. Milk constituents i.e., percentage of fat was estimated by the Gerber butyrometer (ISI: 1224 - Part I 1977) and the percentage of SNF was determined gravimetrically. Data on body weight of cows were also collected from records for each cow. The total milk yield for the lactation was estimated using monthly milk yield. The animals are generally fed with wheat straw and concentrate (oil cake, mostly rice bran) green fodder as per availability

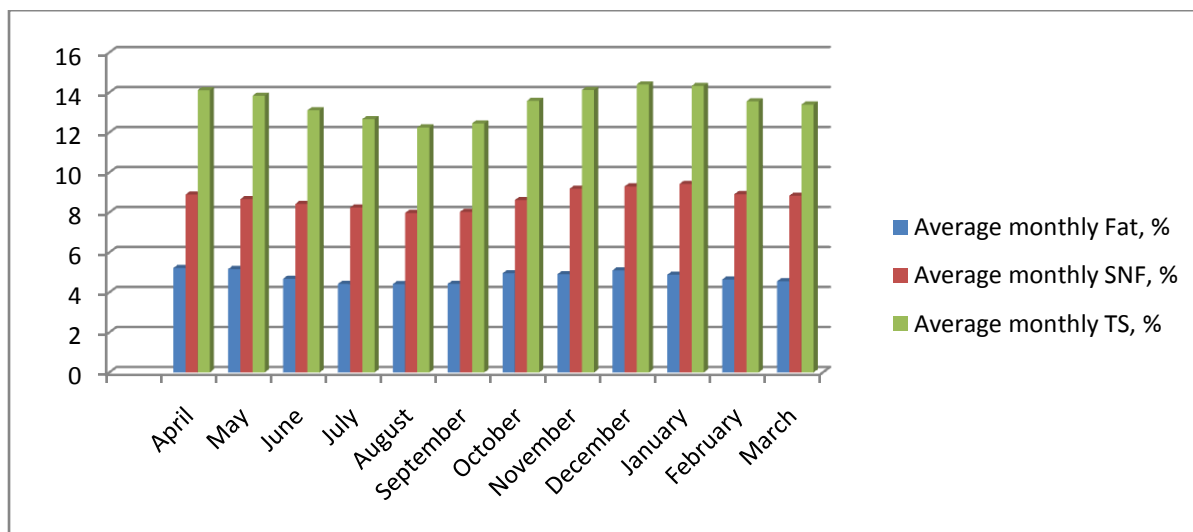
## III. Results and discussion

The study revealed that 28% of milch animals were in first lactation and 33% in second, 29% in third, 7% in fourth and 3% in fifth and above. Cows in second and third lactation were found in large numbers. Calvings were found to be distributed throughout the year. The monthly morning, evening, daily milk yield, fat, SNF and TS contents of Gangatiri cattle are furnished in Table 1.

**Table 1. Monthly milk yield and milk constituents of Gangatiri cows**

Month of lactation	Monthly morning yield (kg)	Monthly evening yield (kg)	Monthly daily yield (kg)	Average monthly Fat %	Average monthly SNF %	Average monthly TS %
<b>Overall</b>	<b>5183.8</b>	<b>3505.7</b>	<b>8689.5</b>	<b>57.318</b>	<b>104.529</b>	<b>161.847</b>
April	419.7	253.9	673.6	5.219	8.896	14.116
May	490.7	275.3	766	5.170	8.667	13.838
June	577.7	312.2	889.9	4.683	8.428	13.108
July	479.5	313.3	792.8	4.424	8.248	12.672
August	361.4	241.7	603.1	4.417	7.976	12.251
September	294.1	209.8	503.9	4.429	8.029	12.455
October	287.3	213.5	500.8	4.961	8.619	13.586
November	343.1	269.6	612.7	4.914	9.188	14.129
December	348.1	254.2	602.3	5.100	9.301	14.404
January	501.4	308.6	810	4.883	9.426	14.333
February	540.2	401.2	941.4	4.645	8.915	13.560
March	540.6	452.4	993	4.559	8.836	13.395





**Monthly partial Milk yield, Fat, SNF and TS percentage**

**Monthly partial milk yield**

The overall monthly partial milk yield was 8689.5 kg and it ranged from 500.8 kg to 993 kg. The milk yield recorded did not show any definite pattern. The milk yield was highly variable with a coefficient of variability of 35%. This suggests the possibility of improving their daily production by genetic means. The milk yield increased from April to June and decreased from July to October and again increasing trend was noticed from November to march. The reasons might be due to difference in amount of milk fed to different calves, allowing growing calves to suck more milk and then milking the animals. The total estimated partial milk yield for morning, evening and total of both from April to March was **5183.8, 3505.7 and 8689.5** kg, respectively. ? The total milk yield estimated in this study was generally higher than the earlier reported values of 338 kg and 354 kg for this breed (*Kanakaraj et al 1993; Thomas 1995*), which was based on farm records.

**Milk constituents**

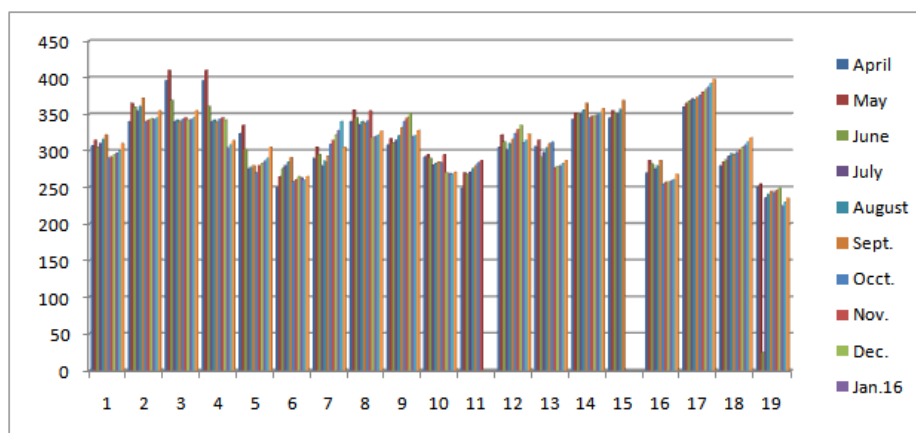
The average of milk fat percentage was 4.79. There was no specific trend in the monthly averages for the fat, SNF and TS content. But, when fat content of the milk considered as early, mid and late lactation the same was found to increase as the lactation advanced. The fat content was higher than the reported value of 3.89 in Kangayam cattle, another draught breed in the same state (*Rajendran 1995*) and comparable with other Indian breeds. The average solids-not-fat percentage was 8.72 and ranged from 7.97 to 9.42. The SNF was found as per the standard of 8.5% prescribed for cow milk under PFA rules 1955. This might be due to genetic potentialities of the Gangatiri cows with respect to SNF percentage; *Robertson et al (1956)* had confirmed the strong inheritance of SNF percentage.

**Table 2. Average monthly weight of Gangatiri cows**

Month	281	283	288	293	294	302	306	313	319	322
April	307	340	396	396	324	250	290	340	308	292
May	315	365	410	410	335	265	305	356	317	295
June	305	360	369	361	302	276	295	345	311	290
July	310	355	340	340	275	280	280	336	315	281
Aug	316	361	342	342	278	285	286	340	321	283
Sept	322	372	340	340	280	291	293	338	332	285
Oct	290	340	343	343	270	258	309	341	340	284
Nov	292	342	345	345	280	261	315	355	345	295
Dec	295	344	342	342	283	265	322	318	351	270
Jan	297	343	343	304	286	263	328	320	320	269
Feb	300	345	345	308	290	260	340	322	321	268
Mar	310	355	355	314	305	265	305	327	328	271

Month	323	348	353	361	364	365	476	477	478
April	249	305	306	345	343	270	360	280	250
May	270	322	315	355	352	287	365	285	255
June	268	312	292	351	350	282	368	288	255
July	271	302	298	350	350	275	371	293	236
Aug	276	310	304	357	356	280	370	296	241

<b>Sept</b>	280	316	310	369	365	287	373	295	245
<b>Oct</b>	284	324	312	-	345	255	376	298	243
<b>Nov</b>	287	329	277	-	347	257	380	301	246
<b>Dec</b>	-	335	279	-	348	258	383	305	249
<b>Jan</b>	-	311	280		349	259	387	308	225
<b>Feb</b>		315	283		352	261	392	312	230
<b>Mar</b>		323	287		358	268	398	318	235



### Weight of cows

The average weight of cows from April to March was 298.69 kg. But, it ranged from 264.5 to 410 kg. The highest gain in weight was found in cow number three and four in the month of May, followed by cow number seventeen in the month of September. No specific trend was found in gain in weight too.

### IV. Conclusion

- The milk yield was highly variable with the feed supplied. This suggests the possibility of improving their daily production by feeding and management.
- The actual milk production capacity of Gangatiri cows might be higher than that estimated in this study. Since, it is based on partial milk yield data.
- The major cause for variability in Fat, TS and SNF % might be due to variability in feeding and stage of lactation of the cows as observed from other studies.
- Weight of cows were also found not so satisfactory, it also might be due to feeding and manage mental conditions.

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