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Milk Fat Production Trend and Effect of Season on it at Sree-Nagor Milk Shed Area under Milk Vita Throughout the Year

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Abstract: This study was undertaken to find out the milk fat production trend both in qualitative and quantitative aspect and seasonal effect on it at Sree-Nagor Milk Shed Area (MSA) under Milk Vita in Munshigonj, Bangladesh. The experiment was conducted during the period of 1995 to 1999. Season had the tremendous effect on milk yield (l/d). The milk production showed highest in the month of June, lowest in January, August, September and December; but in other months of the year it seemed almost similar. However, the average fat value of milk at Sree-Nagor MSA followed almost a specific trend throughout the year. Furthermore, the average fat value of Sree-nagor MSA was in-significant ($P>0.05$) between different months of the experimental period, but that of each year (1995-1999) between different months were highly significant ($P<0.01$), which means that season has large effect on fat value.

Key Words: Milk fat, milk shed area, milk vita

Introduction

Milk is the first food for the newly born human beings. To serve this purposes it is the food that contains all the nutrients, the newly born requires. Main components of milk are water ($\approx 87\%$) and total solids ($\approx 13\%$). The total solids is further divided into fat and solids-not-fat (SNF). The components of milk especially fat and SNF are acted as an indicator of the quality of milk. Milk fat production trend is a seasonal operation, depending on the availability of feed, climatological conditions and on tradition (Berg, 1988). The milk fat content appears to be more strongly influenced by "season" than other components (Johnson, 1978) relatively high fat per cent observed during the autumn of each year and during the summer months (Sargeant *et al.*, 1998).

Fat contents exhibit a pronounced seasonal trend, being higher in winter than in summer season (Yadav *et al.*, 1994). In the context of Sree-nagor MSA, it is very important to know the milk fat production trend. Because, milk producers get milk price from Milk Vita on the basis of milk fat content. So, the present research work was undertaken to investigate the following objectives: -

- i) To know total milk fat production pattern throughout the year at Sree-nagor MSA.
- ii) To study the effect of seasons/months on milk yield and milk fat production.

Materials and Methods

This study was conducted at Sree-Nagor milk shed area (MSA) during the period from January 1995 to December 1999.

Sree-Nagor MSA: Sree-nagor MSA is situated on the bank of Ichamoti River under Munshigonj district,

Bangladesh. In October 1993, through Milk Vita's own resources this plant was established primarily for chilling purposes of collected milk (8,000L/day). Presently, it is nourishing 20 active primary milk producing societies covering 3 Districts, 4 Upa-zillas, 14 Union, 25 Villages & 950 family members (Azad, 2001).

Animals: Cattle breeds are mostly Holstein Frisian. Some of them are Sahiwal and rests are so-called non-descriptive type (Local). As per cattle survey 2001, it possesses about 4,326 cattle head, which is producing milk of about 9,282 L/day.

Parameter studied: Total milk yields (L/d) and its components (g/kg) was observed from different societies of Sree-nagor MSA, and interviewing the randomly selected milk producers through consolidated questionnaire collected relevant information. From 20 primary milk-producing societies, 10 members were randomly selected for this purpose.

Fat value: Mixed milk samples were taken randomly from the different reception vat of the milk producers of different primary milk producing co-operative societies everyday after collection of milk at morning and at evening. Milk samples were collected at 1st to 8th, 9th to 16th, 17th to 24th, 25th to rest of the days of individual month and fat% of those samples were estimated in Milk Vita by commercial or Gerber method. Then, the estimated fat% was converted to g/kg as per research requirement. The values were calculated to obtain 4 mean values (Replication) for a month. These mean values were further averaged to obtain daily average value per month (Treatment). It had been continued from January 1995 to December 1999.

Table 1: Fat value (g/kg) of milk of Sree-nagor milk shed area during the period of 1995-1999

Month	Year					Mean
	1995	1996	1997	1998	1999	
January	40.6 ^{bc}	40.5 ^{cd}	48.0 ^{ab}	45.6 ^a	44.6 ^a	46.0
February	45.7 ^{ab}	45.5 ^{cd}	48.2 ^{ab}	44.2 ^{ab}	43.1 ^b	45.3
March	45.5 ^{ab}	44.6 ^d	48.1 ^{ab}	43.5 ^{bcd}	42.2 ^{bcdde}	44.7
April	43.9 ^{cd}	46.0 ^{cd}	48.1 ^{ab}	43.2 ^{bcd}	41.0 ^{de}	44.4
May	43.9 ^{cd}	45.0 ^{cd}	47.3 ^b	47.7 ^{bc}	40.9 ^e	44.3
June	43.3 ^d	47.0 ^{bcd}	47.0 ^b	42.1 ^{cd}	42.0 ^{bcdde}	44.2
July	43.7 ^{cd}	49.7 ^a	48.4 ^{ab}	41.9 ^{cd}	42.2 ^{bcdde}	45.1
August	44.0 ^{cd}	49.0 ^{ab}	49.2 ^a	41.2 ^d	42.2 ^{bcdde}	45.2
September	44.9 ^{bc}	47.3 ^{abc}	48.0 ^{ab}	42.3 ^{cd}	42.5 ^{bcd}	45.0
October	45.6 ^{ab}	47.7 ^{abc}	47.6 ^{ab}	43.0 ^{bcd}	41.5 ^{cde}	45.0
November	46.0 ^{ab}	47.5 ^{abc}	47.8 ^{ab}	42.3 ^{cd}	41.2 ^{cde}	44.9
December	46.4 ^a	47.4 ^{abc}	47.1 ^b	42.6 ^{bcd}	42.6 ^{bcd}	45.2
Average	44.5	46.4	47.9	43.0	42.2	44.9
Level of significance	**	**	**	**	**	NS
LSD	1.093	0.222	1.170	1.617	1.280	-

Means with different superscript(s) in the same column differ significantly; ^aSignificant at 5% level of significant
 **Significant at 1% level of significant; ^{NS} Non-significant; ^{LSD}Least significant differences between two means.

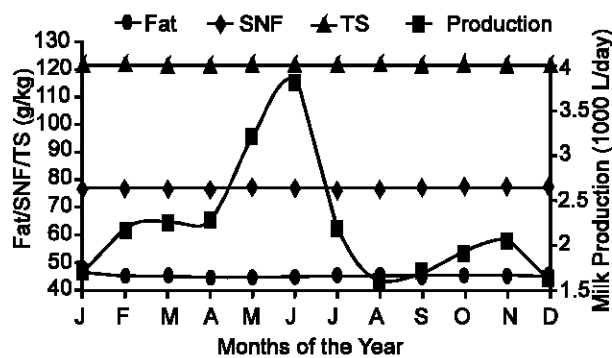


Fig. 1: Average milk production (L/D) with chemical qualities of Sree Nagor milk shed area during the period of 1995-99

Design of experiment: The collected data of the fat value were analyzed statistically by Completely Randomized Design (CRD) and significant differences among the treatment means were adjusted by Duncan’s New Multiple Range Test (Gomez and Gomez, 1984) using a MSTAT statistical package programme with the help of microcomputer.

Results and Discussion

The fat value (g/kg) of milk at Sree-Nagor milk shed area (SMA) during the period of 1995 to 1999 are presented in Table 1. Average fat value of Sree-nagor MSA did not differ significantly ($P>0.05$) between different months of the year (considering the whole experimental period), but the fat values of each year (1995 to 1999) between different months were differed significantly ($P<0.01$). Considering the average fat values of 5 years, the highest (46.0 g/kg) fat value was observed in January (46.0 g/kg); lowest (44.2 g/kg) in June; and almost

average (44.9 g/kg) in other months of the year. This variation might be happened due to the variation of green grass availability, seasonal effect, natural afford ability, disease infestation, and continuously using inadequate amount of roughages (straw) in the feeding system. Doll (1999) agreed with the present findings, who said that milk production became concentrated on competitive grassland locations.

Fig.1 represent the seasonal effect on chemical composition and production trend of milk at Sree Nagor, Munshigonj. The figure shows the message that season had little effect on average fat, solids-not-fat (SNF) and total solids (TS) value of milk (g/kg). The average yield (g/kg) of fat, SNF and TS were almost similar throughout the year. However, season had the tremendous effect on average milk yield (L/d). The milk production had been shown highest in the moth of June and lowest in January, August, September and December but in the other moths of the year it seemed almost similar. The average milk yield (L/d) was linearly increased from April, reached peak in June and then decreased. Per cent of fat production, some how, inversely related with the amount of milk production. The findings are in close agreement with that of Wood (1970), who showed that cyclic changes in day length, nutrition, or management may affect the milk production as well as milk fat production system in dairy cows. Yadov *et al.* (1994) also agreed with this result who stated that season have the large effect on milk yield as well as milk fat production.

Conclusion: From this study it was concluded that milk fat followed a specific trend and season have a tremendous effect on production system. Availability of forages may play the major role. So, aiming to gyre-up the economic status of the dairy co-operators of Sree-nagor MSA selective and planned technical know-how

and *ad-libitum* utilization of roughages should be introduced on priority basis in the traditional management of dairy enterprises.

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