

## SEASONAL VARIATIONS IN THE FAT CONTENT OF COW MILK UNDER VILLAGE CONDITIONS OF TAMIL NADU

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### ABSTRACT

In Namakkal district, 14 Tamil Nadu Co-operative Milk Producers Societies (TCMPS) were selected randomly and the data (n=16028) available at Namakkal Chilling Centre, Tamil Nadu Co-operative Milk Producers Federation (TCMPF) were used for this study. The mean milk fat percentage was generally higher in the evening milk when compared to the morning milk. The pooled overall mean fat percentage was found to be 4.42 per cent. Mohanur block recorded significantly highest milk fat per cent both in the morning and evening followed by Sendamangalam and Namakkal blocks. Maximum mean fat per cent (4.517) was observed in north-east monsoon followed by winter (4.43 per cent) and south-west monsoon (4.372 per cent). The least mean fat per cent was registered during summer (4.343 per cent) season

### INTRODUCTION

India is predominantly an agrarian society where animal husbandry forms the backbone of national economy. Indigenous cattles are being bred with exotic germplasm to increase the milk yield, but the milk producers are facing "low fat and low Solids-Not-Fat (SNF)" problem very frequently. In Namakkal, Salem and Erode it is one of the common complaints (Anon, 2008). The problem of low fat percentage in crossbred cows was reported in Kerala (Sosamma Iype *et al.*, 1994 and Radhika and Sosamma Iype, 1999). Hence, the present study was taken up to analyse the trend in fat content of cow's milk in Namakkal district of Tamil Nadu.

### MATERIALS AND METHODS

In Namakkal district, 14 Tamil Nadu Co-operative Milk Producers Societies (TCMPS) were selected randomly for this study. The data available at Namakkal Chilling Centre, Tamil Nadu Co-operative Milk Producers Federation (TCMPF) were used for this study. Past three years data (from March 2004 to February 2007) on morning and evening fat content (n=16028) of cows' milk of selected villages were collected. Based on the climatic conditions prevailing in this region, four seasons namely summer (March, April, May), south west monsoon (June, July, August), north east monsoon (September, October, November) and winter (December, January, February) were identified. To study the impact of season on fat content of the cows' milk the data were grouped according to season and were analysed. As the number of fat percentage data were unequal and disproportionate, least-squares analysis as outlined by Harvey (1979) was followed to delineate the effect of non-genetic factors. All the traits under study were analysed by considering block, month and season as fixed effects. All the statistical analyses of data were carried out using LSMLMW and MIXMDL PC-2 version computer programme (Harvey 1990). The least-square means were compared using Duncan's Multiple Range Test (DMRT) as described by Harvey (1979).

## RESULTS AND DISCUSSION

### Milk fat content between blocks

The pooled overall mean fat percentage was  $4.416 \pm 0.002$  per cent (Table 1). Mohanur block recorded significantly highest ( $P < 0.01$ ) milk fat per cent both in the morning and evening followed by Sendamangalam and Namakkal blocks. This is in agreement with the findings of Gokhale and Mangurkar (1994) who observed regional differences in milk fat content ranging from 4.05 to 4.48 per cent. The differential agro climatic conditions, varying timings for milking, variation of duration between two milkings, differential calf suckling patterns, animal feeding and management variations could be some of the reasons for the differences noticed.

**Table 1. Least-squares means ( $\pm$  SE) of fat per cent for different blocks and seasons**

Effect	Number of records	Fat per cent
<b>Overall mean</b>	16028	$4.416 \pm 0.002$
<b>Block</b>		**
Mohanur	5354	$4.614^c \pm 0.004$
Namakkal	4744	$4.304^a \pm 0.004$
Sendamangalam	5930	$4.329^b \pm 0.004$
<b>Season</b>		**
Winter	4515	$4.430^c \pm 0.005$
Summer	4147	$4.343^a \pm 0.005$
South-west monsoon	3680	$4.372^b \pm 0.005$
North- east monsoon	3686	$4.517^d \pm 0.005$

*Means bearing the same superscript in a column do not differ significantly. \*\*  $P < 0.01$*

The evening mean fat percentage was higher compared to the morning mean fat percentage (data not shown). This might be due to more milk yield in the morning than evening and due to the grazing during the day. A similar finding was also reported by Prasad and Subramanyam (1986) in crossbred cattle reared in Kerala state.

A highly significant ( $P < 0.01$ ) difference in milk fat percentage was noticed between the blocks. This is in agreement with the findings of Gokhale and Mangurkar (1994) in Jersey crossbred reared under village condition where more fodder was available in Maharashtra State.

### Seasonal influence on milk fat and SNF content

Maximum mean fat per cent (4.517) was observed in north-east monsoon followed by winter (4.43

per cent) and south-west monsoon (4.372 per cent). The least mean fat per cent was registered during summer (4.343 per cent) season (Table 1). Availability of green fodder was more in July to September (30 to 36 kg per day per animal) compared to April to June (15 to 20 kg/day/animal).

High environmental temperature observed during the summer season could cause decline in milk yields and fat percentage. Climatic condition appeared to have maximum influence during the early stage of lactation (Sharma *et al.* 1983). Bandaranayaka and Holmes (1976) reported that fat percentage decreased from 4.84 to 4.53 in the heat stressed cows compared to control.

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#### REFERENCES :

Anon, (2008). Field data analysis on fat and solids-not-fat (SNF) contents of cow and buffalo milk in Tamil Nadu. Department of Animal Genetics and Breeding, Veterinary College and Research Institute, Namakkal and Dairy Herd Improvement Programme Action (DIPA), TCMPI, Erode.

Bandaranayaka, D.D. and C.W. Holmes (1976). *Trop.Anim.Health.Prod.*, **8** : 38 – 46.

Gokhale, S.B. and B.R. Mangurkar (1994). *Indian J. Anim. Sci.*, **64** (11): 1277 - 1281.

Harvey, W.R.(1979). Least-squares analysis of data with unequal subclass numbers. USDA, Science and Education Administration-Agricultural Research, Beltsville, USA.

Harvey, W.R. (1990) User's guide for LSMLMW and MIXMDL PC-2 version mixed model least-squares and maximum likelihood computer programme. Ohio State University, Columbus, Ohio, USA.

Prasad, V. and M. Subramanyam (1986). *Kerala J. Vet. Sci.*, **17** (1): 33 – 45.

Radhika, G. and Sosamma Iype (1999). *Indian J. of Anim. Sci.*, **69** (7):522 - 524.

Sharma, A.K., L.A. Rodriguez, G. McKonnen, C.J. Wilcox, K.C. Bachman and R.J. Collier, (1983). *J. Dairy Sci.*, **66** (1) : 119 – 126.

Sosamma Iype, K.C. Raghavan, C.R. Girija, T.V. Aravindakshan, J. Radhakrishnan and G.Mugundan (1994). *Indian J. of Anim. Sci.*, **64** (3): 312 - 313.

