

## COMPOSITIONAL QUALITY OF CROSSBRED COW RAW MILK IN RURAL AND URBAN AREAS OF YSR KADAPA DISTRICT

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**Abstract:** An investigation was carried out to study the compositional quality of raw milk from crossbred cows in rural and urban areas of YSR Kadapa district, Andhra Pradesh. The quality of milk was analyzed by chemical composition and somatic cell counts (SCC). The Protein per cent of cow milk in rural areas showed a significant variation ( $P \leq 0.05$ ) with that of urban areas. The average SCC ( $\times 10^3$ ) per ml of milk was lower ( $395.96 \pm 95.44$ ) in urban areas than in rural areas ( $551.33 \pm 163.93$ ). The average SCC per ml of milk was higher than 2,00,000 cells in both rural and urban areas of the study. The report thus shows that milking practices followed by farmers in these areas need improvement, to obtain clean milk production.

**Keywords:** Crossbred cattle, Chemical Composition of milk, SSC, Hygiene.

### Introduction

Profitability of dairy industry and end product quality is closely related to the hygienic and chemical properties of incoming raw milk. Raw milk quality encompasses criteria relating to composition and hygiene. The composition of the milk varies with breed, feeding regimes and health status of the dairy animals and SCC is one of the most important factors to evaluate the quality and health of milk (Yarabbi *et al.*, 2014). Keeping these things in mind the present study was designed to know the compositional quality of crossbred cow raw milk in rural and urban areas of YSR Kadapa district.

### Materials and Methods

YSR Kadapa district was selected for this study and the district was divided into five divisions as per Animal Husbandry Department of the YSR Kadapa district. The five divisions are Kadapa, Jammalamadugu, Pulivendala, Rajampeta and Raychoti. Two villages were selected randomly from rural and urban areas of each division. A total of 60 farmers were selected from five divisions of the district consisting of 30 farmers from the rural areas and 30 farmers from urban areas.

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About 10 ml of milk was collected from four individual quarters during milking excluding fore and residual milk into single sterilized container and the samples were analyzed within 2 hours after collection. A total of 60 milk samples were collected.

The composition of milk samples of both crossbred cows and buffaloes in rural and urban areas were analyzed by Laktan 1- 4 model 225 milk quality analyzer and the somatic cell count of milk samples was analyzed by De Laval somatic cell counter.

### **Results and Discussion**

Milk composition and SCC (Mean  $\pm$  SE) of Crossbred cattle in rural and urban areas of the study is given in Table 1. The pooled average fat per cent of crossbred cows in the study area was  $3.61 \pm 0.09$ . The fat content in urban areas ( $3.75 \pm 0.14$ ) was higher than in rural areas ( $3.47 \pm 0.11$ ). The results are in agreement with findings of Kumaresan *et al.*, (2008) who reported milk fat per cent ranging from 3.00 to 5.20 per cent in Jersey crossbred cattle in Namakkal district of Tamilnadu. Slightly lower fat per cent in rural areas ( $3.47 \pm 0.11$ ) than urban areas ( $3.75 \pm 0.14$ ) suggest that milk fat composition is also influenced by feed types making different types of substrates available for synthesis of milk. The research was undertaken during the months of summer with temperatures above  $42^{\circ}\text{C}$  which is in agreement with Davis (1947) who reported lower value of Fat, SNF and Total solids during summer months.

The average SNF per cent of crossbred cows was  $8.20 \pm 0.04$  which is lower than findings of Radhika *et al.*, (2012) who reported SNF percentage of  $8.35 \pm 0.04$  in crossbred cows of Kerala. In both the rural ( $8.13 \pm 0.06$ ) and urban ( $8.26 \pm 0.07$ ) areas the SNF percentages were lower than the standard, which may be due to the changes in feeding practices that occurred concurrent with change in season (summer) as per Bailey (1952).

Further Kumaresan *et al.*, (2008) also reported lower fat and SNF contents during summer months of year indicating that Fat and SNF are more vulnerable to the environmental temperature which indirectly reflect plane of nutrition in his study on dry corn supplementation crossbred cattle to improve SNF content. Hence farmers may be advised feeding of energy rich concentrates to improve SNF content.

The average protein per cent of crossbred cow milk in the study area was  $3.41 \pm 0.06$  which is similar to the findings of Dang and Anand (2007) who reported protein content ranging from 3.02 to 3.99 per cent in crossbred cow.

The average pooled SCC ( $\times 10^3$ / ml) per ml of crossbred cow milk in the study area was  $473.65 \pm 94.58$  coinciding with findings of Koc (2008). The average SCC ( $\times 10^3$ ) per ml of

milk was lower ( $395.96 \pm 95.44$ ) in urban areas than in rural areas ( $551.33 \pm 163.93$ ). The results were similar to the findings of Dang and Anand (2007) who reported that SCC was higher under village conditions compared to peri-urban areas. It was further observed that average SCC per ml of milk was higher than 2,00,000 cells in both rural and urban areas of the study. Hence milking practices followed by farmers needs improvement to obtain clean milk production Dang and Anand (2007).

It was observed that in crossbred cow milk there was a significant ( $P \leq 0.05$ ) negative correlation found between SCC and protein per cent in rural areas. This finding was nearly similar to the findings of Rajcevic *et al.*, (2003) who reported that milk SCC was in a highly statistical correlation with protein. Forsback *et al.*, (2009) concluded that the changes in protein and fat content in milk with elevated somatic cell numbers arise from increased risk of proteolysis and lipolysis. Hence milking practices followed by crossbred cow milk producers needs improvement to obtain clean milk production

### **Summary**

The composition of milk samples of crossbred cows was analyzed with Lactan 1–4 model 225 milk quality analyzer. The fat content in urban areas was higher than in rural areas. In both the rural and urban areas the SNF percentages was lower than the standard due to changes in feeding practices that occurred concurrent with change in season (summer) with temperatures above 42°C. Both Fat and SNF are more vulnerable to the environmental temperature which indirectly reflect plane of nutrition. Hence farmers may be advised feeding of energy rich concentrates like grounded maize to improve SNF content. The somatic cell counts of milk samples were analyzed by using the Delaval Somatic cell counter. SCC per ml of crossbred cow milk was higher than 2,00,000 cells in both rural and urban areas of the study. In crossbred cow milk there was a significant ( $P \leq 0.05$ ) negative correlation found between SCC and protein per cent in rural areas.

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**Table 1. Milk composition and SCC (Mean  $\pm$  SE) of Crossbred cattle in rural and urban areas of study**

| S.No. | Parameter                           | Rural (N=30)%       | Urban (N=30) %     | Overall (N=60)%    |
|-------|-------------------------------------|---------------------|--------------------|--------------------|
| 1.    | Fat %                               | 3.47 $\pm$ 0.11     | 3.75 $\pm$ 0.14    | 3.61 $\pm$ 0.09    |
| 2.    | SNF %                               | 8.13 $\pm$ 0.06     | 8.26 $\pm$ 0.07    | 8.20 $\pm$ 0.04    |
| 3.    | Protein %                           | 3.27 $\pm$ 0.09     | 3.55 $\pm$ 0.09*   | 3.41 $\pm$ 0.06    |
| 4.    | SCC(x 10 <sup>3</sup> / ml) of milk | 551.33 $\pm$ 163.93 | 395.96 $\pm$ 95.44 | 473.65 $\pm$ 94.58 |

\*differ significantly (P $\leq$ 0.05)