

## Chemical and Sensory Quality of Indigenous Milk Based Product 'Rabri'

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**Abstract:** Study was conducted to evaluate the chemical and sensory quality of indigenous milk-based product "Rabri". Samples were purchased from randomly selected Sweet/Dairy shops (25) situated at different areas at Hyderabad city and Latifabad. A total of 50 Rabri samples, two from each Sweet/Dairy shop were purchased and brought to the laboratory of Dairy Technology, Sindh Agriculture University, Tandojam for achieving the objectives of present study. The concentration of different components of Rabri varied greatly sample to sample. The percentage of moisture content ranged between 24.33 and 38.85%, fat 16.23 and 22.55%, protein 9.94 and 12.01%, lactose/sucrose 27.08 and 43.72% and ash 2.09 and 2.84%. Overall mean values were observed as 31.76±0.96%, 19.42±0.33%, 10.74±0.10%, 35.82±0.99% and 2.43±0.03% for moisture, fat, protein, lactose/sucrose and ash, respectively. Energy values of Rabri varied between 315.59 and 400.15 Kcal/100g with an overall mean of 361.05±4.73 Kcal/100g. Sensory quality of Rabri was within the acceptable range. Score rated by panel of Judges averaged 3.21±0.08 from the score of 5 for appearance, 5.43±0.17 from 10 for aeroma, 18.87±0.28 from 30 for taste/flavour, 18.68±0.29 from 30 for body/texture, 5.49±0.15 from 10 for overall sweetness and 5.29±0.27 from 10 for overall acceptability.

**Key words:** Rabri, quality, milk based product

### Introduction

Rabri is an indigenous milk-based product widely consumed by the people of the Indo-Pak. It is concentrated and sweetened whole milk product, containing several layers of clotted cream. The basic methodology denotes to fresh cream milk heated in wide pan to bring it to boil. A thin layer of clotted cream formed on the surface of milk clotted from time to time with thin wooden stick. The layer of cream clotted on the edge of pan is placed one over the other. This process is continued until 1/6<sup>th</sup> of original milk is left. Sugar 5-6% by weight of original milk is added and dissolved the same. The clotted cream called Malai scrapped off from the edge of pan and immersed in thick sweetened milk and stored till marketing (Prasad, 1997). Nevertheless, this process of manufacturing of Rabri based on traditional methods and may vary place to place. As a consequent, the composition of Rabri varied greatly. Beside the above fact, the initial composition of milk from which it has been manufactured, the degree of concentration of milk solids and the percentage of sugar added may also affect the composition of Rabri. However, Rabri contains all the milk solids in an approximately five-fold concentration, plus additional sugar, enrich it with very high food and nutritive value (Sukumar, 1980). In Sindh Province, research has not been conducted on any aspects of Rabri. Thus, present investigation is limited with chemical and sensory quality of the Rabri produced at Hyderabad, Sindh.

### Materials and Methods

A total of 25 Sweet/Dairy shops were randomly selected from different areas of Hyderabad city and Latifabad. 50

Rabri samples (two from each shop) were purchased and brought to the laboratory of Dairy Technology, Sindh Agriculture University, Tandojam for chemical and sensory analysis. Each Rabri sample was divided into four parts, of which one part was thoroughly mixed together using pestle and mortar and analyzed for Total Solids (TS) content, ash (Association of Official Analytical Chemists; AOAC, 2000), fat content, calorific values (James, 1995), protein content (British Standards Institution; BSI, 1990) and lactose/sucrose (by difference: Lactose/sucrose % = TS %- (Fat%+Protein% + Ash%). The rest (three parts) of the samples were mixed together and served to a panel of five Judges drawn from the staff and M.Sc. students of Department of Dairy Technology for sensory evaluation. The Judges were first experienced in the evaluation of Rabri accord with a scheme of Nelson and Trout (1981). The vocabulary and Hedonic scale comprised of appearance (score 05), aeroma/odour (score 10), taste/flavour (score 30), body/texture (score 30), sweetness (score 10) and overall acceptability (score 10) were used to rate a score to individual Rabri sample.

### Results and Discussion

The concentration of different components observed in the Rabri varied widely sample to sample in the present study. This is probably due to initial composition of milk, the degree of concentration of milk solids and the percentage of sugar added during manufacturing of Rabri (Sukumar, 1980).

**Moisture content:** Variation in the moisture content of Rabri observed in the present study is presented in

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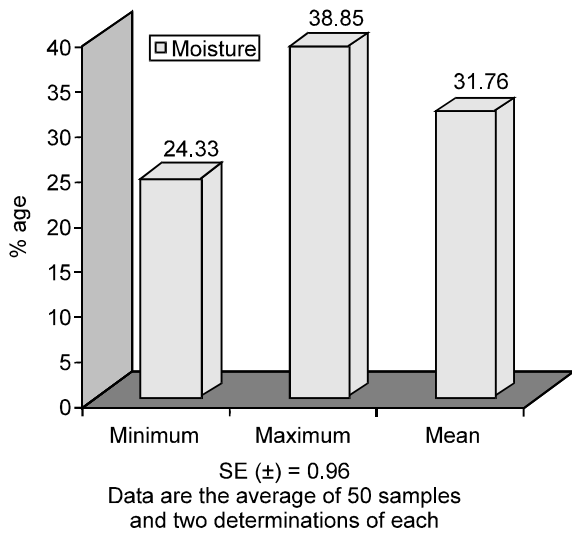


Fig. 1: Moisture content of Rabri produced at different Sweet/Dairy shops at Hyderabad city and Latifabad

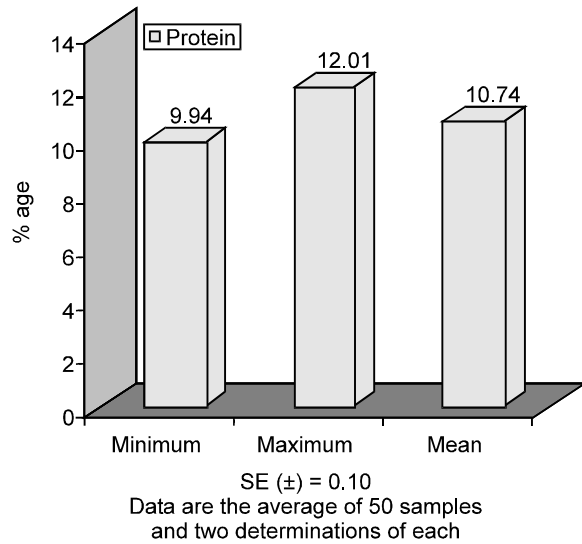


Fig. 3: Protein content of Rabri produced at different Sweet/Dairy shops at Hyderabad city and Latifabad

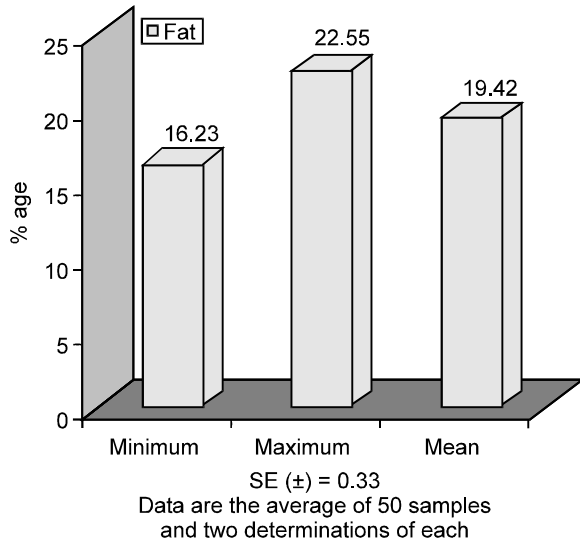


Fig. 2: Fat content of Rabri produced at different Sweet/Dairy shops at Hyderabad city and Latifabad

**Fat content:** The concentration of fat in Rabri varied greatly and ranged between 16.23 and 22.55% (average  $19.42 \pm 0.33\%$ ) in the present study (Fig. 2). Variation in fat content was also observed in a study conducted by Chatterjee *et al.* (1994). Moreover, the results of the fat content in the present study was comparatively higher than reported by different workers (Gayen and Pal, 1991; Mahadevan, 1991; Rajorhia, 1995) i.e. 16.10%, 13.22-16.26%, 15.10%, respectively, whilst lower than reported by sukumar (1980) and Prasad (1997) i.e. 20.00%. It could be incurred from the present result that fat content of Rabri had depended on the initial fat content of raw milk and degree of concentration from which it was made, as raw milk quality could affect the quality of final products (Harding, 1995).

**Protein content:** Rabri samples were evaluated for protein content and results are shown in Fig. 3. The minimum percentage of protein content of Rabri was observed as 9.94 and the maximum 12.01%. Moreover, the results of the present study ( $10.74 \pm 0.10\%$ , average) was slightly higher than reported by Sukumar (1980), Gayen and Pal (1991) and Prasad (1997) (i.e. approximately 10.00%), whilst lower than reported by Rajorhia (1995) (i.e. 12.00%).

Fig. 1. The result revealed that the concentration of moisture in Rabri ranged from 24.33 to 38.85%. This variation could be attributed to undefined heat treatment applied to the product during its traditional manufacturing. Similar trend of variation was also reported in the Rabri samples obtained from Delhi and Karnal i.e. 44.71 and 50.16%, respectively (Gayen and Pal, 1991). However, the over all mean values of moisture ( $31.76 \pm 0.96\%$ ) in Rabri observed in the present study showed the higher percentage than the reported values of Sukumar (1980) and Prasad (1997) i.e. 27.90% and 30.00%, respectively.

**Lactose/sucrose content:** The concentration of lactose/sucrose in Rabri ranged between 27.08 and 43.72% with an average of  $35.82 \pm 0.99\%$  (Fig. 4). The result of the present study was not inline with the results of the reported work (Sukumar, 1980; Gayen and Pal, 1991; Prasad, 1997; Rajorhia, 1995) (i.e. < 26% of lactose/sucrose content). The reason of the variation in

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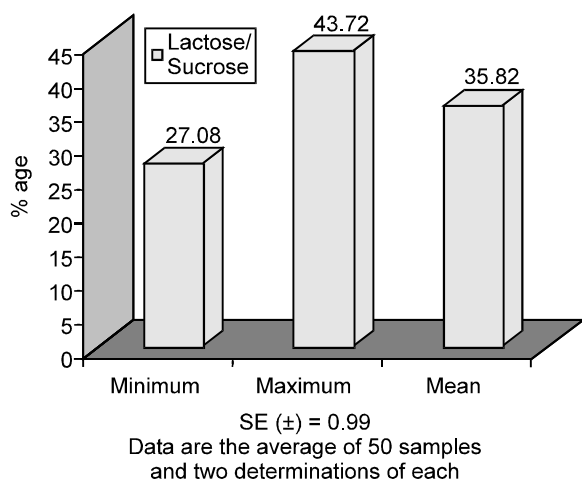


Fig. 4: Lactose/Sucrose content of Rabri produced at different Sweet/Dairy shops at Hyderabad city and Latifabad

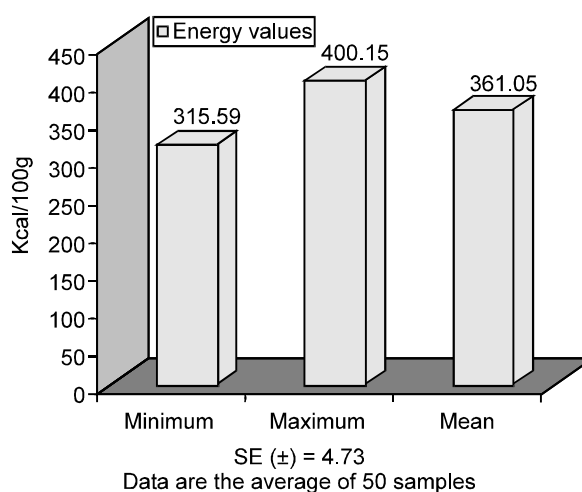


Fig. 6: Calorific values of Rabri produced at different Sweet/Dairy shops at Hyderabad city and Latifabad

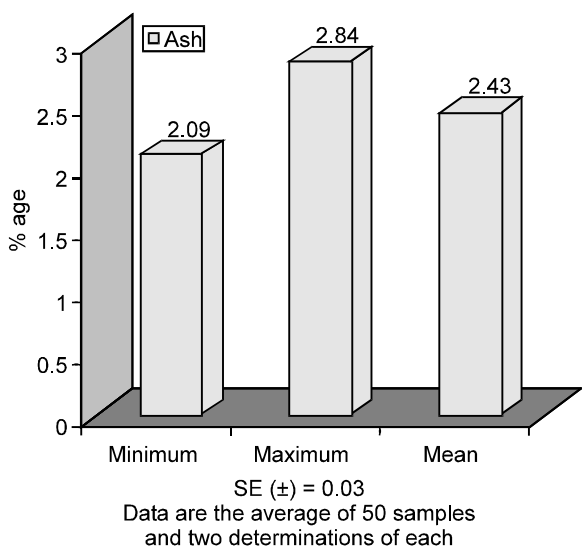


Fig. 5: Ash content of Rabri produced at different Sweet/Dairy shops at Hyderabad city and Latifabad

lactose/sucrose content of Rabri in the present study could be attributed with the manufacturing methods, which were based on traditional systems and/or according to a developed taste of consumers of Hyderabad city and Latifabad.

**Ash content:** The percentage of ash in Rabri samples varied between 2.09 to 2.84% with an average of  $2.43 \pm 0.03\%$  (Fig. 5). The results obtained were within the reported range (i.e. 2.00-3.00%) of different workers (Sukumar, 1980; Gayen and Pal, 1991; Rajorhia, 1995).

**Calorific values:** Energy values of Rabri were measured from the main three nutrients (i.e. protein, fat and carbohydrate) and computed in between 315.59 and 400.15 Kcal/100g with an average of  $361.05 \pm 4.73$  Kcal/100g. A wide variation in the energy values of the Rabri produced at different Sweet/Dairy shops at Hyderabad city and Latifabad indicated that:

- Ⓒ Manufacturing method was based on traditional techniques and varied shop to shop. Thus condensing of the product was not quite similar. This could also be incurred from the moisture percentage of Rabri observed else where in the present study where the percent of moisture was also varied widely.
- Ⓒ Milk used to prepare Rabri was varied either due to seasonal variation or from different species.

However energy value of Rabri observed in the present study is very high compared to the energy values of milk products like fresh or soft cheeses (Rosenthal, 1991).

**Sensory evaluation:** The results of sensory evaluation of Rabri rated by panel of judges are shown in Table 1. All the attributes (i.e. appearance; aroma, taste/flavour, body/texture, sweetness and acceptability) were within the acceptable range. Score rated for appearance of the Rabri was in between 2.50 and 3.83 from a total score of 5, whilst mean score was  $3.21 \pm 0.08$ . Of the total score 10, the aroma perceived the score in between 4.33 and 7.50 with a mean score of  $5.43 \pm 0.17$ . The taste/flavour rated the minimum score of 16.50 and the maximum 22.83, whilst the average score was calculated as  $18.87 \pm 0.28$  from a total score of 30. Body/texture received the highest score of 21.50 and the lowest 14.33. Where as mean score was computed as

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Table 1: Sensory quality of Rabri produced at different Sweet/Dairy shops at Hyderabad city and Latifabad

Attributes	Scale	Score			
		Minimum	Maximum	Mean	SE (±)
Appearance	5	2.50	3.83	3.21	0.08
Aeroma	10	4.33	7.50	5.43	0.17
Taste/Flavour	30	16.50	22.83	18.87	0.28
Body/Texture	30	14.33	21.50	18.68	0.29
Sweetness	10	4.50	7.00	5.49	0.15
Acceptability	10	3.33	7.17	5.29	0.27

Data are the average of 50 samples

18.68±0.29. The sweetness of Rabri was acceptable and perceived the score in between 4.50 and 7.00 from a total score of 10. The mean score was computed as 5.49±0.15. The overall acceptability profile stood minimum score of 3.33 and the maximum 7.17 from a total score of 10. The mean score was calculated as 5.29±0.27.

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