STUDIES ON THE CHEMICAL AND SENSORY QUALITY OF
DAHI SOLD IN NAGPUR CITY
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ABSTRACT
The present investigation was undertaken with the objective of studying the chemical and sensory quality of dahi sold in Nagpur city. In all 64 samples from four localities viz., East, West, North and South were collected and judged for sensory quality and chemical composition. From the results, it was observed that the samples of dahi sold by hotel were higher in fat (4.80%), SNF (8.39%) and lactose (4.48%) contents than dahi samples sold by vendors. While the moisture (86.65%) and titratable acidity (1.08% lactic acid) content was lower than the dahi samples sold by vendors. It was noted the dahi sold by hotels was better in quality than the dahi sold by vendors. The overall sensory score of dahi sold by hotels was 90.39 as compared to 74.20 points for dahi sold by vendors.

INTRODUCTION
Fermented milks are known throughout the world for their taste, nutritive values and therapeutic properties. Dahi is an Indian fermented milk known for its refreshing taste, palatability and therapeutic values. Since ancient times, dahi has received its importance as dietary adjunct. The popularity of dahi is also due to its scientifically proven role as a nutritious milk product. In Indian sub-continent the conversion of milk in every household by souring with the left over of previous day sour milk has been a common practice ever since the Aryans inhabited land. In this way the utility of milk nutrient were extended.

Dahi under the existing practice, is produced invariably on small scale either in the household or in the halwai shops. Composition and quality of dahi varies widely in different domestic conditions and with milk having variable chemical and bacteriological quality. However, the chemical composition of dahi has been reported as fat content ranging from 5-8 %, protein 3.3 – 3.4%, lactose 3.5 to 4.5 and 0.5 – 1.1% lactic acidity (Garg, 1988). The best quality milk is a must for preparing good quality dahi.

MATERIALS AND METHODS
Collection of dahi samples : In all, total 64 dahi samples were collected from four areas of Nagpur City viz., A- Eastern area, B- Western area, C-Northern area, D-Southern area. Two sources were selected from each area. (i) Vendors – 32 samples, (ii) Hotels – 32 samples. From these sources eight dahi samples each from vendor and hotel were collected from each area. Samples of dahi were collected from two hotels and two vendors each from east, west, north and south area of Nagpur City. The samples were collected four times during experimental period at an interval of fortnight. The samples were collected in suitable container and stored in refrigerator till the judging for sensory and chemical analysis.

Chemical analysis of dahi samples : The dahi samples were analysed for fat, SNF lactose, moisture and titratable acidity by using standard procedure as laid down by BIS (1981).

Sensory quality : The samples of dahi were subjected to sensory quality. The samples were presented to a panel of five semi trained judges for evaluation of organoleptic quality such as flavour, body and texture, colour and appearance, acidity and container and closure.

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The score card as recommended by Bodyfit et al., (1988) was used for the evaluation of sensory quality of dahi.

**Statistical Analysis**: The experimental data were analysed using factorial randomized design with four replications. Statistical analysis of data was done as per the method of Panse and Sukhatme (1978).

**RESULTS AND DISCUSSION**

**Chemical analysis of dahi samples**

**Fat content**: It is revealed (Table 1) that, the average fat content of dahi samples collected from hotel and vendor of four areas of the city was 4.80 and 1.23 per cent, respectively. The average fat content of dahi from hotels was higher than vendors.

The fat content of dahi samples collected from hotel in east, west, north and south area were 4.77, 5.10, 4.90 and 4.45 per cent, respectively and did not differ significantly. It can also be noticed that higher fat percentage (5.10%) was observed in dahi served by hotels in west area of the city. The average fat content of dahi samples collected from vendors in east, west, north and south area of city were 1.25, 1.02, 1.17 and 1.47 per cent, respectively.

From the above results, the fat percentage in dahi samples from hotels and vendors shows significant difference. It indicates that hotels used whole milk for manufacture of dahi due to which dahi therefrom contained higher fat. While vendor dahi samples found low fat content which may probably resulted due to its manufacturing practices adopted by most producers. They collect the fat layer after boiling of milk, and prepare the product. In another method, the top layer of dahi might be removed for preparation of butter and lower portioned dahi may used for selling. The results obtained in the present investigation are in general, accord with the results of Laxminarayana et al., (1952) who reported the wide variations in fat content of 0.7 to 8.60 per cent in the samples collected from different parts of India.

**SNF**: It was revealed (Table 1) that the SNF content of dahi samples collected from hotels and vendors of four areas in the Nagpur city was 8.39 and 7.73 per cent, respectively. The content of dahi samples from hotel was higher than the vendor’s dahi samples. There was significant differences ($P<0.05$) in content of hotel and vendor samples. The highest SNF per cent (8.70%) was noticed in dahi samples of hotels in west area. The highest per cent (7.95%) was observed in vendors dahi from south area. Whereas, there was no significant difference in content of dahi samples from vendors in east, west, north and south area.

From the above results, it seemed that difference observed in SNF content of dahi samples may be due to the type of milk used for manufacture of dahi. As per Shrinivasan and Anantkrishnan (1964), SNF content was in the range of 8 to 8.5% in the market dahi samples.

**Lactose**: It is observed (Table 1) that the lactose content of dahi samples collected from hotel and vendor of four different localities of the city was 4.68 and 4.36 per cent, respectively. The highest per cent (8.70%) was observed in hotels dahi samples in west area. The highest per cent (7.95%) was observed in vendors dahi from south area.

Whereas, there was no significant difference in lactose content in dahi samples from vendors in east, west, north and south area.

From the above results, it seemed that difference observed in SNF content of dahi samples may be due to the type of milk used for manufacture of dahi. As per Shrinivasan and Anantkrishnan (1964), SNF content was in the range of 8 to 8.5% in the market dahi samples.

**Moisture**: The average moisture percentage of dahi sold in the city was found to be 86.65 and 90.90 per cent, respectively. (Table 1). The moisture content of dahi samples of hotel was lower than the moisture content of vendor samples. There was significant differences in moisture content of dahi samples from hotels and vendors. The average moisture content of the dahi samples collected from hotel in east, west, north and south area were 86.80, 86.15, 86.52 and 87.12 per cent, respectively. The results obtained for moisture contents are in close agreement with those reported by Garg (1988) and Gandhi and Murlidhar Rao (1989).

**Titratable acidity**: It is revealed from Table 1 that the titratable acidity in dahi samples...
collected from hotel and vendor of four different areas in city was 1.08 and 1.35 per cent (LA), respectively. The acidity of the samples from vendors was higher than the hotel samples. The average acidity content of dahi samples collected from hotel in north, west, south and east areas were 1.11, 1.09, 1.08 and 1.02 per cent, respectively. There was significant difference in acidity content in areas east, west, north and south of dahi samples collected from hotel but the values of acidity content were at par with each other.

The observed differences in titratable acidity of dahi was due to the various storage period, condition of storage, type of starter cultures used and techniques used for preparation of dahi. Laxminarayan et al. (1952) conducted survey on types of dahi produced and marketed in different parts of the country and found that quality of dahi varied a great deal from place to place. The lactic acidity of market dahi samples was ranged between 0.81 and 2.45%.

The composition of dahi sold in Nagpur city by hotels as well as vendors did not conform the P F A Standards.

Sensory quality of dahi

Flavour: It is revealed (Table 2) that the average flavour score of dahi samples collected from hotels and vendors of four different localities was 41.51 and 36.27, respectively. There was significant difference in flavour score of hotel and vendor samples. The samples which had score 41 to 45 were clean, pleasant acidic flavour and which scored 21 to 30, were bitter in flavour. It was observed that the hotel samples had clean, peasant acidic flavour while vendor samples showed bitter flavour.

Body and texture: From the results (Table 2) it is seen that the body and texture score for dahi samples from hotels was 28.28 and from vendors was 23.18. The samples which have score of 27-30, were firm, solid, uniform, smooth without gas bubbles, while samples having score 23-26, with little wheying off.

Appearance: The score for appearance of dahi samples collected from hotels and vendors was 8.29 and 6.20, respectively. There was significant difference (P < 0.05) in appearance score of dahi samples collected from different localities of city. The samples having score 8-10 were clean, velvety, smooth in appearance with no gas bubbles, while those having score 5-8, showed gas bubbles, rough wrinkled and watery surface.

Acidity score: It is evident (Table 2) that the acidity score of dahi samples collected from hotel and vendor of four different localities of Nagpur
There was significant difference in acidity score of hotel and vendor samples. It is seen that the samples have higher acidity score had lower acidity while those have lower score had higher acidity. Hotel samples had higher score so they have lower acidity, while vendor samples had lower score which have higher acidity content. **Container and closure:** It is seen that the container and closure score of dahi samples collected from hotels and vendors of four localities of city was 3.85 and 2.29, respectively. It is revealed (Table 2) that the overall score of dahi samples collected from four localities of Nagpur city from hotel and vendor was 90.39 and 74.20, respectively. The highest score was 90.39 in hotel samples. It could be revealed that the dahi samples collected from hotel were of superior over the dahi sold by vendor in all localities of Nagpur city.

It is concluded that with the nutritional and economic importance of dahi, it has long been realized that this product should be produced on scientific lines in unorganized sector of our dairy industry. The conditions of distribution should be standardized, so as to ensure the supply of good quality product for day to day consumption.

**REFERENCES**


Kumar, H. et al. (1952) : Indian J. Dairy Sci. 22 (13) : 106.


**Table 2.** Sensory quality of dahi samples collected from Nagpur city.

<table>
<thead>
<tr>
<th>Source</th>
<th>Area</th>
<th>Flavour (Out of 45)</th>
<th>Body &amp; Texture (Out of 30)</th>
<th>Appearance (Out of 10)</th>
<th>Acidity score (Out of 10)</th>
<th>Container &amp; closure (Out of 10)</th>
<th>Overall score (out of 100)</th>
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<tbody>
<tr>
<td>Hotel</td>
<td>A</td>
<td>41.60</td>
<td>28.12</td>
<td>8.37</td>
<td>7.90</td>
<td>3.90</td>
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<tr>
<td></td>
<td>B</td>
<td>42.02</td>
<td>28.75</td>
<td>9.14</td>
<td>8.17</td>
<td>4.05</td>
<td>91.92</td>
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<tr>
<td></td>
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<td>41.30</td>
<td>27.92</td>
<td>8.67</td>
<td>7.67</td>
<td>3.77</td>
<td>90.07</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>41.12</td>
<td>28.32</td>
<td>8.57</td>
<td>8.02</td>
<td>3.57</td>
<td>89.67</td>
</tr>
<tr>
<td>Vendor</td>
<td>A</td>
<td>36.80</td>
<td>23.32</td>
<td>6.20</td>
<td>6.60</td>
<td>2.32</td>
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</tr>
<tr>
<td></td>
<td>B</td>
<td>36.73</td>
<td>23.10</td>
<td>6.72</td>
<td>6.45</td>
<td>2.45</td>
<td>74.87</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>36.07</td>
<td>22.77</td>
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<td>6.27</td>
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<tr>
<td></td>
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<td>5.85</td>
<td>5.87</td>
<td>2.22</td>
<td>73.27</td>
</tr>
</tbody>
</table>

S.E. (D) 0.1157 0.0988 0.1068 0.1178 0.0682 0.2395

C.D. 0.3403 0.2905 0.3141 0.3465 0.2008 0.7045

F test: Hotel and Vendor ** NS ** ** NS ** NS **

Area ** NS ** NS ** NS

Interaction NS NS NS NS NS NS

while vendor used tin container and not stored dahi samples in refrigerator.