

Sensory Evaluation and Microbial Analysis of Probiotic Ambil Using Sorghum (*Sorghum bicolor*) Flour

Abstract

The present study was conducted to evaluate the sensory and microbial qualities of Sorghum-based Probiotic Ambil enriched with varying levels (20%, 30%, 40%, and 50%) of probiotic curd containing *Lactobacillus acidophilus*. Sensory evaluation focused on key attributes including colour and appearance, flavour, body and texture, and overall acceptability. Among

the treatments, T3 (40% probiotic curd) received the highest scores across all sensory parameters. Panellists described T3 as having a smooth texture, appealing white appearance, and a pleasantly sour and palatable flavour, resulting in superior overall acceptability. This indicated that the 40% incorporation level struck an optimal balance between taste, texture, and visual appeal.

Microbial analysis revealed that the probiotic count increased proportionally with higher levels of probiotic curd. Fresh samples of Sorghum-based Probiotic Ambil showed acceptable standard plate counts and probiotic viability. Importantly, yeast and mould, as well as coliforms were not detected in any treatments at the time of fresh consumption, confirming the microbiological safety and stability of the product under the tested conditions.

These findings suggest that incorporating 40% probiotic curd (T3) into Sorghum-based Ambil not only enhances its sensory qualities but also ensures a safe microbial profile, making it a promising functional beverage with improved consumer acceptability.

Keywords: (Sorghum-based Probiotic *Ambil*, Probiotic curd, *Lactobacillus acidophilus*)

1. INTRODUCTION

About 11,000 years ago, when farming started to take the place of hunting and gathering in the Middle East, milk was first used for human nourishment. In order to break down lactose, a milk sugar that was indigestible to adults, cattle herders first started fermenting milk to make yoghurt and cheese (Curry, 2013). A cultural history of milk consumption has also been linked to other lactase persistence pockets in South Asia, the Middle East and West Africa. In these regions, genetic mutations linked to the lactase gene have also been found (Burger, Kirchner, Bramanti, Haak, and Thomas, 2007; Ingram et al., 2009; Gerbault et al., 2011). As farming began, milk from cows, sheep or goats became a valuable source of nutrients. Additionally, fermented milk products could be preserved, making them less dependent on harvests and seasonal fluctuations, which helped during famine. In addition to lactose, the primary milk sugar, milk also includes vital amino acids, lipids, vitamins, minerals and proteins (caseins, whey proteins and minor proteins). Thus, its use may have played a role in the centuries-long success of human evolution. But in addition to being extremely nourishing for people, milk is also a great place for microbes to develop.

Probiotics are live organisms that help the host's health when given in sufficient quantities. This phrase describes particular bacterial strains and common probiotics contain lactic acid bacteria like *Bifidobacterium* and *Lactobacillus*. Dairy products like yoghurt, cheese and kefir are frequently fermented using these strains. For this reason, one of the most popular sources of probiotics is fermented dairy products that contain live bacterial cultures. Numerous gastrointestinal and digestive disorders may benefit from this kind of probiotic-containing milk product. (Suryawanshi, N. A., 2021).

Originally known as *Bacillus acidophilus*, *L. acidophilus* was first isolated from the human gastrointestinal system (infant feces) by Moro in 1900. *L. acidophilus* is present in over 80 per cent of yogurts made in the United States. *L. acidophilus* isolates have been grown from the oral, intestinal and vaginal regions and are also a component of the natural human microbiota. *L. acidophilus* is a gram-positive, short

(2–10µm) bacillus that may thrive at temperatures as high as 45°C but grows best around 37-42°C. It grows most when the pH is between 5.5 and 6.0 and it stops growing when the pH is 4.0. One of the least oxygen-tolerant LABs is *Lactobacillus acidophilus*, an obligatory homofermentative bacteria that ferments carbohydrates to create lactic acid. One of the primary commercial species of *Lactobacillus acidophilus* is found in goods such as milk, yogurt, baby formulae and probiotic-containing dietary supplements. (Marchesi J, Bull M, Plummer S et al., 2013).

As a crop that can withstand drought, sorghum is ranked as the fifth most important staple cereal (Dlamini, Taylor and Rooney, 2007; FAO 2006; Raihanatu, Modu, Falmata, Shettima, and Heman, 2011). According to Taylor, Schober and Bean (2006) and Waniska, Rooney and McDonough (2004) it has been used to make porridge, beer, unleavened bread, couscous composite mixes and ethnic beverages. For the African and Indian populations, sorghum is a major source of energy, protein and minerals, including trace elements like iron and zinc (FAO 2006; Mohammed and Barbiker, 2011). Sorghum is rich in phenolic acid, flavonoids, antioxidants and condensed tannins in addition to these nutrients (Awika and Rooney, 2004; Dykes and Rooney, 2007; SernaSaldivar and Rooney, 1995).

2. MATERIAL AND METHODS

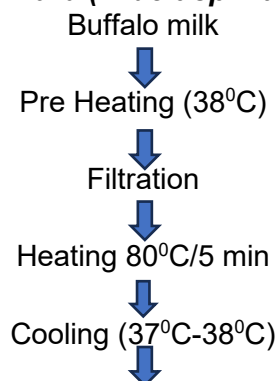
All the material required was procured from local market and also facilities provided by Department of Animal Husbandry and Dairy Science, College of Agriculture Dapoli, Ratnagiri, (M.S) India.

2.1.1 Starter culture, its maintenance and propagation

The freeze dried probiotic pure cultures of *Lactobacillus casei* were obtained from the National Dairy Research Institute, Karnal, Haryana and SMC college GAU, Anand. The culture was maintained separately in sterilized reconstituted skim milk test tubes.

The sterilized skim milk test tubes were separately inoculated with these cultures and incubated at 37°C for 8 hrs and thereafter stored at refrigerated temperature. In order keep these cultures active, they were propagated once in week. (Shankar, 1975).

2.1.2 Preparation of Probiotic Curd (*L. acidophilus*)



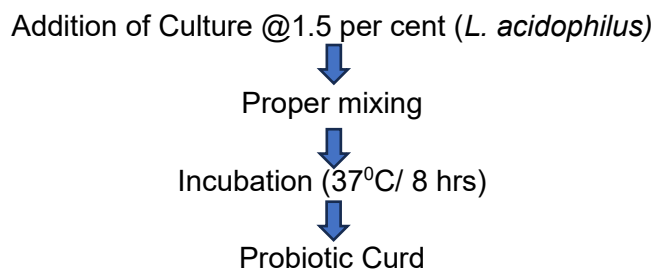


chart 1 The flowchart indicate Preparation of Probiotic Curd (*L. acidophilus*)

2.1.3 Preparation of sorghum based probiotic Ambil (Flow Chart)

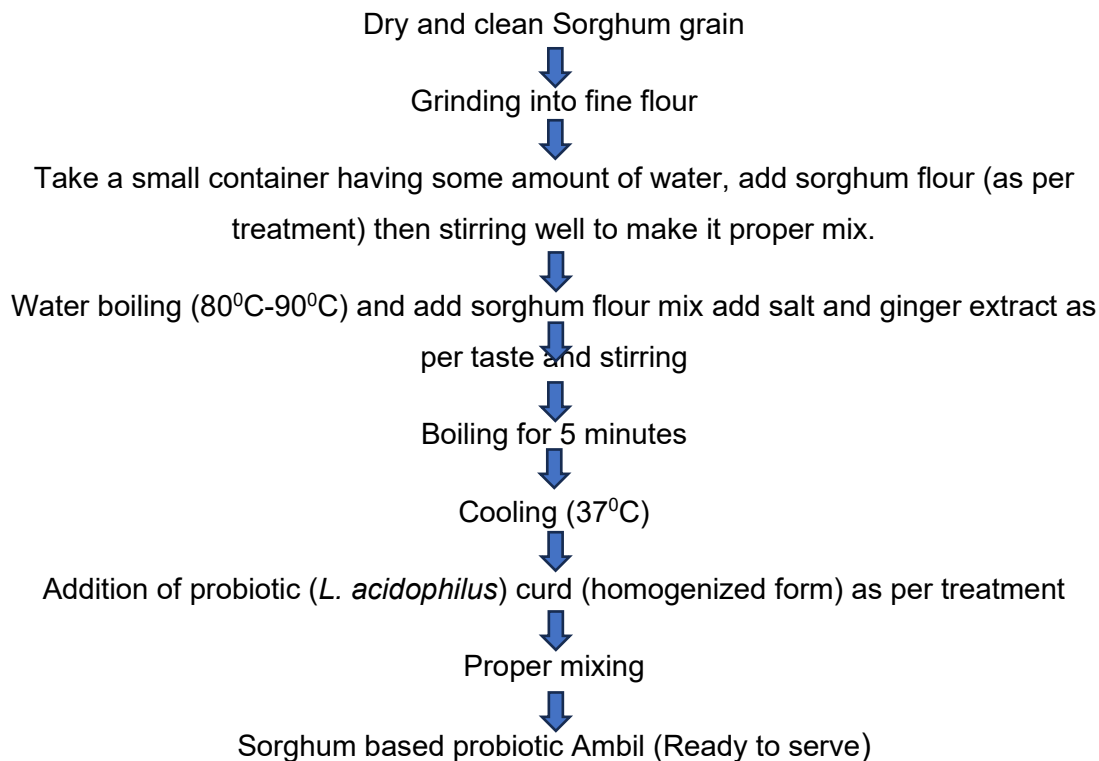


chart 2 Preparation of sorghum based probiotic Ambil (Flow Chart)

Treatments details

PHASE - I: Determination of optimum level of sorghum flour

In this phase by carried out filler-trial, sorghum flour was used at different proportion (5%, 7.5%, 10%, 12.5%) to finalize with constant level (7.5%) of sorghum flour.

PHASE - II: Preparation of Sorghum based Probiotic Ambil

In the present investigation Sorghum flour will be used @ 7.5 per cent for all treatments, whereas probiotic curd *L. acidophilus* was used in different proportion of 20, 30, 40 and 50 per cent.

The designed Sorghum based Probiotic Ambil was prepared in following different combinations,

T₀= 7.5% Sorghum flour + without adding probiotic curd

T₁= 7.5% Sorghum flour + adding 20 per cent probiotic curd (*L. acidophilus*)

T₂= 7.5% Sorghum flour + adding 30 per cent probiotic curd (*L. acidophilus*)

T₃ = 7.5% Sorghum flour + adding 40 per cent probiotic curd (*L. acidophilus*)

T₄= 7.5% Sorghum flour + adding 50 per cent probiotic curd (*L. acidophilus*)

2.2 Sensory Evaluation

The samples of Sorghum based probiotic Ambil was evaluated for sensory qualities by using 9-point hedonic scale as per IS: 6273, (Part-II), 1971 for various sensory attributes. The flavour, colour and appearance, body and texture and overall acceptability was the characteristics considered for the purpose of scoring the products (Appendix-I).

2.3 Microbial Analysis

The most optimum level found during research was subjected for microbial analysis for same day of freshly prepared product.

The parameters under study were probiotic count, Standard Plate count (SPC), Yeast Mould count and Coliform count. The most optimum level was subjected to sensory evaluation and microbial evaluation of product which was done on same day for freshly prepared product.

3. RESULTS AND DISCUSSION

3.1 Colour and Appearance

It is an important property for any food material that increases the consumer's aesthetic appeal. acceptance of any milk product by customers largely depends upon colour and appearance of the product. The desirable colour of the Sorghum Based Probiotic Ambil should be creamy white to white attractive, uniform, pleasing and typical represented in Table 1

The data regarding colour and appearance of Sorghum based Ambil fortified with probiotic curd (*L. acidophilus*) at different levels indicate that at 40 per cent addition of probiotic curd (*L. acidophilus*) to treatment T₃ scored highest (8.30) followed by treatment T₂, T₄ and T₁ whereas the control T₀ scored least (6.70).

It has been observed that there was continuous increase in score for colour and appearance when probiotic curd (*L. acidophilus*) was added @ 20 per cent, 30 per cent and 40 per cent. However, at 50 per cent addition of probiotic curd (*L. acidophilus*) product showed declining trend.

The statistical interpretation of data revealed that the results are statistically significant at 1 per cent level of probability. All the levels of probiotic curd (*L. acidophilus*) were found to be at par with each other whereas control sample differ significantly from Sorghum based probiotic Ambil fortified with probiotic curd (*L. acidophilus*)

The colour and appearance of liquid milk product largely depends upon its colour and viscosity. The colour must be uniform throughout the body of product and presence of any tinge of foreign colour is not accepted. In the present investigation, it has been observed that as proportion of probiotic curd (*L. acidophilus*) goes on increasing, product attains typical white colour. This bright colour was found to be very attractive and provide typical tinge to product which was well accepted by judges. However, at 50 per cent addition of probiotic curd (*L. acidophilus*) product attains dark crystal white colour which is not a natural feature of Sorghum based Probiotic Ambil so it was not liked by judges.

Kumar (2006) observed that Colour and appearance of the product had a maximum sensory score (7.75) for the formulation which included 3.73 per cent flour (24 h germinated flour) and 57.32 per cent of water on curd basis. However least score (6.75) was obtained with the formulation consisting of 8.00 per cent flour and 75.00 per cent of water on curd basis.

Shinde (2011) concluded that good quality of Ambil is creamish to light white in colour as A₄ (100% malt) sample had derived maximum score for acceptance of colour and appearance.

Wakil and Kazeem (2012) carried out the quality assessment in which they found that there is no significant difference in the preference for colour and appearance.

Chopade (2013) observed that the highest score for colour and appearance was observed for treatments C₂S₂, C₂S₃ and C₃S₂ i.e. 8.55 for each, at 12 hrs. Also, the highest scores were observed for treatment C₂S₂ i.e. 8.66 and 8.61, after 16 hours and 20 hours, respectively.

Table 1 Score obtained for colour and appearance of Sorghum based Probiotic Ambil

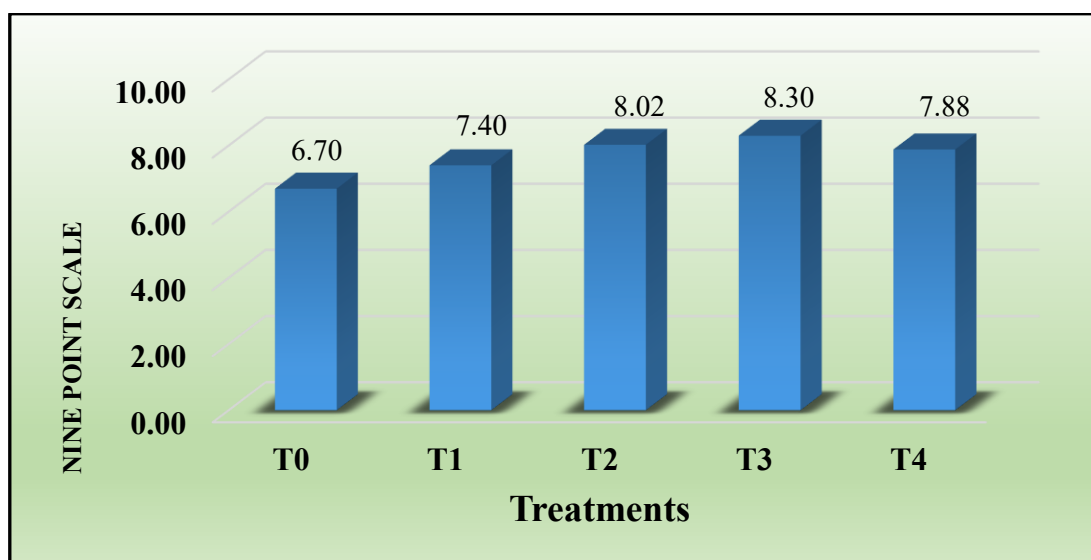
| | R-I | R-II | R-III | R-IV | R-V | R-VI | Mean |
|----------------|------|------|-------|------|------|------|--------------------|
| T ₀ | 6.23 | 6.89 | 7.44 | 7.19 | 6.26 | 6.18 | 6.70 ^b |
| T ₁ | 7.22 | 7.60 | 8.02 | 6.25 | 7.20 | 8.13 | 7.40 ^{ab} |
| T ₂ | 8.08 | 8.11 | 7.26 | 8.23 | 7.91 | 8.55 | 8.02 ^{ab} |

| | | | | | | | |
|----------------|------|------|------|------|------|------|--------------------|
| T ₃ | 8.23 | 8.39 | 8.05 | 7.94 | 8.68 | 8.50 | 8.30 ^a |
| T ₄ | 8.15 | 7.92 | 7.97 | 8.16 | 7.31 | 7.78 | 7.88 ^{ab} |

| Anova Table | | | | | | | |
|-------------|----|--------|-------|--------|---------|----------|--------|
| SV | DF | SS | MSS | Fcal | Ftab 5% | F tab 1% | Result |
| Tr | 4 | 9.476 | 2.369 | 10.440 | 2.759 | 4.177 | SIG |
| Er | 25 | 5.673 | 0.227 | | | | |
| Total | 29 | 15.148 | | | | | |

| S. E. ± | CD at 1% | CD at 5% |
|---------|----------|----------|
| 0.275 | 1.084 | 0.801 |

fig.1 The Bar Graph shows the Score obtained for colour and appearance of Sorghum based Probiotic Ambil



3.2 Flavour

Flavour plays crucial role in consumer's acceptance and preference it also indicates the freshness and quality of the product by enhancing satisfaction level. The score observed regarding flavour of Sorghum based Probiotic Ambil presented in table 2

The data regarding flavour of Sorghum based Ambil fortified with probiotic curd (*L. acidophilus*) at different levels indicate that at 40 per cent addition of probiotic curd

(*L. acidophilus*) to treatment T₃ scored highest (8.24) followed by treatment T₂, T₄ and T₁ whereas the control T₀ scored least (6.88).

It has been observed that there was continuous increase in score for flavour when probiotic curd (*L. acidophilus*) was added @ 20 per cent, 30 per cent and 40 per cent. However, at 50 per cent addition of probiotic curd (*L. acidophilus*) product showed declining trend.

The statistical interpretation of data reveals that the results are statistically significant at 1 per cent level of probability. All the levels of probiotic curd (*L. acidophilus*) were found to be at par with each other whereas control sample differ significantly from Sorghum based probiotic Ambil fortified with probiotic curd (*L. acidophilus*).

Using both taste and smell, flavour is created. In the present investigation it has been observed that as proportion of probiotic curd (*L. acidophilus*) goes on increasing product attains concentrated flavour which is not accepted. However, at 40 per cent (T₃) addition of probiotic curd (*L. acidophilus*) product was well accepted by judges.

Flavour is the important criteria for measuring the quality of product, which in turn determines its acceptability as per Kumar (2006) who studied the sensory scores for flavour of the rabadi-like beverage ranged from 6.45 to 7.31. The maximum score was given to the beverage consisting of 5.50 per cent flour and 75.00 per cent of water on the curd basis, while the minimum was obtained with 7.27 per cent flour and 57.32 per cent of water on the curd basis. this indicates clearly that at higher levels, the effect of flour is prominent on flavour.

Shinde (2011) concluded that Ambil prepared from malted sorghum had better acceptability almost far better than the control sample which had formulations containing 100 per cent and 75 per cent malt flour (A₃) and (A₄) also suggest that A₄ sample had good sour taste without off flavours and without any sediments of the spice mix.

Wakil and Kazeem (2012) suggested that sample AB₂ had the highest rating (5.80) by the 48 hr fermentation time, in terms of taste as well as flavour.

Chopade (2013) stated that highest score for flavour was observed for treatments C₂S₂, C₂S₃ and C₃S₂ i.e. 8.55 for each, at 12 hrs. Also, the highest scores were observed for treatment C₂S₂ i.e. 8.66 and 8.61, after 16 hours and 20 hours, respectively.

Table 2 Score obtained for flavour of Sorghum based Probiotic Ambil

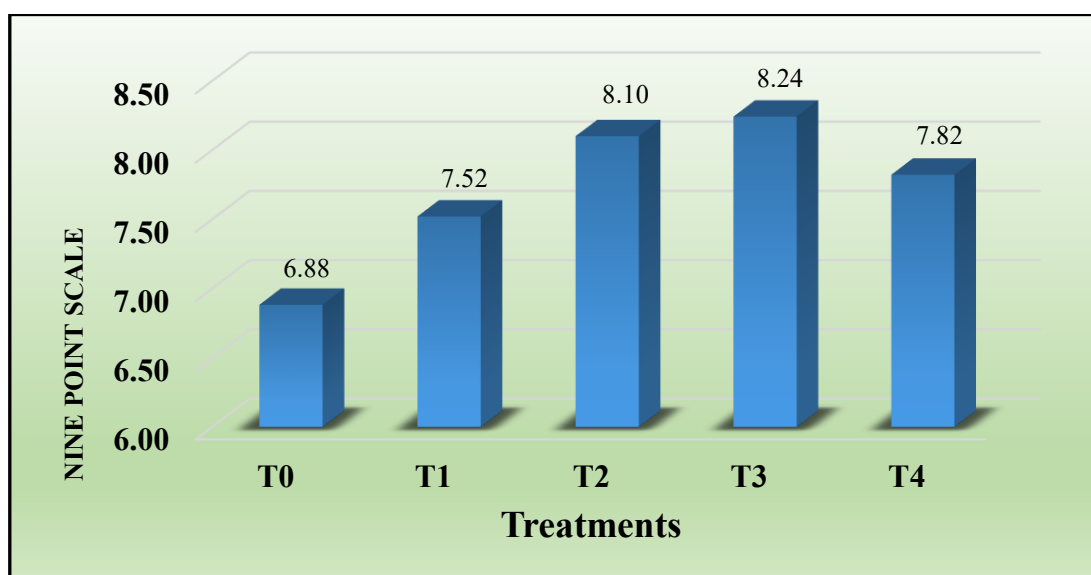
| | R-I | R-II | R-III | R-IV | R-V | R-VI | Mean |
|----------------|------|------|-------|------|------|------|--------------------|
| T ₀ | 6.45 | 6.66 | 7.11 | 7.00 | 6.92 | 7.16 | 6.88 ^b |
| T ₁ | 7.19 | 8.12 | 8.05 | 7.04 | 7.25 | 7.48 | 7.52 ^{ab} |
| T ₂ | 8.45 | 6.79 | 8.41 | 8.57 | 8.24 | 8.15 | 8.10 ^{ab} |

| | | | | | | | |
|----------------|------|------|------|------|------|------|--------------------|
| T ₃ | 8.59 | 6.66 | 8.52 | 8.65 | 8.78 | 8.26 | 8.24 ^a |
| T ₄ | 7.91 | 8.04 | 8.12 | 7.20 | 7.45 | 8.22 | 7.82 ^{ab} |

| Anova Table | | | | | | | |
|-------------|----|--------|-------|-------|---------|----------|--------|
| SV | DF | SS | MSS | Fcal | Ftab 5% | F tab 1% | Result |
| Tr | 4 | 7.017 | 1.754 | 5.772 | 2.759 | 4.177 | SIG |
| Er | 25 | 7.598 | 0.304 | | | | |
| Total | 29 | 14.615 | | | | | |

| S. E. ± | CD at 1% | CD at 5% |
|---------|----------|----------|
| 0.318 | 1.255 | 0.927 |

fig.2 The bar graph presents the Score obtained for flavour of Sorghum based Probiotic Ambil



3.3 Body and Texture

Body and Texture are key physical and sensory characteristics of dairy product which impacts mouthfeel as well as stability of the product. The score observed for Body and Texture of Sorghum based Probiotic Ambil presented in Table 3

The data regarding Body and Texture of Sorghum based Ambil fortified with probiotic curd (*L. acidophilus*) at different levels indicate that at 40 per cent addition of probiotic

curd (*L. acidophilus*) to treatment T₃ scored highest (8.35) followed by treatment T₂, T₄ and T₁ whereas the control T₀ scored least (6.86).

It has been observed that there was continuous increase in score for body and texture when probiotic curd (*L. acidophilus*) was added @ 20 per cent, 30 per cent and 40 per cent. However, at 50 per cent addition of probiotic curd (*L. acidophilus*) product showed declining trend.

The statistical interpretation of data reveals that the results are statistically significant at 1 per cent level of probability. While (T₂), (T₃) and (T₄) were found to be at par with each other whereas control sample (T₀) and (T₁) were found to be at par with each other.

In the present investigation it was observed that as proportion of probiotic curd (*L. acidophilus*) goes on increasing product showed more homogenize level of body and texture which were accepted by judges. However, at 50 per cent addition of probiotic curd (*L. acidophilus*) product seems to be less consistent which was not acceptable by judges.

Kumar (2006) explained that maximum body and texture was obtained in formulation of standard order 9, which had 7.27 per cent flour and 57.33 per cent of water on curd basis. The minimum body and texture were obtained with beverage consisting of 3.73 per cent flour and 92.68 per cent of water on curd basis. This is the clear indication that higher levels of water affected the body and texture of product significantly.

Shinde (2011) suggested that the consistency of the formulations A₃ and A₄ were preferable to that of the others. While sample A₄ having good viscosity with inclusion of 75 per cent malt flour.

Chopade (2013) reported that the body and texture for different treatments were significantly differed from each other. It is observed that, the highest score 8.50 was observed for treatment C₂S₂ at 12 hours and 20 hours, while, highest score 8.55 was observed for treatment C₂S₂ at 16 hours.

Table 3: : Score obtained for Body and Texture of Sorghum based Probiotic Ambil

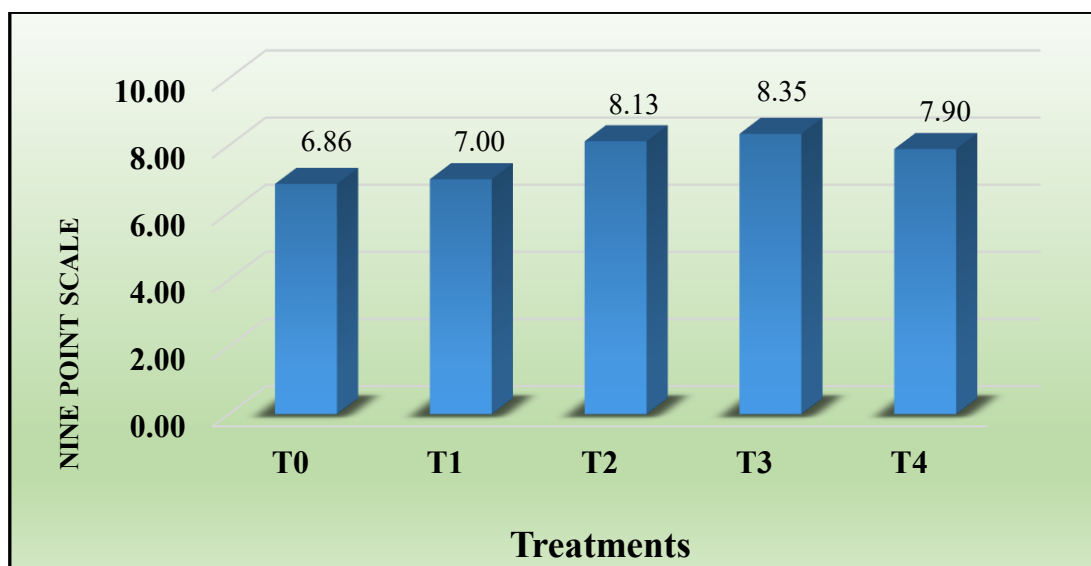
| | R-I | R-II | R-III | R-IV | R-V | R-VI | Mean |
|----------------|------|------|-------|------|------|------|--------------------|
| T ₀ | 7.12 | 6.49 | 6.91 | 6.44 | 6.69 | 7.51 | 6.86 ^{bc} |
| T ₁ | 6.34 | 7.25 | 6.32 | 8.57 | 6.50 | 7.02 | 7.00 ^b |
| T ₂ | 7.90 | 7.85 | 8.31 | 8.20 | 8.12 | 8.40 | 8.13 ^{ab} |
| T ₃ | 8.43 | 8.09 | 8.35 | 7.89 | 8.74 | 8.61 | 8.35 ^a |

| | | | | | | | |
|----------------------|------|------|------|------|------|------|--------------------|
| T₄ | 8.16 | 7.87 | 7.24 | 8.22 | 7.56 | 8.34 | 7.90 ^{ab} |
|----------------------|------|------|------|------|------|------|--------------------|

| Anova Table | | | | | | | |
|--------------------|-----------|---------------|--------------|---------------|----------------|-----------------|---------------|
| SV | DF | SS | MSS | Fcal | Ftab 5% | F tab 1% | Result |
| Tr | 4 | 10.986 | 2.746 | 11.123 | 2.759 | 4.177 | SIG |
| Er | 25 | 6.173 | 0.247 | | | | |
| Total | 29 | 17.153 | | | | | |

| S. E. ± | CD at 1% | CD at 5% |
|----------------|-----------------|-----------------|
| 0.287 | 1.131 | 0.835 |

fig.3 The Bar Graph shows the Score obtained for Body and Texture of Sorghum based Probiotic Ambil



3.4 Overall Acceptability

The overall acceptability of Sorghum based Probiotic Ambil was determined on the basis of average of the score recorded for different sensory attributes viz., colour and appearance, body and texture and flavour was considered. The results are presented in table 4

The data regarding overall acceptability of Sorghum based Ambil fortified with probiotic curd (*L. acidophilus*) at different levels indicate that at 40 per cent addition of probiotic curd (*L. acidophilus*) to treatment T₃ scored highest (8.30) followed by treatment T₂, T₄ and T₁ whereas the control T₀ scored least (6.82).

It was observed that there was continuous increase in score for overall acceptability when probiotic curd (*L. acidophilus*) was added @ 20 per cent, 30 per cent and 40 per cent. However, at 50 per cent addition of probiotic curd (*L. acidophilus*) product showed declining trend.

The statistical interpretation of data reveals that the results were statistically significant at 1 per cent level of probability. While (T₂), (T₃) and (T₄) were found to be at par with each other whereas control sample (T₀) and (T₁) were found to be at par with each other.

In the present investigation it was observed that as proportion of probiotic curd (*L. acidophilus*) having 40 per cent (T₃) were accepted by judges and secured highest score for overall acceptability. Hence treatment T₃ was considered as most acceptable level.

Kumar (2006) revealed that overall acceptability is the indicative parameter of sensory quality of product in totality and consists of appearance, flavour, body and textural characteristics according his studies the sensory score for overall acceptability ranged from 6.64 to 7.24. the overall acceptability is affected most by flour, as the minimum scores were obtained in samples with highest amount of flour.

Shinde (2011) interpreted according to statistical analysis that sorghum based Ambil prepared by different sorghum genotypes differed significantly for overall acceptability of product.

Wakil and Kazeem (2012) conclude that overall acceptability indicates that sample AB₂ i.e. sample fermented with mixed cultures of *Lactobacillus plantarum* and *Pediococcus acidilactici* is significantly different from others and having highest score rating respectively.

Chopade (2013) determined that the overall acceptability for treatment C₂S₂ shown highest score and it was significantly varied from other treatments. it is observed that, the scores for overall acceptability were 7.83, 8.22 and 8.16 at 12, 16 and 20 hours, respectively. And it is observed that 16 hours was the best time for incubation than that of 12 and 20 hours. Hence, he selected 16 hours incubation time for his research.

Table 4 : Score obtained for Overall acceptability of Sorghum based Probiotic Ambil

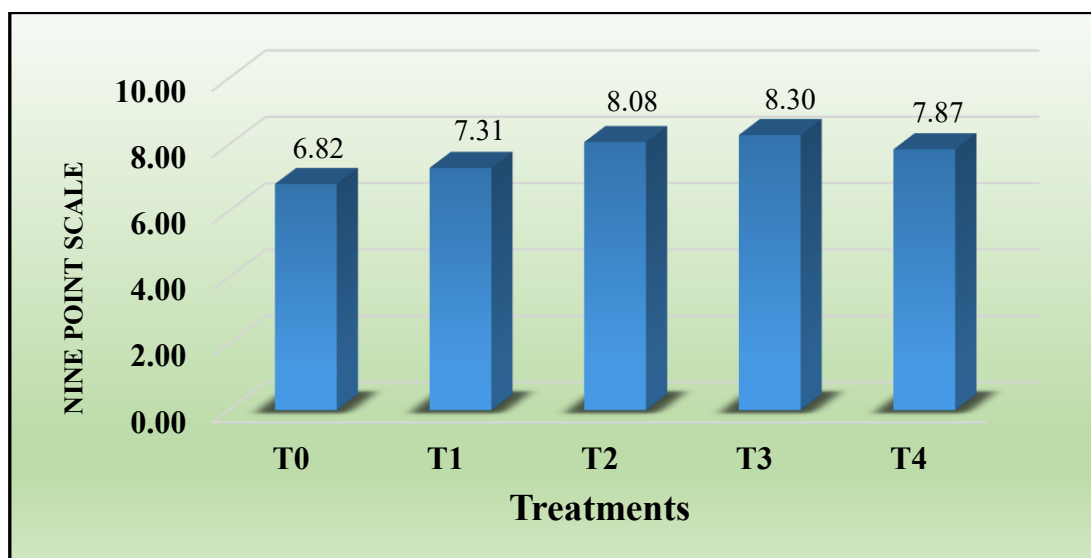
| | R-I | R-II | R-III | R-IV | R-V | R-VI | Mean |
|----------------|------|------|-------|------|------|------|--------------------|
| T ₀ | 6.66 | 6.68 | 7.15 | 6.87 | 6.62 | 6.95 | 6.82 ^{bc} |
| T ₁ | 6.92 | 7.65 | 7.46 | 7.28 | 6.98 | 7.54 | 7.31 ^b |

| | | | | | | | |
|----------------|------|------|------|------|------|------|--------------------|
| T ₂ | 8.14 | 7.58 | 8.00 | 8.33 | 8.09 | 8.36 | 8.08 ^{ab} |
| T ₃ | 8.41 | 7.71 | 8.31 | 8.16 | 8.73 | 8.46 | 8.30 ^a |
| T ₄ | 8.07 | 7.94 | 7.77 | 7.86 | 7.44 | 8.11 | 7.87 ^{ab} |

| Anova Table | | | | | | | |
|-------------|----|--------|-------|--------|---------|----------|--------|
| SV | DF | SS | MSS | Fcal | Ftab 5% | F tab 1% | Result |
| Tr | 4 | 8.726 | 2.182 | 27.899 | 2.759 | 4.177 | SIG |
| Er | 25 | 1.955 | 0.078 | | | | |
| Total | 29 | 10.681 | | | | | |

| S. E. ± | CD at 1% | CD at 5% |
|---------|----------|----------|
| 0.161 | 0.636 | 0.470 |

fig.4 The bar Graph shows the Score obtained for Overall acceptability of Sorghum based Probiotic Ambil



3.5 Microbial Analysis

The most optimal amount discovered throughout study was taken for microbial evaluation on same day. The product was tested for microbial characteristics on the same day. The sensory evaluation of the product was taking place concurrently.

The parameters studied were *L. acidophilus* count, standard plate count, coliform count, yeast and mould count.

Table 5 displays the results of the Microbial evaluation of the most acceptable level of Sorghum based Probiotic Ambil.

Table 5: Microbial evaluation of most acceptable level of Sorghum based Probiotic Ambil

| Most acceptable level treatment (T ₃) | Probiotic count (10 ⁷ cfu/g) | Standard plate count (10 ⁴ cfu/g) | Coliform count (10 ¹ cfu/g) | Yeast and Mould count (10 ¹ cfu/g) |
|---|---|--|--|---|
| Fresh sample | 83 | 0.65 | ND | ND |

A critical examination of Table 5 reveals the microbial evaluation of most acceptable level of fresh sorghum based Probiotic Ambil. During same day, the probiotic count was 83 x 10⁷cfu/g, the standard plate count was 0.65 x 10⁴cfu/g, while coliform and yeast and mould count were not detected and thus the viability of probiotics will get decreased due to increase in acidity. As per study it was observed that freshly prepared sorghum based Probiotic Ambil seems to be beneficial for consumption. Thus, Sorghum based Probiotic Ambil could serve as good carrier of probiotics to improve gut health and also suitable for lactose intolerant individuals

4. SUMMARY

Colour and appearance

The highest score (8.30) was recorded for treatment T₃ i.e. Sorghum based Probiotic Ambil with addition of Probiotic curd (*L. acidophilus*) @ 40 per cent and lowest score (6.70) was observed for treatment T₀ i.e. Sorghum based Probiotic Ambil manufactured without addition of Probiotic curd (*L. acidophilus*).

Flavour

Highest score for flavour was recorded for treatment T₃ (8.24) manufactured by addition of Probiotic curd (*L. acidophilus*) @ 40 per cent and lowest score (6.88) was observed for treatment T₀ i.e. Sorghum based Probiotic Ambil manufactured without addition of Probiotic curd (*L. acidophilus*).

Body and Texture

As far as body and texture is concerned, the highest score was recorded for treatment T₃ (8.35) and lowest for T₀ (6.86).

Overall acceptability

The highest score for overall acceptability was recorded for treatment T₃ (8.30) which contain Probiotic curd (*L. acidophilus*) @ 40 per cent while lowest score recorded for treatment T₀ (6.82).

Microbial Evaluation

The most optimum level found during research was subjected for microbial analysis and sensory evaluation. The parameters studied were probiotic count, standard plate count, coliform count and yeast and mould count for same day. The results of microbial studies indicate that the probiotic count observe for *L. acidophilus* strain was 83×10^7 cfu/g, whereas yeast and mould were absent throughout study, standard plate count observed as 0.65×10^4 cfu/g and Coliform count was absent. Based on sensory evaluation, it is found that product was acceptable only for fresh consumption.

5. CONCLUSION

Based on results obtained from the present investigation, following conclusions are drawn: The addition of 40 per cent Probiotic curd (*L. acidophilus*) in Sorghum based Probiotic Ambil was most acceptable. The Sorghum based Probiotic Ambil prepared from 40 per cent Probiotic curd (*L. acidophilus*) was recorded highest score 8.30 for overall acceptability. Based on microbial and sensory evaluation, it is found that product was acceptable only for fresh consumption.

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