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## Studies of sensory evaluation of *Lassi* prepared with optimized level of wheat grass (*Triticum aestivum*)

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### Abstract

In this study, the attempts have been made to prepared *lassi* by utilizing wheat grass in different proportion and study the sensory evaluation of *lassi*. The level of wheatgrass extract was optimized on the sensory basis the score obtained was subjected for chemical analysis and organoleptic evaluation by the panel of judges. Mixed the culture of lactic acid bacteria @ 2 percent was used to prepare *lassi* from buffalo milk containing 6.0 percent fat. A 5 percent wheatgrass extract level gave desirable result, i.e. lowest pH, highest the titrable acidity and optimum sensory scores.

**Keywords:** *Lassi*, sensory evaluation, wheat grass

### 1. Introduction

Present era is the time of excellence in every sector of life from simple to complex and vice-versa. Every field changing tremendously due to the increasing scientific attitudes, modernization with industrialization and its impact on lifestyle could not be ignore in each field. The eating and selecting habit of food show so much variation due to the diversification in tradition and culture, purchasing power of consumers, need of lifestyle and specialty of food. The expectation from food are not only to furnish the essential nutrients required for the normal body growth but to impart the curative properties against different disorders or diseases observed normally in human beings. Such type of innovative foods claiming functional, health beneficial and somewhat medicinal are coming in market by different food companies example pro-biotic yoghurt, pro-biotic *dahi/lassi*, *Arjuna* ghee, low cholesterol ghee etc. Milk is one such carrier that has been effectively used to deliver claiming agent for targeted health benefits in the traditional Indian system as well as medical science. There are evidences to suggest that addition of certain herbs into milk products increased antioxidative stability, heat stability, alcohol stability. The application of herb as medicine are practice science civilization and popular in *Aurveda* as *jadibutti* but as the development of scientific attitude and increasing curiosity its, application in dairy may result in raising their nutritional and medicinal values and enable development of value-added dairy products. Likewise, wheatgrass also having medicinal and nutritional properties being helpful for different ways is trying here for development of herbal *lassi*.

Wheatgrass is a food prepared from the cotyledons of the common wheat plant (*Triticum aestivum*) Belonging to a family Gramineae. *Triticum* is genus of annual and biennial grasses yielding various types of wheat and is cultivated almost all over the world shoot of *Triticum aestivum* is called wheat grass.

### 2. Material and Methods

#### 2.1 Materials

The following materials were used for the present investigation.

#### 2.2 Collection of buffalo milk and Wheat

Fresh and standardized buffalo milk for fat 6 percent and SNF 9 percent was procured from Natural Milk Pvt. Ltd., Latur. The wheat seed was purchased from the local market of Latur city of verity (2189).

#### 2.3 Microbial cultures

The standard mixed *dahi* culture i.e. Standard *dahi*, contained *streptococcus thermophilus* and *lactococcus lactis* NCDC-167(BD4) in this study was procured from the National collection of Dairy culture (NCDC), NDRI, Karnal.

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## 2.4 Chemicals

Analytical (AR) or guaranteed grade (GR) reagents were used in the chemical analysis.

## 2.5 Packaging material

Plastic glasses were used for serving the developed *lassi* for sensory study and packaging was done in plastic bottles.

## 2.6 Equipment and accessories

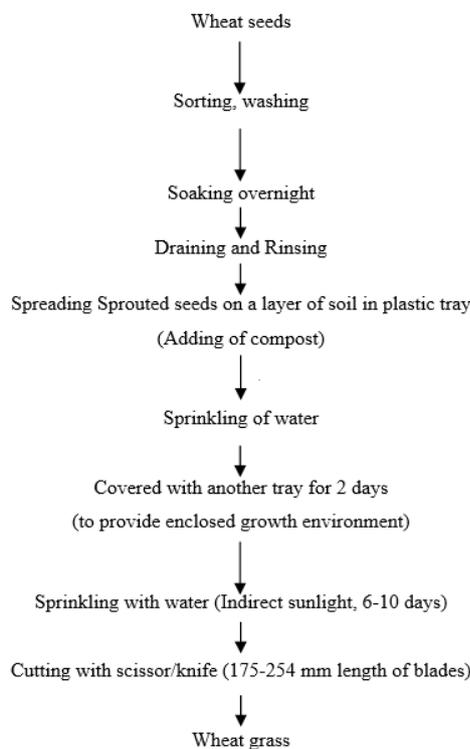
Stainless steel vessels of requisite capacity, Muslin cloth, and standard weight balance, thermometer, gas shegdi, Mixture (HERO Mixture, 550 WATTS) etc. were used for preparation of *dahi*. Before using this material it was properly cleaned and washed with detergent solution. All the precautionary measures were considered during the conduct of trials to avoid contamination.

## 3. Methods

The following methods were followed for the preparation of wheatgrass extract, *lassi* and for evaluation of physico-chemical properties, sensory evaluation and microbial analysis of developed lasso from buffalo milk and wheatgrass extract in the present investigation.

### 3.1 Preparation of wheat grass

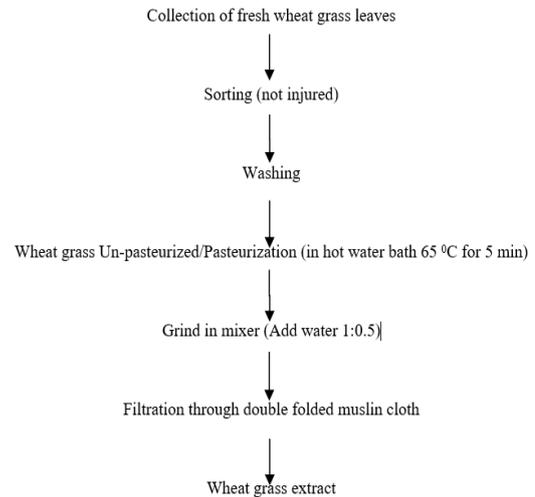
Wheatgrass was cultivated in laboratories from the local variety (2189) of wheat by sorting, cleaning and after overnight soaking of wheat seed in tray, the sprouted seed was grown in soil as per shown in follow diagram. Wheatgrass was harvested after 7 to 10 days of old and used for extract preparation as per the method described by (Kumar, 2017 and Patel 2012) [11,7].



**Fig 1:** Flow diagram No.1: Method of growing wheat grass (*Triticum aestivum*).

### 3.2 Preparation of wheat grass (*Triticum aestivum*) extract

Wheatgrass extract was prepared from the wheat grass cultivated in laboratory as per the method of Patel, 2012 [7] as shown in following flow diagram.



**Fig 2:** Flow diagram No.2: Preparation of wheat grass (*Triticum aestivum*) extract (Patel, 2012) [7]

### 3.3 Procedure

Wheatgrass extract was prepared from the wheat grass cultivated in laboratory as shown in flow chart. Wheatgrass extract was prepared by extracting the harvested grass in mixture (HERO Mixture, 550 WATTS) by using 0.5 percent water for easy and complete extraction of solid grass through following the steps sorting wheat grass, washing, grinding and filtration.

### 3.4 Treatment combinations

For preparation of herbal *lassi* by using *triticum aestivum* extract, the treatment combinations were finalized on weight basis as per follows.

T<sub>1</sub>-100 Parts of curd

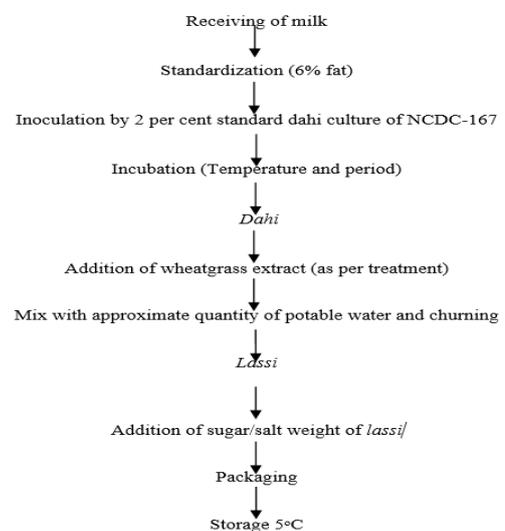
T<sub>2</sub>-95 Parts of curd + 5 Parts of Wheat Grass extract

T<sub>3</sub>-90 Parts of curd + 10 Parts of Wheat Grass extract

T<sub>4</sub>-85 Parts of curd + 15 Parts of Wheat Grass extract

### 3.5 Preparation of herbal (*Triticum aestivum*) lassi

Wheat grass (*Triticum aestivum*) extract added herbal *lassi* was prepared as per the method of (Aneja and Mathur, 2002) [2] with slight modification and one stage of wheatgrass extract addition as shown in following flow diagram No. 3.



**Fig 2:** Flow diagram No.3: Preparation of wheat grass (*Triticum aestivum*) extract added herbal *lassi*. (Aneja and Mathur, 2002) [2]

### 3.6 Procedure

For preparation of *dahi* from buffalo milk using wheatgrass extract, standardized buffalo milk containing 6 percent fat and 9 percent SNF milk was pasteurized 65 °C for 5minute. After pasteurization cooling of milk 37 °C. After cooling the standard culture NCDC-167 was added in milk @ 2 percent and incubated at 37 °C for 10 hrs. The wheat grass extract was added after formation of *dahi* as per treatment. After that equal quantity of potable water was added and churned it by using churner. Then 15 percent sugar was mixed in it. The prepared *lassi* was packed in plastic bottles and stored at 5 °C until further study.

### 4. Sensory evaluation of the product

The *lassi* samples prepared from buffalo milk with mixture of *wheat grass* extract with different levels were subjected for the sensory attributes such as colour and appearance, flavour, body and texture, taste and overall acceptability by a semi panel of judges using a 9 point Hedonic scale and the data so obtained were analyzed by using completely randomized block design (CRBD). The scores given by judges for different parameters were recorded and subsequently discussed in the foregoing tables and paragraphs. Sensory evaluation has been defined as a scientific method used to evoke, measure, analyze and interpret those responses to products as perceived through the senses of sight, smell, touch, taste, and hearing.

## 5. Results and Discussion

### 5.1 Colour and appearance score of *wheatgrass lassi*

Colour is the property, which is based on the spectral distribution of light. The average score for colour and appearance is presented in table no. 1

**Table 1:** Colour and appearance score of *wheatgrass lassi*

Replication treatment	R-I	R-II	R-III	R-IV	Mean
T1	7.50	7.50	7.50	7.50	7.50 <sup>a</sup>
T2	8.00	7.00	7.50	8.00	7.63 <sup>a</sup>
T3	7.00	7.00	7.00	7.75	7.19 <sup>ab</sup>
T4	6.50	7.00	7.00	7.00	6.88 <sup>b</sup>
S.E.±0.16C.D.at 5% 0.50					

The values with different small letters superscripts row wise differ significantly at 5 percent level of significance.

The values of the *wheatgrass* extract added *lassi* in terms of colour and appearances were observed as in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> were 7.50, 7.63, 7.19 and 6.88, respectively. The treatment T<sub>2</sub> was recorded highest score than other treatments but differ non-significantly to other treatments except T<sub>4</sub> indicate that *wheatgrass* extract used to prepared *lassi* samples not affected much more. The treatments T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were found at par with each other. It may be concluded that, 5 percent wheatgrass extract added to the *lassi* was preferred by the judges, as far as colour and appearance character was concerned. The effect of wheat grass extract on colour quality

**Table 3:** Body and texture score for *wheatgrass lassi*

Replication treatment	R-I	R-II	R-III	R-IV	Mean
T <sub>1</sub>	6.50	6.50	6.00	6.00	6.25 <sup>c</sup>
T <sub>2</sub>	7.00	6.50	7.00	6.50	6.75 <sup>bc</sup>
T <sub>3</sub>	7.50	7.00	7.50	7.00	7.25 <sup>b</sup>
T <sub>4</sub>	8.00	7.50	8.00	8.80	7.88 <sup>a</sup>
S.E. ± 0.16 C.D. at 5% 0.50					

of *lassi* was noticeably faint greenish colour feel cooling sensation but excess quantity (>15) reduced the score may be due to the dark greenish obtained as compared to previous treatments. The value recorded for colour and appearance of *lassi* prepared from buffalo milk added wheat grass extract in present investigation are comparable with the finding of below mentioned research worker.

### 5.2 Flavour score for *wheatgrass lassi*

Flavour includes taste and order/aroma. The flavour of any food product is an important attributes as far as consumer liking is concerned and *lassi* is not exception to it. The flavour is much more important than other properties due to its instant feeling and first indication about quality of food.

The flavour score of *lass* prepared from buffalo milk with addition of wheatgrass extract are tabulated in Table 2.

It is observed from the table 4.5, the average mean score of *wheatgrass lassi* in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> were 8.38, 7.13, 7.50 and 7.75, respectively. The highest score for flavor was recorded for T<sub>1</sub> (8.38) followed by T<sub>4</sub>, T<sub>3</sub> and T<sub>1</sub>, whereas the lowest flavor score was recorded for treatment T<sub>1</sub> (6.38). Developed *lassi* treatments were significant different from control, indicates that extract added may be contributed for flour, might be due to the different components particularly enzymes and flavonoids present in wheat grass extract contribute it. It is clearly indicated that the adding of wheatgrass extract in preparing *wheatgrass lassi* was responsible for its flavor positively.

**Table 2:** Flavour score for *wheatgrass lassi*

Replication treatment	R-I	R-II	R-III	R-IV	Mean
T <sub>1</sub>	8.5	8.3	8.3	8.4	8.38 <sup>a</sup>
T <sub>2</sub>	7.00	7.00	7.50	7.00	7.13 <sup>b</sup>
T <sub>3</sub>	7.00	8.00	7.50	7.50	7.50 <sup>ab</sup>
T <sub>4</sub>	8.00	7.50	7.50	8.00	7.75 <sup>a</sup>
S.E. ± 0.183 C.D. at 5% 0.566					

The values with different small letters superscripts row wise differ significantly at 5 percent level of significance.

### 5.3 Body and texture score for *wheatgrass lassi*

Body and texture is the most important property of most of the milk products became cause of attraction for consumers towards milk product as compare to other food items for their specialty and popularity. The evaluation of the product through consumer/judges gives immense importance. The value recorded in respect of body and texture score of the finished product are shown in table 4.6. It is observed from the table 4.6 that the average score for body and texture attribute ranges between 6.25 to 7.88 for *wheatgrass lassi*. All treatments were acceptable on 9 point hedonic scale secured more than 6 point. The highest score for body and texture was recorded for treatment T<sub>4</sub> (7.88) whereas lowest score was recorded for treatment T<sub>1</sub> (6.25).

The values with different small letters superscripts row wise differ significantly at 5 percent level of significance.

It was noticed that the treatment T<sub>3</sub> and T<sub>4</sub> were significantly superior over treatments T<sub>1</sub> and T<sub>2</sub> and at par between themselves indicate that developed treatments T<sub>4</sub> was superior in respect to body and texture proved that the scored increased in subsequent treatments might be due to the gelation property of extract having gluten even though it content low solid as compare to milk used in this study.

#### 5.4 Mouth feel score for *wheatgrass lassi*

Table 4.7 indicates the score of mouth feel of *lassi* prepared from *wheatgrass* extract with buffalo milk was recorded as combine response of sweetness and pleasant smell.

**Table 4:** Mouth feel score for *wheatgrass lassi*

Replication treatment	R-I	R-II	R-III	R-IV	Mean
T <sub>1</sub>	8.00	8.00	8.50	8.00	8.13 <sup>a</sup>
T <sub>2</sub>	8.50	8.00	8.50	8.00	8.25 <sup>a</sup>
T <sub>3</sub>	8.25	8.45	8.00	8.00	8.19 <sup>a</sup>
T <sub>4</sub>	8.00	7.50	7.65	7.65	7.66 <sup>b</sup>
S.E. ± 0.127		C.D. at 5% 0.391			

The values with different small letters superscripts row wise differ significantly at 5 percent level of significance.

**Table 5:** Overall acceptability score for *wheatgrass lassi*

Treatment	Colour and appearance	Flavour	Body and Texture	Mouth feel	Overall acceptability
T <sub>1</sub>	7.50	6.38	6.25	8.13	7.10 <sup>a</sup>
T <sub>2</sub>	7.63	7.13	6.75	8.25	7.41 <sup>a</sup>
T <sub>3</sub>	7.19	7.50	7.25	8.19	7.53 <sup>a</sup>
T <sub>4</sub>	6.88	7.75	7.58	7.66	7.47 <sup>a</sup>
S.E. + 0.320			C.D. at 5% 0.986		

The values with different small letters superscripts row wise differ significantly at 5 percent level of significance.

#### 6. Conclusion

The present study confirmed that wheat grass can be used as flavouring and colouring agent in *lassi* without adversely affecting the quality of the product. From above discussed results for sensory attributes it is noticed that all four treatments secured more than 7 point out of 9 point of hedonic scale which indicated that these treatments were appreciated by the judges and accepted on the sensory parameters and felt essential to investigate their physico-chemical and microbial analysis.

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The table 6 showed mean score for mouth feel of *wheatgrass lassi* for treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> were 8.13, 8.25, 8.19 and 7.66, respectively. The highest score for mouth feel was recorded for treatment T<sub>2</sub> (8.25) and the lowest mouth feel score was recorded for treatment T<sub>4</sub> (7.66). Treatment T<sub>2</sub> significantly superior over the treatment with T<sub>4</sub>, and at par with treatments T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>. The results recorded for

#### 5.5 Overall acceptability score for *wheatgrass lassi*

Overall acceptability can be considered as a complex characteristic of food that determines its value or acceptability to consumer. Quality is judged by both subjective and objective tests. The subjective tests are the sensory tests and whereas the objective tests are the chemical and nutritive tests. The data obtained from overall acceptability for the treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> is tabulated in table 4.8.

Table 4.8 shows that the mean overall score of acceptability of *wheatgrass lassi* for the treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> were 7.10, 7.41, 7.53 and 7.47, respectively. All treatments fall above the like moderately on 9 point hedonic scale having value more than 6. The highest overall acceptability score was observed in treatment T<sub>3</sub> i.e. (7.53). The lowest overall acceptability score was found in treatment T<sub>1</sub> (7.10) in *wheatgrass lassi*. It was observed that all treatments were at par with each other.

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