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#### Honest Pramjeet Simon

Warner College of Dairy  
Technology, Sam Higginbottom  
University of Agriculture  
Technology and Sciences,  
Allahabad, Uttar Pradesh, India

#### Dr. Ramesh Chandra

Warner College of Dairy  
Technology, Sam Higginbottom  
University of Agriculture  
Technology and Sciences,  
Allahabad, Uttar Pradesh, India

#### Sangeeta Shukla

Warner College of Dairy  
Technology, Sam Higginbottom  
University of Agriculture  
Technology and Sciences,  
Allahabad, Uttar Pradesh, India

#### Dr. Shanker Suwan Singh

Warner College of Dairy  
Technology, Sam Higginbottom  
University of Agriculture  
Technology and Sciences,  
Allahabad, Uttar Pradesh, India

#### Correspondence

##### Honest Pramjeet Simon

Warner College of Dairy  
Technology, Sam Higginbottom  
University of Agriculture  
Technology and Sciences,  
Allahabad, Uttar Pradesh, India

## Sensory evaluation of probiotic herbal yoghurt with ginger and garlic extract

Honest Pramjeet Simon, Dr. Ramesh Chandra, Sangeeta Shukla and Dr. Shanker Suwan Singh

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#### Abstract

The experiment “sensory evaluation of probiotic herbal yoghurt with ginger and garlic extract” was carried out in the Research Laboratory of Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad -211007, U.P. (India). The samples of probiotic herbal yoghurt were evaluated for colour and appearance, flavor and taste, body and texture and overall acceptability on a 9-point Hedonic scale by a sensory panel consisting of 8 judges. On analyzing the sensory evaluation of probiotic herbal yoghurt it was found that treatment T<sub>1</sub> Gg= 1% ginger extract + St.thrmophilus + L.rhamnosus 1:1 @ 1.5% has the highest colour and appearance, the highest flavor and taste was observed in treatment T<sub>7</sub> Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 1.5% while as the maximum body and texture and overall acceptability was found with T<sub>0</sub> Control.

**Keywords:** yoghurt, sensory evaluation, ginger, garlic st. thrmophilus and L. rhamnosus

#### Introduction

Yoghurt is one of the most popular Fermented dairy products. Yoghurt is produced by culturing one or more of the optional dairy ingredients namely, cream, milk, partially skimmed milk and skim milk used alone or in combination with a characteristic bacterial culture that contains lactic acid producing bacteria, Lactobacillus Bulgarian and Strepto thermophilus [FDA (2013)]. Yoghurt should not contain atleast 3.25% milk fat and 8.25% of milk. Solid not fat with titrable acidity of not less than 0.9% expressed as lactic acid. Ginger & Garlic has been consumed as spices & food preservatives, Ginger contains approximately 1%- 3% volatile oils & number of pungent compound (Churbasik *et al.*, 2005) Shoyaol and Ginger are effective substance in the Ginger that have local effect on digestive system (Ozgoli *et al.*, 2009) [4]. The uses of Garlic with antimicrobial & antiprotozoal activities have been researched by (Moore & Atkins 1977) [3]. Garlic and ginger have antibacterial properties and cardiovascular diseases as ginger and garlic decrease the risk of diabetis (Morgie *et al.*, 2010). In the present times the herbal products are gaining more popularity over synthetic product in the international market, these herbal products have no side effects on the body of product. The different level concentration of Ginger (1-1.5%) & Garlic (0.2-0.4%) were used. Different physiochemical and microbiological characteristics were analysed to assay the quality of herbal yoghurt.

#### Materials and Methods

The experiment “sensory evaluation of probiotic herbal yoghurt with ginger and garlic extract” was carried out in the Research Laboratory of Warner School of Food and Dairy technology, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad -211007, U.P. (India). Obtained data were analyzed for randomized block designed & critical difference (C.D.). In statistical analysis, data used were average of replicates total no. of treatments combinations were 15 compared with control T<sub>0</sub>. There are 16 combinations of treatments with control under study presented in table 1. The samples of probiotic herbal yoghurt were evaluated for colour and appearance, flavor and taste, body and texture and overall acceptability on a 9-point Hedonic scale by a sensory panel consisting of 8 judges.

#### Results and Discussion

##### 1.1 Average of sensory attributes in probiotic herbal yoghurt.

It can be observed from the table 4.1(a) that average of Colour and appearance score in

probiotic herbal yoghurt T<sub>0</sub> (6.68), T<sub>1</sub> (7.28), T<sub>2</sub> (7.30), T<sub>3</sub> (7.63), T<sub>4</sub> (7.70), T<sub>5</sub> (7.58), T<sub>6</sub> (7.78), T<sub>7</sub> (7.30), T<sub>8</sub> (8.23), T<sub>9</sub> (6.88), T<sub>10</sub> (7.63), T<sub>11</sub> (7.03), T<sub>12</sub> (7.55), T<sub>13</sub> (6.58), T<sub>14</sub> (7.55), T<sub>15</sub> (8.83) and T<sub>16</sub> (8.53). It is evident from the table 4.1 that the highest average value of Colour and appearance score was obtained in the treatment T<sub>15</sub> Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 2%. Whereas lowest value of Colour and appearance score was obtained in the treatment T<sub>0</sub> Control (6.68). It can be observed from the table 4.1(a) that average of Flavour and taste score in probiotic herbal yoghurt T<sub>0</sub> (6.75), T<sub>1</sub> (7.68), T<sub>2</sub> (7.63), T<sub>3</sub> (7.63), T<sub>4</sub> (7.60), T<sub>5</sub> (6.93), T<sub>6</sub> (7.08), T<sub>7</sub> (7.80), T<sub>8</sub> (7.83), T<sub>9</sub> (7.70), T<sub>10</sub>(7.68), T<sub>11</sub> (7.55), T<sub>12</sub> (7.30), T<sub>13</sub> (7.18), T<sub>14</sub> (7.80), T<sub>15</sub>(7.90) and T<sub>16</sub>(7.83). It is evident from the table 4.1 that the highest average value of Flavour and taste score was obtained in the treatment T<sub>15</sub> Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 2%. Whereas lowest value of Flavour and taste score was obtained in the treatment T<sub>0</sub> Control (6.75). It can be observed from the table 4.1(a) that average of body texture score in probiotic herbal yoghurt T<sub>0</sub> (6.60), T<sub>1</sub> (8.08), T<sub>2</sub> (8.05), T<sub>3</sub> (7.38), T<sub>4</sub> (7.70), T<sub>5</sub> (7.53), T<sub>6</sub> (7.53), T<sub>7</sub> (7.73), T<sub>8</sub> (8.33), T<sub>9</sub> (7.55), T<sub>10</sub> (7.63), T<sub>11</sub> (7.03), T<sub>12</sub> (7.70), T<sub>13</sub> (7.55), T<sub>14</sub> (7.78), T<sub>15</sub>(8.65) and T<sub>16</sub>(8.33).. It is evident from the table 4.1 that the highest average value of body texture score was obtained in the treatment T<sub>15</sub> Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 2%. Whereas lowest value of body texture score was obtained

in the treatment T<sub>0</sub> Control (6.60). It can be observed from the table 4.1(a) that average of overall acceptability score in probiotic herbal yoghurt T<sub>0</sub> (6.93), T<sub>1</sub> (7.13), T<sub>2</sub> (7.66), T<sub>3</sub> (7.88), T<sub>4</sub> (7.64), T<sub>5</sub> (7.71), T<sub>6</sub> (7.64), T<sub>7</sub> (7.71), T<sub>8</sub> (8.06), T<sub>9</sub> (7.60), T<sub>10</sub> (7.64), T<sub>11</sub> (7.06), T<sub>12</sub> (7.12), T<sub>13</sub> (7.44), T<sub>14</sub> (7.25), T<sub>15</sub> (8.33) and T<sub>16</sub> (8.19)..It is evident from the table 4.1 that the highest average value of overall acceptability score was obtained in the treatment T<sub>15</sub> Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 2%. Whereas lowest value of overall acceptability score was obtained in the treatment T<sub>0</sub> Control (6.93). In present studies, yoghurt formed may be characterized physically by its smooth viscous gel structure on onrganoleptically by its faste and flavor (Debbie, L. *et al.*, 1991) <sup>[2]</sup> under normal fermentation condition, the main products of metabolism are lactic acid, acetic acid, acetaldehyde, ethanol and diacetyl, all of which contributed to the specific sour flavor of fermented yoghurts. Herbs contain phytochemicals and this may play important role in causing undesirable organoleptic properties of herbal – yogurts. This is because most herbs contain a unique richness and diversity of metabolites responsible for their taste and flavor cinnamon yoghurt was considered by the panelist as the most undesirable in overall taste followed by control yogurt in comparison to plain yogurts. The present study was supported by (Marhamatizadeh *et al.*, 2012) <sup>[1]</sup>. That increase in concentration of herbs promote the growth and viability of probiotic bacteria in yogurt.

**Table 1:** Treatment combination

Treatment No.	Treatment Combination
T <sub>0</sub>	Control
T <sub>1</sub>	Gg= 1% ginger extract + St.thrmophilus + L.rhamnosus 1:1 @ 1.5%
T <sub>2</sub>	Gg=1.5% ginger extract+ St.thrmophilus + L.rhamnosus 1:1 @ 1.5%
T <sub>3</sub>	Ga= 0.2% garlic extract+ St.thrmophilus + L.rhamnosus 1:1 @ 1.5%
T <sub>4</sub>	Ga=0.4 % garlic extract +St.thrmophilus + L.rhamnosus 1:1 @ 1.5%
T <sub>5</sub>	Gg= 1% ginger extract +St.thrmophilus + L.rhamnosus 1:2@ 1.5%
T <sub>6</sub>	Gg=1.5% ginger extract +St.thrmophilus + L.rhamnosus 1:2@ 1.5%
T <sub>7</sub>	Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 1.5%
T <sub>8</sub>	Ga=0.4 % garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 1.5%
T <sub>9</sub>	Gg= 1% ginger extract +St.thrmophilus + L.rhamnosus 1:1 @ 2%
T <sub>10</sub>	Gg=1.5% ginger extract +St.thrmophilus + L.rhamnosus 1:1 @ 2%
T <sub>11</sub>	Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:1 @ 2%
T <sub>12</sub>	Ga=0.4 % garlic extract +St.thrmophilus + L.rhamnosus 1:1 @ 2%
T <sub>13</sub>	Gg= 1% ginger extract +St.thrmophilus + L.rhamnosus 1:2@ 2%
T <sub>14</sub>	Gg=1.5% ginger extract +St.thrmophilus + L.rhamnosus 1:2@ 2%
T <sub>15</sub>	Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 2%
T <sub>16</sub>	Ga=0.4 % garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 2%

**Table 2:** Average of sensory attributes in probiotic herbal yoghurt.

Treatment No.	Treatment Combination	Colour and appearance	Flavour and taste	Body and Texture	Overall acceptability
T <sub>0</sub>	Control	6.68	6.75	6.60	6.93
T <sub>1</sub>	Gg= 1% ginger extract + St.thrmophilus + L.rhamnosus 1:1 @ 1.5%	7.28	7.68	8.08	7.13
T <sub>2</sub>	Gg=1.5% ginger extract+ St.thrmophilus + L.rhamnosus 1:1 @ 1.5%	7.30	7.63	8.05	7.66
T <sub>3</sub>	Ga= 0.2% garlic extract+ St.thrmophilus + L.rhamnosus 1:1 @ 1.5%	7.63	7.63	7.38	7.88
T <sub>4</sub>	Ga=0.4 % garlic extract +St.thrmophilus + L.rhamnosus 1:1 @ 1.5%	7.70	7.60	7.70	7.64
T <sub>5</sub>	Gg= 1% ginger extract +St.thrmophilus + L.rhamnosus 1:2@ 1.5%	7.58	6.93	7.53	7.71
T <sub>6</sub>	Gg=1.5% ginger extract +St.thrmophilus + L.rhamnosus 1:2@ 1.5%	7.78	7.08	7.53	7.64
T <sub>7</sub>	Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 1.5%	7.30	7.80	7.73	7.71
T <sub>8</sub>	Ga=0.4 % garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 1.5%	8.23	7.83	8.33	8.06
T <sub>9</sub>	Gg= 1% ginger extract +St.thrmophilus + L.rhamnosus 1:1 @ 2%	6.88	7.70	7.55	7.60
T <sub>10</sub>	Gg=1.5% ginger extract +St.thrmophilus + L.rhamnosus 1:1 @ 2%	7.63	7.68	7.63	7.64
T <sub>11</sub>	Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:1 @ 2%	7.03	7.55	7.03	7.06
T <sub>12</sub>	Ga=0.4 % garlic extract +St.thrmophilus + L.rhamnosus 1:1 @ 2%	7.55	7.30	7.70	7.12
T <sub>13</sub>	Gg= 1% ginger extract +St.thrmophilus + L.rhamnosus 1:2@ 2%	6.58	7.18	7.55	7.44

T <sub>14</sub>	Gg=1.5% ginger extract +St.thrmophilus + L.rhamnosus 1:2@ 2%	7.55	7.80	7.78	7.25
T <sub>15</sub>	Ga= 0.2% garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 2%	8.83	7.90	8.65	8.33
T <sub>16</sub>	Ga=0.4 % garlic extract +St.thrmophilus + L.rhamnosus 1:2@ 2%	8.53	7.83	8.33	8.19
F-Test		S	S	S	S
C.D at 5%		0.71	0.57	1.01	0.47
S.Ed		0.95	0.28	1.35	0.63

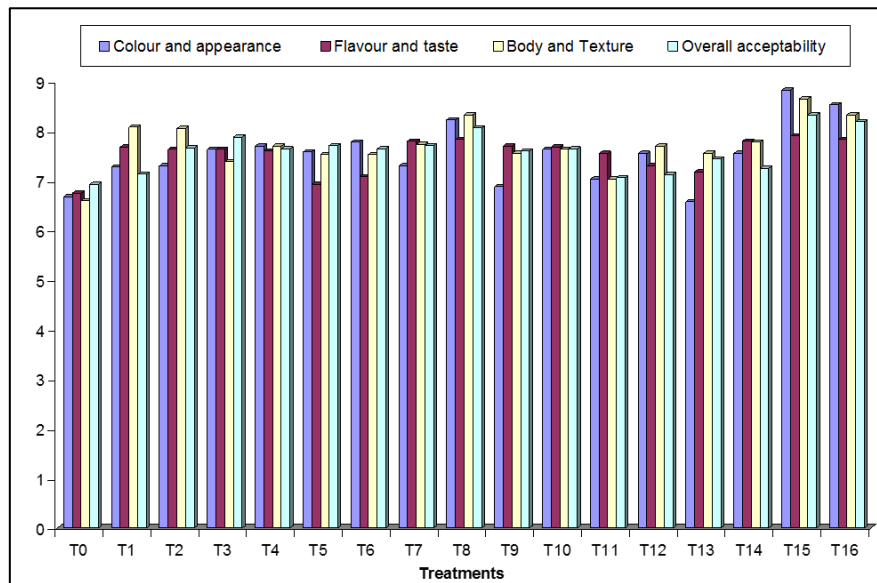


Fig 1: Average of sensory attributes in probiotic herbal yoghurt

**Conclusion**

It can be concluded from our study that garlic shows in treatment T15 (0.2%) enhances this flavor and taste of herbal probiotic yoghurt and recorded as best in overall acceptability. it was also concluded from research that as the amount of the herbal extract increase in probiotic yoghurt. It effect the viability in yoghurt, therefore, addition of ginger and garlic extract in the process milk used for makeup probiotic herbal yoghurt is recommended because the garlic and ginger are the herbal species in produce good flavor with a wide range beneficial and nutritional properties the new probiotic herbal yoghurt a functional food.

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