

Incorporation Technology to Aloe vera (*Aloe barbadensis miller*) Juice as a Functional Ingredients in Yoghurt

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Abstract: *The study was conducted to develop incorporation technology of Aloevera juice in yoghurt which has functional ingredients which increase the bioactivities in human. Aloevera juice was prepared and added into the yoghurt with 4 treatments named as T₁, T₂, T₃ and T₄ with 2%, 4%, 6%, and 8% respectively and T₀ (control). Pre prepared Aloevera mixture was heated in 70°C and added after pasteurization to protect the functional properties from heat shock. The chemical characteristics including the moisture, ash, titratable acidity, pH, protein and carbohydrates were evaluated for raw pulp. Molds and yeast microbial counts were detected for juice before incorporation. The study found that T₃ was the most liked product with highest score for nearly all the evaluating parameters.*

Keywords: Microbial count, Organoleptic, Aloevera, yoghurt

Introduction:

Aloevera juice is utilized for the preparation of yogurt which gives more nutritional value for the yogurt. Aloe vera it helps better functioning of the digestive system as they have analgesic, antibacterial, antifungal and antiviral properties (Ayar A, Gürlin E., 2014).

The Anthraquinones and chromones are responsible for the anti-cancer activity, anti-inflammatory. This product is a new trend in yogurt manufacturing because it is a having gelling agent, could be used as an alternative for stabilizer.

Some of the studies identified that different forms of Aloevera juice were used to prepare Aloevera yogurt. The major classical uses of EOs extracted from different plants are natural flavoring materials, which have great commercial importance.

Worldwide demand for functional oils extracted from spices, dehydrated leaves particularly are increasing. Flavoring agents also plays a major role on yogurt due to the consumer preferences (Assem, M., et al., 2019). Vanilla flavor, strawberry flavor, mango flavors are added into the yogurt as a flavoring agent (Yousef M, Nateghi L, Azadi E 2013, Ramadan, M.F. 2007).

Therefore, addition of Aloe vera juice as a nano-emulsion and functional ingredients to develop flavored yogurt in to the market and test for the characteristics such as physicochemical, and functional properties, antimicrobial activity and stability are very important to evaluate the possibility of using essential as nano-emulsion (Ghodekar, D. R., 1989).

It will include the food law criteria for applicable country. Objective of the study is to understand the production technology and quality of cow milk yogurt by adding Aloevera juice.

Methodology:

Aloevera leaves were washed with water treated with 100 µl L⁻¹ Sodium hypochlorite, peeled and juiced. Five treatments were made with Aloevera juice and named as T₀ as control and T₁-2%, T₂-4%, T₃-6%, and T₄-8%.

All other ingredients were maintained same to all treatments. Pre-prepared and pre-treated Aloevera mixture was heated in 70°C was detected by examined the consistency of mixture and chemical composition shown in Table 1.

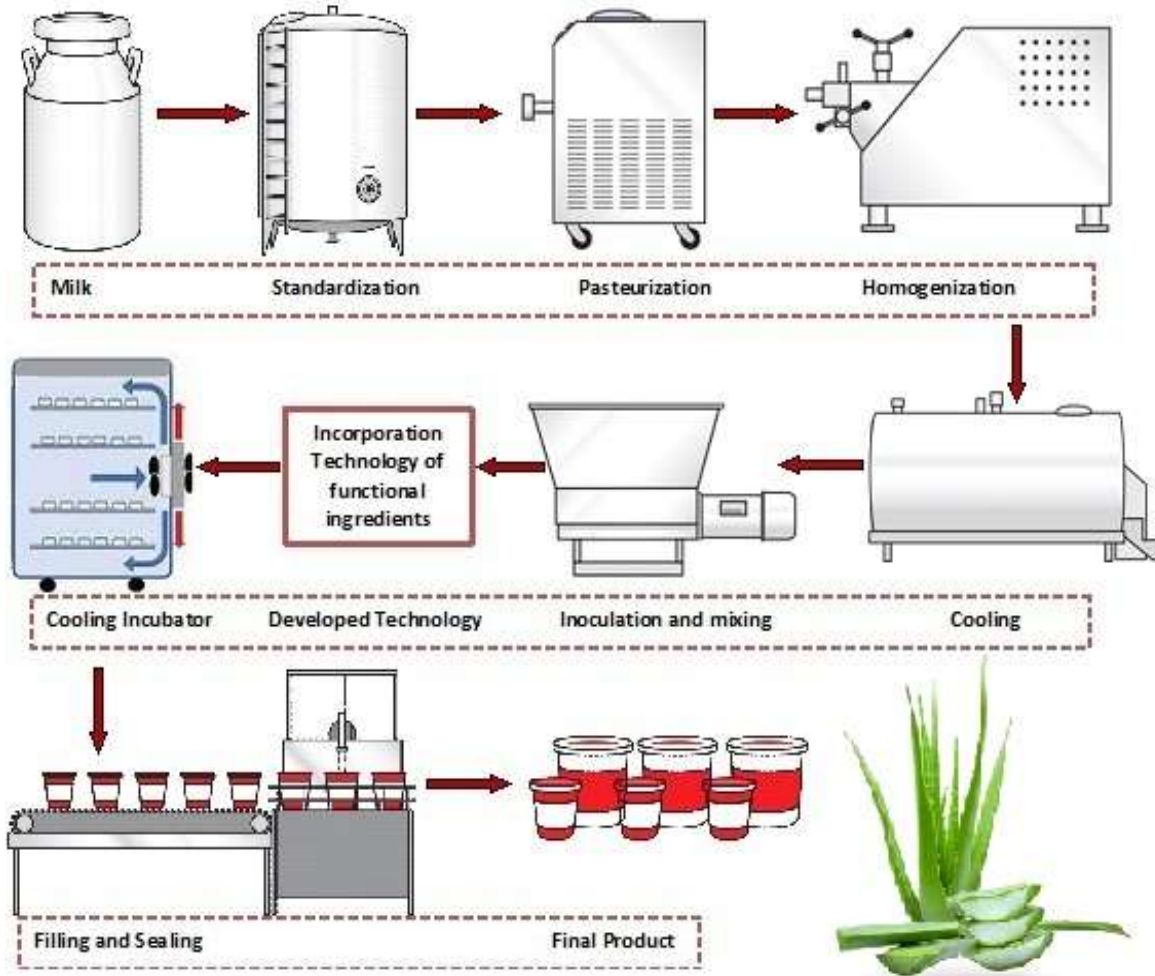


Figure.1: Process Diagram for Incorporation of Aloe Vera in yoghurt

Yoghurt was prepared by using 2 L of pasteurized milk and fruits were added as shown in the treatments and the process is shown in figure 1.

Chemical analysis was carried out to determine ash, moisture, Total Solid (TS), Total Soluble Solid (TSS), Titratable Acidity (TA), and pH of the juice, and yeast mold counts were carried out according to the SLS 265:2011 (Njoya Moyouwou Amadou 2017).

Results and discussion

The pH of the yoghurt was depending on the milk composition, ingredients and the lactic acid bacteria used to produce yoghurt (Genovese, D., Rao, A., 2003). The analysis showed that the pH and TSS percentages are consistent with the yoghurts available in the markets (Haque, M. Z., Islam, M. B., Jalil, M. A., & Shafique, M. Z., 2014).

Table 1. Chemical composition of Aloe Vera juice

Chemical properties	Amount (%)
Moisture content%	91.31± 3.40
TS%	3.34 ±1.04
TSS%	3.10 ± 0.23
TA%	0.12 ± 0.03
pH	4.53 ± 0.56
Ash content%	0.24 ± 0.03
Crude Protein	2.18 ± 0.03
Carbohydrates	6.91 ± 0.56

Table 2. Organoleptic scores (5 point hedonic)

Attributes	T0	T1	T2	T3	T4
Aroma	3.3	3.5	3.4	4.3	4.3
Flavor	3	3.3	3.9	4.3	4.1
Color	4.2	3.2	3.8	4.2	3.9
Texture	3.9	4.2	4.3	4	4.1
Appearance	3.9	4.3	4.1	3.9	3.1

The sensory evaluation was conducted to parameter that influence the acceptability of Aloe vera added yoghurt which includes the aroma, flavour, color, texture and appearance of the samples (Table 02).

The analysis shows that the T3 sample showed a highest level of score (Elbandy, M. A. et al., 2014). The

gel was pressed with a spoon so as to assess the hardness and its springiness as mentioned in the research article. However, the textural improvement and overall acceptability were observed in sample in a significant level ($p < 0.05$) (Lobato-Calleros, C., et al., 2014).

Table 3. Microbial count

Microorganism	Counts				
Mold	<10	<10	<10	<10	<10
Yeast	<10	<10	<10	<10	<10

Total Coli forms count and Molds evaluation showed that the Coli-forms counts and molds were not present in all experiments till 30th days but there were certain number of mold formed in all samples (Cogan T. M., 1972).

Conclusion:

Analytical results showed that T3 (6%) was the most liked Aloe vera yoghurt gourd percentage with highest of all the evaluating parameters.

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