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## Cultural Heritage and Historical Roots of Ghanad Undi (Laddu) in Bidar District: A Comprehensive Documentation

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### Abstract

The traditional sweet "Ghanada Undi" (Laddu) from Karnataka's Bidar district offers both cultural significance and nutritional benefits. In rural India, where healthcare challenges such as anaemia (affecting 52% of women), malnutrition (35% underweight children), and weakened immunity prevail, Ghanada Undi presents itself as a promising local intervention. Made with nutrient-rich ingredients like sugarcane juice, pulses, and dry fruits, Ghanada Undi not only provides essential micronutrients but also boosts rural employment. This study explores the preparation process, standardization, sensory evaluation, and nutritional analysis of Ghanada Undi, revealing significant nutritional differences between its varieties. The standard version, for instance, contains 15.55% fat, 9.42% protein, and 171.85 mg of calcium. Sensory evaluations indicate a decline in acceptability over eight days, while microbial analysis shows minimal yeast and mould presence, confirming product safety. These findings emphasise the need for standardised production to ensure quality and consistency, while also demonstrating Ghanada Undi's potential to improve health outcomes and provide year-round rural employment through sugarcane-based industries.

**Keywords:** Ghanada Undi, nutritional analysis, rural health, sugarcane-based industries, cultural heritage

### Introduction

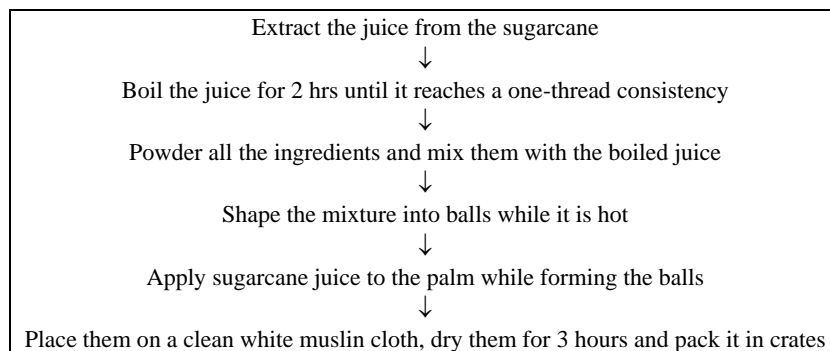
India's healthcare challenges, marked by anaemia, weakened immunity, and malnutrition, persist in rural areas. Despite government efforts, a grassroots initiative in Karnataka's Bidar district is gaining traction. "Ghanada Undi," a traditional sweet enriched with essential nutrients, holds promise as a local remedy. Laddu, a popular Indian sweet, takes diverse forms, including the relatively unexplored Ghanada Undi. Celebrated during festivals, this delicacy stands out for its cultural significance and nutritional richness, incorporating nuts, pulses, and sugarcane juice. Like many other dishes in India, laddu appears in numerous varieties and is created with a myriad of different ingredients.

Sugarcane, a major cash crop, yields about 351 million tonnes annually, with 30% dedicated to jaggery production. Sugarcane juice, a nutrient-rich beverage, supports liver detoxification, boosts immunity, and offers relief from inflammation. Juice and jaggery are considered as energy foods because they are rich sources of vitamins and minerals and have potential to fight the health and livelihood insecurity, particularly in rural India. Jaggery contains potassium and low amount of sodium which helps to maintain the acid balance in the body cells, and also combats acids and acetone and controls body blood pressure (Sangwan S, 2014) [3]. Promoting Ghanada Undi and expanding the sugarcane-based industry in Karnataka can enhance year-round employment and economic growth in rural areas. The 2021-22 Dubalgundi study highlights the cultural significance of Ghanada Undi, a traditional laddu with authentic preparation and nutritional richness. Despite its seasonal production tied to sugarcane harvesting, it symbolizes tradition, addresses healthcare challenges, and fosters community well-being. With this the present experiment is conducted to enhance Ghanada Undi uniqueness and standardize production for quality and to encourage authenticity in preserving the traditional delicacy among families. The present study also aims to thorough nutritional analysis of Ghanada Undi for dietary insights and finally determining Ghanada Undi's shelf-life through systematic analysis.

**Methodology**

The Ghanada Undi preparation method involves meticulous attention to ingredient selection and procedural precision, using freshly harvested sugarcane to avoid undesirable sourness. Raw ingredients are procured wholesale, pulverized, and integrated with cut dry fruits, butter or ghee, and cardamom powder in a deliberate sequence to preserve the undi's distinct flavor. This ensures a palatable and gratifying taste upon consumption. Ghee is a good source of energy. Dates also provide vitamins, fiber, fat, protein,

minerals, calcium, magnesium, iron. Dried dates also have less sugar which is good for diabetic patients. After careful preparation, laddu is dried for three hours on muslin cloth and categorized into Standard, Medium, and Low Standard types based on raw material nuances. The efficiency is notable, as one kadai of juice (200 liters) produces four quintals of meticulously prepared laddu, maintaining consistency in procedural steps with varying raw material choices.



**Fig 1:** Flow chart of Ghanada undi procedure

**Table 1:** Types of Ghanada undi (laddu) prepared by the enterprises

Low (T <sub>1</sub> )		Medium (T <sub>2</sub> )	
Ingredients	Quantity	Ingredients	Quantity
Cane juice	2 qt (200 lt)	Cane juice	2 qt (200 lt)
Roasted bengal gram flour	1.8 qt	Roasted bengal gram flour	1.5 qt
Peanut coarse powder	20 kg	Peanut coarse powder	20 kg
Cardamom powder	1 kg	Sesame	15 kg
Butter / Ghee	2kg	Dry coconut	8 kg
		Cardamom powder	2 kg
		Butter / Ghee	5kg
Standard (T <sub>3</sub> )			
Ingredients	quantity	Ingredients	quantity
Cane juice	2 qt (200 lt)	Almond pieces	10 kg
Roasted bengal gram flour	1 qt	Raisins	10 kg
Peanut coarse powder	20 kg	Tarbuj seeds	10 kg
Sesame	20 kg	Dry dates pieces	10 kg
Dry coconut	20 kg	Cardamom powder	4 kg
Cashew pieces	20 kg	Butter / Ghee	6 kg

**Nutrient analysis:** The nutrients were analyzed by AOAC, 2003 method and microbial analyses were carried out by serial dilution and plate count method.

**Sensory evaluation**

Ten panelists, including academic faculty, used a 9-point Hedonic scale to assess appearance, color, flavor, aftertaste, texture, and overall acceptability of the product. Data were recorded on a sensory scorecard.

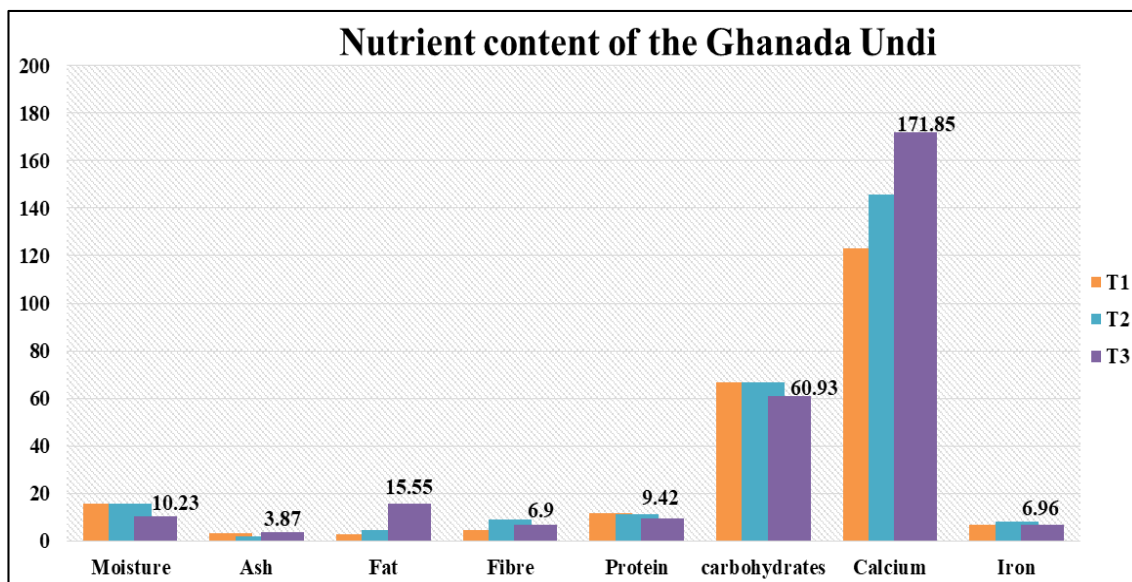
**Data collection and statistical analysis**

A detailed interview schedule guided the study, with personal interviews as the chosen method for data collection. Statistical analysis utilized ANOVA Single

Factor, with a significance test limit set at 0.05.

**Results**

Fig 2 shows variations in nutritional composition among three ghanada laddu samples. Moisture averages 13.46%, with moderate variability. T<sub>3</sub> has the highest ash and fat content (3.87% and 15.55% respectively). Fiber peaks in T<sub>2</sub> at 9.01%, protein averages 10.76%, highest in T<sub>1</sub> (11.57%), and lowest in T<sub>3</sub> (9.42%). Carbohydrates remain stable (CV = 3.70%). Calcium varies notably (CV = 17.26%), highest in T<sub>3</sub> (171.85). Iron shows moderate variability, highest in T<sub>2</sub> (8.27%) and lowest in T<sub>1</sub> (6.67%). Some nutrients, like moisture and carbohydrates, are stable, while others, like fat and calcium, vary significantly.



**Fig 2:** Nutritive value of the Ghanada Undi

Table 2 summarizes Ghanada Undi production enterprises. All maintain a 500 gm laddu size. Enterprises I and III lead with 50 kadai each. Prices range from Rs. 50 to Rs. 100. Enterprise III has a 5-day shelf life; others offer 3 to 4 days, except Enterprise IV at 15 days. Marketing is from

December to April. Enterprise III requires 7.5 lakhs investment, while Enterprise II has the most conservative range at 4.5-5.0 lakhs. Enterprise I leads in annual income at 10.0 lakhs. Variances exist, highlighting diverse approaches while some aspects remain consistent.

**Table 2:** Ghanada undi Specification in gist

Sl. No.	Product specification	Enterprises				
		I	II	III	IV	V
1	Size of laddu (gm)	500	500	500	500	500
2	Production / year	50 kadai	40 kadai	50 kadai	45 kadai	40 kadai
3	Price (Rs./piece)	50-100	50-100	50-100	50-100	50-100
4	Packaging material	Paper wrapping				
5	Shelf life (days)	4	4	5	3	5
6	Duration of marketing	December - April				
7	Spoil (Days) (Hardens)	8	8	12	15	8
8	Investment (lakhs)	7.0	4.5-5.0	7.5	6.0	6-7
9	Income (lakhs)	10.0	9.0	10.0	9.5	9.0

Table 3 shows Ghanada Undi taste evolution over time. T<sub>1</sub> (Low) has a substantial decline from 5.8 to 3.8 by the 8th day, posing overall acceptability challenges. T<sub>2</sub> (Medium) experiences a moderate decrease from 7.7 to 5.7, while T<sub>3</sub> (High) declines from 8.2 to 6.2. T<sub>2</sub> maintains moderate

acceptability with a slower taste decline, and T<sub>3</sub> remains favourable but decreases noticeably by the 8th day. Overall, organoleptic evaluation indicates degradation in taste over time, with varying rates of decline across categories.

**Table 3:** Average overall acceptability of Ghanada Undi

Samples	Initial (0 <sup>th</sup> day)	4 <sup>th</sup> day	8 <sup>th</sup> day
T <sub>1</sub> ( Low)	5.8	4.4	3.8
T <sub>2</sub> (Medium)	7.7	6.3	5.7
T <sub>3</sub> (High)	8.2	6.9	6.2

Table 4 presents the "Total Plate Count" data, with T<sub>3</sub> exhibiting the lowest count (1818 Cfugm), indicating the least overall microbial presence. T<sub>2</sub> has a moderate count (4727 Cfugm), and T<sub>1</sub> has the highest count (7727 Cfugm). In terms of "Mould and Yeast Count," all samples show very low counts, each being "<10 Cfugm," suggesting

minimal presence of molds and yeast. T<sub>3</sub> stands out with the lowest total microbial count, indicating a favourable condition for food safety compared to T<sub>1</sub> and T<sub>2</sub>. Overall, all samples exhibit negligible counts of molds and yeast, contributing positively to food safety.

**Table 4:** Microbial analysis of the Ghanada undi

Samples	Total plate count (Cfu/gm)	Mold and yeast count (Cfu/gm)
T <sub>1</sub>	7727	<10
T <sub>2</sub>	4727	<10
T <sub>3</sub>	1818	<10



T<sub>1</sub>T<sub>2</sub>T<sub>3</sub>**Plates 1: Ghanada Undi****Conclusion**

The "Ghanada Undi" initiative in Karnataka's Bidar district addresses healthcare challenges like anemia and malnutrition in rural areas. The Dubalgundi village study highlights its cultural and nutritional importance, emphasizing the need for standardized production. Beyond nutrition, it provides year-round employment, boosting the rural economy. Recognizing the potential for expanding the sugarcane juice-based industry is crucial for economic empowerment. Ghanada Undi symbolizes both nutritional richness and cultural significance, showcasing community-driven solutions. Future efforts focus on refining production, scaling distribution, and innovative marketing for greater impact on healthcare and the economy in Karnataka's rural areas. Ongoing research aims to strengthen Ghanada Undi's position as a solution to deficiencies and a preserver of traditions.

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