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Development of Nutrient-rich Tofu from Tiger Nut Milk

Mohammed Niyas V P, Muhammed Uwaise V, Ajmal Ashif P, Parvathy Menon PR

UG Students, Dept. of Food Technology, Dhaanish Ahmed Institute of Technology, Coimbatore, India

Assistant Professor, Dept. of Food Technology, Dhaanish Ahmed Institute of Technology, Coimbatore, India

ABSTRACT: The increasing demand for plant-based functional foods has spurred research into alternatives like tiger nut (*Cyperus esculentus*) milk for tofu production. This study successfully developed tiger nut tofu through a standardized process and subjected it to comprehensive analysis. The resulting tofu exhibited favorable nutritional properties, including high energy and significant calcium content, along with a moderate protein level. Textural profiling revealed acceptable firmness, springiness, and chewiness comparable to traditional tofu, while color analysis indicated good visual appeal.

Microbiological acceptability in terms of taste, texture, and overall satisfaction. These findings suggest that tiger nut tofu is a viable plant-based protein alternative and a functional food suitable for lactose-intolerant and health-conscious consumers. This research highlights the feasibility of introducing tiger nut-based tofu into mainstream markets, contributing to food diversification and sustainable nutrition.

KEYWORDS: Tiger nut tofu, Plant based protein, Functional food, Nutritional Analysis, Sensory evaluation

I. INTRODUCTION

Tiger nut milk, a dairy-free, lactose-free, and gluten-free drink from tiger nuts, is gaining popularity as a healthy alternative to dairy milk. Known as horchata in Spain, it's naturally sweet and nutty, rich in fiber, minerals, and vitamins, beneficial for digestion and heart health.

Tofu, or bean curd, a high-protein food from soy milk, has been a staple in East and Southeast Asian diets for over 2,000 years. It's a complete protein source.

This study aims to explore a novel soy-free tofu made from tiger nut milk, assessing its nutritional value, safety, texture, color, and sensory attributes to cater to the growing demand for plant-based, allergen-free foods and expand the applications of tiger nuts in food development

II. LITERATURE REVIEW

Nutritional Properties: High starch, fiber, key minerals (K, Mg), low-allergenic, high monounsaturated fats & vitamin E make tiger nuts ideal for functional, healthy foods.

Tofu Production: Plant milk protein coagulation (e.g., with calcium chloride) is adaptable to various milks (almond, coconut), suggesting potential for tiger nut milk.

Coagulation Challenges: Lower protein in tiger nut milk hinders firm curd formation; effective coagulants and optimized heating are key (Mäkinen et al., 2016).

Consumer Demand: Strong demand for functional, allergen-free foods and rising vegan protein consumption (Euromonitor International, 2023) position tiger nut tofu as a viable innovation.

III. METHODOLOGY

TIGERNUT

Select high-quality tiger nuts, ensuring they are clean and free from any damage. Proper selection is the first crucial step for a good final product.

WASHING

Thoroughly wash the tiger nuts under running water to remove any dirt or impurities. This step ensures the cleanliness of the raw material before processing.

SOAKING

Soak the washed tiger nuts in clean water for a sufficient duration to soften them. Soaking helps in easier grinding and better extraction of milk.

BLENDING

Blend the soaked tiger nuts with an appropriate amount of water to create a slurry. The blending process breaks down the nuts to release the milk solids.

FILTRATION

Filter the blended slurry through a fine cloth or sieve to separate the tiger nut milk from the pulp. This step yields the liquid base needed for tofu production.

HEATING

Heat the extracted tiger nut milk to a specific temperature for a set duration. Heating helps in protein denaturation, which is essential for coagulation.

COAGULATION

Add a suitable coagulant (natural or salt-based) to the heated tiger nut milk and allow it to curdle. This process causes the protein to solidify and form curds.

MOLDING

Carefully transfer the formed curds into molds lined with a porous cloth. Molding gives the tofu its desired shape and helps in expelling excess water.

TIGERNUT TOFU

Allow the tofu to press in the molds for a specific time to remove excess liquid and solidify. The final product is tiger nut tofu, ready for consumption or further processing.

IV. RESULT AND DISCUSSION

Nutrient Richness: Tigernut tofu displayed significant protein and mineral content, suggesting dietary value. Further bioavailability studies are recommended. Sensory

Acceptability: Positive sensory feedback indicates consumer potential. Processing variations could optimize these attributes.

Comparison to Soy: Comparable protein to soy tofu positions it as a valuable alternative. Detailed nutritional comparisons are insightful.

Potential as Novel Food:* Successful production highlights tigernut's potential as a new plant-based source. Culinary applications warrant exploration.

V. CONCLUSION

The study successfully demonstrates the potential of tiger nut milk for tofu production. The developed tofu is nutritionally rich, microbiologically safe, and organoleptically acceptable. This innovation can cater to lactose-intolerant individuals and contribute to the diversity of plant-based food products in the functional food market.

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