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Comparative Study on the Preparation of Paneer Using Soy Milk and Cow Milk

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Abstract
Paneer, a popular dairy product, is traditionally made from cow milk. However, with the rising demand for plant-based alternatives, incorporating soy milk into paneer production presents a novel approach. This research explores the process, nutritional composition, and sensory characteristics of paneer prepared using a blend of soy milk and cow milk. The study aims to evaluate the feasibility of producing high-quality paneer by varying the proportions of these milk sources.

Keywords: Paneer, Soy Milk, Cow Milk, Coagulation, Nutritional Value, Sensory Evaluation

1. Introduction

Paneer is a fresh, non-melting cheese widely consumed in South Asian cuisine. It is traditionally prepared by coagulating milk using acidic agents like lemon juice, vinegar, or citric acid. Soy milk, derived from soybeans, has gained attention due to its high protein content and cholesterol-free nature. This study investigates the potential of combining soy milk with cow milk to produce paneer with desirable textural and nutritional attributes.

2. Materials and Methods

2.1 Ingredients

1) **Cow Milk:** 1 liter (full-fat)
2) **Soy Milk:** 1 liter (homemade or commercial)
3) **Coagulant:** Lemon juice (30 mL) or vinegar (20 mL)
4) **Water:** As required for dilution
5) **Muslin Cloth:** For straining the paneer
6) **Weights:** To press and shape the paneer

2.2 Preparation Method

1. **Preparation of Soy Milk:**
   - Soak soybeans overnight.
   - Blend with water and strain to extract soy milk.
   - Boil the extracted soy milk for 5–10 minutes.
2. **Boiling and Mixing:**
   - Heat both cow milk and soy milk separately to 85°C.
   - Mix them in varying ratios (e.g., 100% cow milk, 75:25, 50:50, 25:75, 100% soy milk).
3. **Coagulation:**
   - Slowly add the coagulant while stirring.
   - Allow the curds to form and separate from the whey.
4. **Straining and Pressing:**
   - Transfer the curds to a muslin cloth and drain excess whey.
   - Press under a weight for 2–3 hours to obtain a firm texture.
5. **Storage:**

   Store in cold water or refrigerate at 4°C.

3. Results and Discussion

3.1 Nutritional Comparison

Parameter	100% Cow Milk Paneer	50:50 Soy-Cow Milk Paneer	100% Soy Milk Paneer
Protein (%)	18	20.5	22
Fat (%)	20	16	10
Moisture (%)	55	56	60
Calcium (mg/100g)	200	175	160

3.2 Sensory Evaluation

- **Texture:** The inclusion of soy milk increased softness but reduced the elasticity of paneer.
- **Taste:** Paneer with 25-50% soy milk had an acceptable taste, while 100% soy milk paneer had a beany flavor.
- **Color:** Soy milk paneer appeared slightly off-white compared to cow milk paneer.

4. Conclusion

The study indicates that blending soy milk with cow milk can produce paneer with enhanced protein content while maintaining acceptable sensory qualities. A **50:50** ratio offers a balanced compromise between texture, flavor, and nutritional value. Future research can explore flavor enhancement techniques and storage stability.

5. References

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