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BACKGROUND

- Over 150 million children under five are stunted globally; nearly half of these live in Asia and Africa, with South Asia (including India) highly affected.
- In India, child malnutrition (stunting, wasting, underweight) remains high, especially among low-income groups.
- After 6 months of age, breast milk alone is not enough; complementary foods must be introduced to meet nutritional needs.
- Many market options are expensive or inaccessible for poor families, increasing the risk of nutrient deficiencies.
- Using affordable, local foods like ragi, soybean, and mango can improve both nutrition and acceptability in complementary foods for infants.

METHODS

- Formulated complementary food using ragi flour, mango powder, soybean flour, milk powder, and sugar in fixed proportions, targeting infants 6–12 months.
- Processed the blend by making a slurry, autoclaving it, dehydrating, pulverizing, and sieving to obtain a fine, shelf-stable powder.
- Conducted proximate analysis (moisture, ash, protein, fat, carbohydrate, energy) and functional tests (water holding capacity, oil holding capacity, titratable acidity, oxalate) using standard AOAC methods.
- Performed sensory evaluation with 20 panellists using a 9-point hedonic scale to assess appearance, aroma, taste, texture, aftertaste, and overall acceptability.

Ragi flour + Mango powder + Soybean flour + Milk powder + Sugar

↓ (Mixing in dry form)

Add water to make slurry

↓

Autoclave at 121°C for 15 minutes

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Dehydrate in tray drier at 75°C for 8 hours

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Pulverize in grinder to get fine powder

↓

Sieve to obtain uniform flour

↓

Pack and store as complementary food powder

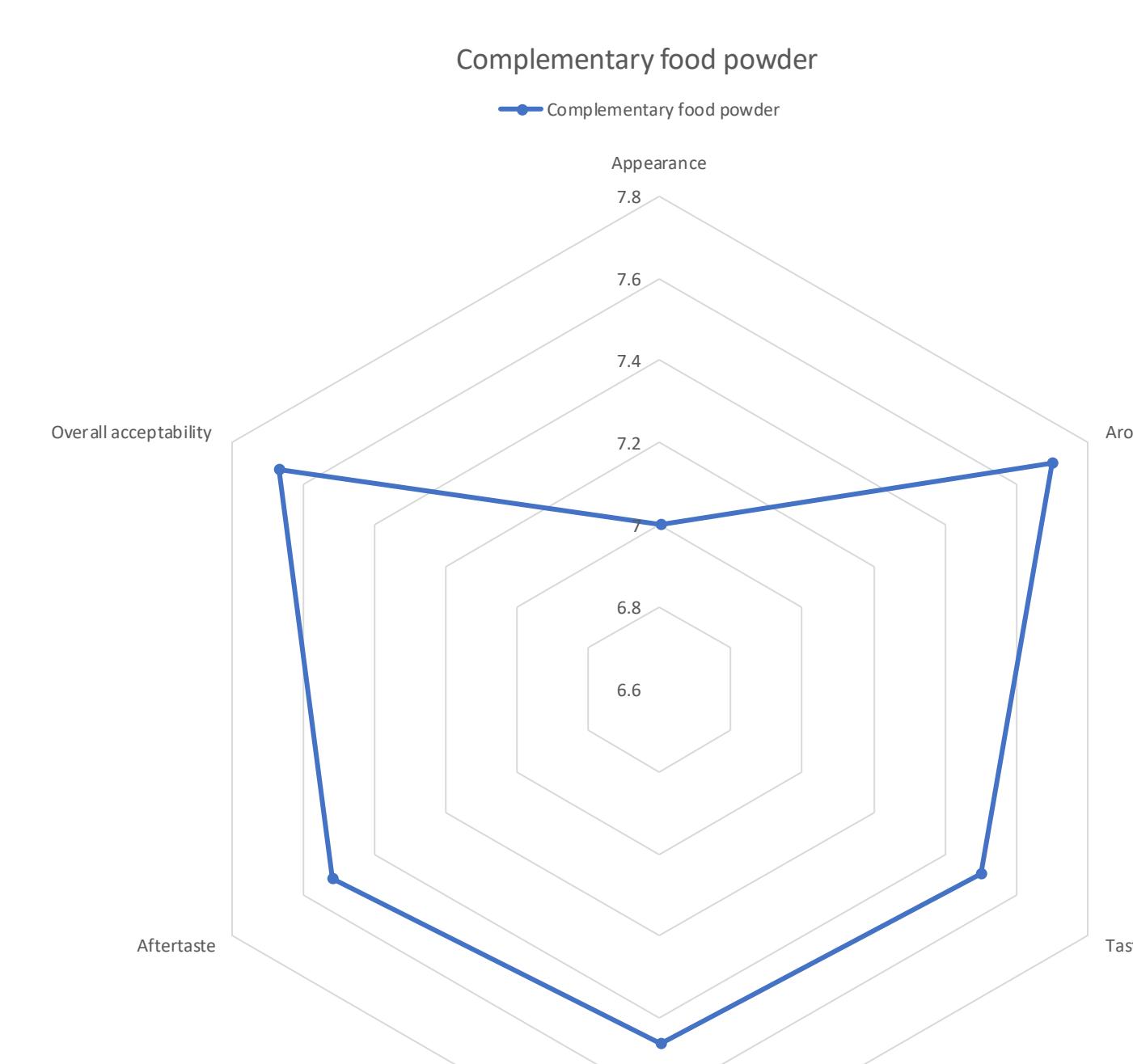


RESULTS

- Proximate composition (per 100g): 270.22 kcal energy, 8.005g protein, 39.96g carbohydrates, 4.4g fat, 3.81g ash, 5.5% moisture.
- Functional properties: titratable acidity 0.064%, water holding capacity 14%, oil holding capacity 15%, oxalate 0.02 mg/g.
- Sensory scores (9-point hedonic scale): appearance 7.0, aroma 7.7, taste 7.5, texture 7.46, overall acceptability 7.67 (moderate to high liking).
- Cost: Rs. 18.39 per 100g, affordable for low-income groups.

Proximate Analysis

Sample	Amounts (g)	Energy (kcal)	Protein (g)	CHO (g)	Fat (g)	Ash (g)	M%
	100	270.22	8.005	39.96	4.4	2.5	5.5



Sensory analysis

Discussion

- Ragi (60%) provides calcium, iron, fiber for bone growth and energy; soybean (10%) boosts protein; mango adds beta-carotene, vitamin E, flavor.
- Low moisture (5.5%) and acidity ensure microbial stability and longer shelf life.
- Minimal oxalates (0.02 mg/g) from ingredients support mineral bioavailability without anti-nutritional interference.
- Balances nutrition, sensory appeal, and cost, addressing malnutrition in infants 6–12 months per WHO/FSSAI guidelines

Conclusion

- Developed complementary food delivers 270 kcal, 8g protein, 40g carbs per 100g, meeting FSSAI standards for infants.
- High sensory scores (7–8/9) confirm excellent acceptability for appearance, taste, and texture.
- Low cost (Rs. 18.39/100g) makes it accessible for low-income families.