

Food Product Development Process

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Key phases, activities, and best-practice tips for turning a food idea into a market-ready product.

1. Ideation & Concept Generation

Step	Description	Tools / Methods
Market research	Identify consumer trends, gaps, and unmet needs.	Surveys, focus groups, social listening, sales data analysis
Idea brainstorming	Generate a wide range of product concepts (flavors, formats, health claims).	Brainstorm sessions, SCAMPER, mind-mapping
Concept screening	Filter ideas based on feasibility, market potential, and brand fit.	Scoring matrix (e.g., market size, profitability, technical difficulty)
Preliminary business case	Rough estimate of cost, price point, and ROI.	Quick financial model, SWOT analysis

Tip: Keep a “concept board” with visual cues (packaging mock-ups, flavor descriptors) to maintain focus on consumer appeal.

2. Feasibility & Technical Assessment

Activity	Goal	Typical Outputs
Ingredient sourcing	Verify availability, cost, and regulatory status of raw materials.	Supplier list, cost sheet, allergen & GMO status
Formulation trials	Develop prototype recipes that meet sensory, nutritional, and shelf-life targets.	Lab-scale batches, sensory scorecards
Process feasibility	Determine if existing equipment can produce the product or if new lines are needed.	Process flow diagram, equipment gap analysis
Regulatory review	Ensure compliance with food law (labeling, claims, additives).	Regulatory checklist, label draft

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Tip: Conduct a “small?scale pilot” (1–5?kg) before committing to larger batches; it uncovers hidden issues early.

3. Prototype Development & Sensory Evaluation

1. **Prototype scaling** – Move from bench?scale to pilot?scale (10–100?kg) while keeping formulation ratios constant.
2. **Sensory testing** – Use trained panels and/or consumer panels to assess:
 - Appearance, aroma, texture, flavor, aftertaste
 - Overall liking and purchase intent
3. **Iterative refinement** – Adjust ingredients, processing parameters, or packaging based on feedback.

Common sensory methods

- 9?point hedonic scale
 - Just?About?Right (JAR) scaling
 - Descriptive analysis (e.g., Flavor Profile Method)
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4. Shelf?Life & Stability Testing

Test	Purpose	Typical Duration
Accelerated stability	Predict shelf life by storing at elevated temps (e.g., 40?°C/75?% RH).	3–6?months
Real?time stability	Confirm product quality under normal distribution conditions.	12–24?months
Microbial challenge	Verify safety margins for pathogens and spoilage organisms.	6–12?weeks
Packaging interaction	Assess migration, oxygen/moisture barrier performance.	Concurrent with other tests

Key parameters to monitor

- Moisture content, water activity (a_w)

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- pH / titratable acidity
 - Texture (e.g., firmness, chewiness)
 - Color & flavor volatiles
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5. Process Scale-Up & Manufacturing Planning

1. **Process design** – Create detailed process flow diagram (PFD) and piping and instrumentation diagram (P&ID).
2. **Equipment selection**