

Introduction to Bee Products Processing

Introduction to Bee Products Processing

Designed as a quick-reference guide for students, hobbyists, and small-scale producers.

1. Overview of Bee Products

Product	Main Components	Typical Uses
Honey	Fructose, glucose, water, enzymes, minor pollen & wax	Sweetener, food ingredient, medicinal (wound care, cough)
Beeswax	Long-chain fatty acids, esters, hydrocarbons	Candles, cosmetics, polish, food coating
Propolis	Resins, flavonoids, phenolics, essential oils	Antimicrobial sealant, dietary supplement, cosmetics
Royal Jelly	Proteins, sugars, fatty acids, vitamins	Nutraceuticals, cosmetics
Bee Pollen	Pollen grains, proteins, lipids, vitamins, minerals	Dietary supplement, functional food
Bee Bread (fermented pollen)	Lactic-fermented pollen, enzymes	Nutritional supplement
Bee Venom	Peptides (melittin), enzymes, amines	Apitherapy, cosmetics, research

2. General Principles of Bee-Product Processing

1. Hygiene & Safety

- Use food-grade stainless steel, glass, or BPA-free plastic.
- Wear gloves, hairnets, and sanitize surfaces before each batch.
- Keep temperature and humidity within recommended ranges to avoid spoilage.

2. Preservation of Bioactive Compounds

- Minimize exposure to high heat, light, and oxygen.

Introduction to Bee Products Processing

- Use gentle filtration, low-temperature drying, and inert-gas (nitrogen) packing when possible.

3. Regulatory Awareness

- Follow local food-safety standards (e.g., HACCP, FDA, EU Novel Food).
 - Label allergens (pollen) and provide batch traceability.
-

3. Processing Steps for Each Product

3.1 Honey

Step	Description	Key Parameters
Extraction	Uncapping frames → centrifugal extractor or crush-and-strain.	30–35°C to keep honey fluid; avoid overheating.
Filtration	Remove wax, brood, bee parts.	Mesh 0.2–0.5 mm; optional fine filter (5 µm) for crystal-free honey.
De-watering (optional)	Reduce moisture to ~18% for longer shelf life.	Vacuum dryer or gentle heating (~40°C).
Pasteurization (optional)	Destroy yeast & delay fermentation.	72°C for 2 min (quick-heat) or 63°C for 30 min (slow-heat).
Packaging	Fill into sterilized jars, bottles, or bulk containers.	Use airtight, UV-protective containers; nitrogen flush for premium grades.

3.2 Beeswax

Step	Description	Key Parameters
Melting	Heat combs or scrap wax in a double boiler.	70–80°C; avoid >95°C (degrades fragrance).
Filtering	Remove debris (pollen, propolis).	Fine mesh or cheesecloth; optional charcoal filter for high purity.
Degumming (optional)	Remove residual honey & pigments.	Add hot water (80°C) → separate layers.
Solidification & Molding	Pour into molds or sheets.	Cool at room temperature; store in dark, dry place.