

## Microencapsulation of Sorrel and Turmeric Colorants

### Objective:

To **trap the colorant in microscopic protective shells** to improve **shelf life, stability**, and **application flexibility** (e.g. in teas, capsules, cosmetics, and food powders).

---

### Example A: Microencapsulation of Sorrel Extract

*(for pH-sensitive anthocyanin stability)*

#### Ingredients:

- Sorrel extract (concentrated and filtered)
- **Maltodextrin** (wall material)
- **Gum arabic** or **modified starch**
- Water

#### Method: Spray Drying (or freeze-drying if available)

##### 1. Prepare Feed Solution

- Mix:
  - 100 ml sorrel extract
  - 15–20g maltodextrin
  - 5–10g gum arabic
- Stir until dissolved into a uniform liquid

##### 2. Drying Process

- **Option A: Spray dryer**
  - Input temp: 150–170°C
  - Output temp: ~80°C
  - Collect powder from drying chamber
- **Option B: Freeze dryer**
  - Pre-freeze the liquid at –20°C
  - Load into freeze dryer for 24–48 hours

- Powder can be ground and stored

### 3. Storage

- Place powder in **airtight container with silica gel**
- Store in **cool, dark place**

#### ✓ Result:

- Reddish powder with **better color retention**, longer shelf life, and easier use in dry mixes or tea blends.
- 

### Example B: Microencapsulation of Turmeric Extract

*(to stabilize curcumin against oxidation and light)*

#### ✓ Ingredients:

- Turmeric extract (alcohol or water-based)
- **Maltodextrin**
- **Soy lecithin** (natural emulsifier)
- **Whey protein isolate** or **modified starch**

### Method: Emulsion + Spray Drying

#### 1. Create Emulsion

- Mix:
  - 100ml turmeric extract
  - 20g maltodextrin
  - 3g soy lecithin
  - 5g whey protein
- Blend using a high-speed blender or hand mixer until homogenous

#### 2. Drying

- Spray dry or freeze dry as above
- Collect **bright yellow powder** that disperses easily in water or oil

### 3. Storage

- Airtight, light-proof packaging

---

### Why These Methods Work:

| Component           | Purpose                             |
|---------------------|-------------------------------------|
| Maltodextrin        | Creates shell & improves flow       |
| Gum Arabic          | Stabilizes color during drying      |
| Soy Lecithin        | Helps emulsify oil-based extracts   |
| Whey Protein        | Binds to pigment & improves coating |
| Spray/Frozen Drying | Reduces moisture & locks in pigment |

---

### Equipment Options for Small Scale

| Equipment          | Approx. Cost (JMD)  | Note                         |
|--------------------|---------------------|------------------------------|
| Home spray dryer   | J\$200,000+         | Can be rented/shared via SRC |
| Freeze dryer       | J\$300,000+         | Useful for premium capsules  |
| Blender/emulsifier | J\$10,000–J\$30,000 | Needed for uniform solutions |

---

### Applications for Microencapsulated Powder

- Sorrel tea powder
- Smoothie sachets
- Curcumin capsules
- Natural soap colorants
- Bakery or sauce blends

**Developed by Quality Solutions Limited**