# SNS COLLEGE OF TECHNOLOGY
# AN AUTONOMOUS INSTITUTION

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## DEPARTMENT OF FOOD TECHNOLOGY

**COURSE CODE & NAME**: 19FTO301 BEVERAGE TECHNOLOGY
III YEAR / V SEMESTER

UNIT : I - INTRODUCTION TO BEVERAGES

**TOPIC : ** QUALITY CONTROL & QUALITY STANDARDS IN BEVERAGE PRODUCTION

# 1. Introduction


- Quality control in the beverage industry is paramount for ensuring
  - Consistent taste,
  - Safety, and
  - Adherence to regulations
- Builds brand trust, satisfies consumers, and enhances operational efficiency.
- Significance of quality control in the beverage industry

✓ **Consistent Product Quality**
✓ **Brand Reputation**
✓ **Regulatory Compliance**
✓ **Customer Satisfaction**
✓ **Cost Efficiency**

# 1.1 Beverage Processing

- Beverage Processing steps includes :
  - ✓ **Blending,**
  - ✓ **Pasteurization,**
  - ✓ **Filteration/Clarification/ Deaeration, and**
  - ✓ **Packaging**
  - ✓ **Ageing**

  That turn raw materials into edible drinks.

- Quality control guarantees
  - ✓ **Finished products' quality,**
  - ✓ **Flavor consistency, and**
  - ✓ **Adherence to safety regulations**

# 2. Pre-requisites of quality Control

✓GAP = Good Agricultural Practices

✓GDP = Good Distribution Practices

✓GMP = Good Manufacturing Practices

GHP = Good Hygienic Practices

# 3. Quality Control System

## 3.1 Tools of quality control system

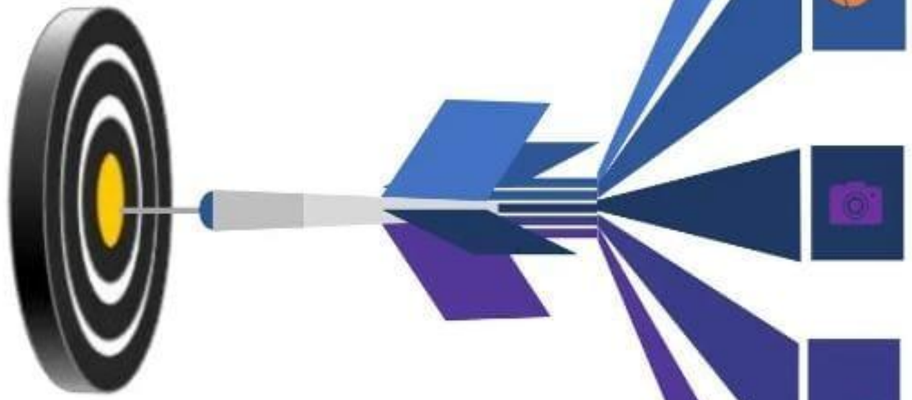
| A. Monitoring the Supply Chain | B. Inspecting Raw Materials and Ingredients | C. Chemical Testing |
|---|---|---|
| • For effective, & smooth production of goods and services<br>• Done from farm to fork<br>• To source high-quality ingredients, track potential recalls or warnings | • Done before beginning the production process, to ensure raw material safety<br>• Identify any possible safety issues and eliminate quality hazards as per SOPs assigned. | • Done throughout the facility's manufacturing process<br>• To ensure smoothness of the process as per guidelines.<br>• Results: inform potential recalls, production pauses, or recipe changes |

# 3. Quality Control System

## 3.1 Tools of quality control system (Cont.)

| D. Nutritional Investigating | E. Ensuring Safe and Effective Packaging | F. Inspection using Senses (Sensory Evaluation) |
|---|---|---|
| • Done to confirm the nutritional information mentioned on label<br>• Beverage should contain nutrients as per the regulation ( i.e., FSSAI) | • Sharp edges or unstable bottoms of pack<br>• No scratches or punctures<br>• Adequate sealing | • A taste, smell, and sight test<br>• Done by sensory panels<br>• Ensure replication of same sensory characteristics of beverage |

# 3.2 Significance of quality control



**Food safety & security**

- Prevent food borne illnesses,
- Ensure safe food consumption

**Compliance with regulations**

- Comply Indian standard FSSAI rules & regulations and international rules codex guidelines

**Consistency in Product Quality**

- Uniform and consistent quality of food, ensures consumer's satisfaction

**Saves time and money**

- Lead to no re-work on production,
- Identify ideas for product improvement

**Maintenance of Company reputation**

- Quality control decreases chances of recalls & finished product elimination and maintain company reputation.

# 4. CCPs in Beverage Processing

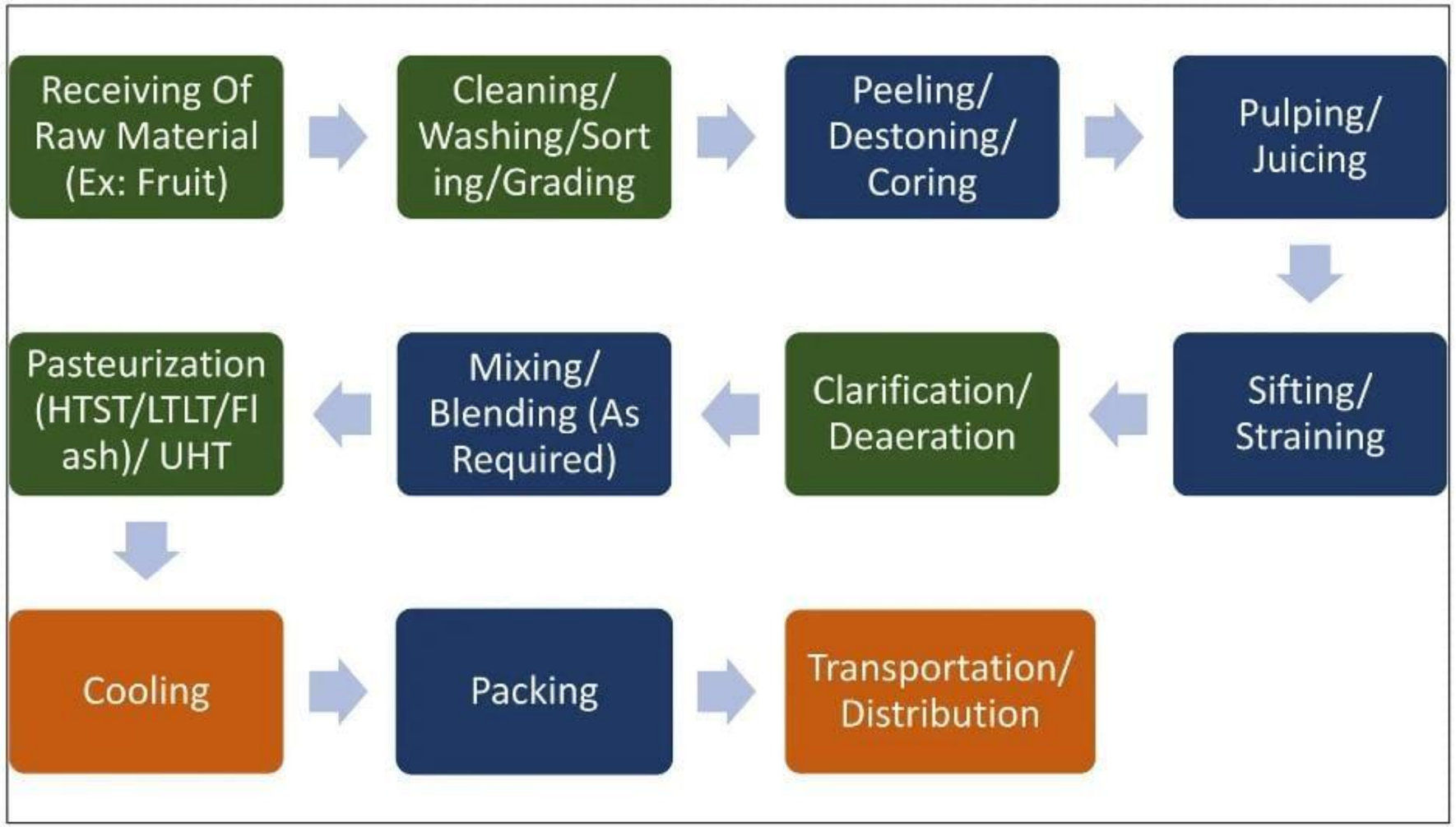
**CCPs Definition**

→ Specific stage where control can be applied to prevent, eliminate, or reduce potential hazards to acceptable levels.

**Identification of CCPs**

→ Thorough analysis of the entire food production process.
→ Assessment of Potential hazards

# 4.1(a) Process Flow Chart: Non-alcoholic beverages



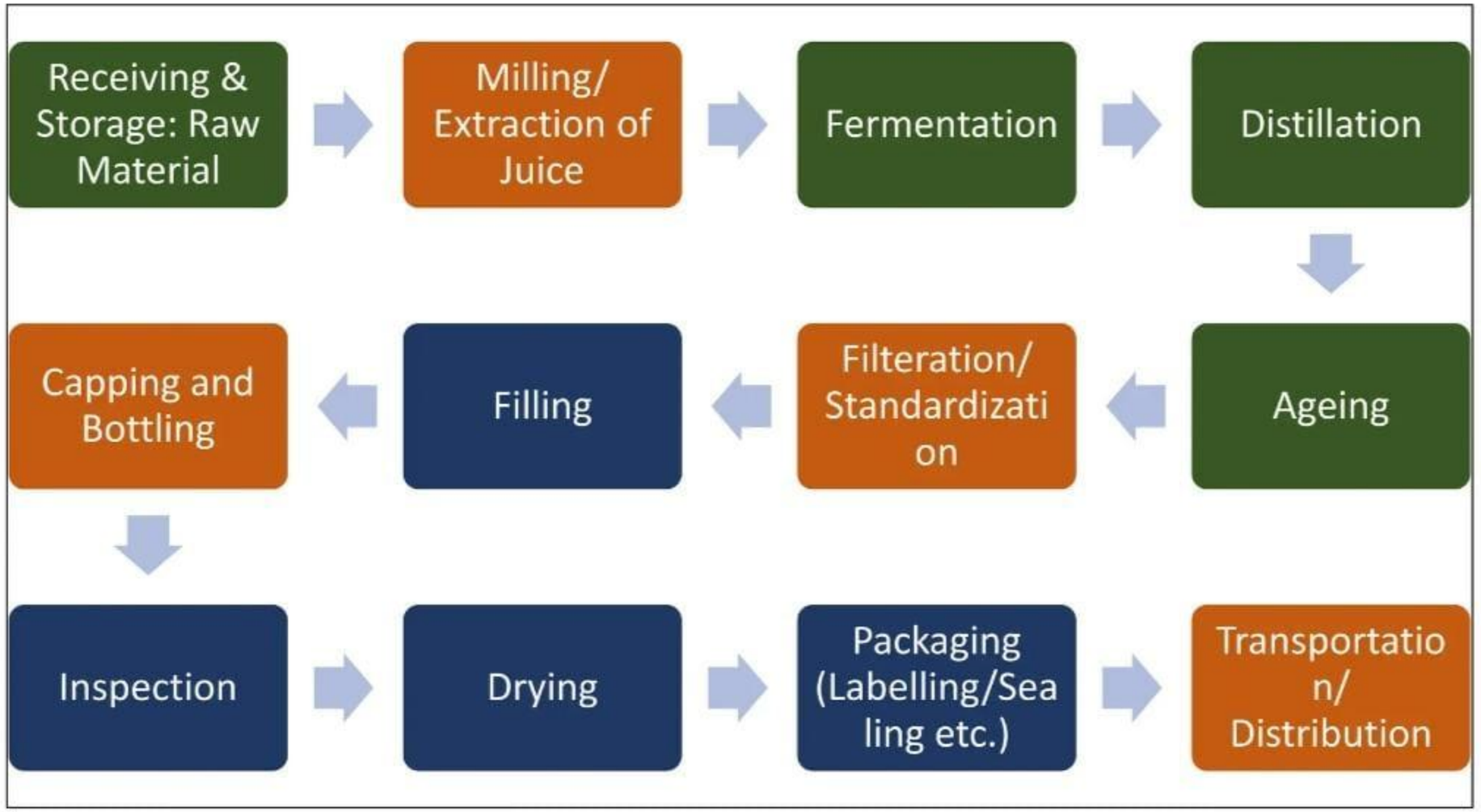
# 4.1(b) CCPs of Non-alcoholic processing

| CCP Nos. | Processing step | Issues (if the CCP not achieved) | Effects of issues | Critical limits |
|---|---|---|---|---|
| CCP 1: Raw material | Receiving of raw material (mainly fruits) | Quality of raw ingredient (as required); affects final product quality | Bitter taste, sour taste in sweet fruit juice, etc. | Ideal & accurate quantity, generally ripe & firm quality fruits |
| CCP 2: Prepared Raw material | Cleaning, Washing, sorting/ grading | Higher microbial count, presence of toxicants, non uniformity in finished product | Short shelf life, non uniform product quality | 1. Pesticide residue: 0.01 mg/kg (FSSAI)<br>2. Microbial count (as per FSSAI):<br>a) aerobic plate count: $\leq 10^6$ CFU/g,<br>b) yeast and mold count $\leq$ 1000 CFU/g,<br>c) E. coli O157:H7 & Salmonella absence in 25g sample |

# 4.2(b) CCPs of non-alcoholic carbonated beverage with critical limits

| CCP Nos. | Processing step | Issues (if the CCP not achieved) | Effects Of Issues | Critical Limits |
|---|---|---|---|---|
| CCP 1: Raw material | Receiving of raw material | Non-uniformity in product, oxidation | Capital loss, toxicity, poor sensory characteristics | Filter aid- perlite, diatomaceous earth or cellulose, No guideline for activated charcoal |
| CCP 2: Container | Sugar sol. preparation | Presence of chemical & microbial hazard | Toxicity, poisoning, company reputation loss | Temp: @78-82°C<br>Sugar syrup strength: 40 – 60°Bx |
| CCP 3: Filter | Filteration | Non-uniformity | Product quality degradation | Pressure: 58 psi or 4 bar,<br>MOC: stainless steel |
| CCP 4: $CO_2$ | Cooling under high pressure | Added $CO_2$ will not properly solubilized | Less fizziness in beverage, low sparkling effect | 1. Pressure: 30 to 50 psi<br>2. Conc. of $CO_2$: Min. 2500mg/L $CO_2$ |

# 4.3(a) Process Flow Chart: Alcoholic beverages




critical control points

critical points

# 4.3(b) CCPs of alcoholic beverages processing with critical limits

| CCP Nos. | Processing step | Issues (if the CCP not achieved) | Effects Of Issues | Critical Limits |
|---|---|---|---|---|
| CCP 1: Raw material | Receiving & storage: Raw material | Quality of raw material may degrade | Financial loss | 1. Higher quality graded raw material<br>2. Storage at cold room (< 10°C) |
| CCP 2: Extract | Fermentation | Production of toxicants | May lead to food borne illness or even death | 1. Controlled time, temp. (28-33°C, as required), and $O_2$ conc. (gen. absent)<br>2. Final sugar content: 14 % to 16 % |
| CCP 3: Distillate | Distillation | Presence of heavy metal, Presence of large amount of phenolic compound (or impurities may present) | Toxicity, poor sensory character-istics | 1. Acetic acid: 2 %<br>2. Dimethyl sulfide (DMS): ≤ 2.84 mg $L^{-1}$<br>3. Cu ≤ 5 mg $L^{-1}$<br>4. Extremely mutagenic substance: 5 mg/L anhydrous alcohol |

# 4.3(b) CCPs of alcoholic beverages processing with critical limits (cont.)

| CCP Nos. | Processing step | Issues (if the CCP not achieved) | Effects Of Issues | Critical Limits |
|---|---|---|---|---|
| CCP 4: Beverage | Ageing | 1. Adverse chemical compounds from wooden barrels<br>2. HPA and furfural formation | Toxicity | 1. Certified and proper wooden barrels<br>2. Control of toasting intensity and temperature & Carbonization of wood.<br>3. Maturation: 50 % of spirit<br>4. Low counts of yeast, mold, and bacteria |

# THANK YOU