

Essentials Issues on Quality and Safety for the Agro-Food Industry

By

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Recommendations for Food Processing and Production

- Quality
- Diseases Transmitted by Food (DTF)
- Good Practices of Manufacturing (GPM)
- Packaging
- Labeling
- Registrations and Habilitation

Introduction:

Is mandatory for Food Processor to fulfill norms of quality and safety

Consumers demand attributes that ensure the quality and nutritional value of food like meat, dairy, fruits, vegetables, grains, cereals, flours, etc and the management of the quality concept

Quality

- Is the result of all the operations and process along the food production chain and marketing. That is: From the Field to the Table
- The quality of a food include the following characteristics:
 - Safety
 - Nutritional
 - Sensorial (Organoleptic) and
 - Commercial

Safety: The food must not cause any injury/damage to the health of the consumer

- Limited use of chemical preservative
- No contaminated with micro-organisms
- No contaminated with toxins
- No heavy metals
- Safe package
- Etc.

Nutritional: The food must satisfy the needs of the persons in terms of energy and nutrients

- Vitamins
- Minerals
- Carbohydrates
- Proteins
- Lipids
- Food for celiac, diabetes, etc

Sensorial (Organoleptic) Attributes: These are associated to socio-cultural tradition, education and convenience

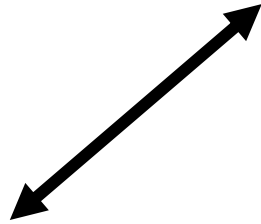
- Flavor
- Odor
- Color
- Texture

Commercial Quality: Food products offered should satisfy needs and expectative of the consumers with price that allow them to be able purchasing

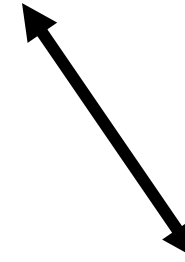
- Adequate package
- Easy to open
- Microwaveable
- Labeled: with clear and complete information

Sanitary Authorities

(Their functions are that food processing plants/local/Installations as well as the food products fulfil with the norms and rules by law)



Consumer Safety



Food Processor
Responsibilities:

- On raw material
- On the process
- On the products
- On the safety
- On the Shelf Life
- On the transport

Types of possible danger caused by foods

- Physical: Due to poor care during processing. Consist of the presence of extraneous materials entering by accidents or brought by the raw material, for instances, dust, stones, piece of glass, little wood, sand, hairs, metallic nails, nails enamel, hooks, rings and others

Types of possible danger caused by foods

- Chemicals: May appear when the food enter in contact with chemicals substances, it may happen due to improper use of substances and/or material contact with the food due to wrong procedures along the food chain production, Ex, plaguicides, antibiotics, chemical additives in excess, inadequate material of the packaging, bad use of disinfection solutions, grease, minerals (lead, copper, etc) among others

Types of possible danger caused by foods

- Biological: They are not visible but can be found in the air, water, soils, food, animals, humans being, or any surface. These include different M.O like: Bacterium, Fungus, Virus, Yeast, Parasites and others.
- Pathogenic: Salmonella, shiguella sp, etc
- Toxigenic: Staphylococcus, Botulism
- Food Spoilage bacterium:
- NOTE: Not all the m.o. cause damage, some are useful in the food industry like acid lactic bacterium for making cheese, yoghurt, wine, bread, etc

Diseases Transmitted by Foods (DTF): Those caused by intake food and/or water contaminated with pathogenic agents or their toxins/other substances affecting the health of the consumers.

- A. Infection types: Brucellosis, Salmonellas, Diarrhea by Coli forms
- B. Intoxication (Toxin) caused by Cl. Perfringes, Cl. Botulinum, Staphylococci
- C. Toxic-Infection: V. Cholera
- D. Parasites: Triquinosis, Thaeniasis, Fasciolasis, etc

Conditions that allows DTF

- Inefficient pasteurization, sterilization, not proper temperatures, the moisture content, poor or lack of vacuum, wrong packaging, poor hygiene, etc
- Bad practices during storage and transport
- Food contamination with m.o and toxins
- Growth of m.o or toxin production in too much quantities
- The consumer is a risk person like: immunodepressed, old person, children and pregnant

Main Symptoms of DTF

- Headache
- Vomits
- Skin eruptions
- Stomach pain
- Nauseas
- High fever
- Diarrhea and
- General decompensate

How to avoid DTF caused by m.o

- To train the personal on GPM
- Not let food long time between 25-60°C after cooking
- Cool fast the cooked food
- Avoid cross contamination (meat/fruits separated, etc)
- respect time and temperatures indicated for each food preparation
- Keep clean and hygiene on local and equipments

Factors that aid the growth of the m.o

- **Temperature:** $>63^{\circ}\text{C}$ m.o. start to die; between $25\text{-}60^{\circ}\text{C}$ Max growth; between $5\text{-}25^{\circ}\text{C}$ medium growth; $0\text{-}5^{\circ}\text{C}$ (slow growth and $<0^{\circ}\text{C}$ latent state of the m.o)
- **Acidity:** Most pathogenic m.o. growth well in food of low acidity, that is pH close to 7 or slightly alkaline
- **Nutrients:** m.o. growth well in food containing proteins and water (meat, chicken, fish, milk products, creams, these are considered food of high risk)
- **Moisture Content:** The more water has the food m.o growth better, in contrast in dried foods m.o do not growth. **NOTE:** One m.o. in 8 hours become 16 millions of m.o.

Different levels of Acidity in fruits

Very acidic fruits pH<3.7	Moderately Acidic fruits pH3.7-4.5	Less acidic fruits pH >4.5
Grapefruit Lemon Lime Orange Tamarind Tangerine	Guava Mango Passion fruit Pineapple Strawberry Tomato	Banana Breadfruit Melon Papaya Squash

(Assuming all fruits are fully ripe, from 'The Composition of Foods', Paul, A.A. and Southgate, D.A.T., Elsevier, 1985)

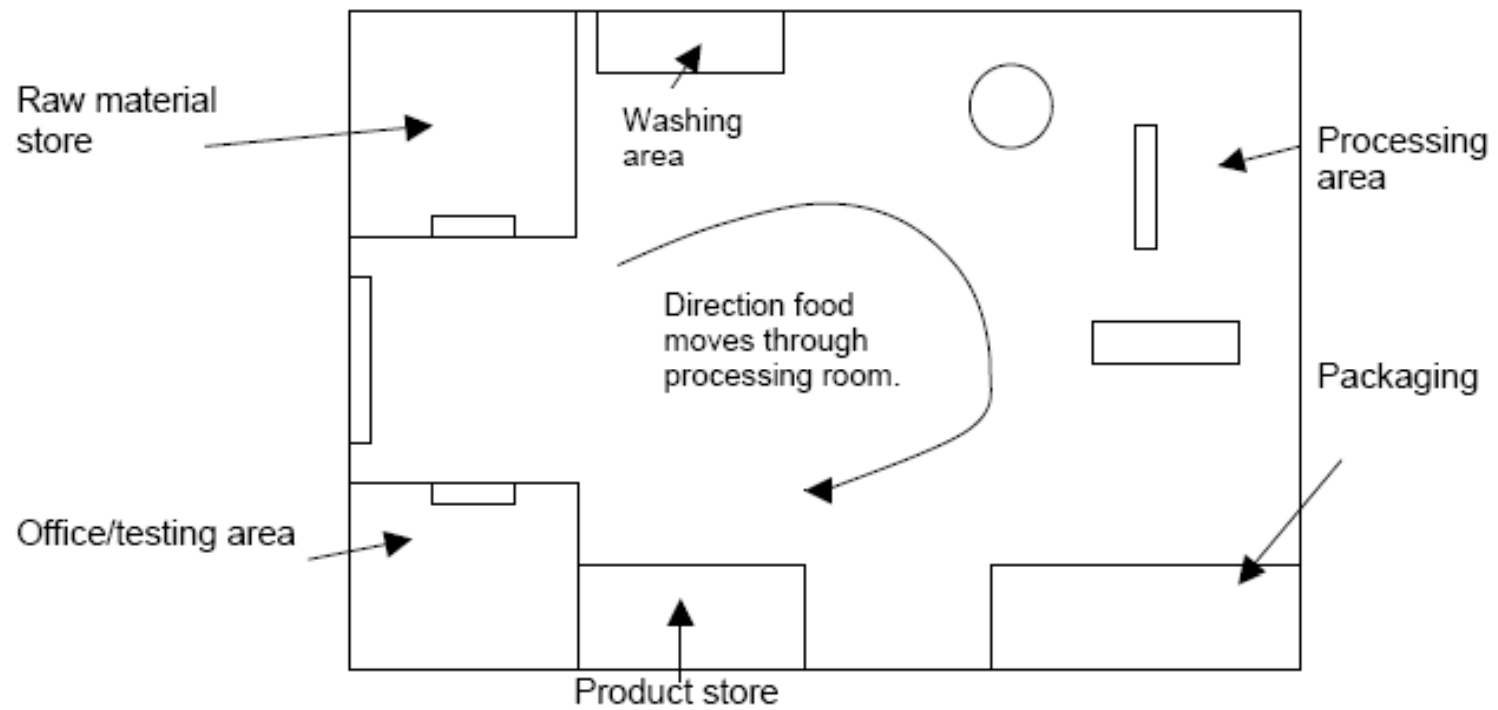
Factors to consider for achieving the safety in a food produced



Good Practices of Manufacture (GPM)

1. Raw Material
2. Locals:
 - a. Design of structures
 - b. Hygiene of locals/installations
3. Mandatory habits of personal hygiene of the staff
4. Hygiene during the process
5. Control of the process
6. Documentation/instructive/registries/(traceability)

Fig. 2.1. Basic design for a fruit and vegetable processing unit
(hand-washing/changing facilities and toilets in another building)



Packaging: Type depend upon the food to contain and can have different form (bags, boxes, cages, jars, drums, sacks, trays, cans, films etc)

- Materials: plastics, cartons, wood, glass, aluminum, iron-tin, etc.
- Function: To contain, to protect, to portionate, to transport, to communicate
- Attributes expected: resistant to compression, to the light, permeable to oxygen and water vapor, shows color, quality, aspect of the food, etc
- Some problem with the packages: Aspect, odors, sealed ness, hermetecity, ink safe, etc
- Size: 50g, 120g, 250g, 500g, 750g, 1kg, etc

Labeling must contain information to identify characteristic of the product

- Name of the product
- Identification of the product/registration number and the processor: (National/regional registration, name and address of the manufacturer)
- Country Origin
- Ingredients: according to its weight from the maximum to the minimum
- Net Content: In volume for liquids (ml, dl, L) and weight for solids (mg, g, kg, etc)
- Date of expire
- Mode of use and precautions
- Lot identification

Registration/Habilitation of the Food Factory

- The Owner/Coop/Society/etc should send a letter of description of the SME addressed to the Municipal/National authorities informing and requesting permits/authorisation in order the factory be established

(Source;INTI-Arg)

Thank you

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Grenada and St. Lucia, May 11^o of 2010