



Chapter 9

Physical Hazards in Seafood

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A physical hazard is any potential material not commonly found in food which causes illness/injury to consumer on consumption. Hazard Analysis and Critical Control Point (HACCP) is a system which identifies, evaluates, and controls hazards which are significant for food safety. In HACCP, hazard is defined as a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect. Accordingly mere contamination or undesirable conditions such as insects, hair, filth, spoilage, economic fraud, and violations of regulations/standards of food, cannot be considered as a hazard.

Physical hazards are potentially harmful extraneous matter, that are not normally found in food; but mistakenly consumed foreign material or object, which is likely to cause choking, injury or other adverse health effects to the consumer. These hazards can enter into food product at any stage of production.

Category of physical hazards:

In general, the physical hazards can be categorized into three

1. Objects naturally present in the foods

Naturally, different kinds of extraneous matter can be found in food, like bone fragments, broken pieces of shells in molluscs and broken pieces of chelate & carapace in shrimp and crab *etc.*,

2. Objects added during production:

Some extraneous materials may get introduced into the food system during the production process. For example, stone particles, rocks, and mud in the case of vegetables and fruits. These kinds of things can be categorized as ‘physical hazards added during production’.

3. Objects added during processing:

During processing/preparation step, due to poor handling practices, anything that comes into direct contact with food can introduce, some physical hazards into the food. Some examples are jewelry, glass pieces, plastics, small concrete pieces, metal fragments, *etc.*



Glass is a very common physical hazard, that can be introduced into the food system from the lightening facilities and glass containers used in the processing plant. Metal is another physical hazard that can be introduced from metallic equipment's, from worn utensils, broken needles, stapler *etc.*, Packaging materials, gloves, cleaning equipment's and all can introduce plastic into the food system. Stones from concrete structures and floors in food processing facilities; broken pieces of wood from wooden structures and wooden pallets used to store or transport ingredients or food products, fields, boxes, buildings, *etc.* are also contribute towards the physical hazards.

These extraneous materials can be again categorized into 2- avoidable and unavoidable. Unavoidable extraneous materials can be a by-product of the processing or something inherent to the raw material such as minute insect fragments in fig, microscopic airborne debris, dirt on potatoes *etc.*, But avoidable extraneous materials are preventable and are having zero tolerance in the food system. These may be introduced as a result of poor hygienic/handling practices.

Health issues associated with the physical hazards:

Generally, physical hazards do not cause a disease, but it can result in an injury like laceration (a deep cut or tear in skin or flesh), perforation (piercing) of tissue in the mouth, throat, stomach or intestines, broken teeth, damage to gums, and choking. The severity will vary with infants, elderly, medically compromised and healthy people. Hence control of this physical hazard is important in food processing.

Control measures of physical hazards:

Preventative approach is the best way to control physical hazards in food system and this approach includes

- ✓ Good Manufacturing Practices (GMP)
- ✓ Standard operating procedures (SOP)
- ✓ Pest control measures
- ✓ Ingredient specifications
- ✓ Supplier certification
- ✓ Use of equipment to screen for physical hazards
- ✓ Using appropriate design of equipment
- ✓ Employee training
- ✓ Personnel precautions (hair cover, gloves, mask, etc.)
- ✓ End product screening