

SUITABILITY OF HACCP SYSTEM IN POST-HARVEST TECHNOLOGY OF DATE

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ABSTRACT

The main criteria governing the date processing and packaging industry are national and international codes & standards, HACCP system (Hazard Analysis Critical Control Point) and finally the specific conditions set by individual customer / importer. The severe competition in the international date market requires the exporters to implement the mentioned codes and standards in the post-harvest treatments of their products and also in their packaging houses. Implementing numerous criteria set by national and international bodies would inevitably increase the retail price of date and its by-products. In the present paper the feasibility and successful implementation of the HACCP system as the sole criterion observed by one of the major date exporter is discussed. This system defines the important hazards in the date post-harvest, packaging and storage stages. Furthermore, this system suggests various approaches to reduce or eliminate hazards and increase in food hygiene and safety levels. The hazards as defined by this system would fall in three categories. These are biological, chemical and physical hazards.

Principles of the HACCP System:

The HACCP system is based on seven principles as described in the following sections:

1. Detection of potential hazard and hazard Analysis:

The recognition and detection of hazards are implemented in various stages of product processing right from the raw material intake up to the final stages of product processing such as packaging. The hazard analysis would guarantee the food hygiene and safety by inspecting the biological hazards (the short-run hazards), The chemical hazards (The long-run hazards) and the physical hazards.

Each of the above categories will be introduced separately.

1.1 Biological hazards:

- Macrobiological hazards: These hazards cover a wide range of insects including flies, pests and the toxic plants and animals.
- Microbiological hazards: such as Gram -Bacteria (such as Salmonella, Shigella, Escherichia-coli) Gram + Bacteria such as Clostridium Botulinum, Clostridium Perfringens, Bacillus Cereus and Staphilococcus aureus
- New causal agents
- Viruses
- Parasites
- Fungal Toxics (Mycotoxine) such as Aftlatoxines, Pattolines, Eurgot and Tricotoxine.

1.2 chemical hazards (long-run hazards)

These hazards may include 'carcinogenic agents and allergic factors Examples: detergents, heavy metals, pesticide and insecticide residues, chemical additives (such as Nitrite, Nitrate Sodium meta bisulphate, tartrazine) and Allergic foods (such as walnut and hazlenut)

1.3 Physical hazards:

These hazards include glass, metals, stones, wood chips and hard plastic chips and part/organs of birds and insects.

Table 1 lists the biological, chemical and physical hazards detected at the Fars Kabkaab Co.

2. Identifying critical control points:

The critical control points are those specific stages in various food processing operations which need careful control and the absence of efficient control cause the end product to be either unacceptable or their consumption is associated with high risk for customers.

Table 2 lists the critical control points in various processing operations of date products in the Fars Kabkaab Co.

3. Establishing: critical limits:

Table 3 shows the critical limits imposed on various hazards. The acceptable range at each stage is either defined by customers or by standards and are controlled by the quality control man or other responsible persons as explained in table 3. This Table also suggests remedies for the hazards exceeding the critical limits.

Table 1. The biological , chemical and physical hazards detected at the Fars Kabkaab Date Co.

Biological Hazards:

1. Macrobiological : flies, insects and pests.
2. Microbiological Hazards: TVC, Coliform, E. Coli, Mould, Yeast and Bacillus Cereus

Chemical Hazards:

1. Allergic agents
2. Pesticides and Insecticide residue

Physical Hazards:

glass, stones , metals, wood chips , plastic chips, hair, birds, feather, rodents, and birds organs

Table 2. Critical control points in date processing plant

| hazard source/ stage | type (s) of hazard |
|---|-------------------------------------|
| raw material (date) | macrobiological, micrbiological |
| water | microbiological, chemical, physical |
| nuts | rancidity, macrobiological |
| stages in date processing disinfecting, washing, sorting processing and packaging | biological, chemical, physical |
| final product | physical |

Table 3. Hazards, critical limits inspection procedure, responsible and remedies in post-harvest technology of date-palm

| | hazard (s) source | critical limits | inspection procedure | remedies | responsible person (s) |
|---|---|---|---|--|--|
| 1 | water microbiological chemical and physical hazards | national standards | weekly sampling and testing | colorification purification | processing manager quality control man |
| 2 | raw-date biological, chemical and physical hazards | factory standards | sampling and testing each consignment | rejection / disinfecting date consignment | supply and quality control managers |
| 3 | nuts (almond, walnutm etc.) | factory standards | sampling and testing of each consignment | rejection / replacement of consignment | supply and quality control managers |
| 4 | storage | factory standards | sampling and testing each consignment (45 - days period) | disinfection temperature control | storage manager quality control man |
| 5 | processing/production | factory standards | sampling and testing after each operation using metal detectors | return to previous operation (s) reject and control | production and quality control managers production and quality Control managers |
| 6 | metal in final product | nil | | | |
| 7 | final product | customer/factory and national standards | sampling/testing product batches | reject/withholding unacceptable products | production and quality control manager |

4. Establishing strategies to monitor critical control points CCP:

Certain instructions are prepared for monitoring the CCPS to ensure that the products undergo each of the inspections needed, Implementation of the instructions will prevent production of goods not satisfied by standards/ consumers expectations.

5. Corrective actions:

At this stage actions are taken to ensure that deviations in the product quality and quantity which have occurred in the previous processing stages are corrected to the desired levels.

6. Verification of efficient implementation of HACCP system:

Various procedures are defined and implemented to monitor efficiency of the HACCP Implementation. These may range from statistical analysis of the product quality indices, monitoring the customers, satisfaction and product conform to the Standards.

7. Documentation of the actions taken:

At this stage notes are taken from all the actions and measures taken during implementation of the HACCP in various stages such as processing, packaging and storage. The records are kept securely so that future references are easily possible.

REFERENCES

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