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Review Article

PURE AND APPLIED RESEARCH AND TECHNOLOGICAL ADVANCES IN FEED PROCESSING FOR REDUCTION OF POST HARVEST AGRICULTURAL LOSSES: A SPECIALIZED REVIEW

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ABSTRACT

Losses incurred at post-harvest are quite common and enormous leading to valuable food loss. At every stage of post-harvest practice, agricultural products are deprived from quality due to physical, chemical, biological and mechanical factors. In this article an overview has been presented on the major and common reasons for post-harvest food losses.

Keywords: Food, Loss, Post-harvest, Quality.

INTRODUCTION

As a result of increasing world population, the need for increased food supply has become an urgent and important consideration in many developing countries. Considerable efforts made in agricultural research and extension has resulted in increased crop yield resulting to increased food production. Post-harvest losses of vegetables, fruits and fisheries are difficult to predict, the major agents producing deterioration mostly being attributed to microbiological causes and physiological damages¹. Post-harvest losses may be grouped broadly into food losses after harvesting and food losses due to social and economic reasons.

The losses at each stage of harvest and post-harvest practices due to improper handling can be large enough to result in a total loss of millions of food commodities every year². It is believed that a 50% reduction in post-harvest food loss in developing countries will reduce the need for food importation in these countries and will cause an increase in the food supply to meet the food demands². Also loss is far less than the amount of money that will be used to produce the same amount food.

Primary Causes of Post Harvest Damages to crop produce and feed

Food losses after harvesting may include deterioration by biological or microbiological agents and mechanical damage due to unfavourable climate, cultural practices, poor storage conditions, and inadequate handling during transportation all

of which can lead to accelerated product decay. Food losses also can either be due to the reduction in weight of food meant for consumption or it could be due to damage of physical spoilage which is usually reported as a percentage of the food sample since it is difficult to measure it³.

Improper harvest and post-harvest practices expose the food commodity to many deterioration agents which lead to food spoilage. There are various types of losses depending on the post harvest practices and deterioration agent. Losses are caused mainly by mechanical damage during transportation⁴. Food losses lead to a loss or reduction in quantity, quality, nutritional and economic value of the food produce. These losses could either be primary, secondary or tertiary.

Primary Losses

These are the losses that affect the food produce directly⁴. They are during the food delivery chain. They include:

Losses occur as a result of the action of micro-organisms e.g. bacteria, mould and fungi. During the packing of vegetables, fruits and fishes into boxes, crates, baskets and trucks after harvesting, they are mostly subjected to cross-contamination by spoilage. These agents produce toxic substances (like mycotoxins) which causes food commodities to rot. These losses are more of loss in nutritional value than loss in weight. This occurs mostly during storage and marketing stages.

Chemical losses are as a result of the reaction of the naturally present chemical constituents in the stored food to cause loss of colour, flavour, nutritional value and texture.

Sometimes, undesirable reactions occur which prove to be harmful for intermediate and final products. These can lead to significant loss of nutritional value such as rancidity and agro-chemical contamination and in most cases the whole vegetable, fruit and fish is lost. On the other hand, they are losses as a result of the reaction of chemical and biological constituents of the stored food. These losses give rise to discolouration and softening which leads to reduction of nutritional and economic value of the food product.

Insect pests and parasites

These losses are as a result of the action of biological agents like rodents, insects, birds etc. the agents usually consume the food during storage and causes a reduction in weight and quality of the food. Fresh produce can become infected before or after harvest by diseases widespread in the air, soil and water. Some diseases are able to penetrate the unbroken skin of produce: others require an injury to cause infection. Damage so produced is probably the major cause of loss of fresh produce.

Secondary Losses

These are losses that do not affect the produce directly, but presents favourable conditions for the actions of primary losses. They are incurred during the delay in food processing and delivery chain. They are usually as a result of inadequate harvesting, packaging, transportation, storage and drying or processing facilities and poor quality control practices⁵.

Tertiary Losses

These losses are usually caused by the consumer due to unhygienic and careless handling of the foodstuff which can lead to wastage or loss. Various surveys have been carried out to assess the losses of food crops. A qualitative assessment must be made in order to know the post-harvest practices to prevent huge losses. The type of measures required to reduce the losses and the manner in which the measures should be adopted and applied also needs to be judged properly and with adequacy⁵.

Adversity from excessive temperature and heat stress

All fresh produce is subject to damage when exposed to extremes of temperature during chilling and freezing. Commodities vary considerably in their temperature tolerance.

Their level of tolerance to low temperatures is of great importance where cool storage is concerned⁶.

As food processing decreases the population or load of pathogenic microorganisms in food and neutralizes the harmful mycotoxins, if present therein. So, it reduces the microbial load and deleterious microorganisms and incidences of mycotoxicoses (majorly, aflatoxicosis, ochratoxicosis and zearalenone) due to prolonged improper storage of feed⁶.

CONCLUSION

The harvested produce should be properly processed and/or treated followed by proper handling and storing hygienically under conditions of optimum temperature and humidity. This improves the shelf-life of the stored agricultural produce until it reaches the consumers.

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