

**PREVENTING FOOD-BORNE ILLNESS  
FROM FARM TO PLATE  
HIGHLIGHTS OF BEST PRACTICE  
Transport and Storage : Safeguarding Food**

Transport and storage form vital links in the food chain between the farmer's field and the consumer's table. While the role of the farmer, the food processor and the retailer in the food chain is easily understood, it is easy to forget the importance of well-managed transport and storage, in ensuring that food stuffs are protected from hazards such as contamination, spoilage and deterioration.

Maintaining the quality and safety of food in transport and storage requires both operating procedures to ensure the preservation of food products, and monitoring procedures to ensure operations are carried out as intended.

### Monitoring Procedures

Identity documents have become increasingly essential elements in monitoring transport and storage procedures in Asia. They may be used to trace a food product's history from the farmer's field or barn right through to the consumer's plate.

To ensure "traceability" of food products, participants in the food chain are increasingly committing themselves to documenting each step in the process. The history of a product contains a great number of important details: the land on which the product was raised, the lots of seed and



fertiliser used, the record of pesticide treatments where appropriate, dates of harvesting, location of storage silos, the particular herd or flock from which an animal came, the date and location of slaughter, location and date of processing and packaging, the identity of ingredients used in

processing, the condition of transport vehicles, the dates, duration and conditions of transport, storage locations, dates by which the product should be used and why, and the name and location of the final retail store.

The methodical recording of this data is in part due to the increased awareness of its importance by the participants in the food chain and also to the use of modern information technology to process the relevant information.

The Japanese agriculture ministry is developing a traceability system to label each pack of beef, to show where the animal was born and the farms where it was raised. The new numerical system is designed to restore



public confidence in beef following recent public alarm over a small number of confirmed cases of Bovine Spongiform Encephalitis (BSE) in cattle. Further, national codes of practice have also been established for the handling,

storage, transport and sale of red meat, poultry, fish and crustacea; safety of food in national and international trade; and food service hygiene in travel catering.

### Temperature

A wide variety of fresh products (vegetables, fish, meat, poultry, and prepared meals) must be kept at low temperatures throughout processing, transport, storage and final sale. Likewise, it is imperative to keep frozen foods at temperatures that prevent thawing to point of sale, and from retail premises to the home. Similarly, food heated in advance must be kept hot between locations, for example between a central institutional kitchen and aeroplane where the food will be offered to passengers. Transport and storage containers along the route therefore, must be insulated, temperature controls working properly and an alert system needs to be in place to warn when errors occur.

In China for example, the demand among consumers and restaurants for frozen and chilled foods has resulted in the need to move perishable food products quickly, efficiently and hygienically from the farm or food processor to the consumer. China's cold chain infrastructure is currently striving to modernise and invest to meet the ever-growing demand.

### Humidity

Air that is too dry or too damp damages many fresh foods: Excessive dryness can dehydrate meats as well as some fruits and vegetables. High humidity, which is common in many parts of SE Asia, can lead to the growth of moulds and bacteria on meat, and fungus on fruit, vegetables and cereals. Controlling humidity is often achieved by management of the airflow circulating around products in trucks, shipping containers and storage areas.

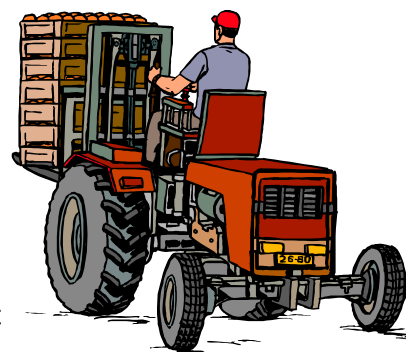


In turn, airflow is dependent on the type of containers in which food is packed, for example - net bags for certain kinds of vegetables, or slatted cartons for fruits etc. Airflow is also dependent on the way these containers are packed together, e.g., with relatively little airflow among them or with spacers between cartons specifically designed to enhance airflow.

### Handling Conditions

Workers handling food products throughout transport and storage play a critical role in food quality and safety. They are responsible for ensuring that products and packaging are not physically

bruised, broken or bent, that conditions are free of dust, odours, rodents and insect pests. For example, food transported in a truck previously used to transport fish and not thoroughly cleaned, could absorb fish odours. For this



reason, training of personnel at each step in the process is important. Many countries provide personnel training courses. For example, in Japan, prefectural governments provide food sanitation training courses for food handlers. In addition, a food sanitation week is observed annually.

## Packaging

Packaging is very important in preventing both recontamination of processed foods, and the introduction of new hazards into foodstuffs in transit or storage. Whether in metal, glass, paper or plastic, hygienic packaging plays an important role, both as a physical barrier against physical, biological and chemical contaminants, and in preventing the growth of undesirable organisms: for example by acting as a physical barrier in hot humid environments, and thus preventing the growth of moulds.



## Maintaining Quality Standards

Because of the importance of maintaining high standards in transport, an increasing number of agreements exist between organisations representing the food industry, transporters and even those specifically responsible for cleaning trucks and containers. In addition, there are at least two international bodies responsible for implementing quality standards in the transport and storage of food in the Asia Pacific region.

- The norms of the International Standards Organisation (ISO) contain a chapter on the storage and delivery of food products.
- The Codex Alimentarius established in 1962 by the World Health Organisation and the Food and Agriculture Organisation, includes the issues of transport and storage in the overall recommendations for the preservation of food.

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