



REFRIGERATED TRANSPORTATION OF FOOD AND TEMPERATURE SENSITIVE PRODUCTS



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LEARNING STRATEGY

- 1) The course is divided into sections and these into different classes. You have 90 days to complete the course.
- 2) Follow the established order of sections and classes.
- 3) Open the class that you are going to study. Read and analyze the slides one by one.
- 4) Do not move to the next slide until you have understood completely the information.
- 5) In some sections you will find a short quiz or test to evaluate your learning process. You can take the Quiz several times.

COURSE OBJECTIVES

GENERAL OBJECTIVE

To know the technical and operational aspects involved in transporting refrigerated and frozen cargo in refrigerated containers extensible to reefer vessels and be able to evaluate and analyze these aspects

SPECIFIC OBJECTIVES

- Recognize the types of containers and vessels used to transport food and agricultural products
- **Understand and identify the structural parts of a container and the terms used**
- **To identify and interpret the serial of a container according to ISO**
- Recognize the types, characteristics and parts of an integral refrigerated container and ancillary parts and their operating characteristics
- **Knowing the basics of storing and moving containers in marine terminals**

SPECIFIC OBJECTIVES

- **Know and understand the instructions for handling perishable cargo**
- **To establish the optimal conditions of transportation for a given product (temperature, relative humidity, ventilation, ethylene control, product compatibility, controlled and modified atmospheres...)**
- **Knowing the most common postharvest treatments for fruits and vegetables and their impact on transportation and preservation**
- **Evaluate packaging of products, including: types, requirements and packaging and palletizing procedures**

SPECIFIC OBJECTIVES

- **Knowing the procedures to be performed previous to loading refrigerated containers and the critical factors that must be observed.**
- **To understand and analyze stuffing and stowage procedures of refrigerated containers and precautions to be taken for successful transportation, based on the characteristics of the product transported.**
- **Knowing the types of temperature recorders and data acquisition systems frequently used during transportation.**
- **To know the safety measures for handling full containers**
- **Knowing the basic steps for stripping and container transfers in case of reefer failure or physical damage.**

SPECIFIC OBJECTIVES

OPTIONAL

General knowledge on reefer vessels:

- **Characteristics of refrigerated holds and compartments.**
- **Typical operating parameters**
- **Gratings and air distribution systems in compartments**
- **Characteristics of refrigeration systems**
- **Refrigerants and environmental protection. The Montreal Protocol**

INTRODUCTION

CARRIAGE OF REFRIGERATED PRODUCTS

- ***Food is*** the most important item involved in refrigerated transportation.
- There are other products also carried as refrigerated cargo: ***flowers, plants, medicines and pharmaceuticals, certain chemicals, electronic and special equipment, photographic material and other heat sensitive materials.***

Foods with higher trade volume as refrigerated cargo:

- **Fruits and vegetables:** bananas, citrus, apples, pears, grapes, plums, peaches, nectarines, kiwi, mangoes, papayas, melons, garlic, onions, nuts and potatoes among others.
- **Processed foods:** cheese and dairy products, prepared pasta, pre-cooked frozen foods, meat, poultry, fish and seafood, fruit pulps and concentrates, among others.

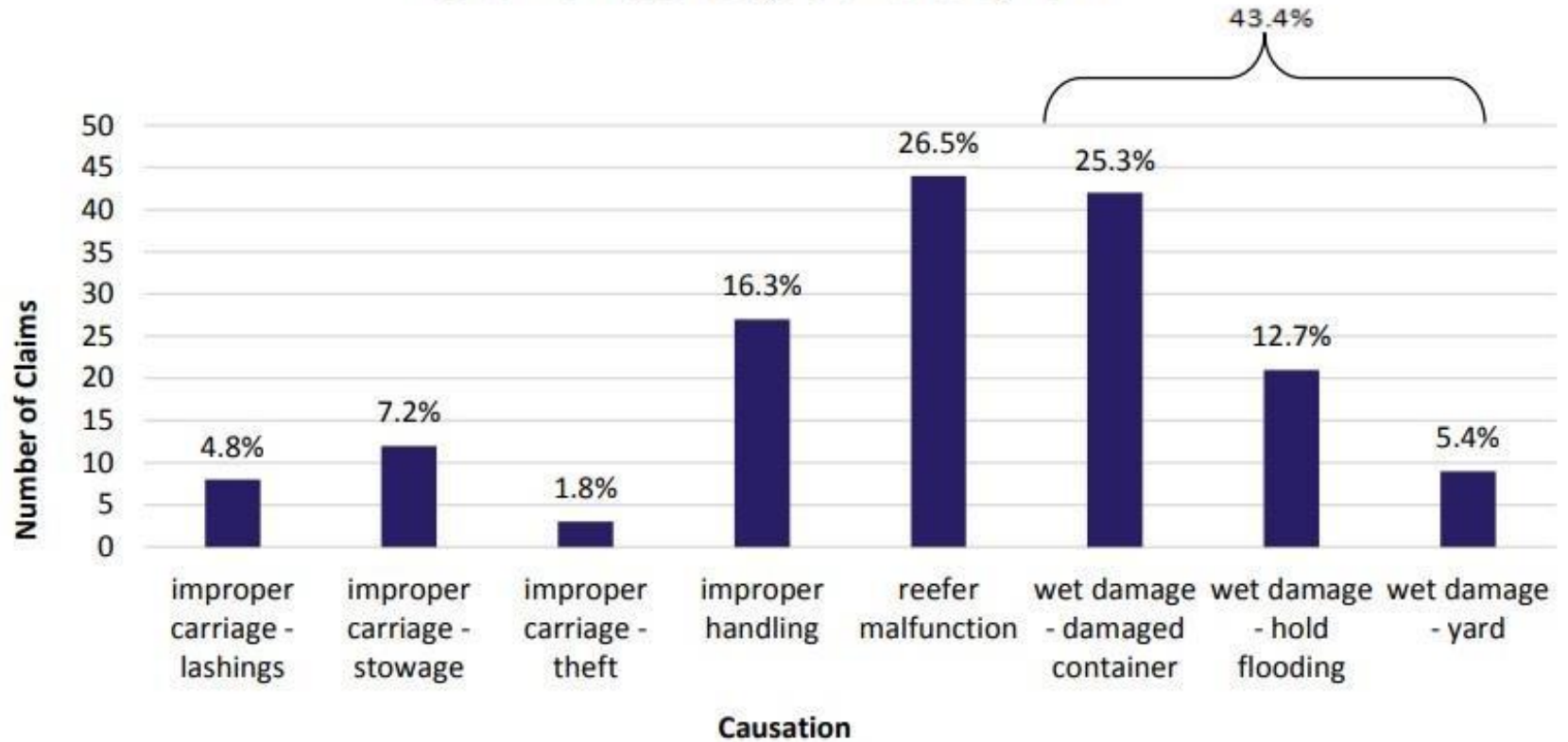
Fresh foods are generally produced in farms in agricultural areas. They are processed, stored, transported and distributed to the consumer.

Transportation represents a *complex chain from the point of origin to the final destination and should be done in the most appropriate manner, in the required time and with competitive costs. This process is known as food **transport logistics.***

Transport Logistics: Is the process of planning, implementing and controlling the appropriate movement and storage of products, services and related information from the point of origin to the point of consumption, so that the consumer needs are satisfied.

Storage and transportation of raw materials and finished products represent important activities in this process and account for around **one third of all logistics costs**, hence the importance of this link in the chain.

Container Vessel Cargo Claims 2016/2017



Container vessels cargo claims (2016-2017)

- More than 43% of damages are caused by water
- 26.5% by failures in the refrigeration system
- 16.3% by mishandling containers
- 7.2% and 4.8% by defective stowage and lashing respectively
- And 1.8% due to theft



END OF PRESENTATION

1.1 OBJECTIVES AND INTRODUCTION