



# **SNS COLLEGE OF TECHNOLOGY**

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### **DEPARTMENT OF FOOD TECHNOLOGY**

**COURSE CODE & NAME:** 19FTT301 & Refrigeration & Cold Chain  
Management

**III YEAR / V SEMESTER**

**UNIT : V - COLD CHAIN**

**TOPIC 1 : Introduction & Components of cold chain**



# What is a cold chain?

A **cold chain** is a temperature-controlled supply chain. An unbroken cold chain is an uninterrupted series of refrigerated production, storage and distribution activities, along with associated equipment and logistics, which maintain quality via a desired low-temperature range



# INTRODUCTION

- Refrigeration plays an important role in preservation, reduction in losses by means of storage in the required temperature, processing, packaging, transportation, supply & distribution, wholesale and retail sales.
- However, refrigeration is also vital to ensure food safety which is paramount, and is required to maintain the right temperature.
- Refrigeration and cold chain are inter-linked and directly related, whereby refrigeration plays an important and vital role in the food industry as a whole, especially keeping in mind the relevant issues such as food safety, food hygiene, health and environment as well.





- Refrigeration is a part of cold chain and pivotal to food industry, so to say, is part of “Farm to Table” phenomena and is very much necessary for storage, preservation, transportation and distribution of frozen, chilled or food grade materials with ambient temperature, which is also a must in order to control and avoid decomposition, decay and contamination right from the time of produce, storage, transportation, distribution and consumption, as it is directly related to health whereby, it is directly linked to one of the most important aspects of food safety and food hygiene, which is paramount.



- Refrigeration technology has an important role to play in the cold chain and food industry.
- Refrigeration is widely applicable and used in food supply chain such as packaging, processing, storage, transportation, waste management, distribution of perishable products that requires further refrigeration during storage and transportation to prevent deterioration of product quality and losses.
- Hence, the extensive use of refrigerated cold rooms and refrigerated transport systems is widely used in the cold chain and food chain supply industry, where refrigeration plays a pivotal role.



Conclusively, refrigeration is necessary in order to prevent the formation of mildew, growth of fungus and microbes.

It helps extend especially the shelf-life of farm fresh vegetables and fruits, dairy product, poultry and meat products. At the same time, it helps maintain freshness and quality as well.



# COMPONENTS OF THE COLD CHAIN



The three fundamental elements of the cold chain rely on cooling technology to maintain the integrity of shipped goods. These elements include the following:

**1. Product**

**2. Origin and destination**

**3. Distribution**



## Product:

- Cold chain logistics involves getting temperature-sensitive goods from one place to another.
- The products need specific temperature and humidity conditions during the shipping process.
- Cooling systems bring the product to the appropriate temperature and, depending on the method and duration of the trip, cool the products in transit.





## Origin and destination:

- The places where the product originates and ends up are crucial to consider in the cold chain.
- The longer the physical distance, the more challenging it is to keep a regulated temperature.
- Once products arrive at the final market, whether it's a grocery store or a local pharmacy, they will receive constant refrigeration.
- While in transport, however, the items may be cooled by gel packs or kept cool using insulation. In those cases, there may be higher chances for temperature fluctuation.



## Distribution:

- Cold transport vehicles, or reefers, move goods and maintain stable conditions as the products travel to their final destinations.
- Refrigerated shipping containers can support uninterrupted travel.
- Otherwise, a distribution network may rely on cold storage facilities along the route.
- Products may be stored in several refrigerated facilities along the supply chain.
- They may wait to ship overseas at a refrigerated warehouse at the origin, then arrive at an intermediate location for processing and distribution.
- Finally, they will be stored close to the destination market for distribution.



THANK YOU..."