



Refrigeration for Food Preservation

Fruits and vegetables are perishable commodities. If not stored at recommended temperatures after harvesting, they rot in a short time by chemical reactions, bacterial attack, or water loss. Improperly stored fruits and vegetables lose nutrition value over a period of time. Changed physical appearance or taste also affects their consumer appeal. Refrigeration helps in preserving fruits and vegetables by storing at low temperatures to slow down decay and natural metabolic processes.

Meat, fish products and precooked foods also have limited life because of enzyme activities, bacteria attack and ageing. Low temperature is very effective in limiting these reactions.

Similarly, ice cream, other dairy products, bakery products and beverages need to be stored at low temperatures for long term use.

Q. How does refrigeration help to conserve food products?

Food products get spoiled because of internal chemical reactions which cause ripening and fermentation; and the growth of mould and bacteria. These processes can be stopped or slowed down by storing the food at low temperatures. Thus, refrigeration techniques help to preserve food products for longer periods.

Q. Can all fruits and vegetables be stored at the same temperature?

No. The optimum storage temperature varies for different kinds of food products. Fruits like grapes, kiwifruit, apple, cherry, peach, strawberry, raspberry and vegetables like onion, cabbage, beet, carrots are ideally stored at temperatures of around 0°C. Oranges and potatoes are stored at 4 to 5°C. Watermelon, pumpkin, grapefruit, and cucumber require 10°C storage temperature. Mango, lemon, tomato, and banana are stored at 14 to 15°C temperature.

Q. What is the normal relative humidity required for the food storage?

Normally most food products require 90 to 95 % relative humidity (RH) inside the cold storages. Onions require very low RH of 65 to 70%. Leafy vegetables are stored at more than 95% RH to avoid excessive moisture loss.

Q. Why do frozen foods last longer than refrigerated foods?

Fruits and vegetables are stored at temperatures slightly above freezing point to prolong their life by a few days or weeks. Here, product decay process is slowed down but not stopped completely. Whereas, meat, fish, precooked foods as well as fruits and vegetables may be frozen and stored at very low temperatures until they are defrosted and cooked by the consumer. In this case, the decay process is stopped completely and the food can be preserved.

Q. What is the ideal meat storage temperature?

Ideally, meat is stored at a temperature between 0 and 2°C (7°C maximum). Under these conditions, ageing is slowed down and the growth of bacteria greatly reduced. Freezing and deep-freezing between -18°C and -50°C stops the enzyme activity and the ageing process. These conditions allow meat products to be preserved for periods between 6 and 18 months without deterioration of the product.

Q. How does the dairy industry benefit?

Milk is one of the fastest decaying products as the growth of bacteria takes place at a very rapid pace. Chilling of milk through refrigeration increases the life of milk and other dairy products by bringing the temperature down quickly.

Q. What is the storage temperature for dairy products?

Milk is stored at 3 to 4°C; while cheese requires 6 to 10°C storage temperature. Ice cream is hardened till it reaches a temperature of -28°C and is then stored at this temperature. After distribution it is consumed at -13°C

Q. Does freezing of food change its original taste and nutrition value?

No. In fact, in frozen state where the storage temperature is generally below -18°C, all the natural metabolism and bacterial activity stop completely. So, original taste and nutrition value remains unaffected.