Refrigeration used to preserve foods dates back to prehistoric times. At the time, people used snow and ice to store hunting products. Slow freezing was risky; it was not until the 20th century that the commercialization of frozen foods began with the discovery of a rapid freezing method: the deep freezing.

In order to reach a negative core temperature for preservation, there are 2 options: freezing or deep freezing. What is the difference between these two techniques?

**FREEZING**

Freezing is a technique which involves a slow decrease (up to 24h) in temperature. The water contained in products is transformed into large ice crystals. This technique is used by private individuals who keep their food stored in the freezer.

**Disadvantages:**

- The edges of the crystals can end up perforating the food cell wall. Parts of the water and the most volatile aromas can evaporate. Disorganization of structural tissues can lead to enzymatic and non-enzymatic reactions which alter texture and flavours of the food products. Also they tend to dry out.

**DEEP-FREEZING**

Deep-freezing is an industrial technique which involves cooling rapidly and brutally (a few minutes to an hour) food by exposing them intensely to temperatures from -30 °C to -50 °C, until the product core temperature reaches -18 °C. With this process, the water contained in the cells is finely crystallized. The killing of cells and the proliferation of microorganisms are limited. The cells become dormant as result of the low-temperature. Thus the products treated retain their freshness, textures and flavours keeping their essential nutrients and vitamins.

To ensure optimum efficiency, deep-freezing equipment must be adapted according to the frozen food. **It is therefore necessary to observe the freezing capacity given on the data sheet** of the deep freezing unit (deep-freezer, blast chiller for trays or trolleys, deep-freezing tunnel).

Hengel offers deep freezing equipment for food industry professionals and other sectors such as medical on request. Once the deep-freezing cycle is performed, products are transferred to a negative cold room or freezing storage system for storage.
DIFFERENCE BETWEEN FREEZING AND DEEP-FREEZING

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Deep freezing, can cause serious food poisoning if the process is not performed correctly, it is therefore necessary to take numerous precautions to avoid this and to preserve the original quality of the products.

SAFETY PRECAUTIONS FOR DEEP-FREEZING

TEMPERATURE
Food should always be cooled to 4 °C before being frozen to avoid increasing the temperature of the chamber and cause electric consumption. Once frozen, the products must be stored at a negative temperature varying from -9 to -18 °C depending on the product. Remember to check the temperature and maintain your storage equipment.

HYGIENE
It is better to deep freeze a fresh product rather than a product that has already started to spoil in order to preserve its qualities.

Basic hygiene rules still need to be adhered to even though we are working with low temperatures for although there are fewer micro-organism or they become dormant some can survive at low temperatures. It is therefore essential to:

• Wash hands throughly and all food handling tools
• Wash the products
• Clean and disinfect the deep-freezer / storage system / cold room
• Use sealed freezer bags or suitable containers to protect the food while taking care to air vacuum and carefully close lids or bags
• Never refreeze a product that has been defrosted or during defrosting. Re-freezing a product which has been defrosted causes proliferation of bacteria. If they are pathogenic, they can cause food poisoning!

STORAGE TIME
The shelf life of frozen foods varies from 1 to 24 months according to different food products. It is therefore essential to label them so as not to exceed the recommended expiry date. Here are the best use before dates for the following food groups*:

• Fruits and vegetables: 24 months
• Pre-cooked potato products: 24 months
• Meat and poultry, whole or in portions: from 15 to 18 months
• Minced Meat: 12 months
• Sea food fished or farmed: 24 months
• Fatty fish: from 9 to 10 months
• Breaded Fish: 24 months
• Baked pastries, doughs and Viennese pastries: 12 months
• Raw Viennese pastries: 24 months
• Ready meals: from 18 to 24 months
• ice creams and sorbets: from 18 to 24 months
*Source toupargel.fr
**DEFROSTING**

Defrosting allows, by gradual warming, a frozen product to return to its original state. During the rise in temperature, micro-organisms will wake up and multiply. From -18 °C to -2 °C, microbial hazards are close to zero. Depending on the products, it is recommended:

- To defrost products at a temperature below 4 °C than at room temperature where bacteria multiply rapidly.
- Or cook it directly without defrosting

Warning after thawing in a refrigerator / positive storage system or cold room, food product must be consumed within a maximum of 3 days after thawing. Never refreeze or deep freeze again a product that has been defrosted or put into thawing cycle.