



Food Manufacture

Heat processing

Lesson 3

Become competent in heat processing understanding processes such as blanching, pasteurisation, sterilisation, evaporation, dehydration, smoking, frying, baking and roasting.



Evaporation

Evaporation is used to remove water from products to create a concentrated liquid product.





Evaporation of products helps to prevent microbial growth increasing shelf life and can reduce storage and transportation costs.





Evaporation can be performed to produce a concentrated liquid which is then further processed by drying, freezing or sterilisation e.g. milk and coffee.





Evaporated products can be convenient to the consumer by creating a more concentrated product e.g. fruit drinks which can be diluted so they take up less space.





An evaporator works by using a heat exchanger to transfer heat from steam to the product. The product is kept in a vacuum chamber which causes the product to boil at a low temperature and vapours produced are carried through a condenser to a vacuum system. The steam then condenses inside the heat exchanger.



There are five main types of evaporators:

- Batch type evaporator
- Natural circulation evaporator
- Rising film evaporator
- Falling film evaporator
- Forced circulation evaporator



Dehydration

Dehydration is also known as drying of a food.





Dehydration is used to increase the shelf life of a food it is one of the most ancient methods of food preservation. An example of a dehydrated food is dried spaghetti.





Dehydration is also used to reduce the volume or weight of a product, to produce a convenient powder type product or to create a new product e.g. grapes into raisins.





Dehydration involves the removal of water from a product by evaporation to produce a solid product with a low water content.





There are two main types of dehydration:



- Convective



- Conductive



Hot dry gas (air) is used to provide heat for evaporation and to remove water from the surface of the product. This is sometimes called air drying.



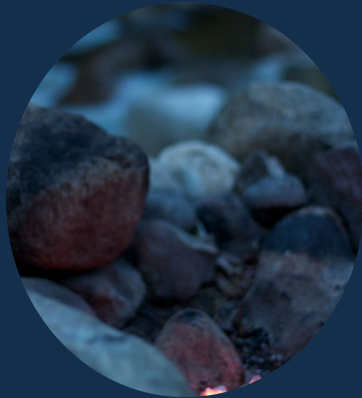


The product comes in contact with a hot surface. The water in the product is boiled away. This is sometimes called boiling drying. Other forms of this type are vacuum drying, drum drying and superheated steam drying.





Smoking



Smoking involves exposing the product to smoke from smouldering or burning material.



There are two main types of smoking, cold smoking (less than 33°C) and hot smoking (60 to 80°C). Hot smoking kills micro-organisms whereas cold smoking does not.





Smoking is used to preserve the product but also to add flavour, browning and to cook a product.





Micro-organisms and enzymes are killed by the heat and dehydration action from loss of moisture by the chemicals in the smoke.





**The most
common foods
which are hot
smoked is fish
and meat.**





Revision Activity 3

What are the different types of dehydration?