Preservation of fish and meat

Preservation is the processing of foods so that they can be stored longer. Preserved foods can be eaten long after the fresh products would normally have spoiled.

The following preservation methods are: salting, drying and smoking of fish and meat, fermenting of fish, canning of fish and meat, cooling and freezing of fish and meat.

A- Lowering the temperature

Products remain fresh in the refrigerator (2- 4 °C) for 4-7days; they can be stored much longer in the deep-freeze (-20 °C). Low temperatures must be maintained accurately and continuously and high demands are made on the freezer, energy supply and food quality. As this method requires a lot of energy and materials and a large investment.

There are **two** possibilities for storing fresh fish or meat at low temperatures:

- 1- Cooling at -1°. +4 °C, which inhibits the growth of micro-organisms.
- 2- Freezing at -18°. -30 °C, which completely stops bacteria from growing.

B- Reducing the water content

Drying is the oldest way of preserving foods. When sufficient water is removed from a product, micro-organisms can no longer grow. The amount of water to be removed varies with the product. The simplest and cheapest method is to dry the product in the open air (with or without sun). Somewhat more expensive and difficult methods make use of driers in which the products are artificially dried using heated air. Sun-dried products are of slightly less quality due to the breakdown of certain vitamins in sunlight.

C- Smoking: Lengthy smoking is also based on the principle of reducing the internal water content. Smoke particles give an added taste to the product.

There are three ways of smoking:

1- Cold smoke method2- Hot smoke method3- Smoke drying

D- Increasing the osmotic pressure

In this technique, salt is added to stop the growth of micro-organisms. Examples are the salting of meat and fish. These preserved products keep well. The nutritional value of the final product is reasonable.

Ways of salting are:

- 1- Dry salting meat
- 2- Wet salting meat
- **E-Food Additives**

Definition of Food Additives:

A <u>chemical</u> added to a particular food for a particular reason <u>during processing or</u> <u>storage</u> which could affect the <u>characteristics</u> of the food, or become part of the food.

<u>1- Ascorbic Acid:</u>

used in cereals, cured meats & fruit drinks as an antioxidant, colour

stabilizer or as a **<u>nutrient</u>**

The purpose of food additives

- 1-To improve or maintain nutritional value
- 2-To enhance quality
- 3-To reduce wastage
- 4-To enhance consumer acceptability
- 5-To make the food more readily available
- 6-To facilitate preparation of the food
- 7- Coloring agents
- 8- As preservatives & prevent fats from rancidity
- 9- To slow growth of microorganisms

2- Nitrates & Nitrites

1- Both nitrates and nitrites are thought to have antimicrobial action.

2- The action of nitrate in meat curing is considered to involve inhibition of toxin formation by *Clostridium botulinum*, an important factor in establishing safety of cure meat products.

3- Both nitrates and nitrites are used as color stabilizers especially in canned meat

3-Food colouring & flavour enhancers

- 1- Maintain nutritional quality example: Vit. A and ascorbic acid (Vit C).
- 2- Enhances stability
- 3- Keeps quality of food stable
- 4- Aid in food processing such as nitrite in canned meat and like natural antioxidants (fenugreek, rosemary and ginger).

Which method should be chosen?

The choice of a preservation method depends on the product, the desired properties of the product to be stored, and the availability of energy sources (wood, gasoline, oil, electricity, and sun), the storage facilities, possible packaging materials and the costs involved for each method.

F- Cooking meat: Cooking is intended meats exposure to high temperature, which leads to Change the color and the original construction and the occurrence of thrombosis and synthesis of protein molecules and this leads to increase hardness meat and lack of solubility.

Cooking methods: There are several ways through which they can raise the temperature of the meat and depend on pieces quality cooked:

1- Dry cooking: - It is cooking without water is a quick way and fit a piece of fresh meat such as slides back and chest (feathers). And cooking duration depends on the thickness and size of the meat. The large piece with thick and need a longer time, but you should pay attention to the lack of cooking for a long time because it leads to dryness and hardness meat, exemplified barbecue and reddening oven or oil.

2- Wet cooking: - In this way water is used a method suitable for piece least moisture and a high content of connective tissue (nerve and tendons meat) for cooking here will be a long, slow and favorite pieces in this cooking leg, shoulder and neck.

3-Cooking oven with ultrasound (microwave): - It is a fast, new and used ultrasound short in this process. They are used in the industry and have now begun to use them in simple homes.

What Happens When Meat Is Cooked?

Individual protein molecules in raw meat are wound-up in coils, which are formed and held together by bonds. When meat is heated, the bonds break and the protein molecule unwind. Heat also shrinks the muscle fibers both in diameter and in length as water is squeezed out and the protein molecules recombine, or **coagulate**. Because the natural structure of the protein changes, this process of breaking, unwinding, and coagulating is called **denaturing**.



Beef muscle fibers, before cooking



an uncoiled, or *denatured*, protein, After cooking