

Episode 9: Food preservation

Host: Our kind listeners, we welcome you from everywhere, especially from the lands of beloved Syria. We welcome Engineer Kifah Al-Azzawi, a food manufacturing specialist who graduated from the University of the Euphrates and from the Second Agricultural Engineering College in Deir Al-Zour.

We are having a dialogue with you and our guest that includes discussing the most important conservation methods used to preserve foodstuffs, both in our current time and as used by previous civilizations and getting to know them.

As it is known, after a period of harvesting, the foodstuff begins to decompose and become corrupted. As a result, these methods were found to prolong the life of the foodstuff and to provide it at times other than normal, thus meeting the food needs of humans.

We start with you the engineer of Kefah and start our dialog with the first question. What do we mean by food preservation and why do we conserve food?

Presenter: Before we begin to define what is the preservation of food, it must be noted that the foodstuff, whether from a plant or animal source, is highly corrupted. We therefore resort to preserving it. Preservation of food is a form of man's adaptation to the environment for survival. When we mention the word preservation of food, one may realize that it is a simple but truly highly professional process, conducted in scientific ways, to slow down the corruption of food for periods that vary according to the method of conservation. We resort to preservation for several other reasons, including the provision of the raw material outside its seasons. Thus, through preservation, the foodstuff is provided throughout the year or for as long as long as possible to retain its nutritional value.

Host: Is food preservation modern technology or was it known to the people in the past?

Presenter: Food preservation, as we have seen, whether of plant or animal origin, has been taking place since ancient times. Every people or civilization of ancient civilizations has had its way of preserving food. Today, however, some of the methods used by the ancients, such as the method of drying, the scientific and technological progress, and the industrial revolution, have been introduced and developed in parallel with this development.

Host: Would you like to briefly introduce the methods that were used in ancient food preservation?

Presenter: Historically, preserving food in ancient times has extended the abundance of food in one season, in the hope that it will continue to be supplied until the next harvest. Although conservation techniques and equipment are not available today, there have been many ways that are the basis for innovative methods, which can be summarized as follows:

1. drying: This is the easiest, longest, and reasonably so, because the presence of water in food makes it fertile ground for microorganisms.
2. Salting and smoking: Previous civilizations used salting and smoking techniques to dry food, especially during trade of foodstuffs over long distances.
3. Cooling: Refrigeration is known to slow the proliferation of microorganisms in food. Some former civilizations have put their food in cold caves or under cold water to maintain it.

4. Freeze: If refrigeration slows down food damage, freezing increases it to a higher level. So freezing was a clear conservation method in cultures that lived in harsh winter zones, but the potential for freezing as an ideal conservation method did not materialize until the late nineteenth century.
5. sugar (jam or jelly): Ancient cultures used sugar as a preservative, during which time food was commonly stored inside clay honey jars.
6. Pickling and packing: It is also an old way of preserving food.
7. Fermentation: Sometimes sugars and starches in matter react with living organisms and produce alcohol. Regardless of alcohol production, fermentation has proven to be a good method of preservation.
8. burial: If we stop a little at this method we find that burying food in the sand seems unconvincing. However, the burial of food has long been considered part of the fermentation process.

Host: What are the most important conservation methods used in modern (or current) times?

Presenter: As we have said, with the technological advances and the fast-paced lifestyle we now experience, many have been forced to rely on the quality of fast food. We all know that ready-to-use, abundant foods contain preservatives and in large quantities to keep them safe between supermarket shelves and storage trucks.

1. canning: They are widely used in legumes, fish and vegetables. They store them by getting rid of oxygen without air and putting them in an acid, diabetic or saline solution, which in turn prevents the reproduction of bacteria.
2. Freeze: The method of saving a substance by freezing it in a fraser, and it is the most widespread for its ease and longevity.
3. Cooling: It has become a given in our modern life and we can say there is no house without a refrigerator.
4. Desalination/Closing: by putting the fruit in high-sugar pills to prevent the reproduction of bacteria and used to preserve the fruit through the operation of nannies.
5. Footer/Salt: As we mentioned in the desalination, salt acts as a sugar denominator in dissolving and prevents the reproduction of bacteria by attaching water and reducing its proportion.

Host: Can you tell us briefly about the mechanism of preservation (conservation technology) in the most important ways?

Presenter: The saving mechanism varies with the method:
drying mechanism: It's based on lowering the moisture in food, so there's not enough water left in the food to grow the bacteria that feed and decompose the food.

Host: Does it mean that once water is disposed of food is kept intact for a long time?

Presenter: yes, it should be noted that during the drying process, the drying technique is based on getting rid of the free water contained in the foodstuff, not the water associated with it. It can be said, therefore, that the moisture rate in the dried food is not zero percent. The presence of food-eating bacteria does not disappear.

- rectification mechanism: Of course, the effectiveness of reduction lies in preventing or inhibiting bacterial growth by inhibiting the air, as well as by adding salt that exceeds the salinity ratio that enables bacteria to grow easily.
- Sugar mechanism: Sugar inhibits its growth. Sugar causes salt to become a little water available for bacterial growth.
- cooling and freezing mechanism: It is one of the most modern and effective methods, and it was found with the presence of refrigerators. Their effectiveness lies in lowering the temperature of food by cooling or freezing it, thus inhibiting the growth of bacteria due to the low temperatures of the medium. It is also known that the decomposed organisms need a temperate and warm atmosphere to grow.

Host: Does storage time for frozen and cold materials vary by temperature?

Presenter: the preservation period is certainly proportional to the decrease in temperature. The less heat the longer the preservation period, for example, we notice that chickens or any foodstuff outside the refrigerator or refrigerator is spoiled in about two days, while the period may be two weeks or longer when cooled in the refrigerator. This also depends on the temperature of the refrigerator. If the chickens are frozen for two or more years, the lower the refrigerator will be able to restock the bacteria, in which case the chickens will not spoil and will not decompose rapidly.

- canning mechanism: This method is also one of the more modern methods, as mentioned above. Its mechanism is based on several things, including preventing the air from bacteria so that they do not grow through the sealing of canned animals. It also relies on increasing the salt as well, which in turn discourages the growth of bacteria. In addition, preservatives are also considered a disincentive for the growth of decomposed organisms (we notice in canned sodium, the high amount of sodium), and therefore the consumption period lasts for years, depending on the type of food.

Host: Are there advantages to some conservation methods for foodstuffs or is there a positive additional benefit to some conservation methods for human health?

Presenter: Yes, there are ways to add extra benefits such as a pickling process which increases the number of useful microorganisms which are abundant in pickles. Another useful method is fermentation, such as soybean fermentation, which boosts vitamin K as well as increasing the percentage of useful organisms. Fermentation breaks down difficult elements, making them easier to digest and less constipating.

Host: On the other hand, is the preservation of food harmful to human health, and does conservation lead to changes in nutritional value ?

Presenter: For example, in the use of preservatives, such substances have a disadvantage. They reduce the health benefit of preserved foodstuffs by up to 40%, especially when preserving vegetables and fruits. Preservatives increase the rate of density of the substance, which makes humans, when eating a lot of them, more likely to be obese than those consuming fresh materials. There is also damage to other methods, such as pickling. Pickled substances are harmful to heart patients, especially blood pressure patients. They can trap

liquids because of salt, which is harmful to the kidney when taking the pickle, for example, compared to consumption of the fresh cucumber, which does not have these effects.

Host: In your opinion, what is the best way to preserve food for Syrian families in Syria, especially in light of the current circumstances?

Presenter: Of course, compared to the situation in Syria before, Syria reached a high level of food technology, manufacturing, and conservation methods. Most factories and products had ISO certificates. However, under the current circumstances, as everyone knows, it can be said that if there are available and redundant food items, they can be preserved by drying as a method of preservation.

Host: What tips can a listener provide for proper preservation of foodstuffs?

Presenter: There are a lot of recommendations that we can follow or avoid in order to arrive at a product that is reasonably healthy:

1. It is desirable for humans to consume foodstuffs, especially fresh fruit and vegetables, during their season. Conservation techniques make them lose some of their nutritional value.
2. To keep as far away as possible from foodstuffs preserved in a manner in which preservatives and colorful substances have been added because of the harm they have on human health.
3. When making pickles, we rely on the preservation of salt and dispense with preservatives.
4. In the end it can be said that the best way in terms of the longest storage period is to freeze, followed by drying, nannies, but in terms of maintaining nutritional value, and that's the concern: drying is at the top of that.

In the end, we thank our dear listeners, hoping to meet them in another episode.