THE ECONOMIC ASPECTS OF FOOD PRESERVATION

Ali Boukhalfa université de Batna

ملخص

يدور هذا المقال حول الأغذية والطرق المستعملة لحفظها. ونهدف من خلاله إلى تزويد القارئ بمعلومات حول مختلف الطرق التي تستعمل لحفظ الطعام لفترة من الزمن حتى يبقى صالحا للاستهلاك، بدءا بالطرق التقليدية التي كانت سائدة قديما كالتجفيف والتمليح، مرورا بالطرق الأخرى المتمثلة في التتبيل والتعقيم وصولا إلى الطريقة المستعملة حديثا وهي الحفظ بالتبريد (التجميد).

كلنا نعرف أن الأطعمة إن لم تحفظ تفقد نكهتها وذوقها وتصبح غير صالحة للاستهلاك بل قد تكون سامة ولا شك أننا لاحظنا كيف تتغير الفواكه مثلا خلال فترة زمنية وكيف أن السمك يبدأ في كسب رائحة كريهة.....الخ. كل هذه العوامل هي الدليل على فساد الطعام الذي يمكننا تجنبه عن طريق الحفظ. وهو ما سنحاول التعرض إليه من خلال هذا المقال.

Abstract

This article is about food preservation methods. It aims at providing information for readers on different methods used in preserving food, starting from the ancient traditional method used in the past in the form of drying and salting, and then other methods in the form of pickling and sterilizing to the most modern method in the form of freezing.

Keywords: Food Preservation, Drying, Salting, Pickling, Sterilizing, Freezing,
Food poisoning bacteria, Enzymes, Microorganisms.

1- INTRODUCTION

Foods are very perishable commodities, some highly than others, however good they are in their original state, eventually they will deteriorate and go bad unless something is done to preserve them and make them keep.

Some foods such as wheat, rice and corn can be kept in good conditions for a considerable period of time without deteriorating, because they are seeds and seeds are made to last from one season to the next; potatoes, onions and some root crops can also be stored for a long time, so that we can have them available out of their growing season. However, many foods start to deteriorate and decay very rapidly after harvesting. Everyone knows how quickly soft fruit goes squashy, milk goes sour and fish starts to smell and so on. Beside this, the fluctuation of food supplies according to season made it difficult to have all foods available all year round. In temperate countries such as Britain, there is only one growing season and several months separate one autumn harvest from the next. The weather also plays an important part, as sometimes draught or floods ruin a whole crop and such losses will obviously lead to food shortage.

Thus, it appears from the foregoing that preserving foods so that we can have them available whenever required become essential, as without some means of preservation, we would be deprived of some or all of the foods for large part of the year.

2- FOOD DETERIORATION

Generally, all foods keep their fresh qualities for certain period of time, some longer than others, depending on their perish ability, but eventually they all decay and deteriorate if not preserved to be stored for future use. Therefore, and for along time storage, foods must be given some preservation treatment to prevent this decay and deterioration from happening.

The deterioration of food is caused by the activity of tiny living cells which exist in all foods called food poisoning bacteria, food enzymes and microorganisms.

2.1- FOOD POISONING BACTERIA

They are minute livings organisms, live on dead food, as they grow in number they turn good food into bad.

2.2- FOOD ENZYMES

They are chemical substances which occur in all living materials and bring about changes in the food; they affect specifically the taste and the flavour of the food over a period of time, but in no way render the food inedible as they have no harmful results.

2.3- MICROORGANISMS

They are microscopic living cells; show themselves in the form of yeasts and moulds, they have some harmful affects on food as they may cause spoilage and decay.

The activity of these bacteria, enzymes and microorganisms is strictly related to temperature; some can be destroyed by heat and some by cold. Food poisoning bacteria are very active at room temperature, but in refrigerator temperature they grow very slowly and they are dormant below, so they cannot affect the food stored in refrigerator in any way.

Food enzymes can be destroyed by heat and microorganisms can be controlled by very low temperature -9°c and below.

Because of the effects of bacteria, enzymes and microorganisms on food and hence on our health we become to bother about preserving our food to make it keep for a long time without deteriorating by controlling the activity of these bacteria, enzymes and microorganisms.

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1 – Gary, S. Tucker, Food *Biodeterioration and Preservation*, Blackwell Publishing, Iowa, 2008, pp . 12 - 15

3- METHODS OF PRESERVING FOOD

Food if not preserved cannot be stored for a certain period of time, as it deteriorates and goes bad quickly. From our experience we know that food can be preserved better if kept in cool surroundings,

clean and well covered; food kept in refrigerator, for example, keeps longer than if left in the kitchen.
Preserving food can be done by various methods, from the ancient traditional practices of drying and salting to more modern techniques known today in the form of sterilizing and freezing. The principles of all preservation methods are based on factors which cause food to decay and deteriorate i.e. (the activity of bacteria, enzymes and microorganisms) and the preserved food must be safe and have good quality, be attractive to eat and nutritious.

3.1- DRYING[1]

In drying food thoroughly it will last in good condition for a long time, since bacteria, enzymes and microorganisms require water and if deprived if it, they will become inactive and dormant. Many vegetables today can be shredded and dried for preservation, and dried fruits such as raisin, prunes and apricots are available in shops.

3.2- PICKLING, SALTING, ADDING SUGAR[2]

Bacteria, enzymes and microorganisms can be controlled by putting food in a solution that they are not familial with. Pickled foods are in vinegar, and syrups can make life intolerable for bacteria and hence sugar is used in jams, marmalades and crystallized fruits.

3.3- STERILIZING[3]

Foods are sterilized to kill bacteria and kept in sterile conditions. The usual form of sterilizing is heat. The food is sterilized in a container until all the bacteria are dead and inactive, then the container is sealed and because no more bacteria can enter, the food is safe from further decay.

It must be noted, however, that all these means of preservation have the advantages of keeping food safe and available, but have one

particular drawback, in that the flavour of the food can be altered, this can be so dramatic as the preserved food is hardly the same in flavour or texture as when it was fresh.

3.4- FREEZING[4]

Preserving food in cold conditions emerged as an alternative, since it is well

established that most bacteria, enzymes and microorganisms become less active

as the temperature drops and that the food preserved in low temperature will

safeguard its quality and flavour better.

Food poisoning bacteria become completely inactive below 4°c, the temperature at

which the home refrigerator is designed to run, yet this temperature is considered

to be insufficient to control the microorganisms as they are still active even below

the freezing point of water 0°c. in fact they are active at temperature down to -7°c.

Therefore, preserving food at much lower temperature become obvious, this is what

we know today in the form of a freezing method.

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1. Carole, Jeri, "Dry it you Will like it : Food Preservation and Dried Food", *Country side & Small Stock Journal,* 1 July 2008.
2. Ahsan Sohail, "The many Ways of Food Preservation & Processing", *Economic Review*, August 1999 pp. 10 – 11
3. Ibid pp 14 – 15
4. Karin, Welzel, "Freezing is Easiest Preservation Method", *Pittsburgh Tribune Review*, January 2008 pp 21 – 24

Freezing is a method of holding food in a state of suspended animation, once food is introduced into a very low temperature, tiny ice crystals form within its structure and almost all bacterial growth and enzymes activity are arrested until the food is removed from the freezer

At -9°c the food is ensured to be safe by the inactivity of microorganisms[1], but the quality of the food can be affected by the action of food enzymes which are not completely controlled by the above mentioned temperature. However, by dropping the temperature down to -15°c, their action is greatly decreased and at temperature of -18°c it becomes negligible. Although the enzymes changes are not poisoning and they only cause unattractive deterioration and quality loss, it is advisable that where enzymes activity is strong, the food should be treated before freezing, as for instance , in blanching[2] of vegetables by plunging them into boiling water for a short time and cool in icy water before freezing; the process of blanching must be carefully timed to destroy the enzymes without softening the vegetables in order to maintain their quality.

4- CONCLUSION

It appears from the foregoing that the food we eat can not be stored for a long time if not preserved properly, and although there are many ways in preserving food we should always choose the method that preserves the quality and the nutritious value of the food.
We have seen that the principles of all preservation methods are based on factors which cause food spoilage, and we have also seen that the

activity of food poisoning bacteria, food enzymes and microorganisms is strictly related to temperature, as some can be destroyed by heat and some can be controlled by cold. Drying, pickling and sterilizing serve a very useful purpose in preserving food but the characteristics of the food alter during preparation and storage producing a food quite different in flavour or texture from when it is fresh; in freezing the same product will come out of the freezer as it went in, no part of it is destroyed and thus on thawing it is treated as a fresh product.

1. Ibid, p 19
2. Ibid, p 33

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