

LESSON 1 INTRODUCTION

For many thousands of years humans have been preserving meat by different techniques. Traditionally, drying meat played a role in survival of the human race. Dried meat was non-perishable and lightweight which was ideal for being packed and carried for the long journeys we know of in hunting societies. This is only one example. In Europe it is known that Romans lived on a pork-rich diet which was mostly salted or smoked as a preservation strategy. Indian cultures preferred a method of curing which involved potassium or sodium nitrate.



There are many ways of preserving meat or fish; but whatever method used; remember that the produce will be vulnerable to contamination prior to being preserved. There is no point preserving any food product after it is contaminated, if you are preserving the contaminant too. As a general rule, keep it cold and clean; and do the preservation promptly to minimize any chance of microorganisms developing.

Today, preserving meat is carried out either as a culinary tradition or still as a survival strategy. Some remote populations or those which exist in mountainous or drought-

stricken regions are very accustomed to preserving meats. These days we also see a rise in the popularity of meats which have undergone home preservation techniques.

METHODS

Meat will spoil as microbial activity begins decomposing the tissue. Some microbes can be dangerous to human health, while others are simply going to destroy the meat. All microbes need a certain level of water in the meat to function, therefore the chief way of preserving meat is to reduce the level of water to a point where microbial activity is inconsequential.

Meat can be preserved lots of different ways:

- **Curing** - adding salt, sugar, nitrite and/or nitrate
- **Drying** - can be done rapidly in low heat ovens, or slow dried
- **Smoking** - gives the meat its characteristic smoky flavour.
- **Freezing** - can be done with raw or cooked meat or fish
- **Canning or bottling** - canned ham, canned fish
- **Vacuum Sealing** - used with both fresh and preserved meat and fish
- Combinations of the above.



If refrigeration is not readily available, pack fish in ice as you clean and fillet it.

Suggested Tasks: ▼

Throughout this course you will be provided with suggested tasks and reading to aid with your understanding. These will appear in the right hand column. Remember: these tasks are optional. The more you complete, the more you will learn, but in order to complete the course in 20 hours you will need to manage your time well. We suggest you spend about 10 minutes on each task you attempt, and no more than 20 minutes.

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Suggested Tasks

Think of three different meats (e.g. pork, lamb, fish).

Write down the percentage for each meat that you think is preserved globally through each of the preservation methods listed here (curing, drying, smoking, etc.).

Now go online and search to find out if your guesses were accurate. Search using phrases such as “global percentages of meat cured annually”, “worldwide percentages of dried meat production” or “table of world meat preservation statistics”.

HEALTH RISKS

There are various short and long term risks that can be associated with preserved foods. These may fall into the following broad categories:

- **Microorganism Contamination:** Bacteria or other microorganisms may contaminate the food before or during processing; and may grow on the food after processing. Botulism is a relatively common example; but there are many other microorganisms that can also become problematic. Cleanliness is of utmost importance during any handling of foods.
- **Farm or Environmental Chemical Contamination:** Meat from farm animals can become contaminated by chemicals an animal comes into contact with whilst it is alive and growing, or after it has been killed. Examples include pollutants in water, soil or air, or pesticides, pharmaceuticals, hormones etc, used in the farming of animals.
- **Packaging Contamination:** Some people don't tolerate some or most preservatives very well, whether they are preservatives to preserve the food or those used in the actual packaging. Chemicals in packaging (e.g. BPA in plastics) can eventually make their way into food from the packaging.

Plastic containers, bags and wrappings can vary in their chemical composition. It is widely acknowledged that plastics which contain BPA are not good for long term storage of preserved foods. It is also understood that defrosting



Cured meats that contain preservatives may resist contamination by microorganisms for longer than untreated meats; but are still vulnerable to contamination, particularly once sliced. Avoid leaving sliced ham or sausage at air temperature for any length of time.

or heating foods in any type of plastic container is unwise, as it is likely to release unwelcome chemicals into the food at a vastly accelerated rate. Food is far better to be removed from the plastic and defrosted or heated in a glass container.

- **Contraction of Botulism:** Botulism is an illness contracted from the bacterium - *Clostridium botulinum*. If botulism spores germinate, the meat can easily become quickly contaminated. Sodium nitrate is often mixed with curing salts to combat the risk of botulism. Salt suppliers often dye salt pink when they add sodium nitrate; this enables chefs and cooks to differentiate salt containing sodium nitrate, from salt that does not. Some people have sensitivity to nitrates though and in large quantities, sodium nitrate can be toxic. It is important to note that botulism can be deadly. It tends to grow in acid, anaerobic (without oxygen) conditions. Nitrates negate the risk of botulism. Wine or vinegar added to the meat mix will reduce the risk of botulism too. Botulism does not produce food that smells or tastes 'off' it is usually encouraged during the preparation phase – that is why strict hygiene and cool conditions for the meat is so important.

It is also worth remembering the human body produces sodium nitrates naturally and our saliva has large quantities in it, as do many vegetables. Some 'natural' curing salts that contain nitrates derived from plants, have similar concentrations of nitrates as commercial curing salts.

Once the meat is cured, if it starts to smell off, then it isn't botulism but invasion of other spoilage bacteria. Always discard any salami that smells, or appears green.

- **Chemical sensitivities/allergies are another risk:** Chemical additives such as preservatives and colourings can also become problematic for some people more than others.

Individuals can vary in their genetic make-up and physical condition and those variations can result in some people being able to cope with contaminants in food more than others. This "tolerance" is not straight forward though. One individual may be able to cope well with some chemical contaminants and not others; while another person may not tolerate what the first coped with, but be unaffected by things which the first did not cope with.

Note: Pregnant women should avoid cured meats as should those with a lowered immune system due to illness.

Plastic Packaging

Plastic packaging - plastics are widely used as they are very versatile and available in many different shapes and sizes, plastics are also easy to print upon (e.g. with 'use by' dates), lightweight and resistant to chemicals such as acids. They can also be reused and stored over again. The main disadvantage is that plastics are not biodegradable.

Modified atmosphere packaging is plastic packaging where the air inside

ADDITIONAL READING >>>

Try to find out more about the hazards of BPA in food packaging.

Consult any relevant literature you may have or look online for articles and resources concerning the effects of BPA on human health.