FAQs

1: Write notes on what is curing?

Curing is any of various food preservation and flavoring processes of foods such as meat, fish and vegetables, by the addition of a combination of salt, nitrates, nitrite or sugar. Many curing processes also involve smoking, the process of flavoring, or cooking. The use of food dehydration was the earliest form of food curing. Salting or curing draws moisture from the meat through a process of osmosis. Meat is cured with salt or sugar, or a combination of the two. Nitrates and nitrites are also often used to cure meat and contribute the characteristic pink color, as well as inhibition of *Clostridium botulinum*. It was a main way of preservation in the medieval time/ and around the 1700s.

2: Write notes on Botulinum toxin?

Botulinum toxin, one of the most poisonous biological substances known, is a neurotoxin produced by the bacterium *Clostridium botulinum*. *C. botulinum* elaborates eight antigenically distinguishable exotoxins (A, B, C1, C2, D, E, F and G). Botulinum toxin, also called "miracle poison," is one of the most poisonous biological substances known. It is a neurotoxin produced by the bacterium *Clostridium botulinum*, an anaerobic, gram-positive, spore-forming rod commonly found on plants, in soil, water and the intestinal tracts of animals. The botulinum toxin neurotoxin complex is also associated with various other nontoxic proteins, which may also have hemagglutinating properties .

3: How sodium inhibiting microbial growth.?

The primary way sodium acts as a food preservative is by inhibiting microbial growth. Many foods contain enough water to encourage growth of microorganisms (such as yeast, bacteria, or mold), especially at room temperature. When microorganisms overgrow in foods (spoilage), both flavor and nutrition are compromised and the food may actually become dangerous to eat. Foods with high water content, such as fresh meat and fish, some cheeses, and sauces made with vegetables or fruits, are susceptible to spoilage by the microorganisms, which can grow rapidly in an abundance of water. Salt, an added ingredient in these and other foods draws water out of the cells of both the food and the microorganism in a process known as osmosis. Microorganisms that do not have enough access to water will not grow and reproduce as fast as those with ample access to water. In this manner, added salt helps to prevent spoilage of the food. In addition to salt, sodium nitrate and sodium nitrite are often used to prevent spoilage by bacterial growth in meat and fish.

4: What is Listeriosis,how to control in meat and fish?

Listeriosis is a bacterial infection most commonly caused by **Listeria** monocytogenes, although L. ivanovii and L. grayi have been reported in certain cases. Other compounds such as sodium lactate, sodium diacetate or sodium benzoate are added to deli-style meat, hotdogs, and poultry products to inhibit microbial growth of *L. monocytogenes*, a type of bacteria that can cause the food borne illness listeriosis. - Listeria is the name of a bacteria found in soil and water and some animals, including poultry and cattle. It can be present in raw milk .

5: What is theimportance of Dry curing?

The dry cure method is characterized by fast action and it can be used under wider temperature variations than other curing methods. There is a greater loss of meat weight due to the loss of water, product will have more pronounced flavor, will be saltier and will be better preserved. Suitable for meats that will not be cooked but smoked and air- dryed or just air-dryed. It is the best curing method for people living in hot climate or having no refrigeration.

6: How, Preservation of foods by using Sugar,explain?

Sugar is an organic compound in the form of carbohydrate. Carbohydrates are composed of molecules of carbon, hydrogen and oxygen. There are different types of sugar- simple sugars (known as monosaccharides)which includes glucose (dextrose), fructose (fruit sugar) and galactose, and disaccharides which includes sucrose (table/granulated sugar). Sugar has a very long history in food preservation- it has been used extensively in the preservation of fruits such as apples and pears and in the production of a wide range of products such as jams and jellies, fruit juice and sweetened products such as condensed milk.

7: Write notes on Different ways of using sugar to preserve foods?

- Desiccate fruits by drying them and then packing them with pure sugar. Fruits which are traditionally preserved through this method include ginger, cherries and the peel of citrus fruits. Alternatively foods may be stored in a sugar syrup or cooked in sugar until they crystalise.

- To produce jams and marmalade; fruits are initially boiled to reduce the water content of fruit and to reduce contaminating microorganisms. Sugar is then added to the fruit to prevent the regrowth of bacteria.

- Other food preservation techniques involve combining sugar with alcohol to enable the preservation of fruit in alcoholic spirits such as Brandy.

- Sugar is also used with salt to preserve certain foods especially fish and meat. Sugar may either be added to salt to create a dry mixture which covers food or may be dissolved in a liquid to make a brine to surround the food. Adding sugar to a salty brine helps to confer a sweetness to meat and fish and also helps to reduce the harsh flavour of salt.

8: Why sugar is added to the meat?

The sugar added to meat for the purpose of curing it comes in many forms, including honey, corn syrup solids, and maple syrup. However, with the exception of bacon, it does not contribute much to the flavor, but it does alleviate the harsh flavor of the salt. Sugar also contributes to the growth of beneficial bacteria like *Lactobacillus* by feeding them.

9: Mention what is Curing of meat and Fish?

Curing is the addition to meats of some combination of salt, sugar, nitrite and/or nitrate for the purposes of preservation, flavor and color. Some publications distinguish the use of salt alone as salting, corning or salt curingand reserve the word curing for the

use of salt with nitrates/nitrites. The cure ingredients can be rubbed on to the food surface, mixed into foods dry (dry curing), or dissolved in water (brine, wet, or pickle curing). In the latter processes, the food is submerged in the brine until completely covered. With large cuts of meat, brine may also be injected into the muscle. The term pickle in curing has been used to mean any brine solution or a brine cure solution that has sugar added.

10 : What is Salting ,why it is used in food preservation?

Salt inhibits microbial growth by plasmolysis. In other words, water is drawn out of the microbial cell by osmosis due to the higher concentration of salt outside the cell. A cell loses water until it reaches a state first where it cannot grow and cannot survive any longer. The concentration of salt outside of a microorganism needed to inhibit growth by plasmolysis depends on the genus and species of the microorganism. The growth of some bacteria is inhibited by salt concentrations as low as 3%, e.g.,*Salmonella*, whereas other types are able to survive in much higher salt concentrations, e.g., up to 20% salt for *Staphylococcus* or up to 12% salt for *Listeria monocytogenes* (Table 5.3.). Fortunately the growth of many undesirable organisms normally found in cured meat and poultry products is inhibited at relatively low concentrations of salt (USDA FSIS 1997a).

11: What is sodium nitrite?

Sodium nitrite is a salt and an anti-oxidant that is used to cure meats like ham, bacon and hot dogs. Sodium nitrite serves a vital public health function: it blocks the growth of botulism-causing bacteria and prevents spoilage. Sodium nitrite also gives cured

meats their characteristic color and flavor. Also, USDA-sponsored research indicates that sodium nitrite can help prevent the growth of *Listeria monocytogenes*, an environmental bacterium that can cause illness in some at-risk populations.

12: Can cured meats be produced without sodium nitrite?

Cured meats by their definition must include sodium nitrite. Sodium nitrite is the ingredient that gives a product like ham its color and taste. Without sodium nitrite, these products' shelf life would be shortened substantially.

Some uncured products available today use vegetable-based ingredients like celery juice, which may contain nitrate naturally, to deliver a color and flavor similar to traditionally cured meats. When the sodium nitrate in celery, or other sodium nitrate-containing vegetables, is exposed to certain types of bacteria in the product, the nitrate is converted to sodium nitrite, which results in product characteristics similar to traditionally cured meat products. The amount of sodium nitrite consumed from these types of products versus traditionally cured meat products is virtually the same.

13: **What role does Sodium Nitrite have in meat processing?**

Cured meats cannot be produced without sodium nitrite. It gives cured meats their characteristic color and flavor; a product like ham gets its color and taste from nitrite. Without nitrite, product shelf life would also be shortened substantially.

Decades ago, sodium nitrate - a "cousin" of nitrite - was also used as a curing ingredient. Sodium nitrate is rarely used to cure meat today, however.

14: What is the main source of Sodium Nitirte?

Nearly 93 percent of daily nitrite intake comes from vegetables and saliva; less than five prevent comes from cured meats. Vegetables, most notable spinach, lettuce and root vegetables contain nitrate, which is converted to nitrite when it comes into contact with saliva in the mouth. In fact, the amount of nitrate in some vegetables can be very high. The nitrate to nitrite conversion process from eating vegetables makes up 85 percent of the average human dietary nitrite intake.

Another source of nitrite in the body, called the "Molecule of the Year" by Science Magazine in 1992, is nitric oxide. The body nitric oxide uses it to control blood pressure, kill tumor cells and heal wounds. When nitrite oxide is done with its work, its

byproduct is nitrite. So clearly, nitrite is something that is made by the body are part of its normal, healthy processes.

15: Write notes on Nitrate/ Nitrite Curing used to control Microorganisms?

Most salt cures do not contain sufficient levels of salt to preserve meats at room temperature and*Clostridium botulinum* spores can survive. In the early 1800's it was realized that saltpeter ($NaNO_3$ or KNO_3) present in some impure curing salt mixtures would result in pink colored meat rather than the typical gray color attained with a plain salt cure. This nitrate/nitrite in the curing process was found to inhibit growth of *Clostridium*. Recent evidence indicates that they may also inhibit *E. coli*, *Salmonella*, and *Campylobacter* if in sufficient quantities (Condon 1999, Doyle 1999).

16: What is canning?

Canning is a method of preserving food in which the food contents are processed and sealed in an airtight container. **Canning** provides a shelf life typically ranging from one to five years, although under specific circumstances it can be much longer. Out of all the methods of preservation canning is the one that is still used most often. The method started when Nicholas Appert, a French Candy maker won a prize when he made a sealed, glass container. He realized that once food was away from air you could keep it from spoiling. Appert's process of heating pre-cooked food in a container and sealing it tightly killed all the bacteria in the food and kept out air. Food treated this way will keep for years and will be ready to eat when opened. There are only two universally accepted, methods for home canning: boiling-water bath, and pressure canning. In both of these a canning jar and airtight seal are needed. During processing the food and jars reach 212' F to 240' F.