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EC9942 Canning Question Box

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CANNING QUESTION BOX

- Q. What causes canned food to spoil?
- A. Either the growth of microorganisms known as molds, yeasts, and bacteria, or chemical reactions between acids in the food and the metals of which the container is made, or enzymes.
- Q. What are the signs of bacterial spoilage of non-acid vegetables and meats most readily observed?
- A. Cloudiness, mushiness, putrid and disagreeable odors, and gases.
- Q. Under what conditions do molds grow?
- A. Molds need a warm, dark place in the presence of air, sugar, acid and moisture, therefore, they prefer jellies, preserves, and fruit juices. Molds from the air may contaminate food as it is being transferred to jars, or may be in the jars if they have not been properly sterilized. They are killed by heating in a water bath, or boiling for a sufficient time.
- Q. Is it safe to use food upon which molds are growing?
- A. Molds may be removed and the food eaten. A heavy growth sometimes affects the flavor and texture enough to make it undesirable.
- Q. What causes canned fruits to ferment?
- A. Fermenting of canned fruits is caused by yeasts which use the sugar and produce carbon dioxide. The product should be discarded as it has a sour taste, a cheesy odor, and diminished food value. This kind of spoilage may be prevented by heating in a hot water bath long enough to kill the yeasts, and then sealing.
- Q. What are the most common mistakes which lead to spoilage of canned products?
- A. Spoilage of canned products is most frequently due to one or more of the following mistakes:
- (1) Use of incompletely sterilized jars in open kettle canning. Touching inside of jar or lid, or wiping edge with cloth after sterilization.
 - (2) Too short a processing period.
 - (3) Too low a pressure in the pressure cooker to obtain high enough temperature to kill microorganisms.
 - (4) Packing such foods as corn and meat too tightly.
 - (5) Imperfect seal.
 - (6) Storage at too high a temperature.
 - (7) Use of stale unsound, or overmature products.
 - (8) Canning too much material at one time or too long delay between steps in canning.
 - (9) Improper storage.
 - (10) Failure to cool jars promptly after processing.
- Q. What causes "flat sour" in peas, asparagus, corn, lima beans, and green beans?
- A. Flat sour is caused by thermophilic or heat-loving bacteria which require a higher temperature to kill than other bacteria. This type of spoilage may be reduced to a minimum by packing the foods into jars promptly after cleaning and blanching, filling while hot, processing promptly, and then cooling immediately. Store in a cool place.
- Q. When non-acid vegetables and meat contain dangerous toxins, are there always visible signs of spoilage?
- A. Usually, but not always.

- Q. What may be done so that canned meats and non-acid vegetables may be used with confidence in their safety?
- A. They may be brought to a boil and boiled actively in an uncovered vessel for five minutes before they are tasted. This will destroy any toxin present.
- Q. What causes canned food to become brown or black?
- A. Canned food may become brown or black due to one or more of the following reasons:
- (1) Food standing too long in air before packing
 - (2) Presence of air and lack of liquid in can
 - (3) Overcooking in pre-cooking period or over-processing
 - (4) Slow cooking
 - (5) Fruit may darken in top of jar because of enzyme action due to under-processing. Discard the discolored portions, and boil the remainder five minutes, after which it may be used.
 - (6) Corn turns dark when canned in tin because of a chemical action between substances in the corn and the tin containers. Can corn in glass or in tin with C-enamel lining.
- Q. Why must foods be processed in the oven longer than in a hot water bath?
- A. Because air is not so good a conductor of heat as water.
- Q. How may fading of fruits and vegetables be prevented?
- A. By observing the following precautions:
- (1) Storing in a cool, dark place
 - (2) Using thoroughly ripe fruit, and syrup, not water
 - (3) Avoid overcooking
 - (4) Using glass or R (sanitary enamel) lined cans for red foods
 - (5) Using soft, not hard water
- Q. How may one keep from destroying the attractive bright green color of greens during the processing?
- A. The Bureau of Home Economics has found that if greens are precooked in an open kettle just below the simmering temperature (170° F.) that the color is "set" so it will not fade or change as much as it does when the precooking is done at the boiling point. This holds true for spinach, kale, collards, and mustard greens, as well as for green peas and beans. The precooking period will have to be lengthened and it will be necessary to pack the vegetables quite hot.
- Q. What causes lack of liquid in canned fruits and vegetables?
- A. It may be due to one or more of the following conditions:
- (1) Having jars too full, so liquid boils out during processing. (If liquid does boil out, do not open jar to replace it. The fact that a jar is not filled will not affect its keeping qualities.)
 - (2) Too high a temperature or too rapid boiling
 - (3) Allowing pressure in pressure cooker to fluctuate or sudden lowering of temperature at end of processing period. Petcock should not be opened and cover removed until indicator on pressure gauge goes back to zero.
 - (4) Not precooking long enough.
 - (5) Too loose a pack
 - (6) Air bubbles not released before processing
 - (7) Unsealed containers not kept covered with boiling water in the boiling water bath, and containers tipping over in the processing vessel.
- Q. What effect does over-processing have upon fruits, vegetables, and meats?
- A. Over-processing causes shrinkage, loss of color, and destruction of the natural flavor and texture.

- Q. What causes cloudiness of the liquid in canned food?
- A. Cloudiness may be caused by:
- (1) Product crushed, bruised, over-ripe, or over-cooked
 - (2) Spoilage by flat sour
 - (3) Use of hard water for canning
- Q. What causes fruit to rise to the top of the jar?
- A. Fruit may rise to top of jar because of:
- (1) Too heavy a syrup used
 - (2) Over-cooking of fruit causing shrinkage
 - (3) Lack of special treatment of light fruit such as strawberries
- Q. Can glass lids be purchased to replace ones which are broken?
- A. Yes, they may usually be obtained wherever cans are purchased.
- Q. What are the principal causes for spoilage of tomatoes?
- A. Spoilage of tomatoes is most frequently due to:
- (1) Use of over-ripe tomatoes
 - (2) Incomplete sterilization of jars
 - (3) Touching inside of jar with fingers or cloth
 - (4) Too short processing period
 - (5) Imperfect seal
 - (6) Canning too many at one time so that there is too long a time between steps in the canning process.
 - (7) Storage in too light or too warm a place.
- Q. What causes sugar crystals to form in jelly?
- A. Too high a percentage of sugar or under-cooking, as with added pectin. In grape jelly, crystals of cream of tartar may occur. These may be prevented either by using part plum or apple juice for grape jelly, or by canning the grape juice until the crystals have separated and then using the liquid for jelly making.
- Q. Should jars be inverted to test for leaks?
- A. Yes. Vacuum-type seal jars should not be turned upside down, however, until they are thoroughly cold.
- Q. To what may an imperfect seal be due?
- A. An imperfect seal may be due to any of the following reasons:
- (1) Jars and lids not tested for leaks before using
 - (2) Use of poor rubbers
 - (3) Particles of grease or food on the sealing surfaces
 - (4) Failure to adjust wire bail correctly
 - (5) Lifting the jars by the tops or carelessly inverting jars after processing
 - (6) Tightening the jar lids after the jars have cooled
- Q. Where may steam pressure cookers be obtained?
- A. From hardware stores, or from mail order companies; consult the county home demonstration agent or county agent.
- Q. How should dried fruits and vegetables be stored?
- A. In jars or pails or covered crocks in a warm dry place. An airy attic kept warm by flues or pipes passing through it makes an ideal storage place. The jars may be stored on shelves near the pipes. During periods of constant rainfall, such foods may need to be returned to the drier once or twice to prevent loss from spoilage.
- Q. How may the bail which fits over the glass tops of jars be adjusted?
- A. If the bail is not tight, remove it from the tightening spring and bend it so that it will be more nearly straight across the top; if the bail is too tight, remove it and loosen it by curving it slightly. The wire bends easily when the thumbs are pressed against it. New wire clamps may be purchased.
- Q. Should lids with a cracked porcelain lining be used?
- A. No, they should be destroyed as it is almost impossible to wash them clean or sterilize them completely. This leads to spoilage. If cracked lids are used for acid foods the acid will attack the zinc and eventually break the seal so that the food will spoil.

- Q. What causes shriveled pickles? Soft pickles? Hollow pickles?
- A. Hollow Pickles may be due to: (1) faulty development of cucumbers; (2) letting cucumbers stand too long after gathering before brining; or (3) not keeping well covered while brining.

Soft and Slippery Pickles are usually due to not keeping them covered with brine, or keeping in brine that is too weak. Sometimes, however, this condition is due to using vinegar that is too weak, or to overcooking in vinegar.

Shriveling is often due to placing the product at once in a very strong salt, sugar, or vinegar solution. It may also be due to cooking too quickly in strong vinegar or sugar solution and not allowing the product to plump.

- Q. How can the value of canned goods be estimated, in comparison with commercial canned goods?

- A. Learn from local grocery stores the price of a No. 2, No. 2 $\frac{1}{2}$, or No. 3 can of comparable quality. To compute the value of a quart jar, multiply the cost of a No. 2 can by 1.6 or the cost of a No. 2 $\frac{1}{2}$ can by 1.14. A quart jar is approximately equal to a No. 3 can.

To compute the value of jellies divide the cost of one glass at a local store by the number of ounces as stated on the label. Multiply this value by the number of ounces held by containers used at home. A measuring cup holds eight ounces.

(The foregoing information has been taken from Circular 313, Food Preservation, published by College of Agriculture, West Virginia University, Morgantown, West Virginia.)

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