Flashes From the Frontier of Bacteriology

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Bacteriologists alternately battle and cooperate with bacteria in solving food preservation problems.

By canning, it is possible to retain food in perfect condition indefinitely, but this is only after it has been heated so that all microbes causing spoilage are killed or inactivated and then kept sealed in this condition. Once the seal is broken the least bit, the microbe enters, takes over and goes to work.

The Department of Bacteriology has long been interested in the microbiology of frozen eggs and work is now in progress under the direction of Dr. Bryce Prindle, instructor, on the bacteriological aspects of various frozen foods.

A rumor reached the department to the effect that several people were made ill presumably by eating thawed, frozen berries which had been kept in a home refrigerator for about 24 hours after thawing.

Experiments were run on packages of raspberries, youngberries and strawberries after they had been permitted to stand at room temperature for at least 24 hours. Then the food was examined for the incidence of one or more of the three general types of microbes—bacteria, yeasts and molds.

Since most bacteria do not grow readily in an acid medium like berries, little bacterial growth was found. In fact, there was no significant growth of any kind of microbe in a day's time after thawing. In many cases, however an appreciable increase in numbers of particularly yeasts and molds was noted after 36 hours standing at room temperature.

No harmful microorganisms were discovered in the course of these studies, but it was revealed that changes begin to occur in frozen foods that have been thawed and allowed to stand without refrigeration. To enjoy these foods at their best, they should be kept frozen or at least thoroughly chilled until just before they are eaten.

An attempt is constantly being made to pass on the knowledge that has been gained through such experimentation to bacteriology students so that they can go into commercial positions and help produce high quality foods.

A typical example is a class in bacteriology at Iowa State in which the bacterial methods of analysis of such foods as tomato catsup, apple butter, hamburger, oysters, frozen eggs are being studied.

The members of this class will also employ the various methods of canning to familiarize themselves with the influence of the nature of the food being packed on the time and temperature required for effective preservation. Other problems of food preservation and food deterioration such as the development of rope in bread and rot in eggs are also considered.

Not all of the work of microbes is of a destructive nature. Of equal importance are activities of organisms which bring about desirable changes in food. Examples are the production of sauerkraut from cabbage, pickles from cucumbers and vinegar from cider.

In the bacteriology laboratories is a device for the manufacture of vinegar which is a small model of that used commercially. It consists of a large glass vat filled with beech wood shavings. Cider is led through this vat where fermentation takes place due to the action of bacteria which are found in what is commonly called “mother of vinegar.”

The vinegar bacteria grow all over the surface of the shavings. Cider is allowed to drip slowly through the vat to a container below. On the way down, bacteria change it to vinegar in a few hours. Commercially, vinegar manufacture is carried on in cypress vats eight feet in diameter and twenty feet high filled with beech wood shavings.