

BIOLOGY

Floating "Cuke" Problem

The discovery that the interior of some fruits and vegetables contain microorganisms poses a problem for the biologist who had believed the interior to be sterile.

By BENITA TALL

From Rehovot, Israel

► "BLOATERS," cucumber pickles that float, are turning out to be a problem for the biologist as well as the pickle industry.

Dr. Zdenka Samish of the Agricultural Research Station believes her studies with the bloaters disprove an old biological principle that the inner tissue of fresh, normal healthy fruit is sterile. She said there is good experimental evidence that cavities inside the cucumbers are caused by gas- and acid-producing bacteria. The gas-filled hollow makes the "cukes" float.

There have been many theories proposed explaining the formation of these bloated pickles, Dr. Samish said, yet none is satisfactory. Some researchers say gas from the brine penetrates the cucumbers, others that heavy fertilization of the fruit is the culprit. A series of careful experiments conducted by Dr. Samish and her colleagues seems to have established, however, that some cucumbers are "born" with bacteria inside them.

Following incubation, active bacterial growth was found in three different preparations of cukes: mashed pulp, cubes of the inside flesh and cross section slices. The surface of the whole cucumber had in each case been sterilized and dissected aseptically to avoid all possible contamination. In contrast to these tests, Dr. Samish reports that when the fruit had been autoclaved, sterilized with steam, there was no bacterial growth. Also when surface-sterilized cukes were placed peel down on the culture medium, there was no bacterial growth.

Additional evidence was seen in the finding that samples closer to the peel contained fewer bacteria than those close to the interior, Dr. Samish said.

Even though these findings are the center of a controversy concerning the sterility of a fruit's inner tissue, several other researchers have reported similar results with potatoes, various plant tissues and other fruits. Now, Dr. Samish said, she is planning further experiments to be carried out in a special laboratory room where there will be no possible outside contamination.

It is possible, Dr. Samish suggested, that the bacteria enter the cucumber through the blossom end, probably when the flower wilts and drops off.

In the meantime, the cucumber picklers can best reduce the number of bloaters in their barrels by adding benzoate to the brine or pricking the fruit before fermentation occurs.

► THE SMELL of baking bread in one of

the Technion's laboratories at Haifa, Israel, is not a "smell-mirage."

Bread, particularly the problem of Middle East bread, is an important project being tackled by Dr. Markus Reiner, head of the rheological laboratory. The scientists want to know why the bread in this region is flat.

It is not, Dr. Reiner explained, because the people choose to bake the flat bread or "peeta," but rather because the local flour will not produce a high loaf. Middle East wheat, *Triticum durum* is the scientific name, does not rise. The peoples of Central and South America have a similar problem, he pointed out, and bake the typical tortilla, a flat cake made of corn flour.

Studying why the local wheat is as it is from the rheological view, Dr. Reiner is investigating the elasticity and flow properties of the dough.

When gas forms in the cells of the flour mixture, or dough, as a result of the yeast's action, if the cell walls are elastic they expand and the dough rises. A high, "European type" bread results. Apparently, Dr. Reiner said, in Middle East dough the cell walls are weak. They break under the stress of being filled with gas and the bread does not rise.

His work, supported by a Ford Foundation grant, poses a problem similar to the vulcanization of rubber, Dr. Reiner explained. He studies the elastic properties of the wheat in an attempt to learn what gives strength and elasticity to dough just as scientists studied the properties of latex. So far, tests show there is less gluten, a protein, in the local wheat. A possible solution, to be studied by the chemist not the rheologist, Dr. Reiner said, will be to develop gluten-like properties in the local wheat or "vulcanize" it. The research requires the techniques of many sciences.

In its practical aspects, Dr. Reiner's study of bread could result in a savings of some \$25,000,000 for the nation. Israeli imports of Canadian wheat amount to approximately that much each year since most Europeans ask for the bread they are accustomed to eating, the high loaf.

Other nations with similar wheat problems, such as Rhodesia, are also watching the bread baking at the Israel Institute of Technology with great interest.

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TECHNOLOGY

Process Produces Distortion-Free Glass

► A GLASS-MAKING PROCESS may soon mean better and cheaper glass for automobiles, buildings, display windows and mirrors.

It combines the best properties of plate glass and fire-finished sheet glass, the British Information Services reported, to give a distortion-free product without the costly grinding and polishing necessary in previous methods.

Developed by Pilkington Brothers Ltd., St. Helens, Lancashire, England, the process consists of passing a continuous ribbon of glass from a furnace to float on the surface of a molten metal at controlled temperature. The ribbon emerges with a brilliant lustrous finish on both sides.

The product will be intended initially for automobiles, but later is to be supplied for mirrors and building uses.

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