

HOMEMAKERS' CHAT

SATURDAY, April 6, 1940

(FOR BROADCAST USE ONLY)

SUBJECT: "BEHIND THE SCENES IN FROZEN FOOD RESEARCH." Information from H.C.Diehl, Bureau of Agricultural Chemistry and Engineering, U.S.D.A.

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Maybe you've wondered sometimes about the work your Federal and State scientists are doing year after year in laboratory or out in the field. Maybe you've wondered why a scientist begins a special job of research, how he goes about it, what he discovers, and finally what his discoveries mean to Mr. and Mrs. average American.

Well, here's a glimpse behind the scenes. Today I'm going to tell you the story of one of the Department of Agriculture's many research jobs. This is the story of the research in the freezing of fruits and vegetables.

It goes back to 1923, the year the Pacific Northwest had a tremendous crop of strawberries. The crop was so big it brought a call for help to the Department of Agriculture in Washington, D.C. from the strawberry growers in that region. These growers were raising their fruit for cold pack. The processors put the berries with sugar in 50-gallon barrels and set them in a cold-storage room to freeze. The bulk-frozen berries then sold to manufacturers of jam and ice cream and soda fountain supplies.

In the twenties this cold-packing of berries for the wholesale trade was a thriving industry. But the berry crop of '23 was too much for the cold storage plants. Berries literally flooded the warehouses. Barrels of strawberries fermented before they could freeze. Some barrels burst. In one warehouse you could wade ankle deep in berries.

So the Department of Agriculture sent out H.C.Diehl, a chemist and also a



plant scientist. He went out to find a faster way to freeze berries in barrels and a better way to handle them. While he was working on freezing berries in bulk, some of the packers were becoming interested in freezing fruit for the retail trade. So he began investigating freezing containers like cans, or cartons instead of barrels. In '29 Mr. Diehl and his associates put up something like 50 or 60 thousand containers of different fruits packed in different ways and frozen at different temperatures. That pack was a landmark in frozen food research because it showed that a wide variety of products could be frozen in small containers. It showed new possibilities for the retail trade, a new way for the housewife to buy fruit for the family dinner table, and a new market for the fruit grower.

That same year, 1929, these Department of Agriculture scientists also put up a pack of frozen vegetables, but they went about that very quietly and cautiously. The freezing of vegetables was quite new, and vegetables were more of a problem than fruit. There was temperature and spoilage to consider. Freezing doesn't sterilize. And the scientists remembered that the canners had had serious problems with spoilage of vegetables years before. They weren't sure how frozen vegetables would keep.

Peas were some of the first vegetables they tried freezing, because peas grow so well in the cool, mild climate of the Northwest, and the scientists realized that a new big market for peas might mean to growers in that section. But nobody realized then that in a few years thousands of acres of idle or pasture land would be growing peas for freezing. Nowadays the same man who raises peas feeds his dairy cattle on the waste pods and vines turned back at the freezing plant.

Well, the first experiments in freezing peas gave the scientists a surprise but led to a valuable discovery. Some weeks after the first peas went into storage they began to lose color and take on a strange odor. The trouble was not spoilage. Bacteriological tests proved that. The peas were just continuing some of their life



activity even while frozen. So the next problem for the scientists was how to stop this activity in the peas before freezing yet not destroy the freshness. The scientists found that a quick bath in hot water stopped the activity, and, fortunately, also made the peas a deeper green. That's why frozen peas always look so nice and green. And that's why frozen peas take less time to cook than fresh peas.

Temperature was and still is a problem in freezing food. But the scientists have already learned a great deal. One of the early discoveries was that a temperature far below zero is not necessary for freezing most fruits and vegetables if the freezing method is efficient. You see, the temperature necessary for quick freezing depends a good deal on how fast you can take heat out of the product. So the scientists worked to develop a method such as the one where peas are put loose on a belt, carried through the freezing tunnel, and packaged after freezing. Other methods accomplish the same thing in other ways. With a freezing process like that you need a temperature of only zero or a little below zero. That discovery about temperature helped the young industry because it meant a saving in electricity and equipment.

Some of the more recent research in freezing concerns variety, harvesting and standards. With the help of plant scientists the chemists at the Frozen Pack Laboratory in Seattle have tested many varieties of fruits and vegetables to see which freeze best. So now growers can find out which variety to plant for freezing. The scientists have also worked out the proper stage of ripeness for freezing, so growers can know exactly when to harvest their crops. And the scientists have developed methods of harvesting and handling so crops come to the plant in best condition. The latest job concerns standards for frozen foods. If the industry is to continue to thrive, all frozen products must have a uniformly fine quality and be produced under sanitary conditions. So growers and packers are now joining with the Department on quality standards.

There's the story to date of one of the Department of Agriculture's research jobs on frozen fruits and vegetables.

