

PRELIMINARY STUDIES OF HYDRO-COOLING OF PICKLING CUCUMBERS

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HYDRO-COOLING, A RAPID METHOD for removal of field heat, was tested to determine whether it could be used on pickling cucumbers without impairing the quality of the fresh cucumber pickle product. In tests in this laboratory, it had been observed that holding pickling cucumbers in water for 24 hours caused undesirable changes in the color and flavor of the pickles.

Test I

Six bushels of graded pickling cucumbers of the SMR-12 variety were obtained from a local receiving station. They were divided into eight lots, four of which were immediately hydro-cooled in an ice-water bath for 20 to 25 minutes. Two of the hydro-cooled lots, along with two comparable non-cooled lots, were stored at each of two temperatures, 40 and 60° F., for two days. Three quarts of whole dill pickles were manufactured from each of the eight lots of cucumbers. The pickles were evaluated approximately six months after packing by the method described by Cook et al.¹ In this method the experimental jars of pickles are evaluated and numerically rated by comparing each jar with a set of standards subjectively judged excellent, good, fair, poor, and very poor and numerically rated 9, 7, 5, 3, and 1 respectively.

Test II

Six bushels of graded SR-6 variety pickling cucumbers were divided into six lots. Two lots of cucumbers were hydro-cooled for 15 minutes, two lots were hydro-cooled for an hour and two lots were air-cooled

¹Cook, J. A., I. J. Pflug and S. K. Ries (1957). Effect of cucumber holding time and temperature on the quality of pasteurized fresh whole pickles. *Food Tech.* 11: 216-218.

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and held at 40° F.; after cooling all cucumbers were stored four days at 40° F. Three quarts of whole dill pickles were manufactured from each of the two replications of each treatment. The pickles were evaluated using the same procedure as in Test I.

RESULTS

The results of the first trial of hydro-cooling vs. air-cooling are presented in Table 1. No adverse effects of hydro-cooling were found; in fact, in three of the four comparisons the pickles made from hydro-cooled cucumbers were of higher quality than the pickles made from air-cooled cucumbers. The mean values for treatments indicate that hydro-cooling was better than air-cooling at both temperatures, and that hydro-cooled cucumbers stored at 60° F., were of equal quality to air-cooled cucumbers stored at 40° F.

TABLE 1—Quality ratings of pickles made from hydro-cooled and air-cooled cucumbers stored two days. (1 equals good, 7 equals poor)

Cooling method	Storage temperature	Quality rating		
		Replication		Mean
		1	2	
Air-cooled.....	40° F	6.0	5.7	5.8
Hydro-cooled.....	40° F	5.3	5.0	5.2
Air-cooled.....	60° F	6.0	7.0	6.5
Hydro-cooled.....	60° F	6.0	5.7	5.8

The results obtained from cucumbers which were hydro-cooled for 15 minutes, hydro-cooled for 1 hour, and air-cooled are given in Table 2. The pickles from cucumbers hydro-cooled for 1 hour and from air-cooled cucumbers were judged to be better than the pickles from cucumbers hydro-cooled for 15 minutes.

Direct comparison of the results obtained in these two tests are not possible because different varieties and storage conditions were employed.

The absence of adverse effects in pickles made from cucumbers hydro-cooled for 1 hour warrants the conclusion that water temperature and duration of holding were probably responsible for the quality deterioration noted previously in pickles made from cucumbers that were held in water for an extended time before processing.

TABLE 2—*Quality ratings of pickles made from cucumbers hydro-cooled for 1 hour, hydro-cooled for 15 minutes, and air-cooled. (1 equals good, 7 equals poor)*

Cooling method	Quality rating		
	Replication		Mean
	1	2	
Hydro-cooled for one hour.....	3.0	3.7	3.4
Hydro-cooled for 15 minutes.....	4.0	4.7	4.4
Air-cooled.....	4.0	3.3	3.6

These results indicate that field studies should be carried out on hydro-cooling of pickling cucumbers to determine if this procedure is a commercially satisfactory method to improve the quality of pickles.

SUMMARY

Pickling cucumbers were precooled with air and water and stored two to four days at several temperatures prior to manufacture as fresh whole dill pickles. These preliminary trials showed that hydro-cooling for as long as one hour did not adversely affect pickle quality and indicated that hydro-cooling may be more effective than air-cooling for retarding deterioration.