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# CONSUMER REACTIONS to PRESTO-PI

*Agricultural Experiment Station of*



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# CONSUMER REACTIONS to PRESTO-PI<sup>®</sup>

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THE IMPORTANCE of sweetpotatoes as a cash crop in Alabama has diminished in recent years. Production and per capita consumption for the United States as well as Alabama is now less than half that of 1939. For this reason, there has been an increased effort by the Agricultural Experiment Station of The Alabama Polytechnic Institute to develop new uses for sweetpotatoes. If present demand trends for sweetpotatoes are to be reversed, one of the chief means will be through development of new products or uses.

Research to develop new uses for sweetpotatoes is not new. Earlier work at the API Station, beginning in 1942, was directed toward developing candies and other specialty products.<sup>1</sup> Nationwide acceptance tests were conducted to obtain consumer reactions to some of these products.<sup>2</sup> In addition, reactions were obtained from commercial bakeries and other food processors with regard to fully-cooked sweetpotato flour.

Expansion of the frozen food industry during the past decade has created interest in developing new sweetpotato products that

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\*\* Resigned.

<sup>1</sup> L. M. Ware, *Nature of Alayam Products*, Sweetpotato Journal, December 1946.

<sup>2</sup> Ben T. Lanham, Jr., *Consumer Reactions to "Alayam" Candy, "Snacks," and Breakfast Food*, Bulletins 271, 272, and 273, Agricultural Experiment Station of The Alabama Polytechnic Institute, 1950.

would lend themselves to freezing. Moreover, there has been a need for new products that would use Number 2 and Jumbo grade sweetpotatoes, which are ordinarily difficult to market fresh except at unfavorable prices.

A frozen sweetpotato puree developed by the Station's Department of Horticulture has been tested in school and commercial cafeterias primarily for use in pies and as a souffle.<sup>3</sup> Tests of the frozen puree were generally favorable and appeared to warrant further studies. Two products were considered, both made from improved frozen sweetpotato puree. One was a consumer-sized package of puree that would allow a housewife to make a full-sized pie or casserole dish by using her own recipe. The other was a consumer-sized, complete ready-to-use mix containing sweetpotato puree, sugar, whole milk, egg white, oleomargarine, milk powder, and salt. The latter product was chosen for pilot plant processing because acceptance of a ready-to-use product could be more easily determined than with one in which preparation methods by users would be highly variable. This new product was given the name of "Presto-Pi."<sup>4</sup>

Specific objective of the study was to determine the degree of acceptance by consumers of this complete pie or souffle mix made from an improved frozen sweetpotato puree.

## **DESCRIPTION of PRESTO-PI**

Presto-Pi, as used in this study, was a combination of 65.0 per cent sugar-cooked sweetpotato puree, 13.0 per cent sugar, 15.7 per cent whole milk, 1.5 per cent milk powder, 2.5 per cent egg white, 2.0 per cent oleomargarine, and 0.3 per cent salt.<sup>5</sup> The mix had a consistency almost like applesauce when at room temperatures. Used as a plain mix, Presto-Pi had an attractive orange color. Spices tended to darken the mix but other flavor additions had little effect on color.

Presto-Pi was designed as a plain mix to which the housewife could add various spices or flavors if desired. Although it was expected that the mix would be used plain in most instances,

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<sup>3</sup> Jack L. Turner and M. J. Danner, *Acceptance of an Improved Frozen Sweetpotato Puree*, Circular 121, Agricultural Experiment Station of The Alabama Polytechnic Institute, 1957.

<sup>4</sup> Presto-Pi mix was developed and processed by Hubert Harris, Station associate horticulturist.

<sup>5</sup> Hubert Harris and J. M. Barber, *New Uses for Low Grade Sweetpotatoes*, Highlights of Agricultural Research, Agricultural Experiment Station of The Alabama Polytechnic Institute, Fall 1958.



This package wrapper was designed for the Presto-Pi consumer acceptance study.

other uses were given on the package. To prepare the mix as a souffle or casserole required only a 20-minute baking period. A pie shell and 40 minutes of baking time were needed for making a pie.

A waxed fiber carton, 4 x 3 x 1 $\frac{3}{4}$  inches, was used to package the mix. The consumer-sized package weighed 28 ounces. An original wrapper was designed for the study (see photo). A standard corrugated master case holding 12 consumer-sized Presto-Pi packages was used for storing and transporting.

Because of the high solids content of Presto-Pi, some thawing resulted from handling. Cases of Presto-Pi that softened were refrozen and were found to have retained their original flavor and color. Wrapper damage resulted from the thawing. Such damage can be prevented by using better wrapper materials than was used for this test.

## **METHOD of STUDY**

In selecting a sample city for this study, it was desired that a large proportion of the residents have the opportunity to buy Presto-Pi. Since there was a limited quantity available for the

study, it was not possible to supply a large number of stores. For this reason, it was necessary to select a city small enough that all principal stores could be supplied with the test product. In addition, because Presto-Pi was frozen it was necessary that freezer storage facilities be conveniently available during the test period. It was also desired that the people who lived and worked in the selected city buy their food locally.

Leeds, Alabama, located 16 miles from Birmingham, was chosen as adequately satisfying these conditions. Moreover, the population of Leeds was composed primarily of industrial workers, which is the fastest growing segment of the State's population. A small weekly newspaper and a local radio station provided the advertisement coverage necessary.

Five stores sold most of the food in Leeds and all agreed to handle Presto-Pi as part of their regular frozen food line. Sales in stores began February 28, 1958, and were continued for 12 consecutive weeks. The product was competitively priced, and, insofar as possible, a comparative frozen food item was chosen in each store for making sales comparisons. A modest amount of radio and newspaper advertising and in-store demonstration was done.

At the end of the store sales tests, a sample of households in the city was drawn by the area sampling method to obtain data on consumer reactions and attitudes toward the product. Six areas were selected, which provided a sample of 150 families out of the 945 families in the population or about 1 out of every 6. For the most part, no more than two calls were made to each household. Only those that had meals prepared in the home were included in the household survey. The trade area surrounding the sample city was also sampled. It was divided into areas, each containing about 20 houses. Two of these areas were selected at random and surveyed. A total of 140 usable household schedules was obtained from the complete survey.

## **RESULTS of STORE TESTS**

All stores cooperating in the study differed in size, type of ownership, management, and in frozen products handled. Results of each store, therefore, are presented separately.

**Store A.** Store A occupied a corner location on the main street. It was a unit of a large Alabama corporate grocery chain. All sales were for cash. This store ranked second in floor area and

SALES OF PRESTO-PI, FROZEN APPLE PIE, AND FROZEN PEACH PIE IN FIVE STORES, LEEDS, ALABAMA, FEBRUARY 28-MAY 21, 1958

| Store      | Item                   | Packages sold during test |                |                |                |                |                |                |                |                |                |                |                | Total           |
|------------|------------------------|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
|            |                        | 1st week                  | 2nd week       | 3rd week       | 4th week       | 5th week       | 6th week       | 7th week       | 8th week       | 9th week       | 10th week      | 11th week      | 12th week      |                 |
|            |                        | No.                       | No.            | No.            | No.            | No.            | No.            | No.            | No.            | No.            | No.            | No.            | No.            | No.             |
| A          | Apple pie              | 2                         | 1              | 10             | 2              | 0              | 6              | 0              | 3              | 6              | 1              | 1              | 4              | 36              |
|            | Peach pie              | 6                         | 5              | 2              | 2              | 0              | 11             | 2              | 3              | 2              | 7              | 9              | 2              | 51              |
|            | PRESTO-PI              | 9                         | 0              | 1              | 0              | 1              | 4              | 2              | 5              | 1              | 0              | 0              | 0              | 23              |
| B          | Apple pie              | 2                         | 2              | 0              | 0              | 0              | 0              | 0              | 5              | 1              | 0              | 2              | 1              | 13              |
|            | Peach pie              | 2                         | 0              | 0              | 0              | 0              | 0              | 4              | 2              | 0              | 0              | 2              | 0              | 10              |
|            | PRESTO-PI              | 15                        | 7              | 4              | 2              | 1              | 3              | 2              | 4              | 0              | 18             | 0              | 0              | 56              |
| C          | Apple pie              | 4 <sub>1</sub>            | 1 <sub>1</sub> | 2 <sub>1</sub> | 2 <sub>1</sub> | 3 <sub>1</sub> | 0 <sub>1</sub> | 2 <sub>1</sub> | 0 <sub>1</sub> | 1 <sub>1</sub> | 3 <sub>1</sub> | 1 <sub>1</sub> | 1 <sub>1</sub> | 20 <sub>1</sub> |
|            | Peach pie              | 7                         | 0              | 3              | 2              | 0              | 0              | 0              | 0              | 1              | 7              | 0              | 0              | 20              |
|            | PRESTO-PI              | 7                         | 0              | 3              | 2              | 0              | 0              | 0              | 0              | 1              | 7              | 0              | 0              | 20              |
| D          | Apple pie <sup>2</sup> | 17                        | 16             | 6              | 3              | 0              | 10             | 5              | 2              | 5              | 3              | 0              | 0              | 67              |
|            | Peach pie              | 4                         | 0              | 0              | 4              | 1              | 2              | 8              | 1              | 2              | 0              | 0              | 0              | 22              |
|            | PRESTO-PI              | 28                        | 19             | 11             | 14             | 10             | 7              | 9              | 6              | 1              | 22             | 3              | 2              | 132             |
| E          | Apple pie              | 13 <sub>1</sub>           | 5 <sub>1</sub> | 2 <sub>1</sub> | 0 <sub>1</sub> | 0 <sub>1</sub> | 1 <sub>1</sub> | 5 <sub>1</sub> | 6 <sub>1</sub> | 0 <sub>1</sub> | 6 <sub>1</sub> | 0 <sub>1</sub> | 0 <sub>1</sub> | 38 <sub>1</sub> |
|            | Peach pie              | 3                         | 2              | 0              | 0              | 0              | 3              | 0              | 0              | 0              | 0              | 0              | 0              | 8               |
|            | PRESTO-PI              | 3                         | 2              | 0              | 0              | 0              | 3              | 0              | 0              | 0              | 0              | 0              | 0              | 8               |
| All stores | Apple pie              | 38                        | 25             | 20             | 7              | 3              | 17             | 12             | 16             | 13             | 13             | 4              | 6              | 174             |
|            | Peach pie              | 12                        | 5              | 2              | 6              | 1              | 13             | 14             | 6              | 4              | 7              | 11             | 2              | 83              |
|            | PRESTO-PI              | 62                        | 28             | 19             | 18             | 12             | 17             | 13             | 15             | 3              | 47             | 3              | 2              | 239             |

<sup>1</sup> Not offered for sale.

<sup>2</sup> Canned apple pie mix; apple pie not offered.

second in gross sales among the five in the study. Excellent cooperation from manager and clerks was received. Store A's freezer was an open-type chest arranged along a side wall just beyond the first produce racks. Each person entering the store had to pass the frozen food chest. Presto-Pi was the first frozen product in the chest.

Presto-Pi sales in Store A were not pushed by the management. A small sign above the packages of Presto-Pi was the only store advertisement.

Presto-Pi sales were compared with frozen apple and peach pies, frozen candied yams, and a canned blackberry pie filling. Only two cans of blackberry pie filling were sold during the 12-week test period. Sales of frozen apple pie and peach pie were each greater than Presto-Pi sales. There were 36 sales of frozen apple pie, 51 of frozen peach pie, and 23 of Presto-Pi (see table). Sales of all three frozen foods followed the same general sales trend. In-store demonstration had no effect on sales.

The attitude of the manager of Store A toward Presto-Pi was neutral. He felt that it would take a while for the new product to "catch-on." He had no packages of Presto-Pi returned for any reason. After using Presto-Pi in his home,<sup>6</sup> the manager reported that it was satisfactory. He did not, however, use it a second time. One clerk used Presto-Pi and liked it, especially the quick-fix part. She reported adding milk to the product.

**Store B.** Store B was an owner-operated chain store located near Store A. All sales were cash. In volume of business this store ranked fourth, but it was third in floor space. Both management and clerks were highly cooperative.

Produce racks and freezer chests were located side by side along one wall, with produce racks first. All customers had to pass these cases. Presto-Pi was switched from place to place in the freezer chest, but generally occupied a spot left of center. A small sign over the chest advertised Presto-Pi.

This store had a freezer problem in that food would not stay frozen. Presto-Pi thawed to an extent that packages became unsightly and had to be replaced. Almost all frozen foods in this freezer were in a condition similar to Presto-Pi. Foods were loaded above the freeze line, which placed an overload on the freezer's compressor and motor. It is possible also that freezer

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<sup>6</sup> Free samples of Presto-Pi were given to each store manager and to each clerk in all five cooperating stores.



temperature was allowed to vary, although it was satisfactory when checked. Presto-Pi suffered more than did most other products because of its high solids content.

Presto-Pi far outsold either frozen apple or peach pie, with 56 sales of Presto-Pi to 13 of apple pie and 10 of peach pie (see table). Two factors probably accounted for this record. The management actively pushed Presto-Pi sales, but did not regularly offer apple and peach pies for sale. The in-store demonstration resulted in sales of 18 packages of Presto-Pi during the week of the demonstration.

Except for the thawing, the owner of Store B thought Presto-Pi was as good as any sweetpotato product he had tried, and used it in his home several times. Eggs and milk were added to the product, however. There were no packages of Presto-Pi returned to the store.

**Store C.** This store was fourth in floor space, last in sales, and was the only store that sold on credit. It was located in the middle of a block on the main street. This independent, owner-operated store used a closed-type freezer, which at one time had been an ice cream cabinet. The freezer was along a side wall in the middle of the store. Fresh produce racks were along the same wall at the front of the store. Customers were not forced to pass the produce or frozen food displays.

Excellent cooperation was received from the manager. A sign was placed above the freezer chest to indicate that Presto-Pi was a new product. Sales amounted to 20 packages for both Presto-Pi and frozen apple pie. Sales tended to move somewhat together (see table). Sales in Store C were not increased by in-store demonstration. Only one package was sold during the 2 weeks following this demonstration.

Both the store owner and cashier used the product in their homes. The owner thought there was a market for Presto-Pi but that it would be slow to develop. None of the product was returned and comments made by purchasers to the owner were favorable. The closed freezer chest kept Presto-Pi packages in excellent condition throughout the test.

**Store D.** Store D was the smallest in floor space, yet led in gross sales. This independent store was operated by a young aggressive owner. The location was two blocks from the main street on a back street near the railroad tracks. All sales were for cash. Each customer had to pass the fresh produce rack and

then the frozen food chests. There were two, open-type chest freezers, each about 10 feet long. The only store advertisement was the sign used above the Presto-Pi display. Excellent cooperation was obtained from the operator.

Presto-Pi sales totaled 132 during the 12-week test. Combined sales of frozen peach pie and canned apple pie mix were 89 units (see table). Presto-Pi was aggressively promoted by the store manager. However, only nine packages were sold in the 2 weeks following in-store demonstration of Presto-Pi. Sales were made every week of the 12-week test, ranging from 1 to 28 per week. In line with this operator's policy of highly competitive pricing, Presto-Pi was sold at retail for 29 cents, a percentage mark-up of about 7 per cent. (All other stores sold Presto-Pi at 35 cents). This, undoubtedly, contributed greatly to Presto-Pi's sales record in this store, but the operator insisted that such a mark-up was consistent with his over-all pricing practices.

Consumer comments to the store operator were mostly favorable. There were no packages of the mix returned. The store owner appeared anxious to keep Presto-Pi in his store even after completion of the test.

**Store E.** This was one of the largest stores participating in the test. Store E was one block from main street, had ample parking facilities, well-marked counters, and a clean well-illuminated interior, but it had a relatively low volume of gross sales. It was a member of a small independent chain store group. During most of the test period, Presto-Pi was not displayed in the regular frozen food section but was kept in the frozen chest area assigned to dairy products. Sales of Presto-Pi in this store, therefore, were very limited; only eight packages were sold during the 12-week period. Frozen apple pie accounted for 38 sales during the same period. In-store demonstration was not carried out in this store. Shelf-life of the unsold Presto-Pi was highly acceptable, lasting for almost the entire period.

## **SUMMARY of STORE TESTS**

The five stores cooperating in this study did most of the retail food business in the test city. Similar stores are in other cities and towns. Four of the five sold for cash only. All five had frozen food chests, mainly open-type.

All store operators allowed Presto-Pi to remain in their stores for as long as needed and were given samples of Presto-Pi to try

at home. The only critical comment on the product, made by only one store operator, was that it became soft and mushy in his freezer. This apparently was due to higher than normal freezer temperature and other freezer irregularities.

When Presto-Pi was allowed to thaw, the wrapper was discolored to an objectionable degree by outside moisture. This was because of the nature of the wrapper rather than leakage. During the tests, these packages were removed and replaced with fresh, frozen packages. Thawing, however, did not damage Presto-Pi when it was immediately refrozen. No attempt was made to determine extent of wrapper damage in the home refrigerator nor the housewife's reaction to such a condition.

Presto-Pi maintained about the same sales relationship to those products with which it was compared throughout the 12-week test. Sales were somewhat lower than for apple and peach pies, but sales of all three products generally increased and decreased together. Sales of frozen apple pie and Presto-Pi moved together during 9 of the 12 weeks. The relationship between frozen peach pie and Presto-Pi was not as great. Store operators, their clerks, and customers used and liked Presto-Pi. Sales were not overly impressive, but new products usually require a great deal of promotion and time to gain wide acceptance.

## **RESULTS OF HOUSEHOLD INTERVIEWS**

Housewives were interviewed to determine their acceptance of Presto-Pi, their awareness of the product, and their attitude toward new frozen foods. A total of 250 packages of Presto-Pi were sold during the 12-week test. Finding a large number of users in the sample population, therefore, was not possible. In general, housewives who used and served Presto-Pi to their families rated it over a wide range of values from completely unacceptable to completely acceptable. Reasons given for the ratings were generally that the housewife enjoyed using Presto-Pi because it was quick and easy to prepare, but did not accept it as a complete mix. In most instances, other ingredients were added, usually milk and eggs.

The most impressive single feature about Presto-Pi, housewives noted, was that the product was stringless (free of strings or fiber). It appeared that the housewife liked a sweetpotato product free of fiber but that she had rather add her own pie or casserole ingredients. Housewives also noted that there was little waste in using Presto-Pi.

For making a casserole or souffle dish, housewives were more inclined to use the mix as it came from the box than were those who made pies. Housewives who made casseroles were more satisfied with the final product than were pie bakers. Presto-Pi users who made souffles or casseroles were usually those who worked outside the home, young people, or those with small children. Generally, the group with school-age children made more pies. They were more experienced, had more time for pie making, and liked to use their own recipes. They also wanted to add their own ingredients.

**Variation by Income.** Incomes of families interviewed were stratified by occupation into two classes. In the higher income class, which included office managers, business owners, professional men, skilled workers, and salesmen, most of the families that had tried Presto-Pi found it acceptable. About half of those who used the product commented on not having to peel and pulp sweetpotatoes. Only about 13 per cent of those in the higher income group had seen or heard of Presto-Pi. Almost all who had seen it or heard of it, however, had tried it.

Those in the lower income class included clerical, semi-skilled, unskilled, retired, and unemployed. More than half of the families in this group that had used Presto-Pi in their homes found it acceptable. Those who disliked the product had made pies. Only 8 per cent in this group had seen or heard of Presto-Pi. Of those who had seen or heard of it, almost all had tried it.

Users of Presto-Pi in both income groups found it almost equally acceptable. Those making pies, however, did not accept it as readily as did those who made casserole dishes.