Restaurant Acceptance of

DEHYDROFROZEN PEAS

A PRODUCT TEST CONDUCTED IN 100 MILWAUKEE RESTAURANTS

Marketing Research Report No.198

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PREFACE

This report is one of a series based on cooperative studies by the Marketing Research Division, Agricultural Marketing Service, and the Utilization Research and Development Division, Agricultural Research Service, U. S. Department of Agriculture.

The project is part of a broad research program designed to develop markets for agricultural products. Determination of the acceptability of products in various forms--particularly newly developed products--and of ways to reduce marketing costs can provide a guide to industry in the development of new markets or the expansion of present ones.

Personnel of the Western Regional Research Laboratory of the Western Utilization Research and Development Division, at Albany, Calif., where dehydrofrozen peas were developed, provided technical assistance in the planning and execution of the product test and analysis of the results, and supplied technical material for the report. The Market Development Branch, Marketing Research Division, Agricultural Marketing Service, had overall responsibility for the coordination of all phases of the product test, the conduct of the research, analysis of data, and publication of final results.

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RESTAURANT ACCEPTANCE OF DEHYDROFROZEN PEAS

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SUMMARY

The study of restaurant acceptance of dehydrofrozen peas was undertaken to determine their adaptability to preparation procedures used by restaurants.

Dehydrofrozen peas are peas dehydrated to about 50 percent of their fresh weight and then frozen and packaged by the same process as regular frozen peas. Dehydrofrozen peas require a package only about half the size needed to pack the equivalent volume of regular frozen peas. Direct results of these reductions in volume and weight are substantial savings in freezing, packaging, transportation, storage, and other handling and distribution costs.

The study was conducted in Milwaukee, Wis. One hundred restaurants were selected as representative of the restaurant trade in the test area. The study was conducted from October 1956 to January 1957. Each restaurant was furnished, free of charge, with a supply of dehydrofrozen peas equivalent to its average weekly servings of peas.

Restaurant operators found that dehydrofrozen peas compare favorably with frozen peas in ease of preparation and cooking. In comparing them with canned peas, more than half of the restaurant operators considered dehydrofrozen peas as easy to prepare.

The appearance of dehydrofrozen peas after cooking was better than that of regular frozen peas, according to restaurant operators. They reported also that the test product was greener and firmer (skins less wrinkled) than frozen peas, and that dehydrofrozen peas had more resemblance to fresh peas.

The majority of restaurant operators expressed the opinion that dehydrofrozen peas surpassed other forms of peas in maintenance of freshness, flavor, and good appearance after having been left on the steam table for a considerable time.

Saving in usually scarce freezer storage space in restaurants is an important advantage for dehydrofrozen peas. Most restaurant operators considered the saving in freezer storage space to be important. Those who put less emphasis on saving in storage already had sufficient freezer space.

The traditional package size for frozen peas used by restaurants is a $2\frac{1}{2}$-pound package. Even though $2\frac{1}{2}$ pounds of dehydrofrozen peas are equivalent to 5 pounds of regular frozen peas, 7 out of 10 restaurant operators preferred that dehydrofrozen peas be packaged in $2\frac{1}{2}$-pound packages.

At the time of the product test, restaurant operators were paying an average of 24 cents per pound for regular frozen peas. They indicated a willingness to pay as high as 27 cents per pound, on a reconstituted basis, for dehydrofrozen peas. Restaurant owners using canned peas also attributed quality advantages to the test product, which should merit some premium over the product they were then using.

This study indicates that dehydrofrozen peas possess excellent commercial marketing possibilities in restaurants.

Although this study was limited to public eating places, dehydrofrozen peas also may be acceptable for use in the processing of foods such as soups and baby foods. Further studies are needed to explore the commercial possibilities of these peas in this market.

BACKGROUND

It has long been recognized that many completely dehydrated fruits and vegetables do not recover fresh texture quality when reconstituted. Irreversible changes take place in air-drying products to the very low moisture level necessary for preservation.

The suggestion was made at the Western Regional Research Laboratory of the Agricultural Research Service that fruits and vegetables might be dehydrated under controlled conditions only to the point where quality is not adversely affected--thus gaining important weight and volume savings--and then might be preserved by freezing. This combination of processes was called "dehydrofreezing."

Experimental work showed that about a 50-percent weight reduction for many fruits and vegetables did not adversely affect quality. Dehydration much past this point brings about undesirable changes in texture and makes it difficult, if not impossible, to reconstitute many products completely.

While most of the water is evaporated in the dehydrofreezing process, the resulting products still have a high percentage of water. Dehydrofrozen peas, for example, have about two-thirds of the original water removed. The water content is thereby reduced from about 75 percent of the fresh weight to 50 percent of the dehydrated weight. Dried peas, on the other hand, contain approximately 6 percent moisture.

Not only do dehydrofrozen fruits and vegetables retain the quality of those that are frozen in the usual way, but the partial dehydration imparts certain additional advantages. Frozen fruits, particularly those frozen with sugar, drip or bleed when thawed. This is avoided in dehydrofreezing. Used as an ingredient in manufacturing food products, the partially dried peas can be employed to control moisture content in products such as meat pies, soups, and stews.

In summary, fruits and vegetables which can be dehydrofrozen successfully have these advantages over the regular frozen products. They have less weight and bulk, little or no drip upon thawing, and better moisture control in manufacturing food products. Such dehydrofrozen fruits and vegetables rehydrate more easily and completely than dehydrated products, and have better flavor, texture, and color.

Many fruits and vegetables can be better preserved by freezing, in most important respects, than by any other known method. The commercial appeal of dehydrofrozen products arises from the fact that they compare favorably in quality with frozen products, yet incorporate some of the economic advantages of dehydrated products.

These economic advantages appeared to make dehydrofrozen peas particularly well fitted for use in such institutional outlets as restaurants and other public eating places. Therefore, this study was initiated to test the acceptability of the product under actual use conditions in the institutional trade.

Consultation with the National Restaurant Association, representatives of the frozen food industry, and representatives of the Western Utilization Research and Development Division led to the selection of Milwaukee, Wis., as the city in which to conduct the test. Milwaukee ranks 13th in size among the cities of the United States. Thus, it contains restaurants of all types, using all forms of peas.

OBJECTIVE

The major objective of the product test was to determine the acceptability of dehydrofrozen peas to the restaurant trade. Specifically, the study was designed to determine the reactions and attitudes of restaurant owners, managers, and chefs toward use of dehydrofrozen peas. Their judgments were wanted on how the peas fit into the overall cooking and use procedures of restaurants and on the quality-price relationships between the new product and the usual forms of the product.

METHODS AND PROCEDURES

To test the adequacy of the product-testing methods and the schedules 1/ of questions to be used in Milwaukee, eight restaurants and cafeterias in Berkeley and Oakland, Calif., were selected to use dehydrofrozen peas during the period July 2 to 16, 1956. The managers of these restaurants were later interviewed, using the schedules developed for this purpose. On the basis of these interviews, it was decided that the methods and schedules, with a few modifications, were suitable for the product test in Milwaukee.

In October 1956, a sample of 100 restaurants in Milwaukee was selected and cooperation from the restaurant owners was obtained. The sample was made up of 70 general restaurants, 17 specialty restaurants, 7 hotels, 4 private clubs, and 2 cafeterias. 2/ These proportions of restaurant types resulted from random sampling and are considered to be representative of public eating places in Milwaukee.

The product test was conducted in three phases. The first phase was the determination of characteristics of restaurants in relation to their use of peas. Data were assembled to determine the type of peas usually served, methods of cooking them, amount of peas served per week, and amount of storage space available. Other data on the number of meals served per day and the number of employees were assembled to assist in classifying restaurants according to size.

Phase two consisted of making distribution of dehydrofrozen peas to restaurants and instructing or assisting the chefs in preparing the first batch.

Restaurants using frozen peas generally serve a quality product of high grade B or better. For this reason, the peas selected to be dehydrofrozen for the product test were low grade A. The Thomas Laxton variety was selected.

After the restaurants had used dehydrofrozen peas for 1 week, the managers were interviewed to determine their attitudes toward serving dehydrofrozen peas and their opinions of the physical characteristics of these peas as compared with the type they usually serve. This constituted the third and final phase of the product test.

1/ See the appendix for the schedules used in the test.

2/ A general restaurant here is one that serves a variety of meals with no particular emphasis on any one dish. A specialty restaurant is one that publicizes one item such as steaks or spaghetti.

RESTAURANT CHARACTERISTICS

The sample restaurants were divided into three groups of small, medium, and large restaurants, primarily on the basis of number of meals served. 3/ Those serving less than 200 meals per day were classified as small, 200 to 599 meals as medium, and 600 or more meals as large. The sample was made up of 26 small restaurants, 54 medium-sized, and 20 large. The number of meals served per day ranged from 42 to 2,200, with an average of 431 and a median of 310 meals per day. Peas were served from 1 to 7 days per week in the restaurants.

Of the 100 sample restaurants, 21 used frozen peas exclusively, 48 used only canned peas, and 31 used both canned and frozen peas. The reasons for using frozen peas exclusively were predominantly quality and appearance, while those who used canned peas exclusively cited convenience and price as their main reasons (table 1).

Table 1.--Reasons for exclusive use of frozen or canned peas, Milwaukee, Wis., fall 1956

Reason	Frozen	Canned
	Number	Number
Convenience	2	31
Price	0	12
Quality	10	2
Appearance	8	0
Lack of freezer space	0	4
Flavor	2	1
Customer preference	2	0
Don't know	0	2
Total 1/	24	52

1/ Totals add to more than 21 and 48 because some restaurant operators gave more than 1 reason for use of frozen or canned peas.

ACCEPTABILITY OF DEHYDROFROZEN PEAS

Nearly all Milwaukee restaurant owners reacted favorably to dehydrofrozen peas. Restaurant owners appeared to be impressed with their quality, particularly such factors as taste, tenderness, and appearance.

3/ Tabulation excludes orders for sandwiches, refreshments, and short orders.

Dehydrofrozen peas were served an average of 2 to 3 days per restaurant per week. This was about the same as their customary servings of other forms of peas.

Dehydrofrozen peas were compared with frozen and canned peas in terms of (1) ease of preparation, (2) difference in characteristics after cooking, (3) ability to stand the rigors of the steam table, (4) storage and handling, (5) size of package, and (6) price.

Ease of Preparation

Preparation includes removal from package, preparing for cooking, and actual cooking. Dehydrofrozen peas are packed loose in the package and are easily removed by pouring from the package directly into the cooking utensil. The cooking of dehydrofrozen peas is started in cold water, whereas the cooking of regular frozen peas is started in boiling water. This gives the dehydrofrozen peas adequate time to absorb water and reconstitute. The actual cooking time of dehydrofrozen peas varies with the type of cooking utensil and with the volume of peas being cooked. However, the actual preparation time is about the same as for frozen peas.

In comparing ease of preparation of dehydrofrozen peas and other types, the 100 restaurant operators who used dehydrofrozen peas were asked to compare them with peas which they usually used. Forty-five of the operators interviewed compared them with frozen peas, 58 compared them with canned peas, 6 compared them with canned and frozen peas collectively, and 1 compared them with peas in all forms. Because 10 operators compared them with both canned and frozen peas, there were 110 comparisons (table 2).

Table 2.--Ease of preparation of dehydrofrozen peas compared with other types, Milwaukee, Wis., January 1957

Dehydrofrozen peas are:	Types			
	Frozen	Canned	Other	All
	Number	Number	Number	Number
Easier than	11	7	1	19
About the same as	31	32	6	69
More difficult than	3	19	0	22
Total	45	58	7	110

Of the 45 respondents who compared dehydrofrozen peas with frozen peas, 42 found them to be as easy or easier to prepare, chiefly because the cooking process is essentially the same. Of the 3 respondents who found dehydrofrozen peas more difficult, 2 said these peas took longer to prepare.

Thirty-nine of the 58 respondents who compared the new product with canned peas found it to be as easy or easier to prepare. The 19 restaurant operators in this group who found dehydrofrozen peas more difficult to prepare than canned peas gave as their principal reason that opening a can and heating was the easiest way to prepare peas (tables 3 and 4).

Table 3.--Reasons given by restaurant managers for finding dehydrofrozen peas either easier or as easy to prepare, compared with other types, Milwaukee, Wis., January 1957

Reason	Dehydrofrozen compared with: Frozen	Canned	Other	Total
	Number	Number	Number	Number
Same process, simple, no trouble	29	34	6	69
Cooking time very fast/faster	7	2	1	10
Larger portions	3	0	0	3
No waiting for water to boil	2	0	0	2
Held shape better	0	1	0	1
Less seasoning	0	1	0	1
Miscellaneous	1	1	0	2
Total	42	39	7	88

Table 4.--Reasons given by restaurant managers for finding dehydrofrozen peas more difficult to prepare, compared with other types, Milwaukee, Wis., January 1957

Reason	Dehydrofrozen compared with: Frozen	Canned	Total
	Number	Number	Number
Just open can and heat	0	10	10
Dehydrofrozen peas take longer	2	4	6
Dehydrofrozen peas have to be watched	1	2	3
Miscellaneous	0	3	3
Total	3	19	22

Size of establishment, when related to opinions of operators as to ease of preparation, yielded no particular pattern. Evidently, variables other than size of enterprise determined operators' opinions as to ease of preparation.

Characteristics of Dehydrofrozen Peas

During the cooking process, dehydrofrozen peas absorb water and reconstitute to their normal size. Ninety-three of the 100 restaurant operators contacted in this study reported differences between reconstituted dehydrofrozen peas and the form of peas usually served.

The 93 respondents noticing differences in characteristics between dehydrofrozen peas and the type usually served made 150 comments about differences, 128 of which were favorable to dehydrofrozen peas over all other types. Table 5 lists the characteristics in which cooked dehydrofrozen peas show a favorable comparison with other types of cooked peas. The 22 differences noted in which dehydrofrozen peas were compared unfavorably with other types of peas are shown in table 6. Some restaurant owners made a favorable comparison for certain characteristics while others made an unfavorable comparison for the same characteristics.

Table 5.--Differences noticed in favor of appearance of dehydrofrozen peas, compared with other types, after cooking, Milwaukee, Wis., January 1957

Comment	Dehydrofrozen compared with: Frozen	Canned	Other	Total
	Number	Number	Number	Number
Color--green, greener appearance	19	48	4	71
Like fresh	4	17	0	21
Taste--flavor sweetness	4	9	2	15
Didn't mush	6	2	0	8
Full--plump, larger	1	6	0	7
Tenderness	0	4	0	4
Miscellaneous	1	1	0	2
Total number of reasons	35	87	6	128
Total number of restaurant operators	19	54	5	78

Table 6.--Differences noticed unfavorable to appearance of dehydrofrozen peas, compared with other types, after cooking, Milwaukee, Wis., January 1957

Comment	Dehydrofrozen compared with: Frozen	Canned	Other	Total
	Number	Number	Number	Number
Skins came off	7	0	0	7
After standing, lost color	3	2	1	6
Wrinkled--out of shape	2	1	0	3
Color less intense	2	1	0	3
Mushy	2	0	0	2
Color mixture	0	1	0	1
Total number of reasons	16	5	1	22
Total number of restaurant operators	14	5	1	20

Comparisons With Canned Peas

Since canned peas do not have the fresh green color of frozen peas, canned pea users noted greater differences in cooked dehydrofrozen peas than did those restaurant operators using frozen peas. Almost all users of canned peas stated that there was a discernible difference between the appearance of dehydrofrozen peas and canned peas when both were cooked. The most obvious difference was in color; however, a few of these restaurant operators stated that dehydrofrozen peas had other characteristics, such as plumpness and stability, which were not present in canned peas.

Comparisons With Frozen Peas

Among those who compared the new product with frozen peas, 32 of 44 managers noticed that dehydrofrozen peas had characteristics different from those of frozen peas. Twelve respondents comparing dehydrofrozen peas to frozen peas thought there was no difference after the peas were cooked.

The users of frozen peas made 51 comments about differences in characteristics between dehydrofrozen and frozen peas. Thirty-five of these comments indicated that dehydrofrozen peas are as good as or better than regular frozen peas. The major characteristic favorable to dehydrofrozen peas was color. Dehydrofrozen peas appeared to be greener and looked more like fresh peas. The principal unfavorable difference noticed was that the outer skins of dehydrofrozen peas came off or split. The slightly larger number of split and separated skins may be due to the small slits in the

skins made by special equipment during processing, in order to speed dehydration and rehydration and to prevent wrinkling of the skins after cooking and cooling. Wrinkling of skins is characteristic of fresh and frozen peas after cooking and is more pronounced in less mature than in more mature peas. Wrinkling is practically eliminated in dehydrofrozen peas by making a small slit in the skin.

Dehydrofrozen Peas and Steam Table Operations

The steam table is used almost universally in restaurants for maintaining heat in vegetables until they are served to consumers. Its use is based on convenience and efficiency, as the quality of vegetables, and of peas in particular, deteriorates while they are on the steam table.

Because of the importance of determining the ability of dehydrofrozen peas to stand the rigors of the steam table, particular attention was paid to this factor. It was found that 90 of the 100 restaurants in the sample kept peas on the steam table for periods ranging from 15 minutes to 10 hours, the average time being slightly over 3 hours (table 7).

Table 7.--Average time peas were kept on steam table, Milwaukee, Wis., fall 1956

Type	Mean		Range			
			Minimum		Maximum	
	Hours	Minutes	Hours	Minutes	Hours	Minutes
Frozen	1	55	0	15	6	00
Canned	3	40	0	20	10	00
All	3	04	0	15	10	00

Restaurants using only frozen peas held them on the steam table for an average of 1 hour and 55 minutes, as opposed to 3 hours and 40 minutes for users of canned peas.

Ten restaurants served frozen peas to order and did not keep them on the steam table for any considerable length of time.

Seventy-four of the restaurant operators reported that dehydrofrozen peas appeared to stand up to the rigors of the steam table as long as or longer than frozen or canned peas. Twenty-eight felt that they would not hold up as long, but most (18) of this group used canned peas, which are usually held for a considerable period on the steam table.

Of the 44 restaurant operators who compared dehydrofrozen peas with frozen peas, 32 thought dehydrofrozen peas would stand up as long or longer on the steam table, while 9 managers felt that frozen peas would stand up longer.

When 57 respondents compared dehydrofrozen peas to canned peas, 37 thought dehydrofrozen peas would stand up as long as or longer than canned peas on the steam table. Eighteen of this group felt that canned peas held up better (table 8).

Table 8.--Ability of dehydrofrozen peas to stand (retain edible quality) on steam table, compared to other types of peas, Milwaukee, Wis., January 1957

Type of pea	Dehydrofrozen maintains quality--				Total
	Longer than	Same time as	Not so long	Don't know, don't use, or cook to order	
	Number	Number	Number	Number	Number
Frozen	16	16	9	3	44
Canned	16	21	18	2	57
Other 1/	2	3	1	2	8
Total	34	40	28	2/7	3/109

1/ Various combinations of canned, frozen, fresh and/or dried peas.
2/ It was mentioned earlier that 10 restaurant managers in the group served peas to order; however, a few answered this question from past experience.
3/ Total greater than 100 because 9 restaurant operators compared dehydrofrozen peas with both canned and frozen on this question.

The respondents who thought dehydrofrozen peas kept as long as or longer than frozen peas on the steam table were of the opinion that dehydrofrozen peas retained their appearance and color better and kept their shape rather than "mushing."

Those who thought dehydrofrozen peas would not keep so long as frozen peas noticed that the skins broke and there was a tendency to mush.

The tendency to mush becomes more apparent as the time on the steam table increases. The maximum time for frozen peas to remain standing without damage appears to be about 2 hours. Broken skins are not considered a defect, according to the standards for frozen peas. 4/ Unless the skin is completely separated from the body, the pea is considered to be a whole one.

The restaurant operators who thought dehydrofrozen peas kept as long as or longer than canned peas on the steam table felt as they did chiefly because of the retention of color, appearance, and shape. Where these factors were observed and reported by restaurant operators, the dehydrofrozen peas were usually rated superior to canned peas. Many of this group cautioned against leaving any peas on the steam table for a long time (table 9).

4/ U. S. Department of Agriculture, Agricultural Marketing Service. Tentative United States Standard for Grades of Frozen Peas. (Effective March 15, 1945.)

Table 9.--Reasons given by restaurant operators for thinking that dehydrofrozen peas will maintain quality on steam table for different lengths of time, compared with frozen or canned peas

Reason given	Dehydrofrozen maintained quality--					
	Longer than		About same time as		Not so long as	
	Frozen	Canned	Frozen	Canned	Frozen	Canned
	Number	Number	Number	Number	Number	Number
Retained appearance and color better	10	9	4	0	0	0
Didn't mush, kept shape	9	7	7	0	0	0
Kept flavor, taste	1	3	2	0	0	0
Served soon, no difference	0	0	4	7	0	0
Skins more sturdy	0	1	0	0	0	0
Takes longer to puff up	0	1	0	0	0	0
Like canned, can't leave too long	0	0	0	12	0	0
Mushed up	0	0	0	0	5	6
Skins broke	0	0	0	0	3	1
Appearance poor after standing	0	0	0	0	1	10
Frozen are more solid	0	0	0	0	1	0
Lost taste	0	0	0	0	0	3
Too tender	0	0	0	0	0	1
No pea will stand on steam table	0	0	0	0	0	1
Miscellaneous	0	1	1	2	1	0
Total	20	22	18	21	11	22

The operators who found that canned peas could keep well on the steam table longer than dehydrofrozen peas gave as their principal reasons a loss or change of color and mushing. However, time lapse on the table is again considerable. The respondents in this group who cited a loss or change of color were found to keep their peas on the steam table for an average of 4 hours and 11 minutes. Those who noticed mushing kept the peas on the steam table an average of 3 hours and 40 minutes.

Customer Reaction to Dehydrofrozen Peas

The majority of customer reactions were spontaneous, although in a few instances comments were solicited by enthusiastic proprietors. Sixty-three managers stated that they had received some consumer reaction and that most of the unsolicited comments from their patrons indicated that dehydrofrozen peas were well received. Table 10 shows a distribution of unsolicited comments received from consumers.

Table 10.--Favorable customer reactions to dehydrofrozen peas noticed by restaurant operators, Milwaukee, Wis., January 1957

Comment	Number	Percent
Very good, liked them	32	43
Taste, flavor good	14	19
All eaten by customers	13	18
Tasted like fresh peas	8	11
Asked managers what kind of peas they were	3	4
Color, appearance better than usual	2	3
Tenderness good	1	1
One couple ordered especially after seeing them served	1	1
Total	74	100

Suggestions for Product Improvement

Forty-three restaurant managers volunteered suggestions for improving dehydrofrozen peas. Of the suggestions, 24 involved cooking procedures. It had been anticipated that, although cooking instructions were attached to each package of dehydrofrozen peas, the actual preparation would vary, depending upon the routine of the individual restaurant.

Table 11 lists suggestions made by restaurant managers for improving the marketability of dehydrofrozen peas.

Many of the managers commenting upon cooking procedure felt that caution should be exercised to avoid overcooking. This is especially true if the peas are to be kept on the steam table for long periods, or on the back of a stove where additional cooking would ensue. The cooking instructions are relatively simple and are similar to those for frozen peas; the major difference is that dehydrofrozen peas are started in cold rather than boiling water. No soaking is required, since dehydrofrozen peas reconstitute as the water comes to a boil.

The remainder of the 43 suggestions for improvement covered points other than preparation, and prominent here was the hope that a way might be found to keep all types of peas on the steam table longer (table 11).

Table 11.--Suggestions by restaurant managers for improvement of dehydrofrozen peas, Milwaukee, Wis., January 1957

Suggestion	Number	Percent
Cooking procedure:		
Less cooking time	8	19
Don't overcook	4	9
Cook in smaller amounts	3	7
Cook longer	3	7
Use soda	2	5
Cook uncovered	2	5
Use more water	1	2
Miscellaneous	1	2
Subtotal	24	56
Find a way to keep on steam table longer	8	19
Process so skins won't break	5	12
Package in smaller amounts	2	5
Package and distribute to consumer	1	2
Use with dehydrofrozen carrots for color	1	2
Remove more water from the peas	1	2
Miscellaneous	1	2
Subtotal	19	44
Total	43	100

Storage and Handling

Conservation of storage space is one of the specific advantages of dehydrofrozen peas. Compared with conventionally frozen peas, they require approximately 50 percent less freezer space. This saving would benefit both large and small restaurants.

More freezer space was needed in most restaurants. It was found that space available among the sample group ranged from 4 cubic feet to 7,238 cubic feet, the median being only 50 cubic feet (table 12).

More than half of the restaurants have freezer space of 100 cubic feet or less. Two-thirds of the restaurant managers said they needed more freezer space and dehydrofrozen peas would be of value in providing it (table 13).

Table 12.--Freezer space available in sample restaurants, Milwaukee, Wis., January 1957

Restaurant size	Median	Range
	Cubic feet	Cubic feet
Small	31	4 - 1,200
Medium	63.5	5 - 2,000
Large	172	12 - 7,238
All	50	4 - 7,238

Table 13.--Restaurant operators' replies to question whether or not dehydrofrozen peas would be of any value in conserving storage space, Milwaukee, Wis., January 1957

Type of peas used	Yes	No	Total
	Number	Number	Number
Frozen	18	3	21
Canned	29	19	48
Other	22	9	31
Total	69	31	100

As expected, the percentage of respondents who stated that dehydrofrozen peas would be valuable in conserving freezer space was greater among the users of frozen peas. Operators of 18 of the 21 restaurants using frozen peas exclusively said the new product would be of decided value in conserving freezer space. The three restaurant operators who felt that dehydrofrozen peas would be of little or no advantage in this respect operated large restaurants with a median capacity of 140 cubic feet of freezer space.

Package Size

Peas are most commonly purchased by restaurants in 2½-pound packages. A 2½-pound package of dehydrofrozen peas is equivalent to approximately 5 pounds when reconstituted to normal size. Compared to regular frozen peas, dehydrofrozen peas offer substantial savings in packaging costs, storage and handling, and transportation.

Most restaurant operators serving frozen peas use the 2½-pound package. A few large restaurants were buying them in a 5-pound pack. It was found that 72 of the 100 restaurant owners felt that the most desirable and useful package for dehydrofrozen peas would be the 2½-pound pack. This was true even though they were aware that a 2½-pound package of dehydrofrozen peas

reconstituted to 5 pounds. Table 14 shows a distribution of reasons why restaurant managers felt that various sizes of packages were best suited for their needs. The preference for the 2½-pound pack was much stronger than for smaller packages.

Table 14.--Reasons why restaurant managers thought various package sizes most suitable for dehydrofrozen peas, Milwaukee, Wis., January 1957

Reason	5-pound package	2½-pound package	1-pound package	Miscellaneous 1/	Total
	Number	Number	Number	Number	Number
Just right size for needs	8	50	1	0	59
More economical	2	6	0	0	8
Cook more often, smaller quantity, fresher	0	5	4	6	15
This size equals 5 pounds frozen	0	4	0	0	4
Smaller, more convenient	0	5	0	0	5
Saves time	2	0	0	0	2
Portion control	0	0	1	1	2
Lack of freezer space	0	0	2	0	2
Miscellaneous or don't know	0	2	0	1	3
Total	12	72	8	8	100

1/ Sizes range from 10 ounces to 2 pounds.

Price

Information was collected to determine the price at which dehydrofrozen peas would have to sell in order to compete with other forms of peas. An analysis of the prevailing prices for frozen and canned peas was made, and restaurant owners were asked the price they would be willing to pay for dehydrofrozen peas.

Prices paid for frozen peas ranged from 15 cents to 30 cents a pound, and the average was 24 cents. Prices paid for canned peas ranged from 8 cents for bent and unlabeled cans to 25 cents, and the average was slightly over 15 cents per pound on a gross-weight basis, including the weight of the liquid (table 15).

Restaurant managers serving frozen peas indicated a willingness to pay an average price of 27 cents per pound for dehydrofrozen peas on a reconstituted basis, or about 3 cents per pound over their current price for frozen peas. Studies made at the Western Regional Research Laboratory indicate

that a net reduction in delivered cost of at least 2 cents per pound may be achieved by using dehydrofrozen in place of frozen peas under commercial conditions.

Table 15.--Average prices paid by users of frozen and canned peas and average indicated price they would be willing to pay for dehydrofrozen peas on a reconstituted basis, Milwaukee, Wis., January 1957

Type of users	Were paying per pound for peas	Would pay per pound for dehydrofrozen peas	Actual increase	Percentage increase
	Cents	Cents	Cents	Percent
Frozen	24.0	27.2	3.2	13.3
Canned	1/15.2	22.0	6.8	44.7
All	19.1	24.2	5.1	26.7

1/ This price was computed on the basis of total can contents which, according to the National Canners Association, includes about 30 percent liquor.

Those restaurants serving canned peas, and therefore assumed to be more price-conscious, reported a willingness to pay 22 cents for dehydrofrozen peas on a reconstituted basis, or almost 7 cents above the average price paid for canned peas on a gross-weight basis.

Actually, on a drained-weight basis (70 percent of can contents), restaurant operators were paying an average price of 21.8 cents per pound for canned peas. Therefore, canned peas offer less price advantage than the gross-weight price would indicate. However, the difference between the gross-weight price for canned peas and the price for dehydrofrozen peas on a reconstituted basis reflects more adequately the quality advantages attributed to the new product by restaurant operators.

When the average prices were broken down by size of establishment, it was found that the groups willing to pay the highest premium for dehydrofrozen peas were medium-sized restaurants using frozen peas and large restaurants serving canned peas (tables 16 and 17).

Table 16.--Average prices, by size of restaurant, paid by users of frozen peas and average indicated price they would be willing to pay for dehydrofrozen peas on a reconstituted basis, Milwaukee, Wis., January 1957

Size	Were paying per pound for peas	Would pay per pound for dehydrofrozen peas	Increase
	Cents	Cents	Cents
Small	23.4	24.8	1.4
Medium	23.9	29.4	5.5
Large	24.6	25.6	1.0

Table 17.--Average prices, by size of restaurant, paid by users of canned peas and average indicated price they would be willing to pay for dehydrofrozen peas on a reconstituted basis, Milwaukee, Wis., January 1957

Size	Were paying per pound for peas	Would pay per pound for dehydrofrozen peas	Increase
	Cents	Cents	Cents
Small	1/14.7	19.9	5.2
Medium	1/15.6	22.3	6.7
Large	1/14.6	23.2	8.6

1/ Gross-weight basis, including liquid.

APPENDIX

Following are the questionnaires used in making the study of use of peas in restaurants in Milwaukee:

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Washington 25, D. C.

Budget Bureau No. 40-5676.1
Approval expires 12-31-56

RESTAURANT ACCEPTANCE OF DEHYDROFROZEN PEAS IN MILWAUKEE, WISCONSIN

Schedule No. I

CHARACTERISTICS OF RESTAURANTS

Date _____ Interviewer _____

1. Name of establishment _____

   Address _____

2. Person interviewed _____

   Position _____

3. Cooperator: Yes ☐ No ☐ If no, discontinue the interview.

4. Type of establishment:

   Cafeteria _____

   Hotel dining room _____

   Restaurant _____

   General _____

   Specialty _____

   Type of specialty _____

5. How many of your employees are involved in preparing and serving food?

   _____

6. What was the average number of meals served per day last week?

   Breakfast _____ Lunch _____ Dinner _____

7. Are you open 7 days a week? Yes ☐ No ☐

   If no, on what day(s) are you closed? _____

8. How many days each week are peas served as a vegetable? _____

   (Do not consider mixed vegetables, salads, and other uses of peas.)

9. On the average, how many pounds of peas do you serve as a vegetable each week? _____ Pounds

10. Of the peas you serve, what proportion is canned? _____ Percent

    Frozen? _____ Percent Other (specify) _____ Percent

11. Why are you using this/these types? _____

    _____

12. What brand and grade of peas do you usually purchase? _____

    _____

13. What determines the brand and grade purchased? Price _____

    Availability _____ Quality _____ Other (specify) _____

If frozen peas are used:

14. Are they delivered to you? Daily _____ Biweekly _____

    Weekly _____ When needed _____ Other (specify) _____

15. In what size package do you usually purchase frozen peas? _____ Pounds

16. How much freezer space do you have? _____ Cubic feet

17. Could you make good use of additional space? Yes ☐ No ☐

18. If yes, in what ways? _____

    _____

19. How much of your freezer space is generally used to store peas?

_____ Cubic feet

20. What type of cooking utensil is used for cooking peas? _____

21. What size cooking utensil is used for cooking peas? _____

22. How many pounds of peas do you cook at one time? _____ Pounds

23. Are peas kept on a steam table until they are served? Yes ☐ No ☐

If yes, how long? _____

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Washington 25, D. C.

Budget Bureau No. 40-5677.1
Approval expires 3-31-57

RESTAURANT ACCEPTANCE OF DEHYDROFROZEN PEAS IN MILWAUKEE, WISCONSIN

SCHEDULE II

ATTITUDES AND OPINIONS OF RESTAURANT MANAGERS

Date _____ Interviewer _____

1. Name of establishment _____

Address _____

2. Person interviewed _____

Position _____

3. How many times did you serve dehydrofrozen peas during the last week?

_____

PRODUCT CHARACTERISTICS OF DEHYDROFROZEN PEAS:

4. When I talked to you before you told me you regularly serve _____

peas. Is that correct? Yes ☐ No ☐

5. If no, what do you serve? _____

6. Do you feel that the additional work of preparing dehydrofrozen peas for cooking is an important drawback to their use? Yes ☐ No ☐

7. Why? _____

_____

8. After the peas were cooked, did you notice any difference between the appearance of _____ peas and dehydrofrozen peas? Yes ☐ No ☐

9. If yes, what differences did you notice? _____

_____

_____

10. Compared to _____ peas, do you think dehydrofrozen peas will stand on the steam table longer ☐, not as long ☐, same time ☐?

11. Why do you think this? _____

_____

CUSTOMER REACTION:

12. Did you notice any customer reaction to dehydrofrozen peas? Yes ☐ No ☐

13. If yes, what reaction did you get? _____

_____

PRODUCT IMPROVEMENT:

14. What suggestions do you have for improving the acceptability of dehydrofrozen peas? _____

_____

_____

STORAGE AND HANDLING:

15. Do you have sufficient freezer space for the frozen foods you are now using? Yes ☐ No ☐

16. Would dehydrofrozen peas be of any value to you in conserving storage space? Yes ☐ No ☐

17. If no, why not? _____

_____

18. What size package do you think would be most suitable for dehydrofrozen peas? _____

19. Why do you think this? _____

PRICE:

20. What price per pound are you now paying for _____ peas?

_____ Per pound

21. Considering the present price of peas, what would the price per pound have to be in order for you to use dehydrofrozen peas?

_____ Per pound

Comments: _____

_____

_____

_____

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