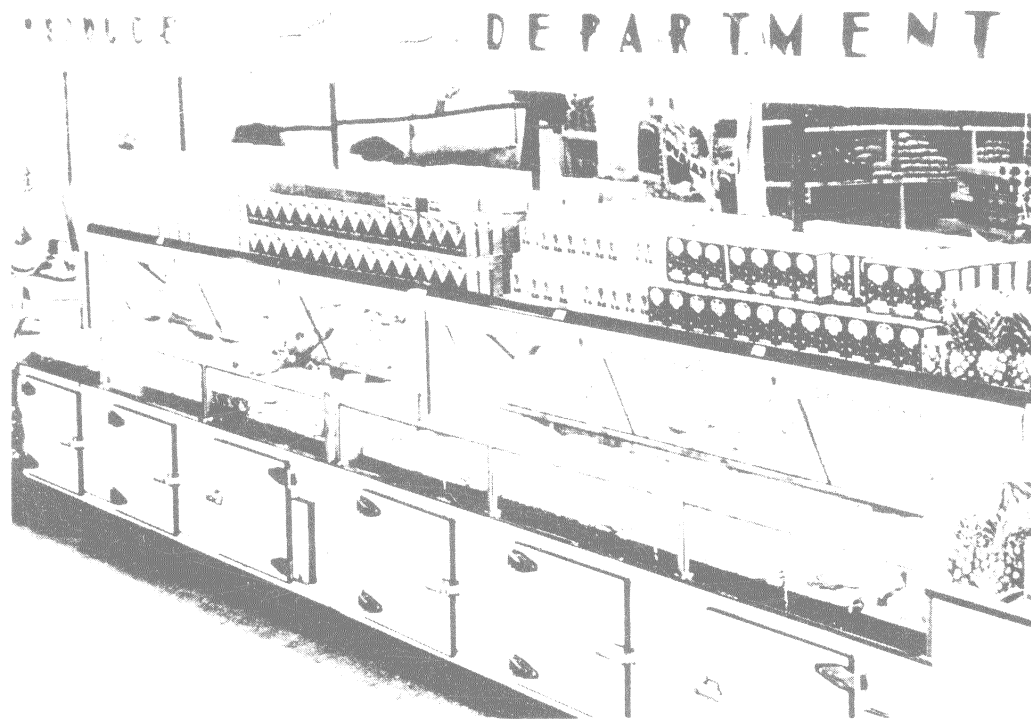


# Prepackaged Produce Requires High Quality Standards and Good Retail Management

by

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and  
Good Retail Management

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INTRODUCTION

Every retail merchandising innovation, before achieving wide commercial adoption, must be proved by practical testing in the crucible of public opinion. Acceptance by consumers finds expression in terms of sales volume, prices, turnover rates, repeat sales. If the goods or services offered are to continue to enjoy a market they must continue to give satisfaction to buyers and to yield a suitable margin of profit to sellers in the face of competition.

"Prepackaged" fresh (unprocessed) fruits and vegetables are undergoing trial at retail under a variety of conditions. Prepackaged items usually are defined as standard goods that have been trimmed and washed ready for kitchen or table use, and then have been packed in sealed, transparent, branded consumer units, labeled with quantity and retail price. To illustrate, carrots are said to be prepackaged when the tops have been removed and one or two bunches of the roots are placed in a bag of cellophane, lumarith, pliofilm or other transparent film. Tomatoes are prepackaged by placing 3 to 5 fruits in a paperboard tray, overwrapped with a transparent film and sealed. Cauliflower is prepackaged when the stems and leaves are removed and the edible curd or flower bud, either whole or segmented, is packed in a transparent bag or overwrapped paperboard tray. Usually prepackaged fresh fruits and vegetables are offered at retail in open top, mechanically refrigerated, self service type display cases.

Though packaged in small units, these are still the same products they were when the grower harvested them. The product offered to the housewife may be somewhat different from the customary bulk form -- as cauliflower, where all rather than part of the stem and leaves has been removed before retail display. But it must be remembered that no change in the character or composition of the edible parts takes place. The cauliflower or the topped carrots or the husked sweet corn or the trimmed and washed spinach remains a raw, unprocessed, unmanufactured agricultural product, just as it was before the inedible or unwanted parts were removed. The grower, shipper, packer or distributor merely has simplified for the consumer the problems of trimming, washing and waste disposal through prior removal of excess leaves, tops, husks and stems, that would later have been removed by the housewife had she purchased the goods in their usual bulk form.

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Assistance in collecting and analyzing the information contained in this report was given by James E. Bryan, John J. Crawford, Wilbur Lenox, Loyd C. Martin, and Holland F. Patterson. Cooperation of the participating retailers also is gratefully acknowledged.

Substantial quantities of fresh produce now are being offered and sold in this manner, and the practice is growing. One of the largest corporate chain food companies in the country is shifting gradually from bulk offerings to prepackaged self service fruits and vegetables. Other chains and many independent packers, shippers, jobbers and retailers are packaging and selling fresh produce in amounts varying from one specialty item to a full line of merchandise. A leading association of growers on the west coast and another important group of shippers in Florida have been experimenting on a commercial scale with prepackaged shipments from these distant points of origin to markets in the east and midwest. In Ohio commercial packers are operating in Cincinnati, Columbus, Cleveland, Toledo and elsewhere, and in addition several fruit and vegetable growers are engaged in consumer packaging on their farms.

A great deal of scientific research is under way in this field for the purpose of promoting improvements and economies and to bring benefits to the industry and to society as promptly as possible. As a measure of the growing interest in the technology and the economic significance of consumer packaging of perishable foods, it may be noted that a long established publishing company began publication in September, 1947 of a new monthly trade periodical dealing exclusively with this subject.<sup>1/</sup>

Though commercial pioneering in prepackaging of fresh fruits and vegetables may have received somewhat more emphasis in Columbus than elsewhere, nevertheless that stage has passed. Prepackaging now has developed in many communities into a factor of importance in the distribution of perishable foods.

In many respects the situation in Columbus now may be thought of as typical. For example, several jobbing houses are engaged in prepackaging of one or more produce items. One special vegetable packing company offers a fairly extensive line of prepacked items to retailers and restaurants. A corporate chain grocery company has been developing gradually since 1944 a program of self service in the produce departments in the supermarkets served from its warehouse in Columbus. Most of its prepackaged items are prepared in the local wholesale warehouse of the company, but some are purchased from other packers and shippers. This company charges no premium for prepackaged products, but offers them at retail at the same prices as identical bulk goods.

Consumer acceptance of prepackaged produce in that central Ohio market was subjected to study, and certain of the results are reported herein. Though the financial outcome ultimately will be determined at the cash register, results in terms of returns and costs are left for consideration in other studies. The present inquiry dealt only with the opinions of consumers and the reasons therefor.

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<sup>1/</sup> Pre-Pack-Age, American Trade Journals, Inc., 124 West Fourth Street, Los Angeles, California.

OPINIONS OF CONSUMERS

A previous study<sup>2/</sup> - revealed that in December, 1945 when 482 representative patrons of 5 of these retail stores were given opportunity to express opinions about this form of merchandising fresh fruits and vegetables, 86 in 100 indicated a preference for prepackaged, refrigerated self-service over conventional bulk displays, not refrigerated, when available at the same prices. Longer experience and increased familiarity of these patrons with prepackaged perishables were accompanied by significantly greater acceptance.

Five months later, in May, 1946, the study was repeated with 261 patrons of 5 other stores under similar conditions. Of these consumers, 84 in 100 expressed a preference for prepackaged goods, about the same as in the preceding inquiry. The difference seems negligible and probably is of no significance. This group, however, indicated less acceptance of prepackaging among those with more than 6 months familiarity than among those with briefer experience, a less encouraging result than in the earlier inquiry. See Table I.

Table I. Preferences of Two Groups of Consumers with Respect to Retail Offerings of Fresh Fruits and Vegetables, Columbus, Ohio, December, 1945 and May, 1946

No. of months experience with prepackaged re- frigerated self- service	Patrons expressing opinions					
	Preferring prepackaged refrigerated self-service				Total	
	Dec. 1945		May 1946		Dec. 1945	May 1946
	Number	Pct. of Total	Number	Pct. of Total	Number	Number
Less than 1	22	73.3	8	80.0	30	10
1 - 6	277	85.2	113	86.3	325	131
More than 6	117	92.1	100	83.3	127	120
Total	416	86.3	221	84.7	482	261

Opinions of both groups of patrons preponderantly favored prepackaging. Those who preferred prepackaged produce preferred it for these reasons, ranked in the order of frequency with which they were mentioned:

- (1) Packaged food is more sanitary
- (2) It has better quality and appearance
- (3) Self-service speeds shopping
- (4) Produce keeps fresh longer
- (5) It stores more readily
- (6) Preparation and waste disposal are simplified, and
- (7) Packaged goods are more convenient to handle.

<sup>2/</sup> "Housewives Prefer Prepackaged Produce", Ohio Agricultural Experiment Station Bi-Monthly Bulletin Vol. XXXI No. 240, May- June, 1946, pp 76-88.

The results of these two inquiries cast some doubt, however, on the continuation of this degree of popularity. Why did 15 persons in 100 still prefer bulk, non-refrigerated fruits and vegetables and service by clerks after months of experience with prepackaged, refrigerated self-service, when prepackaged goods were offered at the same prices as identical bulk goods? Did those who favored prepackaging do so unqualifiedly, and if not, what were the reasons for their reservations?

Some light is shed on these questions by examining the criticisms voiced by these two groups. See Tables II and III.

Table II. Criticisms of Prepackaged Refrigerated Self-Service of Fresh Fruits and Vegetables, stated by 209<sup>1/</sup> Consumers, Columbus, Ohio, December, 1945

Criticism	No. of times mentioned	Percent of		
		total number of criticisms (246)	number of patrons criticising (209)	total number of patrons replying (482)
Some packaged units are too large	103	41.9	49.3	21.4
Quality of packaged produce not entirely dependable	93	37.8	44.5	19.3
Visibility not adequate to permit wise selection	21	8.5	10.0	4.3
Some packaged units are too small	10	4.1	4.8	2.1
Moisture condensation on wrappers undesirable	8	3.3	3.8	1.7
Packaged produce is more expensive	7	2.8	3.3	1.5
Miscellaneous minor criticisms	4	1.6	1.9	.8
Total	246 <sup>2/</sup>	100.0	XXX	XXX

<sup>1/</sup> Of these 209 patrons 146 (69.9%) preferred prepackaged over bulk offerings despite these stated criticisms.

<sup>2/</sup> Since some patrons stated more than one criticism, the number (246) exceeds the number of patrons criticising (209).

Table III. Criticisms of Prepackaged, Refrigerated Self-Service of Fresh Fruits and Vegetables, stated by 117<sup>1/2</sup> Consumers, Columbus, Ohio, May, 1946

Criticism	Number of times mentioned	Percent of		
		total number of criticisms (151) (pct)	number of patrons criticising (117) (pct)	total number of patrons replying (261) (pct)
Quality of packaged produce not entirely dependable	81	53.7	69.2	31.0
Some packaged units are too large	52	34.4	44.4	19.9
Visibility not adequate to permit wise selection	7	4.6	6.0	2.7
Some packaged units are too small	6	4.0	5.1	2.3
Miscellaneous minor criticisms	5	3.3	4.3	1.9
Total	151 <sup>2/</sup>	100.0	XXX	XXX

1/ Of these 117 patrons 79 (67.5%) preferred prepackaged over bulk offerings despite these stated criticisms.

2/ Since some patrons stated more than one criticism, the number (151) exceeded the number of patrons criticising (117).

Especially noteworthy was a growing lack of consumer confidence in the quality and freshness of prepackaged produce. This was mentioned more frequently than any other cause for criticism. Of the first group of patrons consulted 19 in 100 claimed to have found the quality and freshness not always dependable. Of the second group consulted 5 months later the number had risen to 31 in 100, a rise of 60 percent. Though no significant difference was apparent in the majority favoring prepackaged produce (about 85 in 100 in both groups), nevertheless in the second inquiry a much larger proportion of patrons was accepting it with reservations about the quality.

OBSERVATIONS IN 1946 AND 1947

In view of this threatened decline in consumer acceptance an investigation was made to determine the validity of these criticisms of the quality of the offerings, and to suggest remedies.

Prepackaged produce was observed at two-day intervals in 10 Columbus stores over a 6 weeks period in 1946 (July 15 through August 24), and again in the same stores over one 3 weeks period and one 5 weeks period in 1947 (June 23 through July 12 and August 18 through September 20).

In the 1946 observations five stores were visited each Tuesday, Thursday and Saturday; the other five stores were visited each Monday, Wednesday and Friday, and occasionally on Saturday. In the first period in 1947 daily visits were made to each of the 10 stores. In the second period in 1947 each store was visited 3 times weekly at irregular intervals.

On each visit every prepackaged consumer unit of perishable produce offered for sale (not including reserve stocks not displayed) was subjected to critical examination to ascertain its quality, insofar as possible without opening the package. Handling, display and pricing practices were noted, and the packaged age of each package and the source or place where the packaging took place were recorded where known.

Observations did not include packaged potatoes, dry onions or nuts, though these were stocked in very large quantities. These less perishable commodities were restocked less frequently, and as a consequence observations of these packages would have been certain to contain unavoidable duplications, and therefore would have been misleading. Moreover, being packaged for the most part in non-transparent containers, the quality and condition of these items could not be appraised with accuracy without opening the package.

Nor did the observations include produce displayed in bulk either in these stores or elsewhere in Columbus. Consequently, no comparisons were possible between the quality of packaged and nonpackaged offerings of these items in that market at the time of the study.

Obviously no packaged produce item in any market can be of better quality or fresher than the bulk conventional goods from which it was packed. Pre-packaging cannot be expected to improve the original quality of the produce, but only to help in maintaining its quality and prolonging its freshness. In this study no attempt was made to measure the quality and condition of the conventional wholesale shipments arriving in Columbus, from which were supplied the bulk offerings and much of the packaged offerings available in the retail stores in that city at that time.

An unknown but small amount of duplication may exist in the number of packages recorded. Although duplications probably were minor since turnover rate was rapid and observations occurred every other day or at irregular intervals, nevertheless it is practically certain that not all packages observed on any given day were disposed of and replaced by the time of the next observation.



SOURCES

During the 1946 test period 119,740 packages were observed, and in the two 1947 test periods, 157,517. In 1946 the sources of 83,187 or about 70 percent of the consumer units observed in that year were ascertained and recorded. Sources were not recorded for the first ten days of that period. In 1947 sources were determined on all packages observed. These are shown in the Appendix, Tables A & B.

Of the packages with known sources in 1946 a chain store packing house in Columbus supplied 68,434 or 82.3 percent. 11,903 or 14.3 percent were packed in the retail stores, and 2850 or 3.4 percent came from growers or other packers. Of the packages observed in 1947 the chain store packing house supplied 134,583 or 85.4 percent, 10,383 or 6.6 percent were packed in the retail stores, and 12,551 or 8.0 percent came from growers or other packers. It will be noted that the chain store packing house was furnishing about the same proportion of the total in both years, but that substantially larger quantities were being purchased from growers and other packers and less packed in the retail stores in 1947. The number of items purchased in part or entirely from growers or other packers increased from 2 in 1946 to 12 in 1947, and the proportion of the whole more than doubled.

QUALITY AND CONDITION

Quality and condition were expressed in terms of an arbitrary system of grading adopted for this special purpose. Simple specifications were set up to reflect as nearly as possible good commercial standards, based on the relative appearance and utility of the units of packaged produce on display. Three classifications were defined as follows:

- Grade A - good quality produce, fresh, acceptable in every respect;
- Grade B - produce not so acceptable, somewhat deteriorated, wilted or otherwise inferior, but still salable, though perhaps at some reduction in price; and
- Grade C - produce no longer acceptable to consumers, not usable or partly usable only after severe sorting and reconditioning.

Because of the possibilities of a few duplications described earlier, an occasional package may have been recorded as Grade A, and then if remaining unsold and still on display at the time of the next observation it may have appeared in the records as a Grade B or Grade C unit. Accuracy of the records as a reflection of the quality and condition of the offerings available to consumers in these stores day by day throughout the study was not affected.

The quality and degree of freshness of the prepackaged fruits and vegetables displayed in these 10 stores, as expressed by the grade designations described above, are set forth in the Appendix, Tables C and D, by stores, and Tables E and F, by commodities.

Substantial amounts of Grade B merchandise and even some Grade C goods were found in every store in 1946. About 13 packages in 100, on the average, were not up to an acceptable commercial standard of quality and freshness.

Sharp differences were noted in the percentages of these lower grades found in the different stores, varying from approximately 7 to 16 packages in 100. Even the smaller of these amounts would seem to reflect some lack of care in the produce departments to see that produce was moved while still fresh, or when beginning to show evidence of deterioration was promptly reconditioned, separated from good merchandise and reduced in price for quick sale, or otherwise disposed of in such a way as not to affect the attractiveness or salability of the remainder.

Differences in the size of the produce operation were accompanied by no observable differences in the quality of the produce offered. Three of these stores, No.'s 1, 4 and 7, had on display during the 1946 period of observation fewer than 10,000 packages per store. Five stores, No.'s 2, 5, 6, 8 and 9, displayed more than 10,000 but less than 13,000 packages. Two stores, No.'s 3 and 10, displayed over 16,000 packages. No significant differences were found in the percentages of off-grade produce available in any one of these groups as compared to the others. It may be concluded, therefore, that the size of the operation had less to do with these results than did other factors. Presumably a very influential element was the personnel responsible for the operation.

Much less off-grade produce was found in the 1947 observations. Only 4 packages in 100, on the average, were below standard, and less than 6 in 100 were found in any store. The amount of Grade C was negligible.

This marked improvement probably is traceable primarily to better management and to a growing realization that packaging and refrigeration of retail display cases cannot be expected to convert fresh fruits and vegetables into non-perishable merchandise. There may have been a greater awareness among these retailers in 1947 that fresh fruits and vegetables are delicate, living organisms, even after they have been separated from the parent plant, that they are quick to deteriorate and decay even after they have been protected from bruising and other physical damage and from unfavorable atmospheric conditions by packaging and retail refrigeration. In 1947 these merchants may have discovered to a greater extent than in 1946 that constant, painstaking, intelligent care and frequent replenishment are required by every retail display of produce, packaged or not, if freshness is to be maintained and consumers satisfied. In this connection it may be significant that the same 3 stores (No.'s 3, 6 and 7) led in that order both years in terms of percent of Grade A goods offered.

Another element in the improvement was the changes that took place in the preparation and packing methods employed on a few commodities. For example, radishes in 1946 were packed in a local packing house from conventional wholesale shipments. Bunches were transferred to transparent bags, the tops not trimmed or trimmed only slightly. In 1947 most of the radishes observed were purchased from a northern Ohio grower who packed them in transparent bags at the farm. Each bag held the equivalent of about 2 standard bunches, but the tops and feeder roots were removed before packing. Yellowing of the tops and shriveling of the roots were much more apparent before this packing method was changed. The proportion of first quality radishes on display rose from 76 percent in 1946 to 97 percent in 1947.

Some additional light is thrown upon the comparative susceptibility of various types of produce to damage and deterioration under these conditions by classifying these grade observations into commodity groups, as set forth in Table IV. The figures in that table are composites of the periods of observation in both years.

It will be noted that larger proportions of off-grade produce, over 9 percent, were found among the green and leafy vegetables than in any other group, disregarding the minor items classified herein as "Miscellaneous". At the other extreme, less than 3 percent of the cut vegetables showed decline in quality and freshness. This unexpectedly low percentage may have been influenced by the relatively small number of packages in this class, made up of shredded vegetables and potatoes (french fries), and the fact that none were recorded until 1947, when quality standards throughout seem to have risen. About the same proportions of packages with off-grade contents were apparent in citrus fruits, deciduous fruits and root crops, all showing 6 or 7 percent.

The amounts of these respective classes of produce offered in consumer unit packages in these 10 stores during these periods of observation are shown also in Table IV. Green and leafy vegetables made up almost half of the total, 41.1 percent. Citrus fruits were next in order of magnitude, 28.2 percent. Then in order came deciduous fruits, 15.6 percent, root crops, 12.0 percent, and cut vegetables, 3.0 percent.

Table IV. Grades of Prepackaged Fresh Fruits and Vegetables Offered in  
10 Retail Stores, Columbus, Ohio, 6 Weeks, 1946 and 8  
Weeks, 1947, by Commodity Groups

Commodity group	Packages Observed		Grade A		Grade B		Grade C	
	Number	Pct. of total	Number Packages	Pct.	Number Packages	Pct.	Number Packages	Pct.
Citrus fruits	78,117	28.2	72,576	92.91	5,534	7.08	7	.01
Deciduous fruits	43,242	15.6	40,278	93.14	2,949	6.82	15	.04
Green & leafy vegetables	113,849	41.1	103,361	90.79	10,375	9.11	113	.10
Root crops	33,329	12.0	31,259	93.79	1,970	5.91	100	.30
Cut vegetables	8,492	3.0	8,244	97.08	245	2.89	3	.03
Miscellaneous	228	.1	108	47.37	119	52.19	1	.44
Total	277,257	100.0	255,826	92.3	21,192	7.6	239	.1

Source: Appendix Tables E and F.

or  Grade A, standard quality and condition, or better  
 Grades B and C, substandard quality and condition

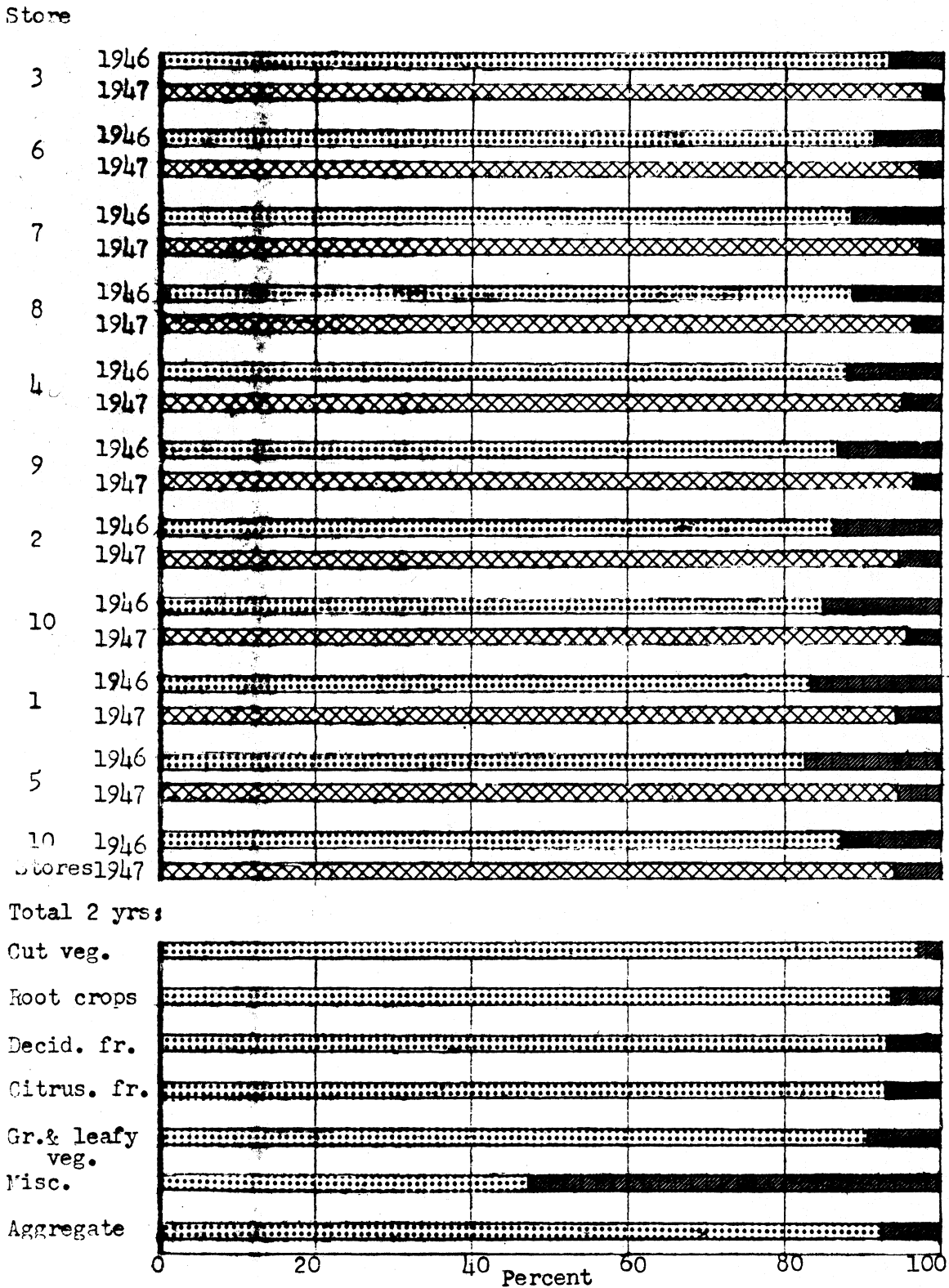


Fig. 1. Grades of Prepackaged Produce in 10 Retail Stores, Columbus, Ohio,  
 by Stores and Commodity Groups, as Percent of Total,  
 6 Weeks, 1946 and 8 Weeks, 1947

PACKAGED AGE

The age of each dated package was expressed as the number of days elapsed since the item was packaged, including time both before and after delivery to the retail store. The packing date was ascertained insofar as possible from the coded date appearing on the label of each machine-wrapped package. Since many items were packaged by hand in the local wholesale packing houses and to a less extent also in the stores, and therefore were not stamped automatically with the date as when machine-wrapped, and since some items were purchased in prepackaged form from growers and other packers outside Columbus, their age at the time of observation could not be determined.

Of the 119,720 packages observed in 1946, only 38,418 or about 32 percent were dated. Of 157,517 packages observed in 1947, only 46,392 or about 29 percent were dated. Calculations herein with respect to the packaged age of the produce are based solely on the dated packages. The data appear in the Appendix, Tables G and H, by stores, and Tables I and J, by commodities.

Obviously a given package may have been recorded as a 1 day old unit on one occasion, as a 3 days old unit if remaining unsold and on display two days later, as a 5 days old unit in another two days, and so on. The purpose of these observations was to record the ages of the packaged items on display at the times the stores were visited, as a reflection of the freshness of the goods available to patrons at those times.

In 1946 almost 30 of these packages in 100 were more than 2 days old, 13 were more than 3 days old, and 6 were more than 4 days old. Some had been packaged as long as a week and 1 percent even longer - as much as two weeks. The average age exceeded 2 days.

Weighted average ages were not uniform among the 10 stores, varying from a low of 1.90 days in Store No. 8 to a high of 2.46 days in Store No. 5. Though the differences seem small, they become more meaningful when expressed in hours. It then is realized that 1.90 days is the equivalent of  $45\frac{1}{2}$  hours and 2.46 days equals 59 hours, or a difference of  $13\frac{1}{2}$  hours. Exposure of fresh produce to the unfavorable atmospheric conditions commonly found in the usual grocery store and to the physical damage associated with a busy produce department for  $13\frac{1}{2}$  hours longer in one store than in another is likely to make a great difference in the freshness of quality of the goods. These age differences, therefore, serve as an enlightening index to the display and merchandising practices employed in these stores.

As may have been expected, age and grade were closely related. In general, the stores that held the produce longest were offering the poorest quality. The 5 leading stores in terms of highest quality (No.'s 3, 6, 7, 8 and 4) also led, though not in this exact order, in terms of shortest average age of the packages displayed. Compare Appendix Tables C and G.

In 1947 some improvement in packaged age was noted. About 24 packages in 100 were more than 2 days old, 11 were more than 3 days old, and 5 were more than 4 days old. The average age was slightly less than 2 days. Almost the same close relationship between age and quality was apparent as in 1946. Compare Appendix Tables D and H. Of the 5 leading stores in terms of quality (No.'s 3, 6, 7, 9 and 8) four were among the first five in terms of shortest

average age of the packages (No.'s 8, 4, 7, 6 and 3). Weighted average age varied from a low of 1.52 days or 36½ hours in Store No. 8 to a high of 2.43 days or 58 1/4 hours in Store No. 2.

The weighted average age in the entire group of 10 stores improved slightly from 2.13 days or 51 hours in 1946 to 1.92 days or 46 hours in 1947. This represented a gain of 5 hours, or 10 percent shorter span in 1947 than in 1946.

Of the 5 classes of merchandise recorded in Tables IV and V, grade was in inverse ratio to age - that is, the lower the percentage of packages more than 1 day old the higher the percentage of Grade A. The longer life expectancy of citrus and deciduous fruits, however, became apparent after 3 days. These two classes had far more packages over 3 days, over 4 days, and even over 5 days old than any of the other classes, yet as expected their quality was maintained substantially better than that of green and leafy vegetables.

The 1946 and 1947 age records combined appear in Tables V in actual numbers of packages observed and in Table VI in percentages.

Table V. Packaged Ages (in Days) of Prepackaged Fresh Fruits and Vegetables Offered in 10 Retail Stores, Columbus, Ohio 6 Weeks 1946 and 8 Weeks 1947 by Commodity Groups

Commodity Group	Number of Units Observed									Total
	1 Day	2 Days	3 Days	4 Days	5 Days	6 Days	7 Days	More than 7 Days	Age Unknown	
Citrus fruits	131	379	15	-	-	15	100	--	77477	78117
Deciduous fruits	3451	3931	2769	1612	824	834	236	240	29345	43242
Green & leafy veg.	31440	15900	7853	3340	1268	469	170	61	53348	113849
Cut vegetables	504	178	44	15	6	3	2	--	7740	8492
Root crops	4112	2618	1345	507	260	96	51	31	24309	33329
Miscellaneous	--	--	--	--	--	--	--	--	228	228
Total	39638	23006	12026	5474	2358	1417	559	332	192447	277257
Percent	14.30	8.30	4.34	1.97	.85	.51	.20	.12	69.41	100.00

Source: Appendix Tables I and J.

Table VI. Number of Packages of Different Packaged Ages Observed in 10 Retail Stores, Columbus, Ohio, 6 Weeks 1946 and 8 Weeks 1947 by Commodity Groups, in Terms of Percentage of Number of Packages of Known Age

Commodity Group	1	2	3	4	5	6	7	More than	Total of	
	Day	Days	Days	Days	Days	Days	Days	7 days	No.	Pct.
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.		
Citrus fruits	20.47	59.22	2.34	-	-	2.34	15.63	-	640	100.0
Deciduous fruits	24.83	28.29	19.92	11.60	5.93	6.00	1.70	1.73	13897	100.0
Green & leafy veg.	51.97	26.28	12.98	5.52	2.10	.77	.28	.10	60501	100.0
Root crops	45.59	29.03	14.91	5.62	2.88	1.06	.57	.34	9020	100.0
Cut vegetables	67.02	23.67	5.85	1.99	.80	.40	.27	-	752	100.0
Total	46.74	27.13	14.18	6.45	2.78	1.67	.66	.39	84810	100.0

Source: Table V.



Packaged Age  
(days)

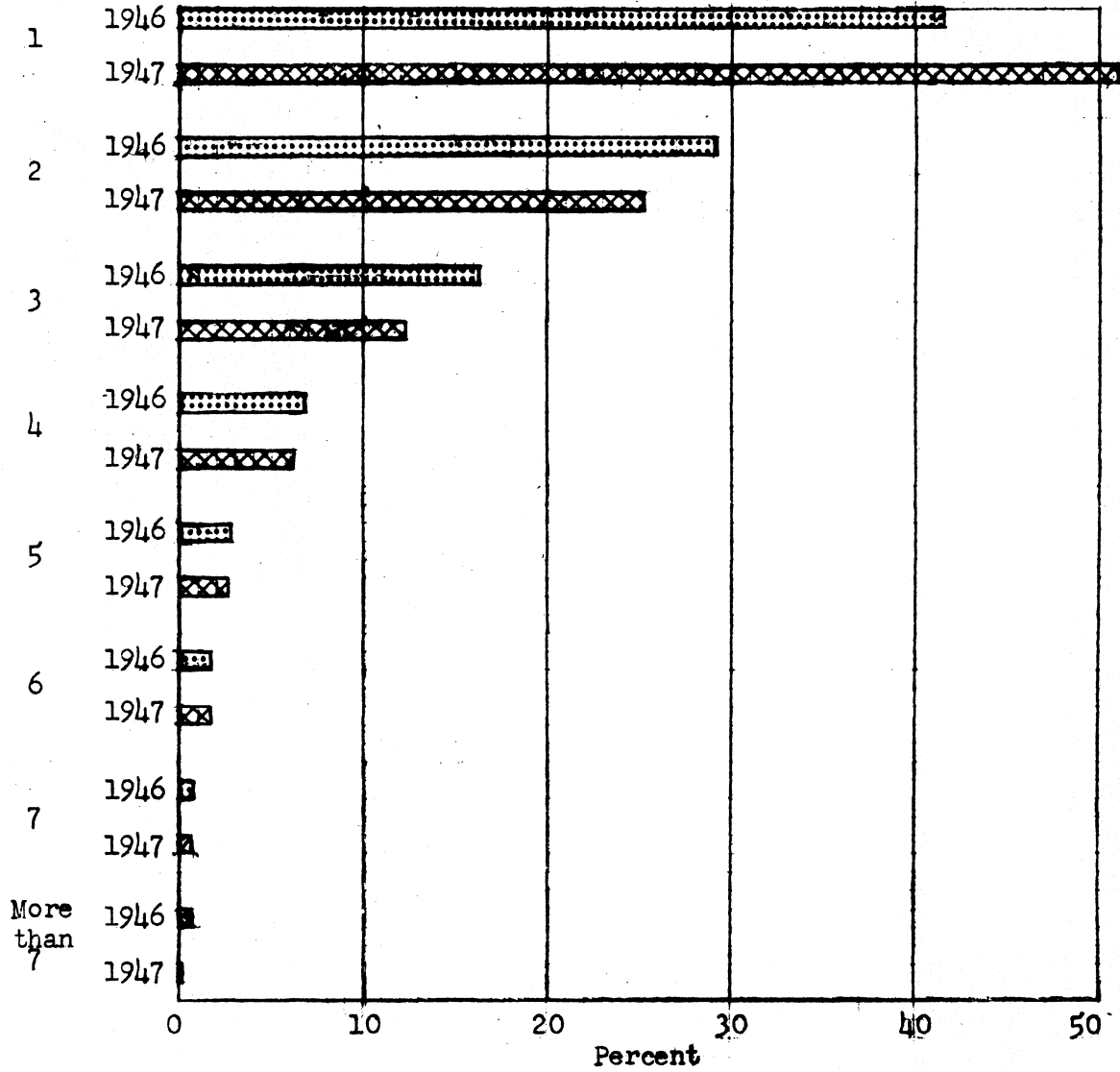


Fig. 2. Packaged Ages of 84,810 Consumer Units of Prepackaged Produce (38,418 in 6 Weeks, 1946 and 46,392 in 8 Weeks, 1947) in 10 Retail Stores, Columbus, Ohio, as Percent of Number of Packages of Known Age.

PRICES OF OFF-GRADE ITEMS

The packages identified as Grade B or C, 15,073 in 1946 and 6,358 in 1947, were further classified to reveal to what extent these goods which were not first quality were being offered at first quality prices, were reconditioned and reduced in price, or were reduced but not reconditioned. These data are recorded in Tables VII and VIII.

It will be noted that in 1946 more than 41 percent and in 1947 more than 55 percent of these off-grade items were offered at first quality prices. Grade B and C units seldom were displayed separately unless the deterioration became pronounced or conspicuous, and so long as the price was not reduced their inferiority might readily have escaped detection by customers at the time of purchase.

Opportunity thus was presented for any shopper except the most observant and critical to select a unit the contents of which when unpacked turned out to be inferior and unsatisfactory.

In this light the objections of some patrons to prepackaged perishables become even more understandable. Prepackaging hardly could fail to suffer from lost prestige and consumer confidence when inferior goods are obscured, either deliberately or unintentionally, though in only an occasional package. Especially must prepackaging be discredited when deteriorated goods continue to be offered at the same prices as Grade A.

Though the number of off grade packages observed in 1947 represented a smaller percent of the total than in 1946, yet the tendency to offer these at first quality prices without repacking or reconditioning was relatively more pronounced in 1947. If the percentages appearing in the 4th column in Tables VII and VIII respectively may be taken as a measure of the care used in managing the produce displays in these 10 stores - the lower the percentage figure the better the care - then it is seen how sharply the stores differed in this respect. It will be noted also that only 2 stores, No. 5 and No. 8, made improvements at this point from 1946 to 1947.

Table VII. Extent to Which Deteriorated Prepackaged Fruits and Vegetables were Reconditioned or Offered at Reduced Prices in 10 Retail Stores, Columbus, Ohio, 6 Weeks, 1946.

Store	Total Number Packages of Grades B & C Observed	Offered for Sale at first quality prices <sup>x/</sup>		Prices Reduced			
		Number Packages	Pct.	Reconditioned		Not Reconditioned	
				Number Packages	Pct.	Number Packages	Pct.
1	1635	742	45.38	686	41.96	207	12.66
2	1456	396	27.20	449	30.84	611	41.96
3	1130	638	56.46	346	30.62	146	12.92
4	1059	195	18.41	482	45.52	382	36.07
5	2218	1119	50.45	688	31.02	411	18.53
6	1011	337	33.33	423	41.84	251	24.83
7	1015	108	10.64	355	34.98	552	54.38
8	1333	470	35.26	568	42.61	295	22.13
9	1671	816	48.83	509	35.43	263	15.74
10	2545	1431	56.23	699	27.46	415	16.31
Total	15073	6252	41.48	5288	35.08	3533	23.44

<sup>x/</sup> Not repacked or reconditioned.

Table VIII. Extent to Which Deteriorated Prepackaged Fruits and Vegetables were Reconditioned or Offered at Reduced Prices in 10 Retail Stores, Columbus, Ohio, 8 Weeks, 1947

Store	Total Number Packages of Grades B & C Observed	Offered for Sale at first quality prices <sup>x/</sup>		Prices Reduced			
		Number Packages	Pct.	Reconditioned		Not Reconditioned	
				Number Packages	Pct.	Number Packages	Pct.
1	836	650	77.75	59	7.06	127	15.19
2	840	474	56.43	174	20.71	192	22.86
3	529	354	66.92	82	15.50	93	17.58
4	646	248	38.39	302	46.75	96	14.86
5	808	224	27.72	427	52.85	157	19.43
6	432	199	46.06	209	48.38	24	5.56
7	386	165	42.74	144	37.31	77	19.95
8	504	131	25.99	188	37.30	185	36.71
9	546	425	77.84	62	11.36	59	10.80
10	831	629	75.69	105	12.64	97	11.67
Total	6358	3499	55.03	1752	27.56	1107	17.41

<sup>x/</sup> Not repacked or reconditioned.

DISPLAY POSITION

The position of any given unit in a self service retail display is known to influence the chances of its selection by customers. Units in relatively exposed or readily accessible positions are more likely to be chosen, other factors being equal or not conspicuously different.

In the interest of moving prepackaged produce into the hands of consumers while it remains fresh, it would appear desirable for the retailer to replenish his displays by stocking salable units remaining unsold from the previous day at the front or on top of new receipts. If the older packages remain in a less conspicuous position their sale may be even further delayed, until eventually their contents deteriorate and finally become completely unsalable.

In 1946 almost 1500 separate item displays (commercial lots exposed for sale at retail) of packaged fresh fruits and vegetables were observed in these 10 stores, to determine to what extent older stock was displayed at the front or on top of new. Results appear in Table IX. Display positions of the prepackaged produce observed in 1947 were not recorded.

Of these 1489 displays about 21 percent (1 in 5) contained older stock either indiscriminately mingled with new, or older stock definitely behind or below the new. Two stores (No.'s 10 and 5) contained twice as many displays of this sort (about 42 percent each or 2 in 5) as any of the other stores. At the other extreme, in one store (No. 1) only 6 percent of the displays were found to be of this kind - that is, 94 in 100 of the separate item displays of packaged produce had the older stock in the most accessible and conspicuous positions.

Of the 5 leading stores in terms of highest quality and shortest average age of the produce in 1946, three (No.'s 7, 4 and 3) were among the first 5 in the distribution in Table IX. Likewise on the basis of the combined percentages of displays with older stock in most accessible position and those with old and new stock mingled, three of these stores (No's 4, 8 and 6) were among the first five.

A positive relationship thus is indicated between (1) good practices with respect to display position and (2) short age and high quality.

Table IX. Positions of New and Old Stock in 1489 Item Displays of Prepackaged Fresh Fruits and Vegetables in 10 Retail Stores, Columbus, Ohio, 6 Weeks, 1946, in Order of Percent of Total Displays with Older Stock in Most Accessible Position

Store	Item Displays Observed						
	Total	Older stock in most accessible position		Old and new stock mingled		Older stock in least accessible position	
	Number	Number	Pct.	Number	Pct.	Number	Pct.
1	118	111	94.1	4	3.4	3	2.5
7	155	138	89.0	9	5.8	8	5.2
4	125	111	88.8	11	8.8	3	2.4
9	145	124	85.5	17	11.7	4	2.8
3	171	143	83.6	20	11.7	8	4.7
8	163	135	82.8	23	14.1	5	3.1
2	119	97	81.5	15	12.6	7	5.9
6	169	132	78.1	31	18.4	6	3.5
10	148	86	58.1	36	24.3	26	17.6
5	176	101	57.4	49	27.8	26	14.8
Total	1489	1178	79.1	215	14.4	96	6.5

SUMMARY AND CONCLUSIONS

1. In studies conducted among patrons of several retail food stores in Columbus in 1945 and 1946, prepackaged, refrigerated, self-service fresh fruits and vegetables were found to be favored predominantly over conventional bulk offerings.
2. The preference, however, was accompanied by a growing lack of consumer confidence in the quality and freshness of prepackaged produce in these stores.
3. In view of this threatened decline in consumer acceptance, an investigation was made to determine the validity of consumers' criticisms of the quality of these offerings, and to suggest remedies.
4. During test periods aggregating 6 weeks in 1946 and 8 weeks in 1947 visits were made periodically to 10 retail stores offering prepackaged perishable produce in Columbus. On each visit the quality of every prepackaged unit on display was recorded. Handling, display and pricing practices were noted, and the source and packaged age of each unit were recorded where known. Observations covered 119,740 packages in 1946 and 157,517 in 1947.
5. Green and leafy vegetables made up almost half of the two-year total, 41.1 percent. Citrus fruits were next, 28.2 percent. Then in order came deciduous fruits, 15.6 percent, root crops, 12.0 percent, cut vegetables, 3.0 percent, and miscellaneous items 0.1 percent.
6. A chain store packing house furnished more than four fifths of the packages with known sources in both years. Units packed in the retail stores made up about 14 percent of the total in 1946, declining to less than 7 percent in 1947. Units bought from growers or other packers rose from 3 percent in 1946 to 8 percent in 1947, and the number of items supplied in part or entirely by growers or other packers increased from 2 in 1946 to 12 in 1947.
7. In 1946 about 13 packages in 100 were below standard quality and freshness. In 1947 only 4 in 100 were not up to this standard. Average for the two years was about 8 in 100.
8. Differences in the size of the produce operation were accompanied by no observable differences in the quality of the produce offered.
9. Presumably the personnel responsible for the produce operation in any store was a very influential factor in determining the quality and freshness of the goods offered. The same three stores led both years in terms of the percent of Grade A or commercially acceptable goods offered.
10. Larger proportions of packages containing off-grade produce averaging over 9 percent, were found among the green and leafy vegetables than in any other group. Citrus fruits, deciduous fruits and root crops all showed 6 or 7 percent off-grade.
11. In 1946 almost 30 in 100 packages of known age were more than 2 days old, 13 were more than 3 days old, and 6 were more than 4 days old. Some had been packaged as long as a week and 1 percent even longer - as much as 2 weeks. The average age was 2.13 days or 51 hours.

12. In 1947 some improvement in packaged age was noted. About 24 packages in 100 were more than 2 days old, 11 were more than 3 days old, and 5 were more than 4 days old. The average age was 1.92 days, or 46 hours. This was a gain of 5 hours, or 10 percent shorter span in 1947 than in 1946.
13. A close relationship existed between age and quality.
14. A strong tendency to maintain full retail prices on prepackaged units, after some deterioration was apparent, existed in both years.
15. Inferior units seldom were displayed separately. So long as the price was not reduced their inferiority might readily have escaped detection at the time of purchase, except by very observant and critical shoppers.
16. In many displays old and new stock was mingled, or older stock was found in less accessible positions. Thus chances were increased that purchases of older units would be even further delayed, and deterioration accentuated.
17. Opportunities existed for patrons to purchase packaged units that turned out to be unsatisfactory thus causing those patrons to lose confidence in the dependability of prepackaged produce and the vendor from whom the goods were purchased. Such a loss of confidence must certainly detract from both the reputation and the sales volume of the retailer.
18. Misrepresentation of quality or value by obscuring sub-standard produce within a closed package, even if unintentional, must be thought of either as unethical or shortsighted merchandising practice. Certainly consumer confidence cannot be gained by offering sub-standard goods at standard prices.
19. Not all produce grades Fancy or No. 1. Important food values exist in fruits and vegetables that fail to meet these high standards of appearance or that may have declined in freshness. Consumer demand exists for these lower grades, at correspondingly lower prices. So long as produce remains salable and usable in any degree it can scarcely be considered ill-advised to offer it to consumers, provided it is identified clearly as to quality, priced ratably, and displayed separately. In this connection, plain (not coded) and conspicuous dating of each unit when packed should be helpful to both buyers and sellers in determining its age and thus stimulating prompt movement before its freshness is lost. Dating of consumer units already is an accepted commercial practice with bread and coffee.
20. The quality and condition of offerings of any commodity in any important market reflect from time to time seasonal, climatic and geographic changes in supply, and thus the quality of retail offerings is bound to vary, both in bulk and packaged form. No prepackaged produce item can be of better quality or fresher than the bulk, conventional, wholesale shipments from which it was packed. But good merchandising would suggest that it not be permitted to be worse. Consumers, on the other hand, cannot expect prepackaged produce to be better than the bulk goods then available for packing.
21. Prepackaging cannot be expected to improve the original quality of the produce, but only to help in maintaining its quality and prolonging its freshness. Packaging and refrigeration of retail display cases do not convert fresh fruits and vegetables into non-perishable merchandise. Fresh

fruits and vegetables are delicate, living organisms, even after they have been separated from the parent plant. They are quick to deteriorate and decay even after they have been protected from bruising and other physical damage and from unfavorable atmospheric conditions by packaging and retail refrigeration.

22. Wise buying, rapid turnover, constant, painstaking and intelligent care, frequent replenishment and occasional reconditioning are required by every retail display of produce, prepackaged or not, if freshness is to be maintained and consumers satisfied.
23. If prepackaging is to be permanently successful, it must be accompanied also at the retail level by a sincere readiness to replace any unsatisfactory purchase with good merchandise or to refund the purchase price.
24. Prepackaging of perishable foods calls for exacting standards not only in merchandising, but at other points in the distribution process as well - grading, packing, transporting, storing, etc. Facilities and commercial practices employed in supplying retailers must be such as to insure a good product and rapid turnover.
25. Since packaging interferes to some extent with the consumer's ability to form an accurate independent judgment of the contents, the packer and retailer must assume even greater responsibility than when offering conventional bulk goods. They can earn the continued confidence of consumers only by combined efforts to guarantee freshness.



Appendix

Tables A - J Inclusive

Appendix Table A: SOURCES OF CONSUMER UNITS OF PREPACKAGED FRESH FRUITS AND VEGETABLES OBSERVED IN 10 RETAIL STORES, COLUMBUS, OHIO, 6 WEEKS, 1946

Commodity	Total packages observed	Unknown <sup>1/</sup>		Sources of prepackaged consumer units					
				Chain Store packing house in Columbus		Retail Store		Growers or other packers	
				No.	Pct.	No.	Pct.	No.	Pct.
Apples	3789	758	20.00	1930	50.94	1101	29.06	-	-
Apricots	771	134	17.38	114	14.79	523	67.83	-	-
Beans, lima	398	62	15.58	336	84.42	-	-	-	-
Beans, snap	3191	1047	32.81	2144	67.19	-	-	-	-
Beets	2104	433	20.58	1665	79.13	6	0.28	-	-
Broccoli	218	-	-	218	100.00	-	-	-	-
Cantaloupes	578	16	2.77	-	-	562	97.23	-	-
Carrots	2965	637	21.49	2303	77.67	25	0.84	-	-
Cauliflower	2550	372	14.59	2170	85.10	8	0.31	-	-
Celery	3517	841	23.91	2617	74.41	59	1.68	-	-
Celery hearts	2653	768	28.95	1885	71.05	-	-	-	-
Celery cabbage	424	9	2.12	-	-	415	97.88	-	-
Cherries	299	110	36.79	69	23.08	120	40.13	-	-
Corn, green	1839	74	4.02	1765	95.98	-	-	-	-
Cucumbers	1027	56	5.45	-	-	971	94.55	-	-
Endive	681	208	30.54	473	69.46	-	-	-	-
Grapes	9496	2161	22.76	7210	75.92	125	1.32	-	-
Grapefruit	1421	88	6.19	-	-	1333	93.81	-	-
Kale	130	9	6.92	-	-	121	93.08	-	-
Lemons	27239	12281	45.09	14958	54.91	-	-	-	-
Lettuce, head	9856	2679	27.18	7177	72.82	-	-	-	-
Lettuce, leaf	1034	181	17.51	60	5.80	793	76.69	-	-
Limes	3615	1324	36.63	17	0.47	-	-	2274	62.90
Nectarines	534	50	9.36	5	0.94	479	89.70	-	-
Onions, green	2576	722	28.03	1854	71.97	-	-	-	-
Oranges	5627	2036	36.18	269	4.78	3322	59.04	-	-
Parsley	277	110	39.71	167	60.29	-	-	-	-
Parsnips	173	-	-	164	94.80	9	5.20	-	-
Peaches	516	91	17.64	-	-	425	82.36	-	-
Pears	1830	90	4.92	1520	83.06	220	12.02	-	-
Peas, green	1934	104	5.38	1830	94.62	-	-	-	-
Peppers	4766	1124	23.58	3642	76.42	-	-	-	-
Plums	4568	1730	37.87	2280	49.91	558	12.28	-	-
Radishes	3897	1123	28.82	2198	56.40	-	-	576	14.78
Rhubarb	50	-	-	-	-	50	100.00	-	-
Spinach	353	68	19.26	-	-	285	80.74	-	-
Squash	28	-	-	-	-	28	100.00	-	-
Sweet potatoes	165	-	-	-	-	165	100.00	-	-
Tomatoes	12528	5054	40.34	7341	58.60	133	1.06	-	-
Turnips	55	-	-	53	96.36	2	3.64	-	-
Miscellaneous	68	3	4.41	-	-	65	95.59	-	-
TOTAL	119740	36553	30.5	68434	57.2	11903	9.9	2850	2.4

<sup>1/</sup> Sources were not recorded for the first 10 days of the period.

Appendix Table B: SOURCES OF CONSUMER UNITS OF PREPACKAGED FRESH FRUITS AND VEGETABLES OBSERVED IN 10 RETAIL STORES, COLUMBUS, OHIO, 8 WEEKS, 1947

Commodity	Total packages observed	Sources of prepackaged consumer units					
		Chain Store packing house in Columbus			Retail Store		Growers or other packers
	No.	No.	Pct.	No.	Pct.	No.	Pct.
Apples	6624	5530	83.48	1094	16.52	-	-
Apricots	670	-	-	670	100.00	-	-
Asparagus	1052	1052	100.00	-	-	-	-
Beans, lima	608	592	97.37	-	-	16	2.63
Beans, snap	4685	4685	100.00	-	-	-	-
Beets	1354	1354	100.00	-	-	-	-
Broccoli	375	89	23.73	3	0.80	283	75.47
Cantaloupes	213	-	-	213	100.00	-	-
Carrots	11405	9678	84.86	1727	15.14	-	-
Cauliflower	2152	1987	92.33	-	-	165	7.67
Celery	4977	4977	100.00	-	-	-	-
Celery hearts	6581	6570	99.83	11	0.17	-	-
Celery cabbage	447	109	24.38	258	57.72	80	17.90
Cherries	398	-	-	398	100.00	-	-
Corn, sweet	3484	3484	100.00	-	-	-	-
Cucumbers	288	-	-	288	100.00	-	-
Endive	531	531	100.00	-	-	-	-
Grapes	1003	401	39.98	602	60.02	-	-
Grapofruit	572	-	-	572	100.00	-	-
Kale	26	-	-	26	100.00	-	-
Lemons	35744	35744	100.00	-	-	-	-
Lettuce, head	15630	15630	100.00	-	-	-	-
Lettuce, leaf	1040	-	-	1040	100.00	-	-
Limes	1801	241	13.38	-	-	1560	86.62
Onions, green	4422	4422	100.00	-	-	-	-
Oranges	2098	-	-	2098	100.00	-	-
Parsley	577	577	100.00	-	-	-	-
Parsnips	418	418	100.00	-	-	-	-
Peaches	292	-	-	292	100.00	-	-
Pears	2267	2267	100.00	-	-	-	-
Peas, green	2316	2316	100.00	-	-	-	-
Peppers	4227	4163	98.49	64	1.51	-	-
Plums	9394	9302	99.02	92	0.98	-	-
Potatoes, french fries	468	-	-	-	-	468	100.00
Radishes	3536	217	6.14	87	2.46	3232	91.40
Rhubarb	579	579	100.00	-	-	-	-
Salad mix	2018	2018	100.00	-	-	-	-
Soup celery	9	9	100.00	-	-	-	-
Spinach	558	-	-	68	12.19	490	87.81
Squash	26	-	-	26	100.00	-	-
Sweet potatoes	20	-	-	20	100.00	-	-
Tomatoes	16236	15402	94.87	619	3.81	215	1.32
Turnips	239	239	100.00	-	-	-	-
Vegetables, shredded	5997	-	-	-	-	5997	100.00
Miscellaneous	160	-	-	115	71.88	45	28.12
TOTAL	157517	134583	85.4	10383	6.6	12551	8.0

Appendix Table C: GRADES OF PREPACKAGED FRESH FRUITS AND VEGETABLES OFFERED  
IN 10 RETAIL STORES, COLUMBUS, OHIO, 6 WEEKS, 1946, BY  
STORES, IN ORDER OF PERCENT OF GRADE A

Store	Total number packages observed	Grade A		Grade B		Grade C	
		Number packages	Percent	Number packages	Percent	Number packages	Percent
3	13,273	15,143	93.06	1,128	6.93	2	.01
6	11,494	10,483	91.21	1,005	8.74	6	.05
7	8,893	7,878	88.59	1,007	11.32	8	.09
8	11,686	10,353	88.59	1,328	11.36	5	.05
4	8,788	7,729	87.95	1,051	11.96	8	.09
9	12,725	11,054	86.87	1,641	12.89	30	.24
2	10,514	9,058	86.15	1,439	13.69	17	.16
10	16,993	14,448	85.02	2,498	14.70	47	.28
1	9,745	8,110	83.22	1,610	16.52	25	.26
5	12,629	10,411	82.44	2,158	17.09	60	.47
TOTAL	119,740	104,667	87.4	14,865	12.4	208	.2

Appendix Table D: GRADES OF PREPACKAGED FRESH FRUITS AND VEGETABLES OFFERED  
IN 10 RETAIL STORES, COLUMBUS, OHIO, 8 WEEKS, 1947, BY  
STORES, IN ORDER OF PERCENT OF GRADE A

Store	Total number packages observed	Grade A		Grade B		Grade C	
		Number packages	Percent	Number packages	Percent	Number packages	Percent
3	22,403	21,874	97.64	529	2.36	0	.0
6	16,512	16,080	97.38	430	2.60	2	.01
7	13,530	13,144	97.15	385	2.85	1	.0
9	14,570	14,024	96.25	543	3.73	3	.02
8	13,209	12,705	96.18	495	3.75	9	.07
10	19,112	18,281	95.65	829	4.34	2	.01
4	13,539	12,893	95.23	642	4.74	4	.03
2	15,894	15,058	94.74	837	5.27	3	.02
5	14,398	13,590	94.39	804	5.58	4	.03
1	14,350	13,514	94.17	833	5.80	3	.03
TOTAL	157,517	151,159	96.0	6,327	4.0	31	.0

Appendix Table E: GRADES OF PREPACKAGED FRESH FRUITS AND VEGETABLES OFFERED  
IN 10 RETAIL STORES, COLUMBUS, OHIO, 6 WEEKS, 1946 BY  
COMMODITIES

Commodity	Total number packages observed	Grade A		Grade B		Grade C	
		Number packages	Percent	Number packages	Percent	Number packages	Percent
Apples	3,789	3,670	96.86	119	3.14	-	-
Apricots	771	576	74.71	189	24.51	6	.78
Beans, lima	398	323	81.16	75	18.84	-	-
Beans, snap	3,191	2,804	87.87	384	12.04	3	.09
Beets	2,104	1,975	93.87	120	5.70	9	.43
Broccoli	218	217	99.54	1	.46	-	-
Cantaloupes	578	122	21.11	455	78.72	1	.17
Carrots	2,965	2,651	89.41	312	10.52	2	.07
Cauliflower	2,550	2,300	90.20	250	9.8	-	-
Celery	3,517	2,770	78.76	734	20.87	13	.37
Celery hearts	2,653	2,347	88.47	295	11.12	11	.41
Celery cabbage	424	424	100.00	-	-	-	-
Cherries	299	249	83.28	46	15.38	4	1.34
Corn, green	1,839	1,819	98.91	20	1.09	-	-
Cucumbers	1,027	344	33.50	683	66.50	-	-
Endive	681	518	76.06	143	21.00	20	2.94
Grapes	9,496	8,756	92.21	737	7.76	3	.03
Grapefruit	1,421	771	54.26	650	45.74	-	-
Kale	130	126	96.92	4	3.08	-	-
Lemons	27,239	24,236	88.97	2,998	11.01	5	.02
Lettuce, head	9,856	8,743	88.71	1,109	11.25	4	.04
Lettuce, leaf	1,034	975	94.29	59	5.71	-	-
Limes	3,615	2,887	79.86	727	20.11	1	.03
Nectarines	534	470	88.01	64	11.99	-	-
Onions, green	2,576	2,348	91.15	226	8.77	2	.08
Oranges	5,627	5,408	96.11	219	3.89	-	-
Parsley	277	158	57.04	105	37.91	14	5.05
Parsnips	173	173	100.00	-	-	-	-
Peaches	516	440	85.27	76	14.73	-	-
Pears	1,830	1,535	83.88	295	16.12	-	-
Peas, green	1,934	1,520	78.59	413	21.35	1	.06
Peppers	4,766	4,041	84.79	716	15.02	9	.19
Plums	4,568	4,292	93.96	276	6.04	-	-
Radishes	3,897	2,971	76.24	843	21.63	83	2.13
Rhubarb	50	48	96.00	2	4.00	-	-
Spinach	353	341	96.60	12	3.40	-	-
Squash	28	12	42.86	16	57.14	-	-
Sweet potatoes	165	164	99.39	1	.61	-	-
Tomatoes	12,528	11,082	88.46	1,430	11.41	16	.13
Turnips	55	55	100.00	-	-	-	-
Miscellaneous	68	6	8.82	61	89.71	1	1.47
TOTAL	119,740	104,667	87.4	14,865	12.4	208	.2

Appendix Table F: GRADES OF PREPACKAGED FRESH FRUITS AND VEGETABLES OFFERED  
IN 10 RETAIL STORES, COLUMBUS, OHIO, 8 WEEKS, 1947 BY  
COMMODITIES

Commodity	Total number packages observed	Grade A		Grade B		Grade C	
		Number packages	Percent	Number packages	Percent	Number packages	Percent
Apples	6,624	6,352	95.89	271	4.09	1	.02
Apricots	670	623	92.98	47	7.02	-	-
Asparagus	1,052	1,048	99.62	4	.38	-	-
Beans, lima	608	487	80.10	121	19.90	-	-
Beans, snap	4,685	4,535	96.80	150	3.20	-	-
Beets	1,354	1,339	98.89	15	1.11	-	-
Broccoli	375	327	87.20	48	12.80	-	-
Cantaloupes	213	49	23.00	164	77.00	-	-
Carrots	11,405	11,395	99.91	10	.09	-	-
Cauliflower	2,152	1,745	81.09	407	18.91	-	-
Celery	4,977	4,838	97.21	139	2.79	-	-
Celery hearts	6,581	6,098	92.66	482	7.32	1	.02
Celery cabbage	447	446	99.78	1	.22	-	-
Cherries	398	389	97.74	9	2.26	-	-
Corn, green	3,484	3,419	98.13	65	1.87	-	-
Cucumbers	288	163	56.60	125	43.40	-	-
Endive	531	465	87.57	62	11.68	4	.75
Grapes	1,003	946	94.32	57	5.68	-	-
Grapefruit	572	438	76.57	134	23.43	-	-
Kale	26	26	100.00	-	-	-	-
Lemons	35,744	35,082	98.15	661	1.85	1	-
Lettuce, head	15,630	14,282	91.38	1,340	8.57	8	.05
Lettuce, leaf	1,040	1,033	99.33	7	.67	-	-
Limes	1,801	1,740	96.61	61	3.39	-	-
Onions, green	4,422	4,161	94.10	260	5.88	1	.02
Oranges	2,098	2,014	96.00	84	4.00	-	-
Parsley	577	523	90.64	48	8.32	6	1.04
Parsnips	418	358	85.65	60	14.35	-	-
Peaches	292	249	85.27	43	14.73	-	-
Pears	2,267	2,235	98.59	32	1.41	-	-
Peas, green	2,316	2,124	91.71	192	8.29	-	-
Peppers	4,227	4,144	98.04	82	1.94	1	.02
Plums	9,394	9,325	99.27	69	.73	-	-
Potatoes, french fries	468	455	97.22	13	2.78	-	-
Radishes	3,536	3,450	97.57	83	2.35	3	.08
Rhubarb	579	554	95.68	25	4.32	-	-
Spinach	558	556	99.64	2	.36	-	-
Squash	26	20	76.92	5	19.23	1	3.85
Sweet potatoes	20	-	-	20	100.00	-	-
Tomatoes	16,236	15,616	96.18	619	3.81	1	.01
Turnips	239	219	91.63	20	8.37	-	-
Vegetables, shredded	8,024	7,789	97.07	232	2.89	3	.04
Miscellaneous	160	102	63.75	58	36.25	-	-
TOTAL	157,517	151,159	96.0	6,327	4.0	31	0

Appendix Table G: PACKAGED AGES OF 38,418 CONSUMER UNITS OF PREPACKAGED FRESH FRUITS AND VEGETABLES OBSERVED IN 10 RETAIL STORES, COLUMBUS, OHIO, 6 WEEKS, 1946, BY STORES, IN ORDER OF WEIGHTED AVERAGE AGE

Packaged age (days)	Number of Units Observed										Total	
	Store 5	Store 9	Store 10	Store 1	Store 2	Store 6	Store 4	Store 7	Store 3	Store 8	Number	Pct.
1	1473	860	2124	1214	1462	1714	1362	1200	2763	1793	15965	41.56
2	1066	1509	1336	813	556	1682	838	854	1395	1200	11249	29.28
3	734	915	944	585	550	525	498	370	715	435	6271	16.33
4	359	264	229	162	420	313	179	186	319	182	2613	6.80
5	250	125	181	71	95	95	81	22	147	63	1130	2.94
6	176	32	49	46	30	122	20	41	100	33	649	1.69
7	43	34	70	30	5	9	9	5	36	28	269	0.70
8	11	7	4	1	1	-	1	24	25	12	86	0.22
9	13	30	28	16	-	-	10	2	-	5	104	0.27
10	2	4	4	-	-	-	-	-	7	-	17	0.04
11	7	1	1	9	-	-	-	-	1	1	20	0.05
12	-	1	29	-	-	-	-	-	-	4	34	0.09
13	1	-	4	5	-	-	-	-	-	-	10	0.03
14	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	1	-	-	-	-	-	-	1	-
Total known	4135	3782	5003	2953	3119	4460	2998	2704	5508	3756	38418	100.00
Wtd. Av. age (days)	2.46	2.41	2.19	2.17	2.12	2.06	1.98	1.98	1.97	1.90	2.13	xx
Unknown	8494	8943	11990	6792	7395	7034	5790	6189	10765	7930	81322	xx
TOTAL	12629	12725	16993	9745	10514	11494	8788	8893	16273	11686	119740	xx

Appendix Table H: PACKAGED AGES OF 46,392 CONSUMER UNITS OF PREPACKAGED FRESH FRUITS AND VEGETABLES OBSERVED IN 10 RETAIL STORES, COLUMBUS, OHIO, 8 WEEKS, 1947, BY STORES, IN ORDER OF WEIGHTED AVERAGE AGE

Packaged age (days)	Number of Units Observed										Total	
	Store 2	Store 1	Store 10	Store 9	Store 5	Store 3	Store 6	Store 7	Store 4	Store 8	Number	Pct.
1	1662	1454	2118	2656	1850	3778	2734	2721	1926	2774	23673	51.03
2	1238	1303	1428	838	855	2256	1127	865	858	989	11757	25.34
3	1247	692	791	430	372	746	445	344	355	333	5755	12.40
4	538	456	424	370	164	239	209	265	96	100	2861	6.17
5	239	195	151	100	61	188	83	150	43	18	1228	2.65
6	137	111	71	50	58	127	101	52	36	25	768	1.65
7	41	36	29	117	12	7	18	4	16	10	290	0.62
8	8	1	2	-	10	-	1	-	-	1	23	0.05
9	-	-	-	5	2	-	-	-	-	-	7	0.02
10	-	-	3	3	-	-	-	-	-	1	7	0.02
11	-	-	-	2	-	-	-	-	-	-	2	-
12	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	18	-	-	-	3	-	-	21	0.05
Total known	5110	4248	5017	4589	3384	7341	4718	4404	3330	4251	46392	100.00
Wtd. Av. Age (Days)	2.43	2.32	2.09	1.97	1.82	1.80	1.76	1.74	1.69	1.52	1.92	xx
Unknown	10784	10102	14095	9981	11014	15062	11794	9126	10209	8958	111125	xx
TOTAL	15894	14350	19112	14570	14398	22403	16512	13530	13539	13209	157517	xx

Appendix Table I: PACKAGED AGES (IN DAYS) OF 38,418 CONSUMER UNITS OF PRE-PACKAGED FRESH FRUITS AND VEGETABLES OBSERVED IN 10 RETAIL STORES, COLUMBUS, OHIO, 6 WEEKS, 1946, BY COMMODITIES

Commodity	Number of Units Observed									Total
	1 Day	2 Days	3 Days	4 Days	5 Days	6 Days	7 Days	More than 7 days	Age Unknown	
Apples									3789	3789
Apricots	21	10	25	4	18	5	7	17	664	771
Beans, lima	147	103	77	9	8	-	1	-	53	398
Beans, snap	1288	771	414	132	84	17	4	2	479	3191
Beets									2104	2104
Broccoli	48	44	95	-	-	-	-	-	31	218
Cantaloupes									578	578
Carrots									2965	2965
Cauliflower	1226	726	234	56	13	8	2	-	285	2550
Celery	1056	834	496	319	109	12	10	5	676	3517
Celery hearts	1197	674	388	129	30	16	7	9	203	2653
Celery cabbage									424	424
Cherries									299	299
Corn, green	606	169	23	1	-	-	-	-	1040	1839
Cucumbers									1027	1027
Endive	201	111	130	62	27	10	8	3	129	681
Grapes	890	1962	1182	805	293	222	99	65	3978	9496
Grapefruit									1421	1421
Kale									130	130
Lemons									27239	27239
Lettuce, head	4755	2686	1066	189	74	17	5	6	1058	9856
Lettuce, leaf									1034	1034
Limes									3615	3615
Nectarines									534	534
Onions, green	1083	617	347	125	73	5	4	1	321	2576
Oranges									5627	5627
Parsley	39	70	56	20	12	7	1	1	71	277
Parsnips	30	51	21	21	16	8	5	-	21	173
Peaches									516	516
Pears	508	540	383	85	20	28	-	-	266	1830
Peas, green	587	367	365	72	23	7	3	-	510	1934
Peppers									4766	4766
Plums	1124	775	572	488	259	254	89	144	863	4568
Radishes	1159	739	397	96	71	33	24	19	1359	3897
Rhubarb									50	50
Spinach									353	353
Squash									28	28
Sweet potatoes									165	165
Tomatoes									12528	12528
Turnips									55	55
Miscellaneous									68	68
Total	15965	11249	6271	2613	1130	649	269	272	81322	119740
Pct. of total	13.34	9.39	5.24	2.18	.94	.54	.22	.23	67.92	100.00
Pct. of pkgs. of known age	41.56	29.28	16.32	6.80	2.94	1.69	.70	.71	100.00	xxx



Appendix Table J: PACKAGED AGES (IN DAYS) OF 46,392 CONSUMER UNITS OF PREPACKAGED FRESH FRUITS AND VEGETABLES OBSERVED IN 10 RETAIL STORES, COLUMBUS, OHIO, 8 WEEKS, 1947, BY COMMODITIES

Commodity	Number of Units Observed									Total	
	1 Day	2 Days	3 Days	4 Days	5 Days	6 Days	7 Days	More than 7 days	Age Unknown		
Apples										6624	6624
Apricots										670	670
Asparagus	145	68	3	6	-	3	-	-		827	1052
Beans, lima	141	155	64	40	17	5	10	2		174	608
Beans, snap	2731	956	269	127	37	27	15	-		523	4685
Beets										1354	1354
Broccoli	21	2	-	-	-	-	-	-		352	375
Cantaloupes										213	213
Carrots										11405	11405
Cauliflower	936	405	164	100	22	2	2	-		521	2152
Celery	2294	855	337	298	145	52	19	-		977	4977
Celery hearts	2087	1496	1063	613	256	117	27	1		921	6581
Celery cabbage	10	7	-	-	-	-	-	-		430	447
Cherries										398	398
Corn, green	2493	348	117	25	2	-	-	-		499	3484
Cucumbers										288	288
Endive	200	132	53	57	27	11	6	1		44	531
Grapes	124	30	58	43	6	3	7	10		722	1003
Grapefruit										572	572
Kale										26	26
Lemons	131	379	15	-	-	15	100	-		35104	35744
Lettuce, head	6774	3868	1657	695	93	12	-	-		2531	15630
Lettuce, leaf										1040	1040
Limes										1801	1801
Onions, green	1625	1148	501	226	74	26	4	1		817	4422
Oranges										2098	2098
Parsley	48	34	6	14	3	1	1	-		470	577
Parsnips	76	46	65	27	23	14	12	-		155	418
Peaches										292	292
Pears	337	225	255	63	175	108	22	-		1082	2267
Peas, green	1072	441	241	107	73	18	8	18		338	2316
Peppers	1175	522	318	145	131	121	40	10		1765	4227
Plums	447	389	294	124	53	214	12	4		7857	9394
Potatoes, french fries										468	468
Radishes	104	-	-	-	-	-	-	-		3432	3536
Rhubarb	10	2	11	24	7	-	1	3		521	579
Spinach										558	558
Squash										26	26
Sweet potatoes										20	20
Tomatoes	153	54	206	100	75	6	-	-		15642	16236
Turnips	35	17	14	12	3	10	2	10		136	239
Vegetables shredded	504	178	44	15	6	3	2	-		7272	8024
Miscellaneous										160	160
Total	23673	11757	5755	2861	1228	768	290	60		111125	157517
Pct. of total	15.03	7.46	3.65	1.82	.78	.49	.18	.04		70.55	100.00
Pct. of Pkgs. of known age	51.03	25.34	12.41	6.17	2.65	1.65	.62	.13		100.00	xxx

