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NEW METHODS IN MARKETING FRUITS AND VEGETABLES

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Two developments of potential importance in the marketing of fresh fruits and vegetables are consumer packaging and air transportation. These are not exactly new, for we have been hearing much about them in recent years. Some of the possibilities and problems of air transport were discussed before this Association at the meetings held two years ago. In large part, however, both packaging and air shipment are still in the experimental stages.

It has been demonstrated, of course, that tons of any product can be loaded in a plane on the West Coast today and delivered at the airport of an eastern city tomorrow morning. The question still is, however, "When, and for what products, will it be profitable." Likewise almost any fruit or vegetable can be wrapped in a transparent film and sold over the retail counter. The question is, "Under what conditions, and on what commodities, will it pay?"

Let us first consider consumer packaging. This quite generally has been called "prepackaging," but no one has quite been able to define that term. It implies, of course, "packaging before" some particular time or place; but it may be done in the retail store, on the farm where the product was grown, or at almost any time and place between these two points. What is meant is that before the product is placed on retail sale, a suitable number of units for the average family has been assembled and put into some sort of a bag or package. Some semi-processing, such as cleaning, sorting, trimming, or waxing, may or may not have been done. The product has been advanced from an offering in bulk, or from a wholesale unit, to a consumer unit. Consequently the term "consumer packaging" more nearly defines it.

The simplest form, and the type most common thus far, has been the packing of potatoes, onion, oranges, and grapefruit in small open-mesh bags, mostly of from 10 to 15 pounds each. This is merely the physical assembly of a semi-perishable product into a unit suitable for the consumer. It is done at shipping point as an alternative to packing in large containers, and at relatively small additional cost since no special care is required after packaging. Convenience to the retail buyer is the major factor, although it does largely prevent loss from picking-over on the retail counter. That and the saving in retail labor offsets part of the extra cost of packagaing in the small units.

The two other products that have been packaged in greatest volume thus far are tomatoes and spinach. With tomatoes it mostly is associated with the repacking of fruit that has been harvested and shipped green. Such tomatoes vary considerably in time required for ripening, therefore they must be sorted from one to several times for selection of the fruit that is ready for use. This may be done over a sorting belt, but it still must be done by hand. Therefore little extra cost is involved in putting the ripe tomatoes into small cartons instead of back into the lug boxes, as formerly was the custom. A material advantage of having the tomatoes in packages

is that they are protected from the handling and pinching to which they are subjected when displayed in bulk. The container most commonly used is a cardboard box with a cellophane window. Such a package does not close tightly, and probably has no effect on the rate of ripening or on other physiological factors. A container with a tight seal might retard ripening somewhat, or might even cause improper ripening. Packaging of tomatoes is done more because it fits naturally into the method of distribution with little added cost, rather than because of its effect of the tomatoes themselves.

Ripening and repacking of tomatoes is expensive in the terminal markets, not only because of high labor cost but also due to the loss from decay that often occurs. During the season when supplies come from the most distant producing areas, air transport may be feasible if it would make possible the harvesting of the fruit after the color has started to break. The resulting savings in ripening and repacking, together with price premiums for the much better quality, might be sufficient to make air transportation profitable. To the extent that this may be done, it is to be expected that the tomatoes will be packed in consumer units at shipping point, and assembled in "master cartons" for shipment.

With spinach, partial preparation for home use, or making it "pot ready," is the major factor in the popularity and success of packaging. The spinach is washed, the roots and coarse stems are removed, and it is sorted for foreign material, dead leaves, etc. Between 30 and 65 percent by weight of the harvested crop is removed in this process. The spinach is then placed in small bags of transparent film. These are closed by stapling, which does not make a tight seal.

Spinach is being packaged in greater volume than any other fresh commodity. In Los Angeles and San Francisco, about half of the total receipts is packaged, although this includes some larger units for hotels and institutions. One Los Angeles firm that specializes on spinach has built a large plant specially designed and equipped for the purpose. This includes refrigerated storage, where the product is thoroughly cooled after it is packaged.

This firm contracts with growers for its supply. The seed is furnished, planting dates are specified, and growing operations are supervised. Sales of the packaged product are made to retailers at the plant or through a store in the wholesale market. Effort is made to hold the retailers' purchases to what can be sold in not more than 36 hours, so as to keep stocks fresh on the retail shelves. The product is on the market the year-around, although volume drops off during the summer months. Occasionally trouble is experienced from decay in the packages, but generally the spinach is good for two days in the retail store. When damage is encountered, supplies are taken back by the packaging company.

Another similar operation is in a plant located in one of the producing districts in California. The spinach is hauled to the plant from the fields, washed, trimmed and packaged, and placed in cold storage rooms. After it is thoroughly cooled, it is distributed by motortruck to the markets of Northern California. Trials also are being made with air shipment from this plant to markets in other parts of the West.

Little information is available on the effect of the consumer packages on the storage life or nutrient content of spinach. Its respiration rate is high compared with most other vegetables. Some studies have indicated that spinach held in an atmosphere with low oxygen content was superior in appearance and taste to that held in normal air. The low oxygen resulted in reduced respiration and better retention of ascorbic acid. Other tests have indicated that spinach is more tolerant of high carbon dioxide than certain other vegetables. Thus the film in which the spinach is packaged not only retards water loss but may have some benefit by creating a more favorable atmosphere, resulting from the respiration of the product. However, these favorable factors are at least partially offset by the bruising which inevitably results from the extra handling. Most of the packaging has been done where the product could be sold within two, or at the most, three days. Methods of handling and treatment are yet to be worked out for longer periods.

Other than on tomatoes and spinach, packaging of perishables is still mostly on an experimental or trial basis. Much experimental work is being done, but realtively little has developed into established commercial operations.

One of the more recent developments in the East is at Glenmar Farms, owned by the Glen L. Martin Company, and located at Chestertown, Maryland. A large acreage of vegetables is grown, and last year a plant was set up in which to package much of their own production. The packaged produce is being distributed to chain stores and service wholesalers in Philadelphia, Baltimore, and Washington. During the past winter and spring, produce was shipped to Glenmar from Florida and from other winter producing areas, and packaged for the same outlets. Arrangements recently have been made whereby research agencies will have an opportunity to conduct studies of both the packaging and the retail distribution, under controlled commercial conditions. Cooperating in this are Glenmar Farms, several chain stores, the Universities of Maryland and Florida, the Bureau of Agricultural Economics and the Farm Credit Administration, and shippers in Florida and California. Studies also will be made of various physiological problems of packaging. The project will cover the packaging and distribution of the products locally grown at Glenmar, and also the repackaging of produce brought from distant producing areas.

A study of terminal repackaging of merchandise shipped from a distance in the usual wholesale containers has been made by the Bureau of Agricultural Economics in cooperation with a group of chain stores in Newark, New Jersey. In the initial development of this study it was discovered that before determination could be made of what commodities could be repackaged profitably, it was first necessary to ascertain the actual costs of merchandising specific commodities in bulk. This involved not only the actual retailing costs but the amount of waste and spoilage involved. Records were kept on one group of stores handling unpackaged products, and at the same time studies were made in other stores of the costs of packaging and the extent to which they could be offset through savings in waste and spoilage and in retail labor. The studies covered the distribution of bulk and packaged products through about twenty stores. The records so obtained have not yet been summarized, but a report on the project is expected to be completed within a few months.

One of the principal things apparent from the Newark study is that refrigeration at the retail level offers opportunity for greatly reducing the spoilage losses. In fact, it is generally believed that refrigeration in the retail stores will be one of the most important improvements in the merchandising of fresh fruits and vegetables in the future. This of course will not be limited to packaged products, but will apply to the unpackaged as well. Some very attrative bulk display counters are now being installed, in which a steady stream of cold air is blown up through the produce from underneath. The refrigeration industries also are pushing the use of ice on retail displays.

In California the Western Growers Association is conducting considerable experimental work on the possibility of packaging at point of production for distant shipment such products as lettuce, broccoli, cauliflower, and carrots. A laboratory has been established where the products are packaged in different materials and held under a variety of conditions of temperatures and atmospheres. Tests are also being made in washing and preparation for packaging, with particular emphasis upon treatment to prevent discoloration and to retard the development of mold and decay. Manufacturers of packaging materials and containers are cooperating.

A group of grower-shippers are also operating a plant in Los Angeles through which a considerable volume of lettuce is being packaged individually for local distribution. The heads are trimmed and washed, placed in individual paper trays or "boats," and overwrapped with a transparent film. This operation is both experimental and commercial, that is, it is an attempt to work out some of the problems on a commercial scale.

There has been considerable discussion of the desirability of various films as packaging materials. Some are practically impervious to gases and moisture, while others have a considerable degree of permeability. Thus far, however, there is relatively little data on the actual benefits or harm from enclosing specific products in the different films, under varying conditions of temperature and humidity, and for different periods of time. In packaging for local distribution, where only from 1 to 3 days is involved, any one of several films can be used. Perhaps some have advantages over others, but most of the available films can be tolerated for the short periods necessary for local marketing. It is considered doubtful that the consumer package as such contributes materially to the storage life of any of the vegetables now being packaged. Initial selection of high grade produce, careful grading, rapid handling, and removal of deteriorated merchandise from the stores are factors which enhance the quality of the packaged vegetables, but likewise they would similarly enhance the quality of the same produce unpackaged. As stated earlier, the additional handling involved in washing, sorting, and packaging tends to offset such protection as the package furnishes.

Packaging at shipping point for sale in distant markets presents more difficult problems. The characteristics of the packaging material then will become more important. Pre-cooling and refrigeration, advisable even for local distribution, will be imperative for distant shipment. Perhaps only the trimming, cleaning and grading, or other preparation for packaging, will be done at shipping point, and the actual

packaging will be done at the receiving end. This is being tried on rather an ambitious scale at Glenmar Farms. Several of the air freight companies have established an operation for regular shipments of produce from Florida and California, to be packaged at Glenmar. As a matter of interest to this group, the man who is heading up this project is Prescott Blount, who was one of the speakers at the Ft. Collins conference two years ago, when he was with United Air Lines.

One commodity which seems well adapted to this method of treatment is cauliflower. As customarily handled, most of the weight of a cauliflower shipment is of the inedible stalks, or "jacket," around the head. In the conventional pack only about 7 to 12 pounds of the edible curd are contained in a standard crate. By stripping the head, some 40 pounds of the curd, or 4 to 5 times as much, can be packed in a container of the same size. Trials have indicated that by this method it is economical to ship cauliflower from California by air and package at the terminal end. The same method of handling also has been used successfully for local truck shipment to Los Angeles from the Santa Maria district. However, there are few products on which the ratio of inedible to edible product is as high as it is with cauliflower shipped in the jacket. Therefore the opportunities will be limited of making such large savings in the volume of product to be transported.

Consumerpackaging of deciduous fruits has been limited. Some work has been done with apples, but thus far the results have not been conclusive. In one instance which came to my attention, there was quite favorable consumer acceptance of packaged apples, but which was due not to any effect of the package, but to careful selection of fruit that was in prime condition when it was distributed.

Berries of all kinds are of course packaged in consumer units, and plums, peaches, apricots, and grapes are frequently packed in small baskets which fit into the shipping crates. These are hardly considered as consumer packages, however, because they are not enclosed or wrapped as separate units when offered for sale. Shippers of soft fruits have experimented in the past with various types of packages, and they now show less interest or enthusiasm in consumer packaging than do the vegetable shippers.

One of the most important questions in consumer packaging is "How much will the customer pay for it?" Presumably the entire cost will not be reflected in the retail price, for to be successful packaging must accomplish certain savings such as reduction in spoilage, lower costs of retailing, and the like. But some of the cost will have to be paid by the consumer for services rendered, such as semi-processing, better quality of product, greater shopping convenience, or attractiveness and "eye appeal." Little is yet known of the measurements of consumer preference - of how much per pound, or per unit, the housewife will pay for the packaged product in comparison with a comparable product unpackaged. In part this is due to the limited scale on which the packaged products have been offered. In part it is due to the conditions of consumer income and demand that have prevailed during the past few years when most of the packaging has developed. Of even greater importance, perhaps, has been the lack of reliable comparisons between the packaged and unpackaged products in the same retail display at the same time. As an example, we attempted to compare

the selling price of packaged and bulk lettuce in a retail store in Los Angeles. The packaged heads were large, clean, and well trimmed - some of the best that was being harvested in the Imperial Valley. The other lettuce was far down the scale in both size and quality - little heads that had been "balled down" because of tip-burn. Obviously any records of the prices and volumes of sales in that store would be almost meaningless as a measurement of consumer demand. Detailed studies must be made of the sale of comparable products, in different types of communities, and under varying economic conditions, before much will be known regarding the price that consumers will pay, or the volumes they will take at specific price differentials. Some such studies have been started, but doubtless they will have to be continued during periods of differing economic conditions and consumer demand before reliable conclusions can be reached.

Of one thing we may be sure, however, and that is that much consumer pacakaging will be done. It seems hardly probable that it will ever be extended to all fruits and vegetables, but it will be important on certain products. Perhaps where we run into difficulty is trying to talk about all vegetables or all fruits in one breath. Actually we are talking about a group of products with widely diverse characteristics. In canning, we have the so-called big four - tomatoes, corn, peas, and snap beans. In freezing, certain products such as green peas and lima beans have been a "natural," but we are not apt to have much freezing of a long list of products such as lettuce, celery, cabbage, cucumbers, onions, etc. Likewise, certain products doubtless will be found to be particularly well adapted to consumer packaging, as already has been demonstrated with spinach and tomatoes. Others may be packaged only in a limited way, for certain outlets.

There is considerable talk to the effect that as self-service retailing is extended, fruits and vegetables will have to be packaged as are other types of merchandise. Of this I am skeptical. In many self-service stores unpackaged fruits and vegetables are being handled entirely on a self-service basis - where the customer takes a head of lettuce, a stalk of celery, a bunch of carrots and a dozen oranges, along with canned and packaged staples. Particularly in stores with modern refrigerated display cabinets that help to keep the vegetables in good condition, the need or desirability of packaging does not seem important on many of the products. In some stores, and particularly in the higher-income districts of our metropolitan areas, customers doubtless will pay for the added convenience and attractiveness of nice transparent wrappers around all these products. In the majority of city neighborhood markets, however, and in the retail stores throughout the smaller cities and towns, in rural areas, in mining camps, and in all the rest of the varied communities which make up these United States, I doubt whether packaging ever will become anywhere near universal.

As expansion of packaging does occur, some changes in methods of marketing also will occur. Some functions will be shifted, new functions may be introduced and others eliminated. The introduction of packaging machinery will change the kind and volume of labor needed in produce marketing. Shifts in market channels similar to those associated with the introduction of packaging in other lines of foodstuffs can be expected to occur in produce marketing. Transportation will be speeded and refrigeration facilities expanded.

In most staple-food lines in which the processors have packaged and branded the product, they have also extended their influence over the marketing process backward toward original production and forward toward final consumption. The first signs of this same development are appearing in the packaging of vegetables. Spinach packers control seed, planting, harvesting and price by contract with growers. Continuous efforts are made to eliminate fluctuations in the buying prices of their products and in the selling prices of the packaged product. They want both the retail trade and consumers to become accustomed to uniform quality and price, both of which are to be associated with the brand. Removal of deteriorated products from retail stores is intended both to control quality and to support price-maintenance programs. They recognize that deterioration in quality or appearance of a packaged and branded product may seriously depress the demand for it, from which recovery may be very slow. Thus, as in foodstuffs for which packaging and branding have been introduced at the processing level, price, quality and volume control have been introduced.

Extension of packaging also may affect the degree to which wholesalers and retailers can influence the marketing process for certain products. In other lines, the packagers of foodstuffs have gone directly to the consumers by means of advertising. As a result, the functions of the wholesalers and retailers have been constricted, and their influence upon the producer has been lessened. Retailers no longer greatly affect the demand for many packaged products, and some independent wholesalers have been reduced almost to the status of branch houses or warehouses. For example grocers have little choice in respect to carrying many branded products, and virtually no leeway in pricing them. To the extent that packing in consumer units can be associated with a stable-price policy, the price-making function will be shifted to the packager.

Now a few comments concerning air transport of fruits and vegetables. During the last three years many such shipments have been made, but thus far they still are mostly on a trial or experimental basis, or made primarily for publicity. Certainly in this day and age it is no great achievement to ship any product by air. The only item is payment of the bill - the air lines will do the rest. In the marketing of fruit and vegetables, the question is "What will be the straight dollars-and-cents value of service performed?"

A frequent and misleading evaluation of the benefit of air transport of perishables is to compare it with rail freight. On prewar schedules, fruits and vegetables from the West Coast customarily were delivered about ninth morning to the Atlantic Seaboard markets. By air, delivery can be made first or second morning, depending in part upon whether direct distribution is made from airport to buyer or whether the product must move through usual wholesale channels. Thus far most air shipments have been whisked directly from airport to the retail outlets or to hotels. This is all right for publicity purposes, or on high-value products, but as a month-in-month-out procedure, it would add materially to the cost of shipment by air.

The most valid comparison with air shipment is rail carlot express. This is considerably higher in cost than rail freight, but probably will continue to be considerably less per ton-mile than by air. Rail express has long been used for the distribution of Louisiana strawberries, and in recent years has been used for western cherries and other soft fruits.

In comparison with rail express, air shipment may save only one or two days rather than the seven or eight days compared with freight. This saving in time, and the better quality and condition of the fruit that results, may not add enough to the final selling price to justify the air rates.

First offerings of certain fruits at the beginning of each season command very high prices. Air shipments can be expected to move some of these, but a difficulty will be to find a sufficient number of planes available for only short periods. Suggestion is often made of a fleet of chartered "fruit tramp" planes, operating successively from various producing areas as the season advances. One handicap they might encounter would be difficulty in getting return loads.

Air transport will be important on certain items at certain seasons. For the producers of many of the specialty products, it may cause important changes in distribution, or in market competition. For produce marketing in general, however, air freight rates will have to be modified materially before a very large percentage of all the fruits and vegetables move to market via the skyways.