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UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
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PRODUCE PACKAGING POTENTIAL

By Donald R. Stokes, Marketing Research Division, AMS, USDA,
for presentation at the American Management Association
Packaging Conference, Palmer House, Chicago, Ill., April 19, 1955

Packaging of fresh fruits and vegetables in consumer packages began quite a few years ago, but it still has a long way to go. Only about 20 percent of our fresh fruits and vegetables are marketed today in consumer packages.

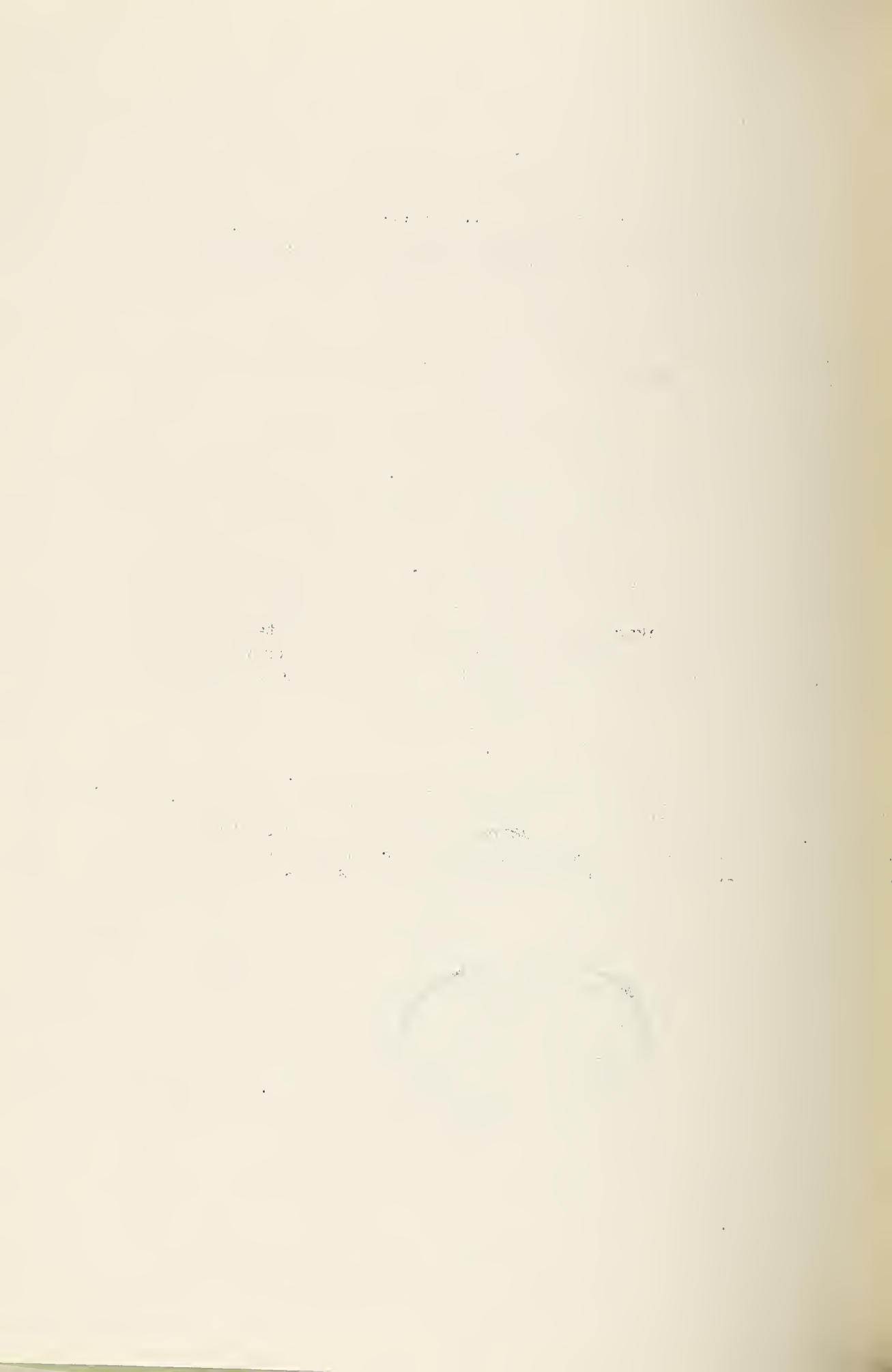
Approximately 56 billion pounds of fresh fruits and vegetables are marketed annually. Some of these commodities may never be packaged in consumer units; for example, watermelons, cantaloupes, and pumpkins. But about 50 billion pounds of produce conceivably could be so packaged eventually. About 11 billion pounds are being packaged in unit containers today.

The following table lists about 100 fresh fruits and vegetables and the 5-year (1948-53) average annual supply of each commodity.^{1/} In the third column of this table, you will find our estimate of the percentage of each commodity which is being packaged today before reaching the retail store. These estimates are based on general observation and are not provable. They are, however, about as close to accuracy as is possible on the basis of available information.

^{1/} Guide to Average Monthly Availability of 102 Fresh Fruits and Vegetables, Third Revised Edition - 1954, United Fresh Fruit and Vegetable Association, Washington, D. C. These estimates represent quantities of fresh fruits and vegetables marketed through commercial channels, including imported produce but excluding the quantities sold at roadside stands and processed or frozen.

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Estimated percentage of fresh fruits and vegetables prepackaged

Commodity	Annual supply : 1,000,000 lbs.	Percent : prepackaged prior : to retail level 1/
Anise	19	
Apples	3,790	25
Apricots	64	
Artichokes	32	
Asparagus	127	5
Avocados	70	
Bananas	2,555	1
Beans, Fava	11	
Beans, Lima	32	
Beans, Snap	556	5
Beets	127	20
Beet tops	*	90
Blackberries	5	100
Blueberries	39	100
Borage (Barrach)	*	
Broccoli	166	5
Broccoli rabe	*	
Brussels sprouts	27	75
Cabbage	1,830	5
Cabbage sprouts	4	
Cantaloupes	1,357	
Carrots	1,749	80
Casabas	1	
Cauliflower	500	5
Celeriac	2	
Celery	1,192	10
Celery cabbage	18	
Cherries	111	5
Chicoria	*	
Chives	.4	
Cippolinis	1	
Coconuts	35	
Collards	58	5
Corn	1,113	5
Cranberries	78	100
Crenshaws	6	
Cucumbers	640	
Currants	*	
Dandelions	*	
Dasheens	.7	
Dates (Domestic)	32	

Estimated percentage of fresh fruits and vegetables prepackaged
(Continued)

Commodity	: Annual supply : 1,000,000 lbs.	: Percent : prepackaged prior : to retail level <u>1/</u>
Eggplant	64	
Endive chicory	32	5
Endive witloof	1	
Escarole	130	5
Figs	6	
Garlic	32	90
Grapefruit	1,556	10
Grapes	1,200	3
Hanover salad	*	
Honeyballs	1	
Honeydews	250	
Horseradish	7	
Kale	32	75
Kohlrabi	9	
Kumquats	.4	
Leeks	19	
Lemons	600	15
Lettuce	2,700	5
Limes	16	5
Mangos	4	
Mushrooms	57	50
Mustard greens	21	25
Nectarines	30	
Okra	20	
Onions, dry	1,570	20
Onions, green	39	5
Oranges	4,260	20
Papayas	1	
Parsley	36	1
Parsnips	34	25
Peaches	1,495	5
Pears	732	5
Peas, green	80	5
Peas, pigeon	.6	
Peppers, sweet	340	5
Persians	24	
Persimmons	6	
Pineapples	96	
Plantains	15	
Plums-prunes	238	5

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Estimated percentage of fresh fruits and vegetables prepackaged
(Continued)

Commodity	: Annual supply : 1,000,000 lbs. :	: Percent : prepackaged prior : to retail level 1/
Pomegranates	5	
Potatoes	14,920	35
Prickly pears	4	
Pumpkins	10	
Radishes	162	50
Raspberries	2	100
Rhubarb	36	5
Shallots	16	
Sorrel	*	
Spinach	343	75
Squash	164	1
Strawberries	375	100
Sweetpotatoes	890	1
Swiss chard	16	
Tangerines	281	5
Tomatoes	3,806	60
Turnips-rutabagas	218	25
Turnip tops	5	10
Watercress	6	
Watermelons	2,210	
Yams	2	

* Quantity undertain.

1/ Where the column is left blank, the amount prepackaged
is unknown.

A few commodities are just about 100 percent packaged in consumer units. These include cranberries and the various fresh berry crops, such as raspberries, strawberries, and blueberries. In addition, there are such items as cole slaw, mixed salads, and soup mixes which are 100 percent prepackaged. The next highest group, percentagewise, consists of items which are 75 to 80 percent packaged, and includes carrots, brussels sprouts, kale, and spinach.

Going down the list, you will find corresponding estimates for some other commodities, as follows:

Mushrooms	50	percent
Radishes	50	"
Tomatoes	60	"
Potatoes	35	"
Turnips	25	"
Parsnips	25	"
Apples	25	"

Potatoes, of course, lead all other commodities in terms of actual pounds prepackaged. There is opportunity for continued expansion of consumer packaging of fresh fruits and vegetables. Ways may be found to package a number of commodities which are not now being prepackaged to any extent, and the extent of packaging many commodities such as potatoes, apples, and citrus fruits is likely to expand.

However, we still have packaging problems confronting us on commodities which are apparently quite successfully prepackaged. Take carrots, for example--more than 80 percent of fresh carrots are prepackaged today, yet, in some stores, patrons reportedly prefer bunched carrots. Consumer confidence in packaged carrots, as in the case of tomatoes and other vegetables, needs to be maintained by careful quality control. The color, amount, and kind of printing on the package also are important.

The prepackaging of lettuce is only gradually developing. Over 100,000 carloads of lettuce are marketed annually. Yet only a small fraction is packaged either at shipping point or in the terminal markets, although prepackaging of lettuce at retail is expanding. This packaging reduces waste and spoilage losses and helps keep the lettuce crisp and succulent, which should promote greater sales of lettuce.

Great opportunities lie ahead for prepackaging of other vegetables. Considerable research has been undertaken on packaging fresh asparagus, cauliflower, broccoli, celery, and green beans, yet only a small volume of these items is prepackaged today. Proper packaging of asparagus preserves flavor and tenderness. Proper packaging of broccoli keeps it fresh, retards yellowing, and, coupled with adequate refrigeration, greatly extends its shelf life and salability. Celery is kept moist and crisp by good packaging, yet, in general, only celery hearts are packaged today. Packaged cut green beans, trimmed for

immediate cooking by the housewife, may develop a large potential market. The market for prepackaged peeled potatoes could be tremendous, considering the fact that this commodity is one of the chief kitchen bottlenecks still confronting the American housewife.

Much of the physiological research has been completed on the packaging of these commodities. Assistance by packaging manufacturers and suppliers in building or adapting packaging machinery and in designing packages for particular products is needed to help growers, shippers, and distributors in prepackaging many of these commodities. The packaging industry has assisted the Department of Agriculture and producers and distributors of fresh fruits and vegetables in finding and developing efficient ways of applying research results commercially.

Relatively, a smaller proportion of fresh fruits are packaged in consumer units than of vegetables. Apples are commonly prepackaged in various types of bags, cartons, and trays, but it is doubtful that more than 25 percent of the apple crop is packaged in consumer containers. A study of packaging of apples at point of production in film bags was initiated by the Department of Agriculture several years ago in the Northwest, under a research contract with the Washington State Apple Advertising Commission. Many of the film manufacturers and converters cooperated closely on that project, and today packers in various apple-producing areas are packaging apples in 3-, 4-, and 5-pound bags. Yet this packaging of apples is confined mostly to the small sizes. Large apples and soft fruits, such as apricots, need protective packaging to reduce handling damage, and these packages should be designed to add to the salability and appearance of the fruit.

We often find that packaging of fresh fruits in unit containers increases the cost of marketing. We should attempt to find offsetting savings, which frequently is not difficult.

Take fresh plums, for example, which are usually packed in 4-basket crates. It may be possible to jumble-pack plums in a much cheaper shipping container and again repack them at the point of distribution in some type of consumer package. Service wholesalers might be able to buy jumble-packed plums and repack them in consumer-size packages before distributing them to their retail customers. The savings in the use of cheaper shipping containers, along with additional savings in labor and spoilage losses in retail stores, might well compensate for the additional cost of the consumer packages. Then, too, service wholesalers are in a good position to give strong merchandising and sales promotion support to such prepackaged commodities, particularly if the products are merchandised under the wholesalers' own brand names.



We have been cooperating with the packaging industry in developing improved shipping containers for Bartlett and winter pears. As you know, winter pears are harvested in the fall and packed in standard wood boxes. By the time you see these pears in the retail stores, in a jumble display, they are sometimes badly bruised and marked up from repeated handlings, or so hard and green that they discourage sales. We are attempting to develop improved shipping containers which will minimize bruising damage and increase the salability of the pears. We also are cooperating with the packaging industry to find out whether pears can be packaged in consumer packages. Pears should be ripened before being offered for sale to consumers, and ripened pears should not be handled. Protective packaging may help solve this problem.

Peaches provide another example of a commodity on which there is a tremendous need for further research and for the development of improved packages and methods of packaging. As you know, peaches ripen very rapidly once they reach maturity. Therefore, if ripened peaches are to be prepackaged, a package and method of packaging them will need to be developed which will be fast and economical.

In conclusion, it seems inevitable that the trend toward more prepackaging of more fruits and vegetables will continue. The basic advantages of packaging fruits and vegetables in unit containers are to (1) offer additional services, (2) increase the efficiency of handling, (3) maintain or improve the quality of product, and (4) promote greater sales. Consumer packaging permits brand identification, which is the first requirement of an effective merchandising program. We welcome the continued cooperation of the packaging industry in helping growers and distributors of fresh fruits and vegetables to improve the packaging of their products.

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