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# THE IMPACT OF FEDERAL REGULATIONS, AND STATUS OF USDA RESEARCH IN SUPPORT OF PROJECT MUM

by

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There are at least two areas where Federal regulations might be construed to impact on the intent of project MUM. These are under fruit and vegetable marketing orders and under the Export Apple and Pear, and the Export Grape and Plum Acts. These were the only Federal regulations that I have been able to identify that directly affect pack and container sizes. There are regulations that require proper labeling and identification, but are not really germane to the issue of reducing the proliferation of container sizes used for fruits and vegetables.

Less than half of the 49 marketing orders for fruits and vegetables have specific pack and container size regulations. These marketing orders (MOs) are authorized under the Agricultural Marketing Agreement Act of 1937 and cover a wide range of fruit and vegetable products in specific production locations. The orders permit regulations covering the size, capacity, weight, dimensions, or pack of the containers used by the industry. This enables an industry to standardize containers and packs and eliminate deceptive containers. Some marketing orders permit pack specifications which designate sizes of the commodity which may be packed, and require that the containers be properly labeled. Essentially, marketing orders are designed to prevent misrepresentation of weight, appearances, and a proliferation of container sizes, and to encourage better buyer-seller understanding. None of these goals are in conflict with project MUM.

A few examples serve to illustrate the points. The Texas orange and grapefruit MO prohibits any handler from handling any variety of oranges and grapefruit grown in the production area unless such fruit is in one of the specified containers and it is packed and marked as specified. It then identifies four fiberboard carton sizes, two mesh bag sizes and one wire crib size. Other types and sizes of containers may be approved by the Texas Valley Citrus Committee for testing in connection with a research project conducted by or in cooperation with the Committee, as long as it has advance approval. The MO also specifies pack regulations (sizes) for oranges and grapefruit for given pack sizes (counts). The Florida Lime MO specifies eight containers with weight capacities ranging from 10-40 lbs. It further prohibits the use of mesh bags with more than 4 lbs. capacity and specified four master containers for holding the 4 lb. bags. The Washington-Oregon Barlett Pear MO specifies a container with specific dimensions and then goes on to say that the pears must be packed meeting the U.S. Standards for summer and fall pears, which are primarily grades and sizes to assure uniform standard packages. The other marketing orders with packaging requirements have similar types of requirements to those that I have just described.

From the standpoint of project MUM, these marketing orders do not present an insurmountable barrier. The container dimensions may be changed by the Administrative Committees of the respective MOs with the approval of the Secretary of Agriculture. If a MUM container can

be shown to effectively substitute for the existing containers, it should not be difficult to get the committees to at least approve a test. The Florida tomato container illustrates the need of the respective committees to be more aware of the MUM containers that may be available. Last year the mature green tomato industry convinced the Committee to change from a 30 lb. box to a 25 lb. net weight box. The MO does not specify container dimensions. At the 25 lb. container size they had a choice of two containers. The one they chose was not a MUM container and it cost them 6 percent of their payload. They cannot stack as many on a pallet and end up with lighter truckloads. The 25 lb. MUM container would have increased the effective payload 4 percent over the 30 lb. box and 11 percent over the selected 25 lb. box. The Committee can switch to the MUM box without the Secretary's approval, if they chose.

The purposes of the Export Apple and Pear Act and the Export Grape and Plum Act are to provide inspection and certification to assure foreign buyers that the fruit meets Federal or State grades and meets minimum quality standards established by the Secretary for export shipment. Container dimensions are primarily to assure delivery of uniform standard packs. These Acts could be more difficult to change, but if the economics are favorable and effective payloads could be increased, they should not be that difficult to amend.

Finally, one should recognize that several States have codes or regulations specifying container sizes for commodities produces in their State and shipped interstate. For example, California Naval Oranges must be packed in a carton which means the standard number 58 as defined in Section 43615 of the Agricultural Code of California, as amended, with a capacity of 38-1/2 lbs. of oranges or such other container and capacity as may be established by the Committee with the approval of the

Secretary. Like the Federal marketing orders, they have provisions for testing new containers and if MUM size containers will work and present an effective pack, the regulation can be changed.

Now I would like to briefly review some of the work we have been doing in support of project MUM for produce, frozen food, and dry groceries. Most of our work on project MUM has taken place in the past couple of years although our involvement and interest in container standardization goes back many years. Following recommendations of the United Fresh Fruit and Vegetable Association and the Economic Commission for Europe, we determined five practical container sizes that would effectively utilize a 48 x 40 inch palley base. While mathematically there may be more than 100 container sizes that will fit on a 100 x 120 centimeter pallet without underhand or overhand, more than half are too small for practical use. It was determined that five sizes could adequately fit the needs for most commodities which are as follows:

- a. 40x30x30 cm (15-3/4x11-3/4x11-3/4")
- b. 50x30x30 cm (19-3/4x11-3/4x11-3/4")
- c. 50x40x30 cm (19-3/4x15-3/4x11-3/4")
- d. 60x40x30 cm (23-1/2x15-3/4x11-3/4")
- e. 60x50x30 cm (23-1/2x19-3/4x11-3/4")

A 50x30x30 cm container proved to be the most effective modular replacement for the 1-1/9 bushel basket for seven commodities (Florida vegetables). However, it did not work as well for different sizes of oranges and grapefruit. Tests were conducted on seven of the more prevalent citrus sizes in the Washington, DC area and compared with the modular container. In six of the seven sizes, the product count that fitted and filled out the test containers was not the same as the presently used count. For example, size #48 grapefruit are usually packed in 3-3-3-pattern four layers of 12 high (because of their small size), and fit the modular container in a 4-3-4-3-4 and 3-4-3-4-3 pattern which yields a count of 53 grapefruit when packed three layers high.

Five of the six citrus sizes, which represent nearly 90 percent of the citrus surveyed, packed adequately in the modular container and could have been handled and shipped with little damage to the product, but the counts were different. Two possible solutions would be to either: (1) Get the industry to accept different product counts for citrus; or, (2) increase the potential number of modular sized containers to seek containers that would come closest to fully utilizing the pallet surface while maintaining the integrity of the industry accepted counts. The latter course may be the easiest to resolve, but requires further study. A further possibility that might be considered would be to consider shifting from count to weight for citrus. This might be the hardest alternative to gain industry acceptance. At this time we would have to say we still have not proven there is a viable, acceptable metric/modular replacement for the 4/5 bushel container for oranges and grapefruit. The key is whether changing the traditional counts is acceptable to the industry, because if it is the 50x30x30 cm carton works fine.

Having said that, we have presently identified MUM replacement containers that could be used for 23 different commodities (51 if you include some of the different common sizes and varieties of those commodities).

We have recently taken the five modular containers and estimated gross payloads for truck shipments of product. We grouped 37 different produce items into five weight classes based upon how the items are packed in conventional containers. We determined the cubic volume of the five modular containers. Two stacking patterns were devised for pallet loads of produce in a conventional refrigerated trailer with 38 feet of interior length and 91 inch width. After determining the number of containers per load and the tare weight of each container, we were able to project gross payloads of truckloads. Twenty-seven or 73 percent

of the 37 produce items had product densities that fell into the 25, 30, and 35 lbs. per cubic foot ranges. Past research has indicated that trailer loads of products in these ranges have an average gross payload of 39,000 lbs. Based on our estimates all but the 60x40x15 cm container, in a straight inloading pattern, exceeded the 39,000 lb. payload for items in the 35 lb. per cubic foot range, (the largest weight category). Unitizing with slip sheets instead of pallets would reduce the gross payload by 1,350 lbs. and could allow more product to be shipped. Thus, the greater the density of the packed product, the more likely the modular-sized containers are to yield a comparable payload to conventional floor load shipments in present containers. The availability of larger refrigerated trailers and permission for heavier payloads will require recalculations.

We still need to develop more reliable estimates of the cost/benefits of switching to MUM containers using observations in actual operations. To date we only have a couple of industry estimates of the potential savings. Jack Rogerson of Stop and Shop has determined that, at prevailing wages, shippers non-compliance with MUM precepts costs their firm more than \$130,000 per year. When time lost during unloading at store level and the probable value of mechanical damage caused by excess handling are added in, the potential savings from industry compliance with project MUM could exceed \$280,000 per year. Standard Fruit and Vegetable Co., Inc. of Dallas indicated a palletized load of lettuce requires one hour and 13 minutes less of their limited dock space than a floor stacked load. Palletization would allow them to handle 24 more unloads each day at their seven unloading door facilities.

With more information being made available on the potential benefits of unitization and modularization, it is worth looking at some of the issues affecting implementation. Some of these are as follows:

A. Case sizes that are nearly square do not lend themselves to interlocking on pallets and thus result in essentially columnar stacking. These may require strapping or wrapping to maintain the integrity of the unit. Receivers prefer not to hassle with strapping materials, but would probably prefer them to floor stacked loads.

B. New count sizes. Some receivers are reluctant to accept metric containers which vary from established weights because they fear their computer programs cannot accommodate them. Computers can be programmed to accept new numbers. It would be desirable to have all shippers agree to shift at once, but that is not likely.

C. Selling by weight instead of count. If this move is made for citrus, for example, the shippers and receivers will need to revert to standard product sizes or dimensions such as 38-1/2 lbs. of 3-1/2 inch diameter oranges vs. a carton of 88s. The computer can help make that adjustment for the benefit of system efficiency.

D. Do not ignore height. Emphasis has been placed on utilizing the pallet surface. Do not forget that once a unit of product is broken up for order selection at the warehouse, the container should still be compatible with other products to move products to the retail store efficiently. We focused on 15 and 30 cm heights.

E. Consider normal supermarket use in planning sizes of modular containers. The hard part is determining what is normal. The checkout scanner will begin to provide more reliable data in this area with actual sales data to compare with order quantities, in-store inventory, and losses, for typical weeks of the season.

F. Pallets vs. slipsheets. Equipment is becoming available to modify fork-lifts to handle slipsheets. Not having to use truck cube for pallets, plus not having the weight and disposal

problem at the receiving end will make slipsheets more attractive. Slipsheets will also make unit load handling more economical because with modular containers, one could approximate floor stack load capacity.

Finally, I would like to take a few minutes and discuss some MUM work that we are doing with frozen food and dry groceries. We started looking at frozen foods last year in cooperation with a Modularization Task Force of the American Frozen Food Institute. Frozen food would appear to be a natural for unitization and modulization in view of the high cost facilities required to store, transport, and display these items. A survey of a typical frozen food warehouse for a full line wholesaler identified 542 case sizes for 891 items. While 153 case sizes accounted for 502 of the items, there were 389 different case sizes for only one item each.

Only five cases utilize 100 percent of the pallet surface. Over 45 percent of the cases utilize less than 85 percent of the pallet surface. We have identified 16 modular cases that provide 100 percent surface utilization for a standard pallet. Of course with frozen foods, case dimensions much smaller than produce cartons are quite common. There is also more height variability with frozen food cases than with produce. As I indicated, we have barely gotten into this study but industry interest is very high.

Our dry grocery product study is underway in cooperation with Michigan State University. It was initiated last fall. It is designed to identify institutional and organizational barriers, and opportunities to improve modularization. I hope it will also provide a good state of the industry (or industries) and suggest promising directions that we should study that might help move the industry forward. In both frozen foods and dry groceries, I expect some of the same issues that surfaced in the product industry to reappear. For example: The issue of case count. With computers documenting inventory movement it may be better to shift to case

units that more nearly match or provide a portion of a typical retailer's needs. This might get away from the need to carry part cases back to the back room (or bury additional product on the shelf). Instead of cases of 12 or 24s, it might make more sense to move to 10s or 20s for some items. Retail sales space is short, and valuable. More research is needed to evaluate product

movement to help manufacturers and processors decide on the units to pack in a carton, and to develop modular containers. Some manufacturing firms could benefit with sales of two cases of 10 vs. one case of 12, etc., and retail merchandise managers might be able to more efficiently use their display space, whether it is a shelf or frozen food case.