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Packaging: Potential Effects on Physical Distribution

Chairperson: Jarvis Cain
University of Maryland

Technological Trends in Supermarket Refrigerated Display

by

Fayez F. Ibrahim, P.E.
Vice President Research & Development
Tyler Refrigeration Corporation
Niles, Michigan

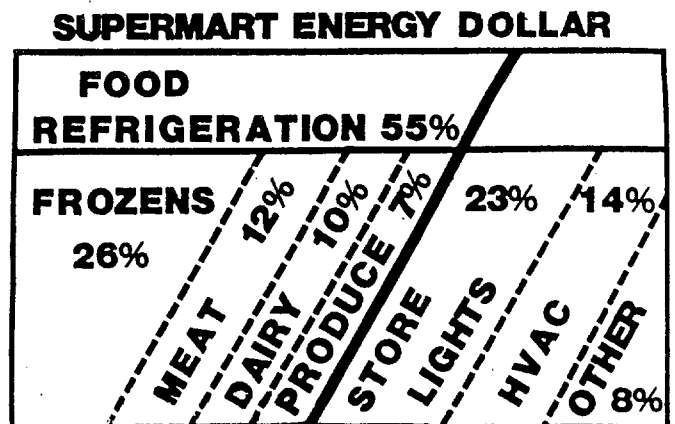
Buying equipment in 1986 and beyond promises to be more rewarding and challenging than it has been. There are more kinds of equipment--more choices to select from and yet there are more factors to consider. The choices presented by manufacturers of supermarket refrigeration are based on their supermarket customers' desires. Their desires are simply defined. They want refrigerated equipment which . . .

1. can be purchased at a reasonable cost,
2. operates economically,
3. minimizes labor costs,
4. utilizes floor space effectively,
5. affords adequate cube for product,
6. presents the product well, and
7. offers display flexibility.

Each department manager has her/his own ideas on how the above points apply to the products she/he is marketing. Most store

managers realize that overall, refrigerated equipment is using a total of 55 percent of the electrical power used in the store. Once the equipment is purchased, power costs are generally geared to the cost of the mighty KWH, although display practices which interfere with the case air flow can increase power consumption markedly. Additionally, the product suffers because of lack of refrigeration.

Figure 1



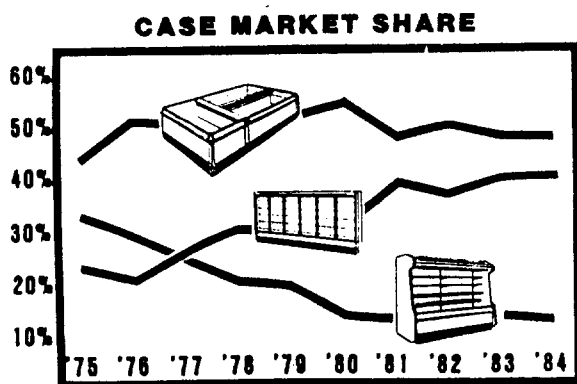
Each department in the store has its own styles of cases and each style fills a merchandising need. Tracking the sales of various styles of cases over the last several years can reveal the current trends. Here are the trends for each department.

The Frozen Food Department

Sales of the three major styles of frozen food/ice cream cases show that the popular well type case in its several forms captures about half of the market with multi-shelf cases declining in popularity. Glass door cases have gradually taken their place because of the definite advantages they offered. See Figure 2.

Figure 2

Frozen Food Cases



Case comparisons have been made using the well type case as a standard index of 100 and assigning values to the multi-shelf and glass door cases. Relative operating costs and their relationship to capacity and display area are shown in Figures 3, 4 and 5.

Figure 3

RELATIVE OPERATING COST

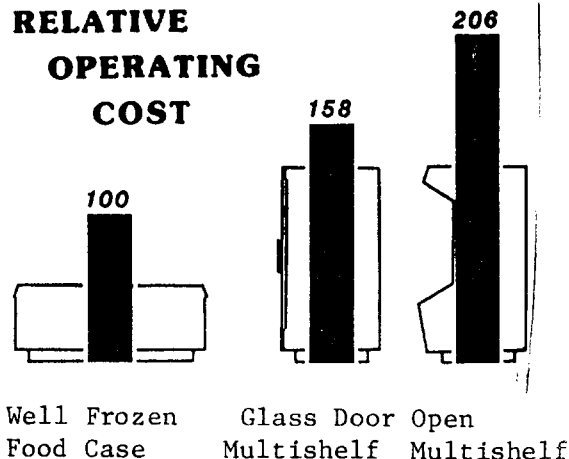


Figure 4

OPERATING COST /Cu. Ft. of CAPACITY

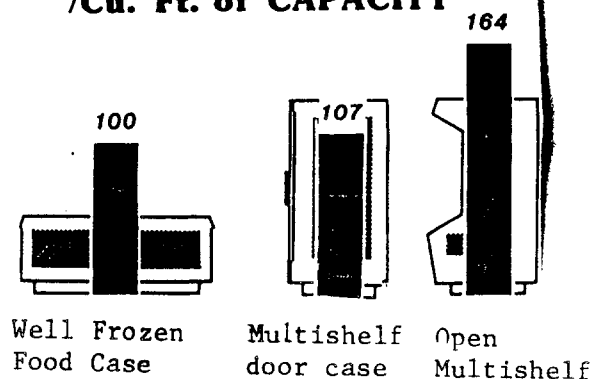


Figure 5

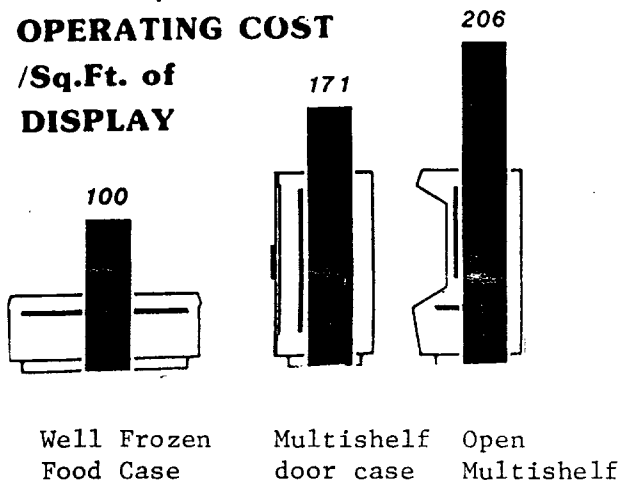
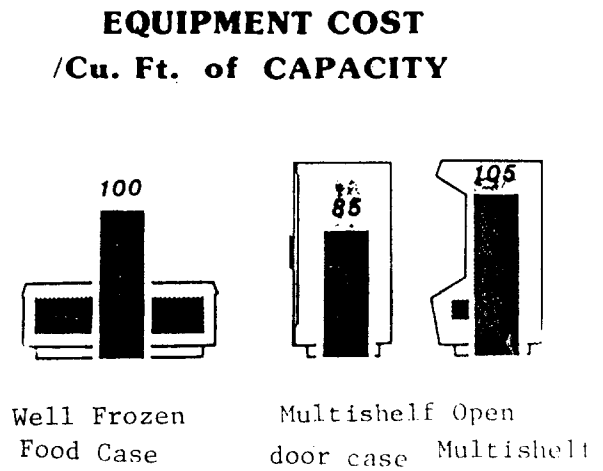


Figure 6



Relative equipment costs and their relationship to capacity and display areas are shown in Figures 6, 7 and 8. From all this, it is obvious that the most expensive case to purchase and operate is the open multi-shelf case. This is the reason demand is diminishing for them. Still, single multi-shelf cases are used to advantage in specialty departments. For example, a bakery department might have a case full of decorated cakes or a meat department might have case full of frozen meat or fish.

Figure 7

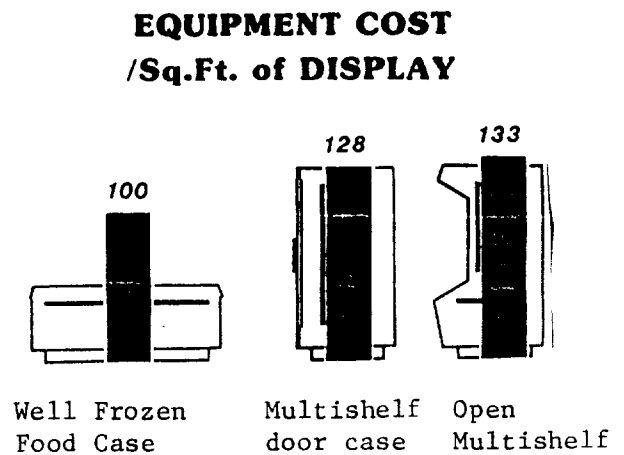
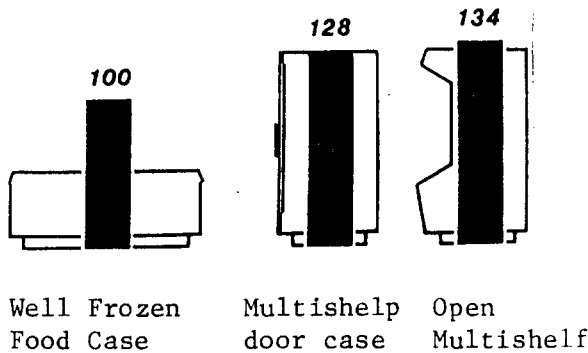


Figure 8

**RELATIVE EQUIPMENT COSTS
(Including Condensing Units)**



The Meat Department

The meat department is divided into service and self-service sections. See Figures 9 and 10. With self-service, there are two popular styles, the single deck (top display) case and the multi-shelf version. Here we see that the single deck is also available in a double duty model which meets the needs for a small group of customers. The multi-deck is gradually becoming more popular than the single deck meat case. A good reason is the need for display area. The top display case area has 32 square feet in a 12' case in comparison to 74 square feet for the multi-shelf case. Therefore, the multi-shelf case displays more than twice the product as the single deck case. We see a recent trend in supermarkets to arrange single deck cases as an island. There is now a demand for a unified single deck island fresh meat case. At this time we don't know if this will be a continuing trend or if it will pass.

Figure 9

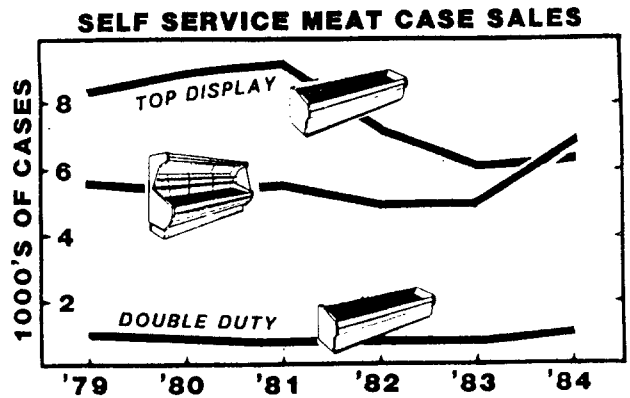
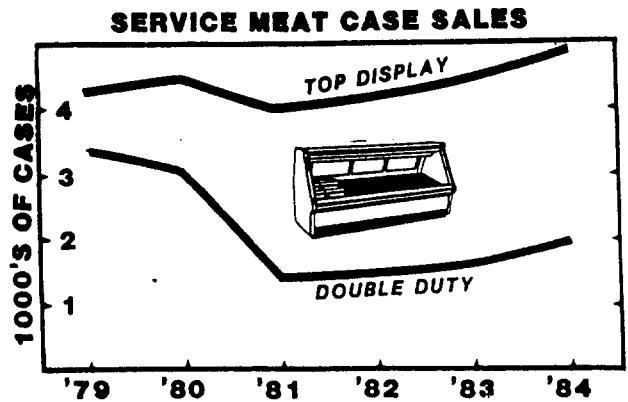


Figure 10



In the service meat department, the case with the storage area beneath is less popular, partially because with the small base, projected front style of case, there is so little area available below the display.

The Deli Department

In service deli display cases, in addition to the standard glass front, we see a growing demand for curved glass deli cases which afford better visibility of the product. See Figure 11. Also in this department we see the European lift front cases which are equipped with a single curve glass or a double curve glass which features even greater visibility. See Figure 12. The glass is either tempered or safety laminated.

Figure 11

Curved Glass Deli Case

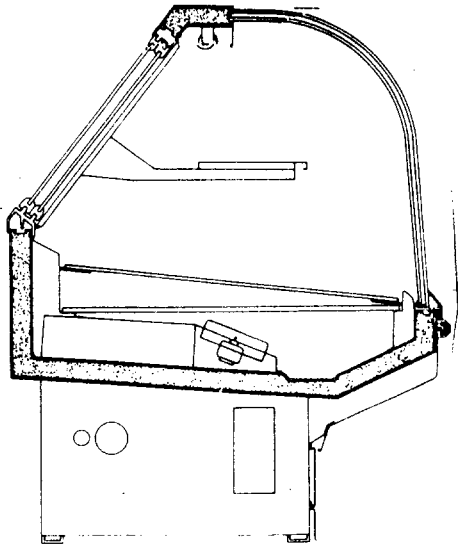
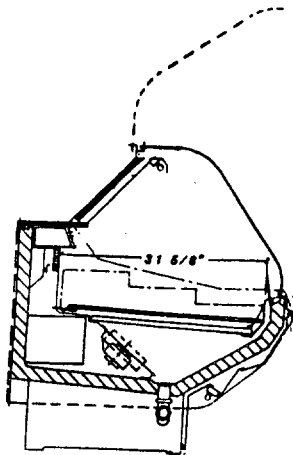


Figure 12

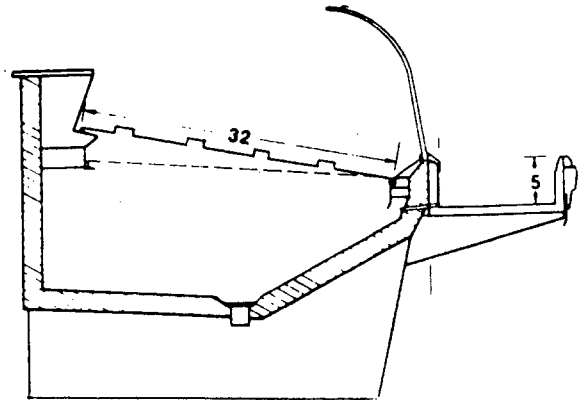
Lift Up Glass Case



Recently, the addition of a display pen in front of a top display fish case for merchandising oysters on ice has come on the market. This is another proof of the ability of manufacturers to provide what merchandisers desire.

Figure 13

Seafood Merchandiser

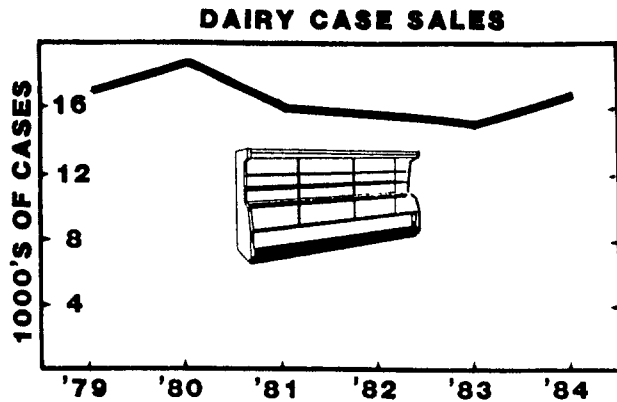


The Dairy Department

The demand for dairy cases has been steady for the last five years. See Figure 14. The lower height dairy cases of ten and more years ago have disappeared in favor of the full height case. There is a small, consistent demand for the roll-in or roll-thru dairy case which enables a merchandiser to utilize carts. The roll-in carts can be stocked at the suppliers and come to the market full of eggs or dairy products. When a cart is empty, a full one takes its place.

There is also a good demand for special cheese cases of walk behind and island styles. The walk behind case can also be arranged as an island.

Figure 14



The Produce Department

Growing in importance is the produce department using three basic styles of produce display refrigerators. See Figure 15. Here we see the tendency for massive merchandising of fresh wrapped or unwrapped produce. In the past ten years we have seen the multi-deck case sales steady with island type cases edging into the single deck display market. A new single deck case has been introduced to satisfy produce managers' desire to display greater amounts of fresh produce. The "waterfall" produce case is basically similar to other standard multi-shelf produce cases but the well area has increased by about 12 inches. See Figure 16.

Figure 15

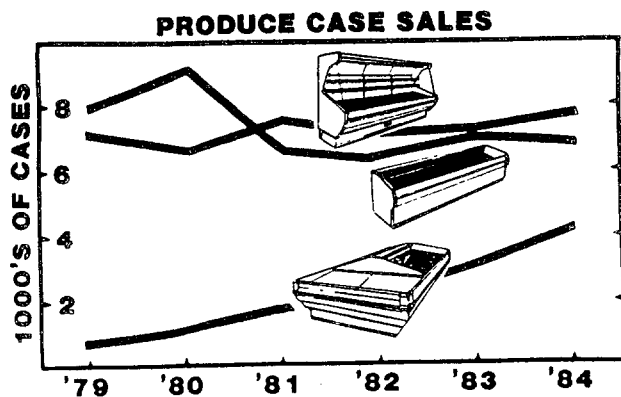
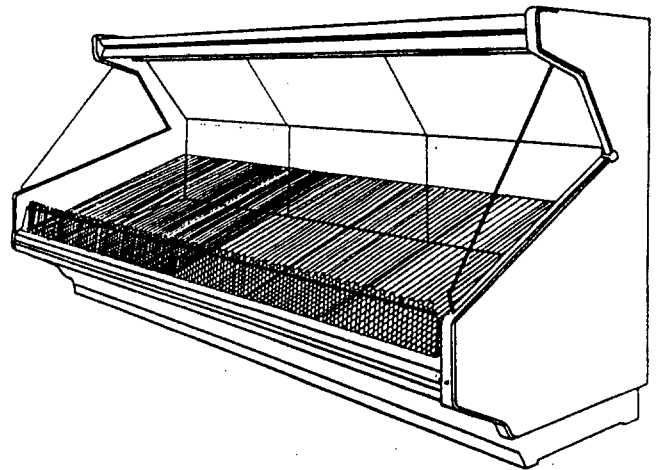


Figure 16

Waterfall Produce Case



Keeping Produce Fresh. Whenever we are dealing with unwrapped fresh produce, we must be concerned with drying of the commodities. For this reason, it has been recommended to spray the bulk produce with water frequently, as often as twice an hour. The Japanese have introduced an ultrasonic humidifier which is installed on the case and which produces a super fine mist that is inducted into the case air circulation system to maintain an extremely high humidity level. We have tested this ultrasonic humidifier and found that the end result is equal to spraying by hand twice an hour. So the advantages are in labor savings and in maintaining high humidity around the clock. The products keep very well for several days more than they would otherwise. However, these advantages are not without their cost.

Disadvantages of Ultrasonic Misting.

1. Refrigeration load is increased by 11 percent.
2. Water drips on customers.
3. Algae forms in case air ducts.

4. Silver backing comes off the edges of mirrors.
5. Rust forms on galvanized case parts.
6. The ultrasonic units have a high failure rate because calcium deposits accumulate around the discharge.
7. Units have a high initial cost.
8. Units have a high energy consumption.

To capitalize on the advantages and minimize the disadvantages, other concepts are being considered. The work is in an early stage and hopefully we will be able to arrive at a better alternative.

Self-Contained Spot Merchandisers

Most supermarkets have a variety of spot merchandisers for specialties such as pizzas, some dairy and deli products and special sale items. There is continuing interest in refrigerated flower carts and flower display cases.

Electronic Controls for Display Refrigerators

Electronic controls for display cases is one of the most exciting concepts in recent years whereby the control of the whole refrigerator can be done with a microprocessor computer. This computer combines many functions including taking the place of a conventional expansion valve, monitoring defrost, diagnosing case operation and providing an alarm function. These features will soon be available on new equipment and can be retrofitted into some present installations.

In Summary

Display case manufacturers aim to please their customers by providing whatever variation of display case will do the job. Some of the newer electronic devices are able to provide benefits merchandisers never even imagined, so building the ideal merchandising refrigerated case is a joint effort with input from both supplier and customer. The trend is for greater challenges and greater rewards for our industry.

