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FOOD SERVICE REFRIGERATION

Significance of Food Protection, Food Storage Requirements, Temperatures, Humidities, and Storage Conditions, Frozen Foods, Reach-In Refrigerators, Refrigeration Systems, Refrigerated Display Cases, Salad Pans, Counter or Back-Bar Refrigerators, Dispensers, Walk-In Coolers and Freezers, Water Chilling Equipment, Ice Making Equipment, Ice Cream Freezers, Equipping the Restaurant, Equipment Use Survey, Specifying and Sizing Equipment, Installation

TODAY'S food service operation is literally a *meal factory* if it is to be successful; the only exceptions being some special diet kitchens and certain restaurants catering to people who prefer having each item cooked to order. Basically, however, efficient food service is a problem of logistics of determining the flow of raw materials through various stages of preparation and storage to the ultimate sale. In this process, the necessary equipment must be arranged in an appropriate pattern and each must be suited for its particular job and coordinated with the others. Furthermore, the entire pattern must be related to the kitchen and dining areas so that steps are kept to an absolute minimum.

There has been a tendency to resist this type of planning on the theory that since the kitchen is responsible for so many different foods, any given arrangement is bound to have major drawbacks; or that set procedures will stifle the cooks and result in tasteless food. Experience has shown that scientific layout, portion control, receipt standardization and various other techniques of operation can be completely successful from all points of view.

The rapidity with which the field of food facilities engineering has grown graphically shows how well kitchen planning pays. The experienced design engineer can demonstrate conclusively that proper planning can bring every part of the entire establishment into the habit of contributing either to profits or efficiency, depending on whether the operation is commercial or not.

The refrigeration equipment, whether it be a water cooler or reach-in refrigerator, is much more than simply a place to cool things or to store them. Every piece of refrigeration equipment is expected, not only to refrigerate, but to perform other important functions. Each must make its own contribution to smoothness of operation, minimizing waste, expediting service and eliminating unnecessary handlings. These extra differentiate food service equipment from other commercial refrigeration items. Even when the item seems identical to that used for other applications, as in the case of the walk-in cooler, there are definite adaptations that differentiate the food service cooler from the cooler in the food store or warehouse. Another difference is that the food service operation is generally concentrated and heavy duty. Kitchens are often under-sized or under-equipped, tend to be hot and have peak periods during which equipment receives very heavy use. Therefore, heavier and more rugged materials such as stainless steel and porcelain enamel are commonly used instead of synthetic finishes for surfaces of kitchen doors. Insulation, hardware, shelves and

other accessories and materials are correspondingly more durable.

SIGNIFICANCE OF FOOD PROTECTION

The effective use of modern refrigeration methods preserves quality and prolongs the useful life of perishable foods which play such an important part in customer satisfaction and food costs in the modern restaurant. Food deterioration continues as an important and never-ending problem in food handling, with enzymes, bacteria, molds and yeast causing most of the trouble. Refrigeration has proven to be the most effective preventative of food deterioration because it inhibits or completely stops the action of bacteria, molds and enzymes. Improperly refrigerated perishable foods suffer wilting, softening, loss of weight and vitamin content, discoloration, molding, rotting and souring.

Dr. Gail Dack of the Food Research Institute, University of Chicago, comments on this subject:

"Certain foods such as dairy products, custard and various types of meats support the rapid growth of some of the bacteria causing food poisoning. These bacteria are common in our environment, and no practical means has been found to keep them from contact with our food.

"One of the most common types is a certain staphylococcus, which, if swallowed with food, is ordinarily harmless. However, if it grows in the above mentioned foods it produces a poison which, when swallowed, causes acute internal disorders. This poison has no abnormal flavor, nor are there any other tell-tale signs to warn prospective victims not to eat such items of food.

"At present, the only known method of preventing the growth of these food-poisoning staphylococci in food is by refrigeration. In experiments on the relation of time and temperature to the growth of these staphylococci, it was found that, under favorable conditions, the poison was produced in 4 to 5 hr at 86 F, in 3 days at 65 F, but not in 7 days at 49 F, nor in 4 weeks at 40 to 45 F."

FOOD STORAGE REQUIREMENTS

In every food service operation, proper storage facilities are essential for (1) preventing shrinkage, spoilage and waste; (2) preserving the quality and appearance of foodstuffs; (3) making possible savings through quantity buying and more adequate use of man-hours during slack hours; (4) providing ample amounts of food for maximum volume; and (5) speeding up service from kitchen to table.

The refrigeration problem, therefore, is to provide the above essential facilities which, in short, means providing proper storage conditions for the various food products until it is con-