Developing an Ordinance and Code for Food Vending Machines

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THE AUTOMATIC merchandising of food has grown from the penny candy vendor to prototype machines which dispense an entire hot meal at the touch of a button. A billion dollars for foods and beverages was dropped into coin slots in 1957, and vending machines are now supplementing snack bars and cafeterias in many factories and offices.

With the rapid expansion of this type of food buying, many States and communities and the trade organization of the industry requested the Public Health Service to develop a model sanitation ordinance and code for vending machines. Culminating 4 years of study and investigation, the recommended ordinance on the vending of foods and beverages was published in July 1957 (*1*). This suggested legislation is not solely a product of the Public Health Service. It also represents the views of State and local health officials and the vending machine industry.

The development of model ordinances and codes for nationwide use is not an easy task. Such a document aims to meet every situation in every State and community. The definitive provisions must reconcile the strict public health point of view, which may not recognize some of the operating problems, and the strict industry point of view, which may not recognize some of the public health considerations. Accordingly, a model or suggested ordinance represents a series of compromises which afford maximum public health protection and yet can be attained in practice.

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History and Growth

The history of automatic merchandising starts about 200 B. C.; the first vending machine of record dispensed holy water in a Greek temple in Alexandria, Egypt. In the early part of the 19th century, bulk tobacco was automatically merchandised in English pubs. Vending machines first appeared in the United States in the late 1880's. Penny gum and chocolate bars were dispensed in packages and salted peanuts and ball gum in bulk. Although cigars appeared in vending machines around the turn of this century, not until the mid-1920's were cigarettes so merchandised. Prior to World War II most vending machine operations were in the penny sales category (*2*).

During the past few decades, the vending industry has undergone phenomenal growth and technical change. Few facts and figures are available that accurately indicate the magnitude of the industry prior to 1950. However, personal observation and limited information indicate that food and beverage vending machine operations in the 1930's and early 1940's were primarily small businesses, with individuals owning and operating only a few machines.

Demands for inplant feeding during World War II increased the number of vending ma-

chines which assisted in meeting the needs for on-the-job refreshment. Subsequently, the automatic merchandising of foods and beverages in factories, office buildings, institutions, and other locations began to supplement and, in some instances, to replace the small cafeteria or snack bar.

The estimated total sales of products through vending machines in 1947 approximated a half billion dollars. In 1957, total sales exceeded $2 billion, about half of which were foods and beverages. The automatic vending of foods and beverages accounts for a large part of the increases during the past few years. For example, about 2,000 coffee vending machines were in use in 1949, with sales of about $1.5 million. In 1957, the sales of 70,000 machines dispensing coffee and other hot beverages were more than $135 million, an increase of 35-fold in machines and 90-fold in dollar sales. Similarly, sales of milk and milk products increased more than four times between 1953 and 1957. Sandwich and pastry sales have tripled since 1953 (*2*).

Until the last few years, most foods and beverages dispensed through vending machines were not readily perishable. However, as the industry expanded, the variety of products dispensed began to include many readily perishable products, such as hot and cold sandwiches, meat dishes, soups, and salads. Currently there are prototype machines which hold precooked frozen meals and dispense these meals hot in a matter of seconds. The expansion has introduced new products in food merchandising and public health protection normally not encountered in conventional food service businesses.

Requests for a Code

The earliest activities of the Public Health Service in connection with the vending of foods and beverages date back to the late 1940's. The changing character of automatic merchandising prompted a number of States and communities to request the Service to furnish opinions on the public health hazards of certain types of vending machines. Opinions delivered were based on the sanitation standards in the existing restaurant and milk ordinances and codes.

As the vending of perishable foods expanded, many States and communities requested the Service, in the interest of uniformity, to develop specific criteria which could be recommended for the sanitary control of foods merchandised in this manner. The National Automatic Merchandising Association, a trade organization representing the equipment manufacturers, the operators, and the suppliers, also requested the Service to formulate a model vending machine sanitation ordinance and code.

This work began in 1954. The Milk and Food Program of the Division of Sanitary Engineering Services made field studies of current practices in vending machine design, construction, and operation. The problems encountered were discussed in detail with individual State and local health authorities, representatives of the vending industry, and others concerned. Conferences were held with groups and individuals who had or were engaged in research related to vending machines.

Next, existing ordinances and regulations specifically concerned with the sanitary control of vending machines were reviewed. In 1954, only six local health departments reported that they had adopted such regulations; however, many indicated they felt there was a need for sanitary control of food and beverage vending. The most comprehensive standards reviewed at that time were those developed for the Armed Forces by the Subcommittee on Food Supply, Committee on Sanitary Engineering and Environment, National Research Council. The industry representatives indicated that the general criteria established in these standards were practical for all types of vending operations, although the standards were limited to coin-operated, bulk-type vending machines which dispensed beverages or liquid foods.

The first working draft of the ordinance was completed in 1955 and was discussed with members of the industry. In April 1956, the second working draft was submitted for review and comment to all States, a representative number of communities, several Federal agencies, the vending machine industry, and interested groups and persons. More than 800 groups and individuals had the opportunity to review and comment on the second draft, and their comments proved invaluable in preparing The Vending of Foods and Beverages for publication.

Basic Assumptions

The ordinance and code is based upon several major assumptions. The first is that it will be adopted only by jurisdictions having established food sanitation programs. Accordingly, the criteria of existing programs are the basis for the acceptability of foods, beverages, and ingredients; acceptability of the commissaries providing the foods, beverages, ingredients, supplies, and equipment; and acceptability of cleaning methods and bactericidal treatment of the surfaces of the machine in contact with the product. Second, ordinance provisions should be directed primarily toward the protection of readily perishable foods, but should cover public health considerations of vending machines dispensing all types of products.

And third, vending machines are unique; generally they are unattended food dispensing devices and must be self-contained units with the necessary built-in controls for protection of foods or beverages. In reference to this, it is recognized that the health authority, as well as industry, may find it desirable to cover automats, or attended vending machines, under the existing regulations for food service establishments. If this procedure is followed, such businesses should conform fully to the requirements for food service establishments.

The format of the ordinance has been designed to permit flexibility in methods of enactment or adoption. It includes a short enabling form for use by those jurisdictions where adoption by reference is legal. Use of this form reduces cost of publication and printing and facilitates keeping the ordinance up to date. To be adopted only as an ordinance, the code material concerning satisfactory compliance under section V should be deleted. The unabridged version has been arranged and presented in a form that can be adopted as an ordinance and code. When the unabridged form is adopted, section IX, enforcement interpretation, should be deleted.

Briefly, these are the major provisions of the ordinance.

Section I defines the terms used in interpretation and enforcement. This is an essential section of any regulation because specificity of intent must be delineated both for those administering the ordinance and for those regulated by it. Such terms as "vending machine," "commissary," "machine location," "readily perishable food," "operator," "employee," and "health authority" are defined.

A surprising difficulty was encountered in trying to define "readily perishable foods." Most of those concerned with food sanitation have a pretty firm idea of what is meant by "readily perishable foods." But try to write a definition that is clear, concise, and definitive! To find one, the counsel of representatives of the Food and Drug Administration, the offices of the Surgeons General of the Army, Navy, and Air Force, the National Institutes of Health, universities, and State and local health departments was sought. The definition in section I reflects the combined thinking of a group of people primarily concerned with food protection.

Permits

Permit requirements are normally a part of most food sanitation laws or regulations and from a public health point of view are a registration device to give the health authority a measure of the magnitude of operations requiring program coverage. Section II of the ordinance establishes for permits requirements governing application, issuance, suspension, revocation, and reinstatement.

It soon became obvious in developing permit requirements that they could become an administrative monstrosity to the health authority and the operator. A large number of operators or a single operation of any size would make it almost impossible for the health authority to maintain a current list of all machine locations. Therefore, the operator is required to maintain such information and to make it available to the health authority of the jurisdiction upon request. Permits are not required for each machine but are issued to each operator. The operator's permit number, of a size and style approved by the health authority, should be conspicuously displayed on each vending machine so that in a public health emergency involving a given machine, the health authority can readily identify and contact the responsible operator.

In applying for an operator's permit, the applicant must advise the health authority of the

products to be dispensed, and whether the products will be dispensed in bulk or packages. To keep his permit, the operator must also notify the health authority of any change in types of vending machines or conversion of existing machines to dispense products other than those for which the permit was first issued. Permits, of course, are nontransferable.

Section III prohibits the sale of misbranded or adulterated foods or beverages, and provides for the examination and condemnation of such products.

The inspection of vending machines and commissaries is covered in section IV. Vending machines dispensing readily perishable foods or beverages and all commissaries should be inspected at least once every 6 months. Machines dispensing other than readily perishable products, for example, peanuts, popcorn, and carbonated beverages, should be inspected as frequently as the health authority deems necessary and practical. In addition to authorizing and requiring inspections, this section requires the operator to provide the health authority with access, either in the company of an employee or otherwise, to the interior of all vending machines he operates.

The health authority is required to notify the operator of unsatisfactory findings of an inspection and to establish a specific, reasonable period of time for correction. When conditions are grossly insanitary, or a substantial hazard to the public health exists, the health authority can, with due process, require the immediate discontinuance of operation.

Sanitation Requirements

The sanitation requirements for vending machines and their operation are set forth in section V. Obviously these requirements must be based on the type of food or beverage dispensed. For example, the vending of prepackaged chewing gum hardly presents a danger to the public health, but the vending of milk, sandwiches, salads, and a variety of other readily perishable foods can be potentially hazardous. This section is concerned primarily with the vending of perishable foods and beverages; however it also includes general provisions which are applicable to all vending machines. An effort was made to cover by specific requirements particular foods or types of vending operations which present a potential health hazard.

Section V is quite detailed and is presented in eight parts. Part A concerns the protection and wholesomeness of foods, beverages, and ingredients, at their sources and in the vending machine, and the protection and maintenance of surfaces of containers and equipment in contact with the product. It requires that readily perishable foods within the vending machine be held at a temperature not higher than 50° F. or not lower than 150° F., whichever is applicable.

Controls are required to insure the maintenance of these temperatures at all times, provided that an exception may be made for the actual time required to fill or otherwise service the machine, and for a recovery period of 30 minutes following the filling or servicing operation. These controls are required to be such that, in the event the temperature in the food storage compartment rises above 50° F. or falls below 150° F., the machine is placed in an inoperative condition until serviced by the operator. The food storage compartment of vending machines dispensing readily perishable foods must have a thermometer with an accuracy of $\pm 2°$ F.

Two points about the temperature controls should be emphasized. First, the 30-minute bypass of the machine cutout is not required but is permitted because of a practical operating problem. The possible public health hazard is calculated to be relatively small. Second, if at the end of this 30-minute period and at any time thereafter, the temperature of the food storage compartment fails to meet required standards, the dispensing mechanism must become inoperative pending the operator's reservicing of the machine. Thus, unless the readily perishable products put into the machine at servicing meet temperature requirements, the machine is likely to become inoperative after not more than 30 minutes.

Milk and fluid milk products offered for sale through vending machines must be dispensed only in individual, original containers or from bulk containers filled at the milk plant. This requirement is excepted when the fluid milk

product is an ingredient in liquid foods or beverages dispensed at 150° F., such as in a coffee machine. In this circumstance, the milk product may be transferred at the machine location from the original container of not more than one-half gallon capacity to the vending machine bulk container which is clean and which has been subjected to approved bactericidal treatment. In such a transfer, the entire contents of the original container must be used.

This exception is a necessary compromise, since dairy-filled containers for fluid milk products, suitable for vending machine use, were not available at the time the ordinance was developed. It is understood that several equipment manufacturers are working on this problem with promise of success.

The cleaning, filling, and protection of containers used in bulk milk vending machines are consistent with the provisions for bulk milk dispensers as set forth in the milk and restaurant ordinances recommended by the Public Health Service.

All parts of vending machines in contact with readily perishable products are required to be cleaned and bactericidally treated daily, unless these parts are kept at all times at a temperature not higher than 50° F. or not lower than 150° F. The frequency for cleaning the contact surfaces and parts of other types of vending machines, such as carbonated beverage or popcorn machines, is established by the health authority. The operator should maintain within machines of this type a date record of cleaning and bactericidal treatment. Protection of single service containers used in vending machines dispensing foods or beverages in bulk is also specified.

Other Requirements

Part B requires that the machine's location have a minimum potential for contaminating the product and that the location be easily cleanable and kept clean. Part C, exterior construction and maintenance, specifies that machines be sturdily constructed and that exteriors be designed, fabricated, and finished to facilitate cleaning and minimize the entrance of vermin. Screens for ventilation louvers are required; however, because of the large number of machines currently in use which are not screened, the requirement is deferred for these machines until they are relocated or removed from present locations for any other purpose.

Part D, covering interior construction and maintenance, provides that all interior surfaces and component parts of vending machines be so designed and constructed as to permit easy cleaning and being kept clean. It further requires that all surfaces in contact with the product be smooth, nontoxic, corrosion resistant, and be made of relatively nonabsorbent material. Such surfaces must be protected from contamination and be capable of withstanding routine cleaning and bactericidal treatment.

Inplace cleaning of pipes and tubing of all machines dispensing other than readily perishable foods is permitted. This practice is acceptable if pipes and pipe fittings are so arranged that cleaning and bactericidal solutions can be circulated throughout the system, these solutions contact all interior surfaces, the system be self-draining or otherwise completely emptied, and the procedures result in thorough cleaning. The vending stage of all bulk food or beverage machines must have a tight-fitting, self-closing door or cover that remains closed except when food or beverage is delivered.

Part E provides that water used in vending machines be from an approved source and be of a safe, sanitary quality. Water used as an ingredient of the product must be piped into the machine under pressure, with connections and fittings installed in accordance with local and State plumbing regulations.

While the water supply provisions of this ordinance were being developed, information was received concerning several outbreaks of illness attributed to copper poisoning from post-mix carbonated beverage machines. In almost every instance, investigation revealed that there had been a breakdown of the check valve in the water supply line upstream from the carbonator. Specific provisions were therefore developed to protect against such occurrences.

Post-mix carbonated beverage machines are required to have two check valves or a double one; or an air gap; or a device to vent carbon dioxide to the atmosphere; or other device

approved by the health authority which will prevent carbon dioxide or carbonated water from entering the water supply system. All contact surfaces downstream from the protective device are required to be of such material as to preclude the production of toxic substances which might result from interaction with carbon dioxide or carbonated water. If check valves are used, a screen of not less than 100 mesh to the inch must be installed in the supply line immediately upstream from the valves. This screen is to remove any particulate matter which might lodge between the valve and its seat and which might be of sufficient size to nullify the valve's purpose.

Part F, waste disposal, states that all trash and other wastes must be removed from the machine location as frequently as necessary to prevent nuisance and unsightliness and must be disposed of in an approved manner. Machines dispensing liquid products in bulk should have containers to collect drip, spillage, overflow, or other liquid wastes. An automatic shutoff is required which will place the machine out of operation before the liquid waste container overflows.

Part G requires that foods, beverages, and ingredients, and the surfaces of containers, equipment, and supplies in contact with the product be protected from contamination while in transit to machine locations. Further, readily perishable foods while in transit must be maintained at a temperature not higher than 50° F. or not lower than 150° F. This provision does not necessarily require a refrigerated or heated truck, but does require maintenance of these foods at appropriate temperatures. A well-insulated container might suffice, depending on the distance and size of the operation.

That employees have clean hands and wear clean outer garments while handling foods, beverages, and surfaces in contact with products are not only standard requirements in food ordinances but are good business practices as well. This provision is in part H.

Sections VI and VII provide for communicable disease control related to vending machines, and for necessary action when disease is suspected.

Some automatic merchandising businesses are both intrastate and interstate operations. Section VIII provides for reciprocal inspection of commissaries and permits the health authority to accept reports from the responsible health authorities in other jurisdictions where commissaries may be located.

Enforcement interpretation, penalty provisions, repeal and date of effect, and the unconstitutionality clause, all standard provisions, are set forth in sections IX, X, XI, and XII, respectively.

Industry Efforts

It would be remiss to fail to recognize the industry's part in the promotion of vending machine sanitation. Only a few small outbreaks of illness attributed to foods or beverages from vending machines have been reported to the National Office of Vital Statistics. However, the rapidly changing technology in this type of food service has substantially increased the potential for foodborne outbreaks. This potential was recognized early by a number of forward-looking members of the vending machine industry. Led by the Public Health Committee of the National Automatic Merchandising Association, vending machine manufacturers and operators assisted in the development of the ordinance and code and have endorsed its provisions. In addition, many of the new vending machines are already being designed and fabricated with greater attention to sanitation, and an aggressive public health program has been initiated by and for the industry.

Adoptions

California and Indiana are using the recommended ordinance and code as the basis for State laws or regulations. Many of its provisions are being incorporated into New York City's sanitary code, which is currently under revision. It is also serving as the basis of vending machine sanitation requirements being prepared by the District of Columbia and the city-county of Denver.

Total implementation of the vending machine ordinance and code, whether at State or local levels, ultimately depends upon the development of genuine cooperation, personal as well as official, between sanitarians and vending

machine operators. In the interest of effective vending machine sanitation, it is suggested that health officials get to know the operators in their jurisdictions. By making some rounds with local operators, sanitarians can become acquainted with machine operations and servicing and learn the public health and operational problems associated with various machines. The result will be a sharing of "know how" and an interchange of ideas and experiences. This sort of cooperation pays big dividends in the area in which we all work—the protection of the health of Americans everywhere.

REFERENCES

(*1*) U. S. Public Health Service: The vending of foods and beverages; a sanitation ordinance and code; 1957 recommendations of the Public Health Service. PHS Pub. No. 546. Washington, D. C., U. S. Government Printing Office, 1957.

(*2*) National Automatic Merchandising Association: Annual directory of automatic merchandising. Chicago, 1954–57.

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Nutrition Quiz

A nutrition quiz for dental hygienists of the New York City Department of Health was held April 26, 1957, at the Fort Green Health Center in Brooklyn. The idea for this quiz originated with the borough consultant in dentistry for Brooklyn, who was looking for a stimulating and novel training activity.

Nutrition has always been an integral part of the Brooklyn dental hygienists' inservice training. Customarily, nutrition consultants and supervising dentists from the New York City Department of Health plan group meetings, often held during school vacations, and hold conferences with individual hygienists on specific problems during this inservice training.

Representatives from the hygienists' group, the borough consultants in dentistry and nutrition, the supervising dentist, and three district nutritionists attended a planning session for the quiz. It was decided that the hygienists would volunteer to study specific nutrients such as vitamins, protein, and minerals as well as calories. Each hygienist was expected to study her topic and to become a "specialist" in answering questions concerning it. The hygienists also agreed to submit questions on their chosen topics.

These questions were then edited and revised by the dentists and nutritionists. The questions were geared to personal nutrition needs as well as those the hygienists met in the field.

For the quiz, all of the 50 hygienists attending were divided into two teams, each with a captain. Each team had its own specialists who had studied their respective nutrients. The consultant in dentistry acted as quiz master, hygienists as team captains and timekeepers, and nutritionists as scorekeepers.

Typical questions were: Define a vitamin. Give five symptoms of a vitamin C deficiency. Name five results of insufficient dietary protein. Is it true or false that fruit is low in calories?

Questions were put first to nonspecialists who earned a score of 2 for a correct reply within 30 seconds. A question unanswered within this time limit was turned over to a specialist, whose reply was worth one point. The nutritionists, as they kept score, made notes of challenged answers, points needing explanation, and questions which no one answered correctly. Fifty-five questions were posed during the hour-and-three-quarter morning session.

The nutritionists used the luncheon following the quiz to dramatize the subject of nutrition. Each platter of food on the buffet table bore a sign identifying its nutritional value.

The participants' interest remained high for the afternoon session when the nutritionists took up debated and unanswered questions. Using teaching devices such as bar graphs and posters, they explained points brought up during the quiz, stimulating further discussion.

The day's activities culminated with the announcement of the quiz prize winners. Prizes provided by the nutritionists for each member of the winning team were oranges, grapefruit, carrots, spinach, escarole, chicory, green celery, apples, and cans of dry, nonfat milk solids.

—HILDA KREIGENHOFER, *borough consultant in nutrition, bureau of nutrition, New York City Department of Health.*