

OBSERVATIONS ON AN IN-SERVICE TRAINING COURSE IN FOOD TECHNOLOGY FOR SANITARIANS

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A report on sanitation practices in local health departments made in 1951, showed that 9.4% of the total program time was spent on restaurant inspection and an additional 7.4% of the time was spent in retail food store inspection. Food processing plants were allotted only 2.1% of the total program time. Yet, the social, economic, and technological changes which have occurred in our society in the last twenty years have probably affected the food processing industries more than they have affected any other segment of the food industry. For instance, there has been an increase in demand for the so-called convenience foods. Women want to spend less time in the kitchen. The number of women in the nation's work force has nearly doubled in the last twenty years. Social change combined with a period of economic prosperity in which it becomes easier for families to bring their food consumption in line with their preference, means that there will be an ever increasing demand for time saving convenience foods and other new foods. The trend has been from preparation of food in the home to preparation of food in the food processing plant. These social, economic, and technological changes are occurring at an ever increasing pace and the public health agencies must be prepared to effectively respond to the new challenges.

The local health department has a definite role in the regulatory control of food processing plants. This is especially true in the major cities where there are concentrations of the food processing plants. For instance, in Philadelphia, one can find almost any type of food processing activity and there are approximately 600 such plants in the city. Local health departments have traditionally been concerned with milk plant sanitation, eating and drinking place sanitation and with food stores. The weakest local program has usually been that in food processing plant sanitation.

Though there had been inspections of food plants in Philadelphia over many years, there were no effective regulations and little specific training in food plant sanitation. The first step was to develop a modern food processing plant regulation. The same methods for preparing other regulations were followed in the preparation of the food processing plant regulations. This consisted of a careful review of the basic draft which was prepared by the Health Department, by a group consisting of food plant

operators, food technologists, university scientists concerned with food technology, and interested citizens. There was much discussion and there were changes in the basic draft. The final result was a modern food processing plant regulation, which has wide applicability for all the types of food plants. The scope of the regulation can be shown by the definition of a food processing or food manufacturing establishment. This is any establishment with "permanent location where food is handled, manufactured or processed and offered for sale or distribution to other establishments. Food manufacturing and processing establishments include but are not limited to bakeries, confectioneries, bottling plants, canning plants, pickling plants, seafood or shucking plants, frozen food plants, and similar plants."

However, a shiny, new regulation is not enough. In order for a regulation to be effective, it requires implementation by sanitarians who know the industry which they are to inspect and to which they are to apply the regulations. At this point we did not feel secure. For the most part, our sanitarians are college graduates and all have basic training in environmental health. They had had experience in milk plant sanitation, in eating and drinking place sanitation, and in retail food store sanitation. Though there are principles which permeate the whole field of food sanitation, there are special factors which apply to each segment of the food industry and to each type of food plant or food operation. This was the problem that we were faced with. Given a group which does have a good basic education and a background in food sanitation, how does one train them to take on new duties and responsibilities in the food processing industry? Though they had the advantages of the past training in milk sanitation and other food sanitation activities, would it be possible that this training had also given them some preconceptions which could not be carried over to the food processing industry?

PLANNING THE COURSE

After considering the problems in giving a course in basic food technology for sanitarians, it was decided that it was necessary to recruit experts outside of the Department. The persons in the community who did have experience and knowledge of the food processing industries were the university

scientists engaged in food research and teaching, and the food technologists and food plant operators. The most effective way to reach these people was through their professional organization which is the Institute of Food Technologists. Fortunately, there is an active local chapter of the Institute of Food Technologists in Philadelphia. The Health Department personnel had participated in the meetings of the local group over a period of years and the contact was not difficult to make. The officers of the local group were most enthusiastic when they were approached and joined with Health Department personnel in the planning of the conference. The joint planning group selected those speakers in the Department and in the community who would best handle the various subjects to be presented during the five day meeting. An invitation letter was then prepared and the letter specifically stated that the training course had been planned jointly with representatives of the Philadelphia Chapter of the Institute of Food Technologists and the Department of Public Health. It was also noted that the training was designed to supplement the Health Department activities under the Regulations Governing Food Processing and Food Manufacturing Establishments, and the course was intended to provide basic information to sanitarians on food processing practices and methods current in the Philadelphia food industries. Several problems arose at this point. There had been some hope of preparing a manual based on the presentations in the course. This would have required a written formal presentation by the invited participants. At the outset we could see that the participants were most reluctant to prepare formal papers. There also was the apparent reluctance of some industry personnel to participate. This reluctance seemed to be based on a certain lack of confidence of the technical industry people in their own abilities as speakers. There were many telephone conversations and many reassurances to individual participants before final acceptances were received. There is the ever present factor of competition for the individual's time. Participation in the training course was a demand on an already busy schedule. The participants did give their time generously and the talks were of uniform high quality and showed the effect of careful preparation.

The recruitment of persons to participate in the program was a most crucial part in preparing for the course.

COURSE CONTENT

All segments of the food industry had to be considered in planning the course content. It seemed advisable to work from a point of view which could yield the most universal information. One way of

accomplishing this is through the "unit operations" approach. Dr. L. V. Burton in 1940 stressed the similarity of various operational steps in food processing by delineating some 15 classifications, including such areas as cleaning, drying, evaporating, etc. The further separation of these classifications into "unit chemical processes" and "unit physical operations" provided a most enlightening introduction into the entire field of food technology and a specific departure point for each of the various specific fields of food processing which were to be considered. In this way the broad principles on which each food process is based are brought to the attention of the beginning student. Although it is important to have the student understand the similarities among the different food processes, the specific differences must also be pointed out. It is important to point out that requirements in one type of processing may be superfluous or even undesirable in another. An example of this was found in the reluctance of many of the students to accept the fact that chocolate liquor lines and pumps need not be cleaned daily, weekly or even monthly. The comparison with milk processing seemed always uppermost in the minds of many of the sanitarians.

A list was made of various divisions of the food industry active in the Philadelphia area, such as baking, candy, meat, poultry, pre-cooked foods, etc. These were then grouped in as closely similar areas as possible and those which seemed to be parallel in either processing techniques, or sanitation practices were considered together for lecture and illustrative purposes. For example, "MEAT and POULTRY PRODUCTS" were grouped into a lecture, and "FROZEN FOODS" and "PRE-COOKED FOODS" were also grouped. The baking industry and macaroni products were the topic for a full day, while candy, confectionery, chocolate and nuts made up the topic of another day. Topics were eliminated which did not seem to be too important either to the general problems being discussed, or to a basic understanding of the major problems encountered or anticipated in the Philadelphia area.

The problem of orienting the course toward sanitation or technology was considered. An understanding of food technology was felt to be basic to the comprehension of the sanitation problems involved. The students had extensive education, training and experience in sanitation, but few had had any experience in actual food technology. It was decided to concentrate on basic food technology and to minimize any specific sanitation considerations.

A convenient time period for the course seemed to be a week. Certainly this did not cover the field as well as we would have liked, but it presented an opportunity for a full day on unit operations and a half day for discussion and review in addition to the

specific food processes. We believed it advisable to give the entire course in one full week, rather than breaking it down to one day a week for 5 weeks or some similar variation. The importance attached to a full week's work by all participants was the prime reason for this choice. Also, transportation time and interference with other activities were minimized. One large inconvenience is frequently less costly in effort and expense than frequent small inconveniences.

Field trips were considered. The group had some field experience in making inspections at food plants. Field trips are time consuming and some plants are so noisy and offer such poor opportunities for visualization of the processes, that it was decided not to have any field visits. Instead, as many visual aids as could be obtained were employed. This included motion pictures, slides, filmstrips, booklets put out by some of the participating companies, charts, flow sheets and outlines, etc. Samples of actual foods and raw materials were also used. Visual aids were of inestimable value.

No text was used in the course, although a number of references were suggested. Some of the students had these books, and all were in the library of the Health Department.

One of the most valuable parts of the course was a panel composed of representatives of the Food and Drug Administration, Pennsylvania Department of Agriculture, the Philadelphia Department of Health, and an Industrial Food Consultant to answer questions and discuss food plant sanitation based on their respective responsibilities and points of view. This panel followed a review of the course which helped to solidify the information presented during the week.

There was active interest on the part of the students in the discussion by members of the panel. Generally, the topics covered were the legal aspects of enforcement, new legislation in this field and the reaction of industry toward food regulations. As a climax to the week's work, this seemed quite stimulating and provided the concrete connection between the training course and the daily activities of each of the students.

During this entire program, the students were quite enthusiastic. Their overt reactions were positive and question and answer periods, as well as class sessions, met with the most active interest. There seemed little boredom, which reflects well on the participants, but also is a measure of student interest.

Some of the participants began lectures with some hesitation, probably due to inexperience in lecturing or teaching, but also due perhaps to some reservations as to the genuineness of interest of the students in the participant's particular field. These reservations

were almost completely dispelled by the attitude of the sanitarians. Some of the industry lecturers made a point of indicating their surprise and gratification that the students were both interested and well qualified for their work.

COURSE EVALUATION

There are several ways of judging the degree of success of a training course. One way is through a subjective evaluation of audience participation and audience interest. On the basis of this measurement, the course was successful. Another evaluation measurement is through objective testing. A written examination was given to the sanitarians at the end of the five day course. The examination consisted of 10 questions, some examples of which are:

1. Describe the various methods of curing meat and meat products.
2. What are the basic elements of a quality control program in the canning industry, the baking industry, and the frozen food industry?
3. Draw a flow chart for bread baking from the receiving of the raw materials in the bakery to the finished product.
4. List the several different methods of preserving food. Give an example of the food preserved by each method. Explain how or why each of the preservation methods prevents spoilage.
5. Discuss the different defects of canned goods and give a reason for each defect.

In the last analysis, the best evaluation of the training course must be how well the sanitarian performs in the field. We are not able to answer this question fully at this time, however, a study of the inspection reports of the food plants would indicate that the sanitarians have added to their competence in this area.

DISCUSSION

The trend in our society is to a shift from food preparation in the home to the preparation of more completely processed foods ready-to-eat foods and convenience foods in the food plant. Health departments should recognize this shift in consumer preference and place a greater percentage of the total food sanitation program time into the food processing industries. Food processing industries can not be effectively regulated by the health agencies unless the sanitarians have a good knowledge of the industry and the specific processes carried on in the industry. There is a need for a standardized training course in basic food technology for sanitarians, in the same way as there are standardized training courses for restaurant sanitation and for milk plant sanitation. These courses could be organized by the Public Health Service or by the Food and Drug

Administration. The university departments of food technology can also play a major role in the organization of courses in food technology for sanitarians. There is also a need for written publication in food processing for sanitarians. There are, of course, excellent books on food processing and the food processing industry, however, these are designed for the use of the food technologist. The texts in public health and in public health sanitation are concentrated on food establishment sanitation and to milk plant sanitation, and the coverage on food processing is not extensive. There is a need for a publication which stresses the public health and sanitation aspects of the food processing industry with special attention to the basic food processes. There are excellent visual aids for eating and drinking place establishment sanitation and for milk plant sanitation, and even for retail food sanitation. However, there is limited visual aid material for training in food plant sanitation. If these materials and courses are not made available to the local health departments, they will have to continue to carry on their own training activity in this field. We have found that it is most useful to bring in the food industry, the trade associations, and the professional groups of food technologists to help plan and present the course in food technology for sanitarians.

CONCLUSION

The Philadelphia Department of Public Health in cooperation with the local chapter of the Institute of Food Technologists developed a basic training course in food technology for sanitarians. The course followed from a need to implement the new regulations on Food Processing and Food Manufacturing which were promulgated by the City. The course was intended to acquaint the sanitarian with unit processes and unit operations in the food industry and with some specific food processes. It was felt that sanitarians are basically oriented toward eating and drinking place establishment and toward milk plant establishment and that training in food processing is desirable. A program of sanitation for the food processing industry can not be successfully implemented unless the inspection personnel are acquainted with the different food processes and the sanitation significance of these processes. The course description and organization is presented here as a beginning effort, and it is hoped that schools of food technology and organizations such as the Public Health Service and the Food and Drug Administration will organize a training course in basic food technology for sanitarians.