DEVELOPMENT OF AN EDUCATIONAL SANITATION PROGRAM FOR THE ST. LANDRY PARISH SCHOOL FOODSERVICE SYSTEM

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We hereby recommend that the Thesis prepared under our supervision by Mary Suzanne Lognion entitled Development of an Educational Sanitation Program for the St. Landry Parish School Foodservice System

be accepted as fulfilling this part of the requirements for the Degree of Master of Science.

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INTRODUCTION

Education includes the process of developing some type of knowledge, skill, or character by formal schooling, teaching, or training (Guralnik 1971). In the foodservice industry education in sanitation/sanitary practices is of major concern. The foodservice industry is obligated to prepare and serve wholesome food to the public (Clingman 1979). This can be fulfilled only if foodservice personnel in every establishment understand what sanitation is, appreciate its importance, and practice it at all times (West et al. 1977). Practicing sanitation calls for applying approved sanitary measures at every stage of an operation to achieve cleanliness and to protect the health of the consumer (Clingman 1979).

Sanitation is a word derived from the Latin word sanus, meaning clean and whole. The modern interpretation of the term "sanitation" is broad, including knowledge of health and of sanitary conditions as well as full acceptance and effective application of sanitary measures (West et al. 1977). Therefore, sanitary practice is concerned with:

> ...the purchase of a sound food supply and its maintenance regarding repairs and cleanliness; the adequacy and cleanliness of storage facilities, equipment, and utensils; sanitary dishwashing operations; the good health, good

> personal hygiene, and good working habits of the food handler; the education of foodservice employees in the various aspects of sanitation in a foodservice operation (Clingman 1979).

According to Foster (1982), "we have gone a long way toward an understanding of the common foodborne diseases and how to prevent them." The major problems are evident through the failure to observe the essentials of safe food handling practices. This can only be remedied through education (Foster 1982).

The main solution to solving current problems of foodborne illness lies in the kitchen--whether it be the institution, restaurant, the home; or increasingly, in the food industry. According to Woodburn (1978), "education is salvation" for taking action on the prevention of foodborne illness. Supervision is an essential part of a safe and quality operation. Along with supervision there must also be an awareness of the importance of foodborne hazards and an acceptance of the fact that these can be controlled (Woodburn 1978).

It should be emphasized that educational aspects of food protection are too important to be allowed to occur by chance or haphazardly. Not only should basic hygiene and sanitation facts be the focus of training, but also an understanding of human motivation and behavior needs to be included. Information concerning the cultural background of

the foodservice worker should also be incorporated in this process for successful communication and education (Walker 1978). The key factor in ensuring the foodservice industry's growth into the 1980's is its ability to provide guaranteed food protection to the consumer (Clingman 1979). This can be done by educating both the foodservice manager and foodservice worker in accepted sanitary practices.

PROBLEM STATEMENT

The purpose of this study was to investigate the question: Is it more beneficial to train (1) the foodservice managers, or (2) both the foodservice managers and foodservice workers in general sanitation practices for use in the school cafeterias. A sanitation checklist for the school cafeterias was used to determine if there was a difference in sanitation practices of foodservice workers who had training and those who have not had training.

DEFINITIONS

Sanitation/Sanitary Practices

For the purpose of this study, sanitation/sanitary practices are accepted procedures which are followed at every stage of an operation or task to achieve cleanliness and to protect the health of the consumer.

REVIEW OF LITERATURE

The foodservice industry is in an era of concern with foodservice sanitation. Because of the nation-wide interest of government, consumers, and the foodservice industry in foodservice sanitation many significant and beneficial changes are taking place (Davis 1977b). It is through the training and education of foodservice managers and workers that improvements in foodservice sanitation can be effective and benefit the consumer and foodservice industry. Public health officials are increasingly recognizing that the foundation of food sanitation practice is not inspection and enforcement, but to a large extent is based on the knowledge, attitude, and behavior of the foodservice worker (Walker 1978).

Foodservice managers have been recognized to be the key to the training and education of foodservice workers in sanitation practices. If the foodservice manager is knowledgeable about sanitation, a cleaner operation will exist. The foodservice workers will have an increased appreciation for sanitation practices (Clingman 1977).

A major goal of public health authorities is education of foodservice managers in the basic concepts of foodservice sanitation. The expectation is that a properly educated

foodservice manager would be able to recognize and eliminate conditions capable of producing and transmitting foodborne illness. Implementation of this concept requires two components. The foodservice manager must be able to (1) identify the problems involved in the foodservice operation; and (2) having identified the problems take the necessary steps to correct or eliminate them (Heenan and Snyder 1978). Foodservice management has been interested in receiving help to meet sanitary regulations, reduce food spoilage, lengthen keeping quality, and prevent food borne illness. Educational programs have been found to be the answer when handling perishable food (S.E. Barnard et al. 1977).

According to Davis (1977a), more emphasis has been placed on sanitation training for managers than for workers. The reason for this is that the manager should be as knowledgeable about sanitation and proper food protection as any other facet of his job. The manager should be able to educate the workers, and to integrate sanitation practices into daily routines (Davis 1977a). While, according to Baker (1980), many attempts have been made in the past to train food handlers, little effort has been expended to teach sanitation to persons in management positions in the foodservice industry. It is recognized that management sets the "tone" as to how effectively an establishment will operate to meet sanitary requirements (Baker 1980).

In 1971, the National Conference on Food Protection suggested that all persons involved in food handling, particularly persons in management positions, should demonstrate that they have knowledge of safe food handling practices to operate foodservice establishments (Baker 1980). The National Institute for the Foodservice Industry has begun and is deeply involved in a training and certification program of foodservice management in sanitation. This program was developed as a result of the 1971 National Conference on Food Protection. It is apparent that a total trend has developed toward a national program of management sanitation training and certification. What appeared to be only an idea a few years back is quickly becoming reality. At present, approximately 35 states have some form of foodservice manager certification program, with 27 of them serving statewide populations. Established programs of sanitation training and certification are available to managers of more than two-thirds of all foodservice operations in America (over 350,000), and approximately 80,000 of these operations are located in public health jurisdictions with requirements which mandate the training (Hall 1980).

According to Hall (1980), sanitation certification of foodservice management involves three steps. First, the manager receives specific training which will enhance his or

her proficiency in operating a safe foodservice operation. Secondly, he or she demonstrates achievement of some level of competence by successfully completing an examination which tests knowledge of the subject matter covered in the training. Third, the manager is placed in an ongoing system in which his or her competence can be measured in actual day-to-day performance (Hall 1980).

In the 1970's, the Food and Drug Administration (FDA) negotiated a contract with the State of Ohio to develop a course of study that would be appropriate for foodservice management and to make recommendations to FDA for implementation of the course. This course of study was tested with some modifications made and finalized by the States of Virginia, Colorado, Vermont, and Maryland for their own use (Baker 1980).

The course developed was found to be practical and includes basic public health concerns of the regulatory agencies. The main objective of the course is to acquaint management with the critical items which result in action to improve and maintain the sanitation level of the foodservice industry at an acceptable level. Some basic subject matter covers the areas of foodborne illness. critical items in food handling operations, and management tools for instructing employees in safe food handling practices (Baker 1980).

Implementation plans of the course include the solicitation of support and advice of the foodservice industry, public health agencies, and other interested parties. According to Baker (1980), qualified persons who can teach foodservice sanitation should be used for instruction. Sanitation results from field inspections should be available to evaluate the training program and check its effectiveness. Initially, it is recommended that pre- and post-testing be done to check the knowledge gained. Making pre- and post-inspections of the establishments whose managers attend the program is another device to assess progress of the training experience. As of October 1979, there were approximately 160 program sponsors with an estimated 300 actual training sites where sanitation training programs were being offered. More than 50 percent of the total number of foodservice establishments in the United States exist in areas where a manager training/certification program is now offered. FDA realizes that manager training/certification in foodservice sanitation is but one component of a total and effective foodservice program, but a very important one (Baker 1980).

Management has been identified as the first and most important sanitation problem. It is of great importance that management be educated as to the real value of a sanitation program to know what it can or cannot accomplish.

Without the complete commitment of management, the effectiveness of sanitary practices is reduced (Holland 1980).

In a study done by Wyatt (1979), managers or owners from 219 randomly selected food markets in Oregon were surveyed concerning their attitudes and practices on sanitation and safe food handling. According to Wyatt (1979), 49.8 percent of those surveyed completed and returned the questionnaires. The questionnaire made inquiries relative to sanitation procedures used, knowledge of sanitation principles, and food protection and safety. Most respondents indicated a concern for sanitation and felt that the employed procedures were effective and efficient. The survey indicated a lack of specific knowledge on basic principles of sanitation. Few understood elementary principles of food contamination, temperature controls, personal hygiene and food protection. Most responses to the survey indicated a need for a training program in sanitation and safe food handling procedures for employees at all levels (Wyatt 1979).

Just as training of the manager is important, it is also important that foodservice workers receive the same type of training as the managers because of their direct involvement in the handling of food. It is through the

mishandling of the food that many of the foodborne diseases occur (Avens et al. 1978).

A study was done to compare four school foodservice systems food handling procedures. Once the results were tabulated and studied, it was determined that educational programs in foodservice sanitation and food safety should be developed. From the data collected continuous on-the-job education of foodservice managers and workers was needed due to many indications of unsanitary food handling and time-temperature abuse. It was also concluded in this study that some schools have foodservice workers that need training due to a lack of knowledge of foodservice sanitation and technology specifications (Avens et al. 1978).

According to Holland (1980), education of employees must be simple and continuing. Posters seem to be an effective vehicle. The sanitation message must be consistent and followed by reinforcement from management, supervisors, and inspectors. The education of food handlers is a priority to help prevent any disasters which may occur from a lack of good sanitary practices (Holland 1980). Mallman (1952) found in a study that management frequently fails to educate the worker about the importance of cleanliness and the part his job plays in producing a quality product. Mallman (1952) also noted that management

generally lays out a routine and provides some cleaning products without explaining to the worker(s) the objective or function of the chemical detergents and sanitizers. As a result of this failure to educate, the worker usually approaches his task as a job to be done without interest other than the expected pay check. The task of cleaning would become interesting and important if the worker had some concept of the importance of soil removal and the destruction of contaminating microorganisms (Mallman 1952). Effective and efficient cleaning of foodservice facilities does not come by accident. It results from management's deliberate actions to introduce the program to those who must carry it out and to supervise implementation. Implementation of such cleaning programs may be done by use of a schedule and outlined procedures to follow (How to Acquaint Employees With A Total Cleaning Program. 1982). Training of personnel can be seen to be far more important than the kind of detergent used (Mallman 1952).

In 1974, a random sampling and inspection of restaurants was conducted. It was estimated that approximately 90 percent of all foodservice places inspected were unsanitary. Most of the violations involved two aspects: (1) dirty dishes and utensils, and (2) improper protection and storage of perishable food. An increasing incidence of food spoilage and food poisoning outbreaks has

been reported since then by state and federal regulatory agencies. Approximately 33 percent of the incidences of foodborne disease outbreaks that were reported during 1974, were acquired in restaurants or schools (Barnard et al. 1977).

Because foodservice involves direct handling of the food by humans, training of employees needs to be continuous. This contact usually occurs at a stage in processing after which destruction of pathogens is no longer possible without altering the flavor of the food product. Another difficulty of untrained foodservice workers arises from the fact the contamination at the preparation and service levels are, in general, related more to habits and practices of foodservice workers than to equipment and the physical facility (Walker 1978). Although foodservice workers do not deliberately contaminate the food they handle, there is evidence of carelessness in both personal hygiene habits and in controlling surface contamination. In a study done on conditions, procedures, and practices affecting safety of food in ten school foodservice systems with satellites, the following recommendation was developed: The foodservice personnel should have control of the implementation of continuous training programs to improve hand hygiene, cleaning and sanitization procedures, food handling practices and food preparation, transportation, and

service procedures (Brown et al. 1982). The hazard of possible contamination should be self-evident, especially to those in a supervisory capacity, but evidence indicates that it is not. There is no consistent and automatic response to the basic principles and practices of sanitation on the part of most foodservice workers, including foodservice managers. Many foodservice workers have been found not to even possess a basic understanding of the meaning of sanitation or of good personal hygiene habits. Foodservice workers can affect the well-being of a large segment of our population, for contaminated food can transmit agents of disease (Litsky 1969). Therefore, training helps foodservice workers to be informed and motivated to take an active part in preventing food contamination, and at the same time, improve the esthetic aspects of foodservice hygiene and sanitation (Walker 1978).

Foodservice workers do have a responsibility to prevent the growth and the multiplication of organisms which might be already present in the food and to keep the food from being further contaminated by the bacteria in the air, on the hands of workers, on the work areas, on dishes, or on other utensils or equipment. One of the main sources of food contamination is the human hand. The practice of handwashing is not as common as one would think in this supposedly advanced age. Each foodservice worker must be

taught an efficient and effective handwashing procedure. Along with handwashing, the foodservice worker should understand why it is important to wear hairnets and why it is important that only clean clothes be worn while on duty. These three practices are the basics of sanitation, and it is the foodservice worker's responsibility to be aware of these basics of sanitation (Litsky 1969).

Foodservice systems need to evaluate their sanitation procedures and practices and update them if necessary. If the adequacy of the procedures and practices are uncertain, education and training may be indicated (Cabot 1971). It takes careful, trained foodservice workers and managers to insure the prevention of foodborne illness (Clingman 1977). Education of foodservice workers and managers is one means, perhaps the most important one, to ensure that the consumer will receive safe food. It is through training that information is provided on food protection which can be shared and discussed so that acceptable food handling practices can be implemented (Clingman 1979).

Interest in starting education programs for sanitation has been shown by many local school officials throughout the nation. This approach to food handling training, as observed by public health officials in central Alberta, Canada, has resulted in improved foodservice practice and communication, and has fostered greater consumer awareness

(Goddard et al. 1979). According to Langhoff (1981), one type of educational program is an in-service training program in Orleans Parish School Foodservice in New Orleans, Louisiana. This program began in 1953. In the beginning, only managers were trained, since then, it has developed into a comprehensive plan for all levels of school foodservice employees. Participants in this program are trained in sanitation, safety, care of equipment, and simple math. These training programs are conducted throughout the year. Training manuals, handouts, films, individual productions, and policy and procedure manuals are used for teaching the classes. Tests are given and evaluations are made on each foodservice employee, and the employees also evaluate the classes. This specific in-service training program has proven to be beneficial. There have been fewer accidents, lower percentages of turnover, more efficiency in production, and--above all--high employee moral (Langhoff 1981).

According to Heenan and Snyder (1978), in Minnesota there is a voluntary Quality Assurance Program for the Prevention of Foodborne Illness. Data collected from pretest and posttest course examinations showed that foodservice workers gained a great deal of new information in the course on the prevention of foodborne illness. The foodservice workers tended to have positive responses to

questions asking if they received useful information for use while on the job (Heenan and Snyder 1978).

There are three goals concerning the role of education in sanitation (Woodburn 1978): (1) Education must be used to overcome the fatalistic acceptance of foodborne illness by the foodservice worker and manager so that there is a real acceptance of the need for prevention and the power to control the problem; (2) There is a need for safety considerations in the system for appraisal of food handling e.g., temperature recommendations; (3) Lastly, foodservice workers need education which will help them distinguish between practices related to food quality and those related to food safety (Woodburn 1978).

It should be emphasized that educational aspects of food protection are too important to be allowed to occur haphazardly. The focus of training should be upon basic hygiene and sanitation as well as an understanding of human motivation and behavior. Information concerning the cultural background of the foodservice worker should also be incorporated into this process for successful communication and education (Walker 1978). The key factor in ensuring the foodservice industry's growth into the 1980's is its ability to provide guaranteed food protection to the consumer (Clingman 1979). Improvement in the sanitation level is expected of the foodservice industry during the 1980's. If

efforts expended during the 1970's are continued and perhaps accelerated, there is sure to be improvement both in the knowledge obtained and the level of sanitation in the foodservice industry (Baker 1980). This can be done by educating both the foodservice manager and the foodservice worker in accepted sanitary practices.

HYPOTHESES

The null hypotheses tested state that: (1) There is no significant difference in improvement of sanitation practices as a result of training foodservice managers and foodservice workers as compared to only training foodservice managers; (2) For individual schools and each group of schools there is no significant difference in the proportion of satisfactory sanitation practices from the first checklist as compared to the second checklist; (3) There is no significant difference in scores when comparing scores, both pretest and posttest. The level of significance for all tests is set at $p<.05$.

METHODS

This study was conducted in St. Landry Parish which is located in the area of Opelousas, Louisiana. A one-day workshop sanitation program (appendix A) for school foodservice employees was conducted. Forty-two schools were involved with this study. Of the forty-two schools, twenty-one were randomly selected in which only the foodservice managers participated (Group I). The other twenty-one schools had both the foodservice managers and foodservice workers participating (Group II). This group consisted of twenty-one foodservice managers and approximately eighty to one hundred foodservice workers (each school varies with the number of workers).

Five months prior to the workshop, a sanitation inspection, using a checklist (appendix B), was conducted in randomly selected schools to determine the extent to which sanitary practices were being followed. An equal number of schools from Group I and Group II were randomly selected for the sanitation inspection. Satisfactory and unsatisfactory marks were given. The checklist was used for information as to what was needed to be covered at the workshop for the benefit of the school foodservice employee.

A pretest (appendix C) at the beginning of the workshop

and a posttest (appendix C) at the end of the workshop was given to each school foodservice employee. These tests were a measurement of the foodservice employee's knowledge of sanitary practices.

Within eight weeks following the workshop, the same sanitation inspection was conducted in the same selected schools as before. This checklist determined if sanitary practices had improved, stayed the same, or regressed.

The types of statistical analyses done were: (1) The Mann-Whitney U test (Hull and Nie 1981) was used to analyze the degree of separation between Group I and Group II. This test was done to determine the net changes between the two groups on the sanitation checklist. The dependent variable was the proportion of satisfactory sanitation practices on the second checklist. The independent variable was the groups. (2) The McNemar Test (Hull and Nie 1981) was used to determine if there was any significant improvement in sanitation practices. The dependent variable was the proportion of satisfactory sanitation practices. The independent variable was the time of measurement. After the workshop, the results of the sanitation inspection were compared. Results of the first inspection were compared to the proportion of satisfactory sanitation practices from the second inspection. (3) An independent means t-test was done to compare the level of knowledge gained by the school

foodservice managers and workers. This was done by comparing the pretest scores. The dependent variable was the test score while the independent variable was managers and workers. This test was repeated on posttest scores.

RESULTS AND DISCUSSION

In this study forty-two schools participated in a one-day workshop sanitation program in which their level of knowledge of sanitation was assessed. Sixteen of these schools, randomly selected, were surveyed with a sanitation checklist to assess sanitation practices. The independent variables, in this study, were the time of test and the groups. The dependent variables were the scores of the tests and the proportion of satisfactory sanitation practices.

When testing the checklist statistically, Group I (foodservice managers only) was found to have no significant improvement in sanitation practices as compared to Group II (foodservice managers and workers). Comparing net changes by groups (Table 1), Group I was found not to be significantly different from Group II ($p = .42$). Group I was found to have improved more in sanitation practices with a mean rank of 9.44 as compared to 7.56 for Group II. The null hypothesis stating there is no significant difference in sanitation practices as a result of training foodservice managers and foodservice workers as compared to only training foodservice managers was accepted. Accepting this hypothesis supports most of the literature reviewed stating

TABLE 1

MANN-WHITNEY U TEST

OF

NET CHANGES BY GROUP

Group	N	Mean Rank	p
I	8	9.44	.4197
II	8	7.56	

that it is only necessary to train managers. Possibly, in the Group II schools, the managers felt that the workers had been trained through the workshop and did not need reinforcement of that training. The managers in the Group I schools may have reinforced sanitation practices to their untrained workers to improve sanitation.

Changes by schools for items from the first inspection to the second inspection are listed in Table 2. Table 2 indicated the schools that improved, regressed, or remained unchanged in their sanitation practices using the items listed on the sanitation checklist. In Group I, schools 1, 2, 6, and 8 improved in their sanitation practices. Whereas, in Group II, school 5 was the only school to improve. Note that in Group II, schools 1, 2, 4, and 6 regressed. Group II was found to have more items which regressed than Group I. But, Group I was found to have more items which improved than Group II. This compares the significant improvement of Group I ($p = .02$) to that of the nonsignificant improvement of Group II ($p > .5$).

Figure 1 compares the groups by net changes. This shows a comparison of the result which says that Group I had significant changes relative to Group II by results of the Mann-Whitney U test (Hull and Nie 1981). School 5 in Group I and schools 1 and 2 in Group II were the largest schools

TABLE 2

CHANGES IN ITEMS FROM

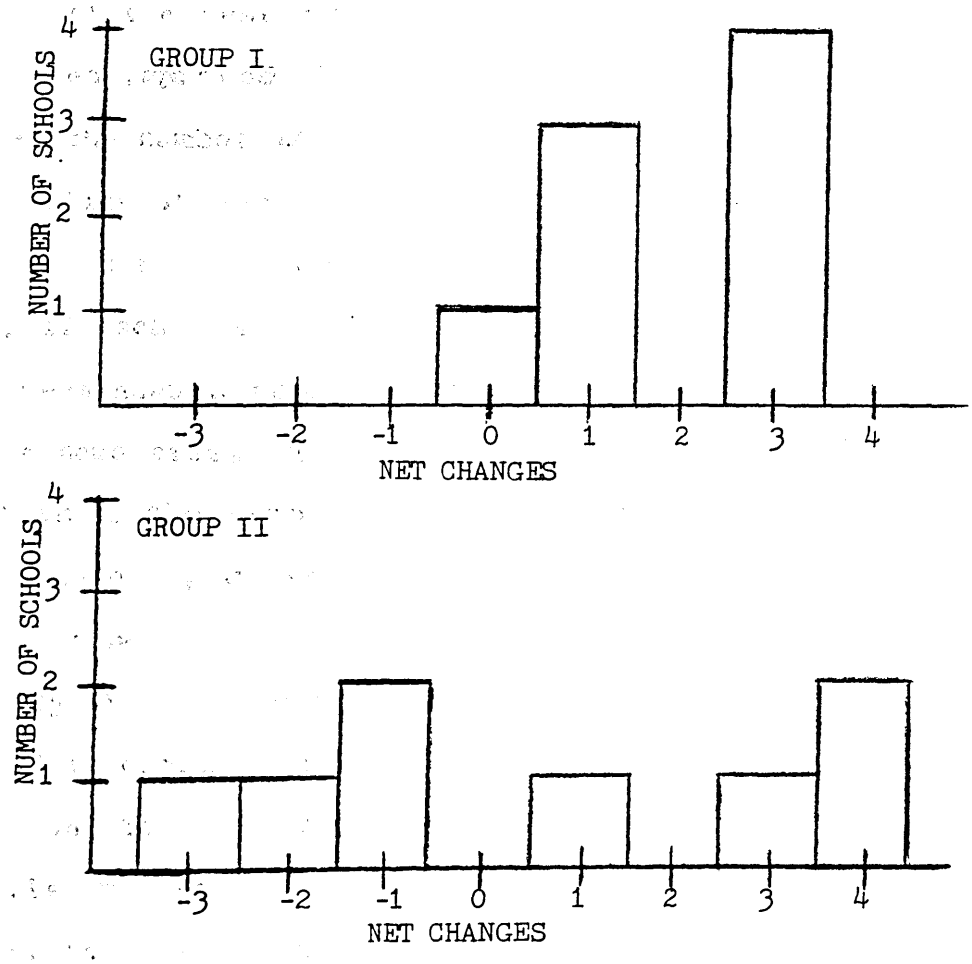
FIRST INSPECTION TO SECOND INSPECTION

BY SCHOOL

School No.	Group	Improved	Regressed	Unchanged	p
1	I	3	0	37	.25
2	I	1	0	39	1.00
3	I	3	2	35	1.00
4	I	2	1	37	1.00
5	I	6	6	28	.77
6	I	3	0	37	.25
7	I	4	1	35	.38
8	I	3	0	37	.25
1	II	1	3	36	.62
2	II	0	3	37	.25
3	II	3	2	35	1.00
4	II	1	2	37	1.00
5	II	4	0	36	.12
6	II	2	3	35	1.00
7	II	5	1	34	.22
8	II	5	2	33	.45
1-8	I	25	10	285	.02
1-8	II	21	16	283	.70

FIGURE 1

COMPARISON OF GROUPS
BY NET CHANGES



and also were found to have regressed more than the others. These schools had approximately ten to twelve employees. The schools with four to seven employees ranged in the middle of the results. The schools with three to four employees improved the most. These results suggest that the larger the number of employees in a school, the greater the possibility of unsatisfactory sanitation practices. Some exceptions to the results are in Group I, school 4 and in Group II, schools 3 and 6. These schools with three to four employees showed regression as compared to the other schools of the same size. This could possibly be due to the location of the school and education of the employees.

Changes by categories from the first inspection to the second inspection by group are listed in Table 3. Each category of the checklist was analyzed. For each category, Group I is compared to Group II. Group I and Group II were both found to have more improvement in Food Equipment and Utensils, Toilet and Handwashing Facilities, Floors, Walls, and Ceilings, and Other Operations. Group I also had improvement in Food, Food Protection, and Ventilation with regression in Garbage and Refuse Disposal and Lighting. Group II was found to have more regression in Food Protection, Garbage and Refuse Disposal, and Lighting. The Total Overall score shows that in Group I schools all eight schools improved. Group II indicates that six schools

TABLE 3

CHANGES BY CATEGORIES FROM

FIRST INSPECTION TO SECOND INSPECTION BY GROUP

Category	Group	Improved	Regressed	Unchanged	p
Food	I	1	0	7	.320
	II	0	0	8	1.000
Food Protection	I	2	1	5	.790
	II	2	5	1	.610
Personnel	I	0	0	8	1.000
	II	0	0	8	1.000
Food Equipment and Utensils	I	8	0	0	.012
	II	8	0	0	.012
Water	I	0	0	8	1.000
	II	0	0	8	1.000
Plumbing	I	0	0	8	1.000
	II	0	0	8	1.000
Toilet and Handwashing Facilities	I	2	0	6	.180
	II	2	1	5	.420
Garbage and Refuse Disposal	I	0	2	6	.180
	II	1	5	2	.140
Insect/Rodent/ Animal Control	I	0	0	8	1.000
	II	0	0	8	1.000
Floor, Walls, and Ceiling	I	4	0	4	.070
	II	2	0	6	.180
Lighting	I	0	1	7	.320
	II	0	1	7	.320
Ventilation	I	1	0	7	.320
	II	0	0	8	1.000
Other Operations	I	2	0	6	.180
	II	3	0	5	.110
Total Overall	I	8	0	0	.012
	II	6	1	1	.040

improved, one regressed, and one remained unchanged.

Table 4 lists the results of the various sections of the checklist with Group I and Group II combined. A significant regression was noted in Food Protection, Garbage and Refuse Disposal and Lighting. Food Equipment and Utensils, Toilet and Handwashing Facilities, Floors, Walls and Ceilings, and Other Operations were found to have improved significantly. Food, Personnel, Water, Plumbing, Insect/Rodent/Animal Control, and Ventilation had no significant difference. As a Total Overall score, a significant difference was noted ($p<.05$). The null hypothesis stating there is no significant difference in the proportion of satisfactory sanitation practices from the first checklist as compared to the second was rejected.

When comparing the level of knowledge between foodservice managers and foodservice workers, a significant difference in mean score of the pretest and, again, of the posttest were noted ($p<.05$). The null hypotheses stating there are no significant differences in scores between managers and workers when comparing pretest scores and when comparing posttest scores was rejected.

Table 5 lists the mean, t-value, degrees of freedom, and probability of the pretest and posttest scores for the managers and workers. Comparison of the group means reveals that the mean scores of the manager's pretest and the

TABLE 4

CHANGES BY CATEGORY FROM

FIRST INSPECTION TO SECOND INSPECTION

Category	Improved	Regressed	Unchanged	p
Food	1	0	15	.320
Food Protection	4	6	6	.800
Personnel	0	0	16	1.000
Food Equipment and Utensils	16	0	0	0.000
Water	0	0	16	1.000
Plumbing	0	0	16	1.000
Toilet and Handwashing Facilities	4	1	11	.180
Garbage and Refuse Disposal	1	7	8	.060
Insect/Rodent/ Animal Control	0	0	16	1.000
Floors, Walls and Ceilings	6	0	10	.030
Lighting	0	2	14	.500
Ventilation	1	0	15	1.000
Other Operations	5	0	11	.040
Total Overall	14	1	1	.001

TABLE 5

MEAN, T-VALUE, AND DEGREES OF FREDOM FOR PRETEST SCORES AND POSTTEST SCORES OF MANAGERS AND WORKERS

Group	N	Mean	t-value	Df	p
Manager Pretest	34	21.6	4.61	94.00	0.00
Worker Pretest	77	17.6			
Manager Posttest	34	24.8	4.71	96.00	0.00
Worker Posttest	66	20.3			

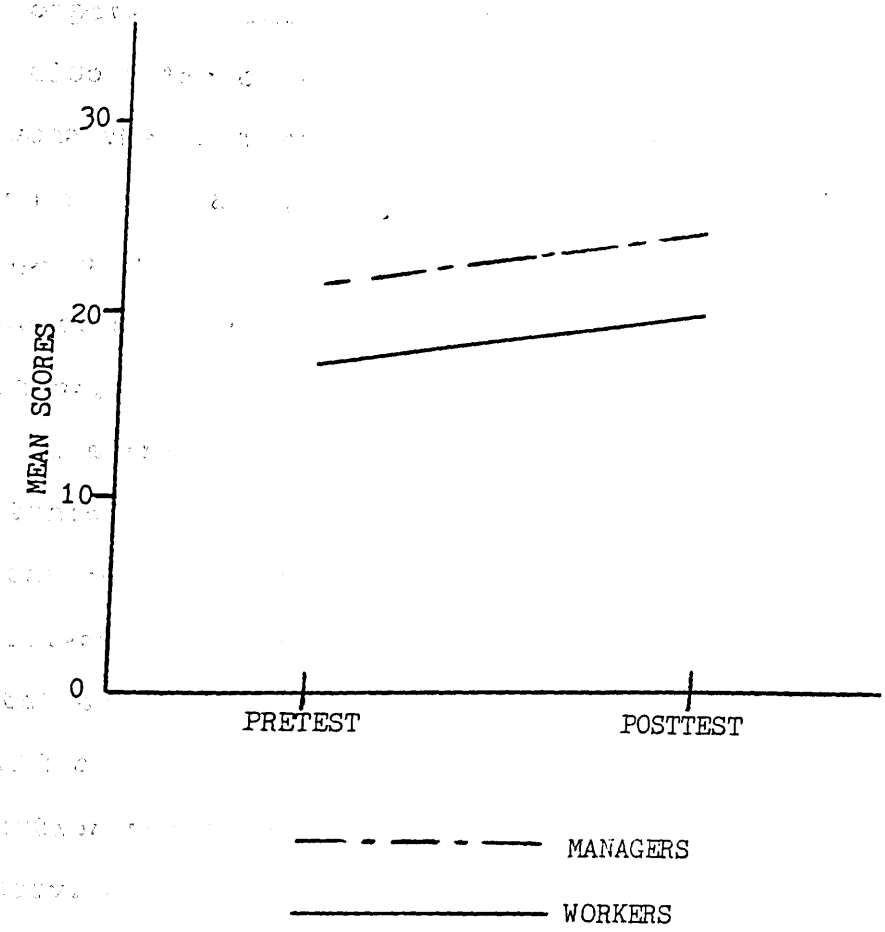
worker's posttest were approximately the same indicating that the workers on the posttest knew as much as the managers on the pretest. As indicated on Figure 2 the managers outscored the workers on both occasions. The score gains of the managers and workers were similar as a result of training.

This result may be due to the fact that all the foodervice managers in the schools studied are required to have the equivalent of a high school diploma and the foodservice workers are not. Hence, not all of the foodservice workers have the same educational background as do the managers. Another implication of education is that some of the workers possibly do not know how to read or write the language in which the tests and workshop was given (English). The area the study was done is a prominent French speaking area and many employees are more fluent in that language.

The results of this study are supported by Clingman (1977), who reported that foodservice managers are the key to the training and education of foodservice workers in sanitation practices. If the foodservice manager is knowledgeable about sanitation, a cleaner operation will exist. The foodservice workers will have an increased appreciation for sanitation practices.

FIGURE 2

MEAN PRETEST AND POSTTEST SCORES FOR MANAGERS AND WORKERS



CONCLUSIONS

There was no significant difference found in sanitation practices as a result of training Group I (foodservice managers) as compared to training Group II (foodservice managers and workers). This null hypothesis was accepted. The second hypothesis was rejected because there was significant difference between the proportion of satisfactory sanitation practices from the first inspection as compared to the second inspection. The third hypothesis was also rejected because there was a significant difference between the pretest and posttest. Group I and Group II were found to have both improved in sanitation practices. The groups differed in their pretest and posttest scores. The managers outscored the workers on both the pretest and posttest.

From the data collected one can conclude that education and training does have an overall effect on improving sanitation practices. Training the managers only is sufficient to see an overall significant improvement in sanitation practices. Another conclusion which can be made is that a higher level of knowledge was achieved about sanitation practices by both foodservice managers and foodservice workers. The educational level of the employees

may have had an impact on how much of an increase in knowledge took place.

IMPLICATIONS FOR FURTHER STUDY

Further study is needed to show better correlation between training and actual practice of school foodservice employees. Different methods of collecting data need to be tested. Identifying demographics may be useful in finding more information about the educational level of the foodservice managers and foodservice workers and the size and location of the schools. Significant findings may be evident if the study was completed within a one calendar school year. This would possibly prevent any major turnover in the employees, such as, employees retiring, and also changes in the foodservice system, such as, a new purchasing procedure. Separating out and identifying each manager between groups and also identifying each worker on both the pretest and posttest may help to identify more statistical differences. With these methods added to what has already been tested, one may be able to determine a correlation between actual knowledge learned and sanitary practices.

APPENDIX A

SANITATION WORKSHOP

ST. LANDRY PARISH SCHOOL FOODSERVICE SYSTEM

PRESENTED BY:

MARY SUZANNE LOGNION

Instruction

Purpose of Workshop: To introduce and familiarize the foodservice managers and foodservice workers with general sanitation practices for use in the school cafeterias.

Objectives: After completing this workshop, the foodservice managers and foodservice workers should be able to:

1. Practice good sanitation in the school cafeterias.
2. List factors which may cause food to become contaminated.
3. List the danger zone temperatures for food.

Materials Needed by Instructor:

1. Slide Projector
2. Over-head Projector
3. Two Screens
4. Slides
5. Transparencies
6. Felt Tip Markers
7. Quizzes
8. Scan Tron Answer Sheets
9. Pencils
10. Handouts

I. Introduction

Good morning, my name is _____.
This morning we will learn about general sanitation practices for use in the school cafeteria.
This is an outline of what will be covered. (Say topics from transparency - 2)

Transparency - 1

Transparency - 2

II. Sanitation Quiz

Before I begin our workshop, I would like for you to take a quiz on sanitation.

Distribute quizzes, answer sheets, and pencils.

Once you receive your quiz, you will notice you have 2 parts: one being the quiz and the other being the answer sheet. Before you begin to answer the quiz, I will explain the procedure for taking the quiz.

Rules for taking the quiz:

Transparency - 3

1. Do not write on the quiz.
2. All answers are to be on the answer sheet.
3. Do not write your name on the answer sheet. If you are a manager of a school, please indicate that by writing "Manager" on the line where it says NAME. If you are one of the workers do not write anything.
4. To answer the quiz, simply correspond the numbers on the quiz to the numbers on the answer sheet and select which letter is more appropriate to correctly answer the question. For questions 1-15 (multiple choice), the letters A,B,C, D, and E are used. For questions 16-30 (true - false) the letters A and B are used. "A" is for true and "B" is for false.
5. If you have any questions, please ask.

Now, you may begin taking your quiz.

Allow approximately 25 minutes for foodservice employees to take the quiz.

If everyone is finished taking the quiz, you can pass the quiz and answer sheet to the end of your row and someone will pick it up. Please keep your pencil, you will need it later.

Pick up quizzes.

III. Sanitation Defined

Sanitation is a word derived from the latin word sanus, meaning "sound and health," or clean and whole. The modern interpretation of the term "sanitation" is broad, including knowledge of health and of sanitary conditions as well as full acceptance and effective application of sanitary measures. Therfore, sanitary practice is concerned "with purchase of sound food supply and its sanitary storage; with adequacy of the physical plant and its maintenance regarding repairs and cleanliness; with adequacy and cleanliness of storage facilities, equipment, and utensils; with sanitary dishwashing poerations; with the good health, good personal hygiene, and good working habits of the food handler; with sanitary manipulation of food and effedtive time-temperature control throughout preparation and service; and finally, with education of food service employees in the various aspects of sanitation in a food service operation" (Clingman, D.C. "Standards for Food Service Manager Sanitation Training and Certification," School Food Service Research Review, 3(1):8, 1979.).

An important obligation of the foodservice industry is preparing and serving wholesome food to the public. This is an obligation that can be fulfilled only if personnel in every establishment understand what sanitation is, appreciate its importance, and practice it at all times. Practicing sanitation calls for applying sanitary measures at every stage of an operation to achieve cleanliness and to protect the health of the consumer.

IV. Food-Borne Illnesses

Germs, bacteris, microorganisms - these are very tiny organisms which can in some instances cause food spoilage and food poisoning. They grow and live in food. Some organisms are harmless, but many can cause serious illnesses, such as:

Transparency - 4

1. Salmonella - spread by contaminated utensils or work surfaces not cleaned before re-use; Food contaminated by unwashed hands (such as not washing hands after using the restroom) and by flies; Also by raw meat and poultry. Salmonella causes "food infections" which is a violent, flu-like illness 12 to 24 hours after eating.
2. Clostridium Botulinum - spread by improperly processed canned foods. Clostridium Botulinum causes Botulism which attacks the nervous system causing headaches, dizziness, respiratory failure, and possibly death.
3. Staphylococcus - spread by food contaminated by persons with boils, infected

wounds and sores, or unwashed hands. Staphylococcus causes "food poisoning" which gives a violent, flu-like illness 3 to 12 hours after eating.
4. Clostridium Perfringens - spread by food that has been precooked, inadequately cooled, then inadequately reheated. Clostridium Perfringens causes cramps and diarrhea about 12 hours after eating.
5. Trichinosis - spread by improperly cooked pork or infected wild animals. The pork is not cooked to an internal temperature of at least 150°F. Trichinosis causes muscle soreness, pain, sweating, chills, nausea, vomiting, and diarrhea.

Most of these symptoms for these five illnesses usually occur within a 24 hour period and they are usually associated with nausea, vomiting, and diarrhea. Some things that stop bacteria germs from growing are: Cleanliness, dryness, extremes of heat and cold, lack of food, and bacteria killing chemicals.

All types of bacteria germs:
1. Take time to grow in food. (a) 1/3 of the food is infected when it come into the kitchen. (b) 1/3 of the food handlers have some type of communicable disease. Bacteria germs split every 10-30 minutes. It takes about 1 1/2 - 4 hours for food to be contaminated.
2. Need the ideal temperature to grow. Bacteria grow fast at body or room temperatures. They are slowed by freezing and possibly are killed by high temperature.

V. Temperature - Danger Zone

The danger zone for food is 45°F to 140°F. Between these two temperatures, this is the ideal zone for bacteria to grow. (REPEAT)

Transparency - 5a

The 4 Basic Rules for keeping and handling food are:

Transparency - 6

1. Keep food clean.
   You need to have clean storage areas, clean preparation areas and equipment, and clean food handling.
2. Keep food hot.
   Food that should be hot should be at least 140°F and above. High temperatures will destroy microorganisms and some toxins (botulism toxin), but will not inactivate staphylococcus toxin necessary to destroy staphylococcus organisms before toxin is produced since this toxin is heat stable.
3. Keep food cold.

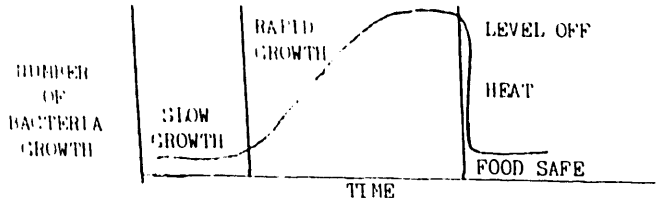
Foods that should be kept cold should be at least in the 40*F - 45*F range; this may vary according to the product being stored.

4. When in doubt - throw it out!

Food can be easily contaminated when in the danger zone for too long a period. Foods need to be consumed within 1 - 1 1/2 hours if in the danger zone.

If you are storing the food once it is cooked, you need to cool down hot foods within 1 1/2 hours below 45*F, as quickly as possible. This can be accomplished by use of shallow pans, agitation, or quick chilling. An example of the shallow pan method is: Soup - use small containers to put it in once it is cooked. If you have all of the soup in a large pot or steam kettle, the surface will cool down but not the middle. If kept in the large container, you will have a soup that will start to spoil and sour.

An illustration of how bacteria grows is:



Bacteria multiply slow at first. As time increases, the number of bacteria increases. Once the food is heated the bacteria die as new ones are growing. The death rate of bacteria exceeds the growth rate as the temperature increases. Once the bacteria is killed food is safe to eat.

Transparency - 7

Reheating Foods: Be sure to heat food for long enough periods of time at the proper temperature to kill and eventually eliminate bacteria. In essence, Heat to Kill to Eliminate.

If reusing food: Need to cool down food properly and then reheat the food properly.

Remember the Danger Zone: Keep food at 140*F or above. Keep cold foods at 45*F or below. This helps to prevent contamination.

Transparency - 8

Other temperatures for cooking food:
1. Botulism - found in low acid foods: squash, peas, meats, beans, mushrooms. If you suspect the toxin, you should throw the food away. You can possibly kill the toxin if you reheat the food to 176°F and cook it for 30 minutes to 1 hour.
2. Salmonella - It is carried in poultry products, eggs, and wild game. You need to cook these products to 165°F to kill the bacteria.
3. Trichonosis - It is associated with pork. Pork needs to be cooked to 150°F to kill the worm.

For all of these food products being cooked you must check the temperature. To check these temperatures you must use a thermometer. A stick thermometer is used to check the internal temperature of all types of food.

Slide - 1

To use the stick thermometer, you simply stick it into the center of the food item being checked. To check the accuracy of the thermometer: Stick the thermometer in a glass of ice, it should read 32°F for freezing; To check the thermometer for hot items, stick it in boiling water and it should read 212°F. This thermometer is good for checking cold food as well as hot. This thermometer enables you to keep food out of the danger zone, which is 45°F to 140°F.

Transparency - 5b
Slide - 2

Some other types of thermometers that are used to check temperatures are:
1. Temperature guages on the refrigerators and freezers.
2. Meat thermometers - which are used when cooking meats.
3. Temperature guages which can hang or sit on the shelves of the refrigerators or freezers.

Slide - 3

Slide - 4

VI. Food Storage

Getting the temperatures of cooked foods is important to prevent contamination, but the temperature of food storage is just as important, if not more.

There are three types of food storage. They are:
1. Dry Storage.
2. Refrigeration.
3. Freezing.

Transparency - 9

Each food has its own correct method of storage.
When storing food, it must be covered. Glass, plastic, and stainless steel are good to use since none of these absorb moisture. Cloth should not be used because it can absorb moisture and is a good breeding ground for bacteria to grow.

Slide - 5

1. Dry Storage - Some items which would be place in dry storage are: canned items, staples (flour, sugar, etc.), boxed items (cake mixes, cereals, etc.), and spices. It is important to store all food off the floor by at least 6 inches. This should be in a clean, dry location. If it is off the floor, this will help prevent food from becoming contaminated by germs and rodents. Off the floor storage will also prevent the food from becoming wet when the floor is washed. When placing boxed items on the shelf, it is important to allow room for air circulation. Whenever you are taking small, prepackaged items, such as sugar, crackers, etc., from the dry good stock area, be careful not to drop them. The outside of the package will then become contaminated so that it cannot be placed on a tray with other food. These prepackaged foods are expensive and should not be wasted. When putting items away in the dry stock area remember to put them in their proper places. If you do not, someone else will not be able to find them later. Also, dry paper goods are kept in this area. They are usually separate from the food.

Slide - 7

2. Refrigeration - The second type of storage is refrigeration. Some items which need to be kept refrigerated are meats, vegetables, eggs, milk, leftover food. Some foods are called perishables. These are foods which spoil easily. Many perishables require proper refrigeration. Refrigeration does not kill germs, it only makes them grow more slowly. Germs are like people, they do not like the cold. It is necessary that the refrigerator be clean. A dirty refrigerator will have more germs, which will cause the food to spoil faster. It is also important that the refrigerator be at the proper temperature. That is why there should be a thermometer in every refrigerator. The temperature in the refrigerator should never go above 45*F. If you notice that the temperature is above 45*F, tell your manager or the person in charge. Some important facts to remember about refrigeration are: Always cover food; Always label and date everything that you put into the refrigerator; Always use old items first. These are the ones that will spoil quickly; Open refrigerator door as seldom as possible; Do not overload the refrigerator as this prevents the cold air from circulating around the food. A refrigerator will not break if you put a hot item in it. Remember to use one of the cooling down methods, such as, the shallow pan, agitation, or quick chill.

Slide - 8

Slide - 9

Slide - 10

Slide - 11

3. Freezing - The third type of storage is freezing. Some items which must be kept frozen are: frozen vegetables; meats; ice cream; frozen juices; and pre-frozen prepared foods. Freezing does not kill germs. It only stops them from growing. When a frozen food begins to thaw, the germs start to grow again. Once frozen food has been thawed out, do not refreeze it until it has been cooked. Some important facts

Slide - 12

to remember about freezers are: The temperature should not go above 0°F; All foods in the freezer must be covered; Each food should be labeled, dated and priced. Meat must be the most in the refrigerator--not left out in the air. When thawing, meat is exposed to the air, the inside part of the meat remains cold for a long time, but the outside parts of the meat warm up quickly and bacteria will begin to grow there. In the refrigerator all portions of the meat will remain cold until it is thawed out completely. If you have a walkin freezer it is important to remember to put all items in their proper place. No one likes to spend a long time in the freezer looking for misplaced food. A map showing the proper place for all foods in the freezer can be placed on the door. This will save time when looking for food.

VII. Food Spoilage

Food storage is important in preventing food contamination. Contamination occurs when food has begun to spoil and contains harmful bacteria. If eaten, it can make someone very ill. It is very easy to be careless about proper food storage. Often when you are in a hurry, you may be tempted to put leftovers into the refrigerator without covering or dating them. You may know what kind of food it is and how old it is, but will someone else know? If you suspect that a food has spoiled, do not taste it. It can make you sick. Your nose is your best guide. However, not all spoiled food smells bad. If you suspect that a food is spoiled, do not use it.

Canned food may spoil if not processed properly. If the can is swollen or badly dented, throw it out. It may contain a harmful bacteria and if eaten can cause death. This bacteria is known as botulism. If a food has an off-color or is slimy, throw it out. If there is mold on any part of the food, throw it out. Do not cut the mold off and use the rest of it. It is very important to use the old stock first, especially when using milk. By law, the milk companies must date each carton. Pay close attention and look for the date. Do not leave milk out in the air for a long time and then put it back in the refrigerator. You cannot see the germs growing, but they are. Always be on the lookout for food spoilage. IF IN DOUBT___THROW IT OUT.

VIII. Handling of Food

There are several ways that bacteria can contaminate food. Some are:
1. Improper storage of food.

2. Use of dirty dishes, utensils, and equipment.
3. Contact with rodents or bugs.
4. Direct contact with people who have dirty hands or infections.

Remember the danger zone, so . . .

You can help to prevent food contamination by properly storing food at the correct temperature. Everything which food touches must be clean. Clean storage areas, equipment, dishes and counters are essential. Cross contamination of food can easily happen if the food handler is not careful. Cross contamination is the process whereby a food is contaminated by some other source than its own. You need to keep foods separate. Bacteria germs get around by "hitch-hiking". They move around by attaching to other things and spreading. Examples of cross contamination are:

1. Using the same cutting board for raw and cooked foods.
2. Storing a cooked food uncovered under another food in refrigerator that drips.
3. Storing food uncovered in a refrigerator.
4. Having raw and cooked food in the same area of the refrigerator.

As you can see, germs from one food or source can "hitch-hike" to another food. It is impossible to see bacteria germs, but a clean kitchen with clean people and safe handling and storage of food will help to prevent germs from spreading. It is especially important that you not spread bacteria germs to food through mishandling. Besides mishandling of food, your own good personal grooming habits will help prevent contamination.

IX. Personal Hygiene

Good grooming habits and personal hygiene take time. But, if you work at it, you will feel and look better. You will also be assured that you are not spreading harmful bacteria to food.

Slide - 13

Personal hygiene is a most important subject for foodservice employees for two reasons; first, good personal hygiene makes it possible for people to have a high level of health so that they may more effectively, and efficiently perform their job; second and most significantly, it helps in preventing the spread of disease in food establishments.

Personal hygiene is the name for a group of practices we can do every day to make us

healthier, stronger, and more useful, regardless of where we work or what we do. It includes practices such as getting enough sleep, routinely seeing the doctor or dentist, staying away from work when sick, and avoiding poor personal habits such as biting fingernails, coughing or sneezing on the hands, wiping the lips with your fingers, or failing to wash the hands after visiting the restroom or handling contaminated or soiled utensils, and then handling food or clean utensils.

While working with food, it is important to be especially careful about keeping clean. There are several things you must be careful to do so that you won't spread germs.

At work you should:

Transparency - 10a

1. Be free of skin lesions, upper respiratory infections, hepatitis, stomach viruses, and other infections.
2. Practice personal cleanliness: Bathe, use deordorant, wear clean uniform, clean and arrange hair, wear hair nets totally covering hair.

Slide - 14

3. When at work control bad hand habits. Do not scratch head or other body parts, play with hair, pick pimples, and so forth. If you accidentally do these things, wash hands thoroughly afterwards.
4. If you must cough or sneeze, try to get away from food, cover mouth and nose, and wash hands thoroughly afterwards.
5. Hands should be washed frequently and after each of the following activities: going to the bathroom; smoking; handling boxes, crates, and other soiled objects; handling raw meat, poultry, shell eggs, fish, or shellfish; handling garbage; handling money; handling anything soiled.

Slide - 15

6. Keep hands and fingers out of food; do not taste food from fingers; use a clean tasting spoon each time. Never lick fingers.
7. Use utensils for preparing food as much as is possible. Be sure that utensils are clean.

Slide - 16

8. No smoking or gum chewing in food preparation and service areas.
9. Avoid touching parts of china and eating utensils that will be touched by the customer's mouth. Pick up serving and eating utensils by their handles and glasses by their bases.
10. Handle plates in a sanitary manner; the thumb should touch the rim of the plate only, never the plate itself or the food on it.
11. Use plastic disposable gloves if food must be manipulated by hand and when serving. Dispose of used gloves.

Transparency - 10b
Slide - 17

12. Remove apron when leaving work area (to go to the bathroom, outside, etc.).

If these rules are followed everyday, you will help prevent the spread of bacteria. Every person is a carrier of germs. It takes a special effort to make sure that you do not spread them. Good sanitation practices will help to prevent food poisoning, as well as many other infectious diseases.

Slide - 18

As an employee you must: THINK CLEAN . . . ACT CLEAN . . . AND BE CLEAN . . .

X. Cleaning Equipment

Just as good grooming is important, cleanliness in the kitchen and of the equipment is just as important. Sanitation includes keeping the kitchen orderly and free from dirt and harmful bacteria. It is essential in a kitchen that good sanitation practices are followed. Dirty work areas and dirty equipment will contaminate food and spread.

You, as a foodservice worker, are required by law to follow good sanitation practices. Every school cafeteria is required by state law to meet strict health codes.

Sanitation is a big job. Everyone who works in the institutional kitchen must practice good sanitation. Just one careless person can create a very large sanitation problem.. Learn to be a watchdog for dirt-catchers.

It is very easy to overlook many places where dirt and germs can collect. Watch out for dark, warm places where they can hide. Remember that no place, no matter how small, is too small for bacteria. Thousands of germs can live on a space no larger than the head of a pin.

Some places in the kitchen that collect dirt and germs easily are: Hair; Body; Hands; Dishes and Silverware; Counter Tops; Refrigerators; Meat Slicers; Pushcarts; Utensils; Inside drawers; Cutting Boards. These are just a few of the many places where dirt and germs can collect in a kitchen. You must be on the lookout for these hiding places all the time.

Here are several tips for good sanitation practices:
1. Always wear a hairnet or hair restraint.
2. Wash your hands several times during the day with soap and water--especially after using the restroom. Make sure you have plenty of soap and towels by the hand washing sink.

Slide - 19

3. Clean as you go. This will prevent bacteria from growing on dirty utensils or counter.
4. Always pick up flatware by the handle.
5. Do not touch glasses or cups on the drinking edge.
6. Use clean utensils when serving food.
7. Do not touch food with fingers or hands; use tongs, spoons or plastic gloves.
8. Use cutting boards between cutting raw and cooked meats.
9. Use a clean spoon every time you taste food.
10. Wipe up spills immediately.
11. Observe the "no smoking" rule in the kitchen.

Only healthy people should handle food. So, if you are ill, it is important that you not work. Remember to let your manager or person in charge know as soon as possible that you are ill so that your work can be covered by others.

Slide - 20

We have said that sanitation involves keeping work areas clean and free from dirt and germs. How is that done? Always wipe down a work area after you have used it with a clean cloth or towel and warm water and cleaning solution. If you just wipe down a counter with an old wet rag, you are doing more harm than good by spreading the dirt and bacteria. All counter space should be cleaned and sanitized at least once a day. Sanitizing a counter means spraying it with a germ-killing (sanitizing) solution to kill bacteria which soap will not destroy. Not only counters should be kept clean and sanitized, but equipment also. They should be wiped down after each use. At least once a week, each device should be taken apart and cleaned with hot soapy water inside and out and allowed to air dry. Clean dishes should never be stored in a dirty piece of equipment. Special attention should be paid to the wheels and any small grooves or cracks where germs and dirt might collect. At this time, I would like to clarify the difference between multi-use and single-service utensils and equipment. Multi-use is used over and over again and is cleaned and sanitized after each use. Single-service is discarded after one use.

Slide - 21

A. <u>Cleaning Small Equipment</u>

All of the equipment which is used in the kitchen should be kept spotless. Special attention should be paid to items like can openers, blenders, mixers, cutting boards and any equipment that touches raw meat. Cutting boards should be washed in hot, soapy water between each use. Separate cutting boards should be used for meat, fish, and vegetables. Each cutting board should be clearly labeled as to which food it is used for.

Slide - 22
Slide - 23

Manual can openers should be taken apart at least once a day and scrubbed with a small wire brush, especially around the cutting edge. Germs can be easily transported from one can to another by a dirty can opener.

Food blenders or processors should be washed after each use. The food container should be disassembled and each part washed with soapy water. The base of the blender should also be kept clean.

Food mixers must be kept clean and in good working order. Food often splashes when it is being mixed. The splash guard will help to prevent this. the mixing bowl should be handled with care. If it is dented, the mixer will not work properly and the whip or paddle will scrape the bowl, making grooves in it. These grooves can collect germs and are very difficult to clean. The mixing bowl, whip or paddle and any other parts used on the mixer (this may include the grinder) must be carefully washed after every use.

If a food grinder is used, it must be disassembled and washed after each use. All parts must be free from grease and food particles. This is an excellent breeding ground for very dangerous bacteria.

All utensils must be thoroughly washed in hot, soapy water after each use. They should be stored on a clean rack or in a clean drawer. It does not make sense to work very hard to keep u'ensils clean and then put them in a dirty drawer or rack.

Slide - 24
Slide - 25

Drawers are dark, warm places where roaches and bacteria can hide. To clean drawers you must pull them out and clean all the sides, inside and outside.

After you have cleaned an area, make sure you finish the job by throwing your dirty cloths into the laundry basket. Neatly put away any cleaners and buckets that you have used. Always remember to keep all cleaning agents away from food. It is possible that they can contaminate food or cause chemical poisoning. Always make sure that the floor is swept and all spills are cleaned up. Food particles left on the floor will attract rodents and bugs.

Slide - 26
Slide - 27
Slide - 28

Practicing good sanitation habits is an attitude, a way of thinking. It must become a part of your lifestyle. Remember to CLEAN AS YOU GO. Good sanitation practices will make your job easier, too. A clean kitchen is an organized kitchen.

D. Dishwashing and Pot Washing

Our next topic to cover is dishwashing and pot washing. Slide - 29

Dishwashing is an important function in the School Foodservice. Dishwashing is important in the school cafeteria because it helps prevent the spread of bacteria from one student to another.

For dishes to be cleaned properly, dishes must be: Washed - to remove visible soil; and Sanitized - to kill germs.

Proper dishwashing requires:
1. Hot water at proper temperatures.
2. Detergent in the proper amounts.

Hot water helps to remove grease and food particles from dishes. A hot water rinse will sanitize the dishes by killing many of the germs. Some institutions may use a chemical sanitizing agent which will work with water at a cooler temperature. The machine should be checked frequently to assure that this chemical is being added correctly. Detergent is very important in washing dishes. A detergent is a chemical which breaks up grease and dirt so that it can be washed away. A detergent does not kill germs. Slide - 30

Dishwashing procedures: Let us talk more specifically about correct dishwashing procedures. There are several important points to remember:
1. All flatware must be pre-soaked in soapy water.
2. Dishes that are difficult to clean should also be pre-soaked.
3. All dishes should be scraped well. Slide - 31
4. Dishes should be placed in the rack so that water can reach all parts of the dish. Do not overcrowd the rack. Slide - 32
5. Use overhead spray to remove food particles.
6. Always allow dishmachine to go through its full wash and rinse cycle.
7. Allow dishes to air dry before removing them from rack. Slide - 33
8. If you are scraping or racking dirty dishes, wash your hands before touching clean ones. In the dish area, there should be a clean side and a dirty side. The same person should not do both jobs in the dish area. Two people man the dish area.

Always be careful when using the garbage disposal. Never allow paper or flatware to fall into it. Never put your hands into the disposal. If it should become jammed

turn it OFF and call your manager or the person in charge.

If you notice that some dishes are not clean, so not put them away. Run them through the dishwasher again.

Locate the temperature gauge on your machine and check to see if it is set correctly. The correct temperatures for the wash cycle is 150°F and the rinse cycle is 180°F. (A chemical wash and rinse are 120°F).

Slide - 34

Remember to clean the dish machine after each meal. Food filters must be kept cleaned and the water tank should be drained. The outside of the machine and each area should be wiped down carefully. The correct procedure for operating the dish machine should be posted in the dishwashing area. If you have any questions about operating the dishwasher or if you notice that it is not working properly, see your manager or the person in charge.

Slide - 35
Slide - 36

Flatware: Special attention must be paid to flatware. Flatware touches the student's mouth directly, so special care must be taken to make sure it is really clean.

After flatware has been pre-soaked:
1. It should be spread out loosely in a dish rack and run through the dish machine.
2. It should be sorted on a clean counter or clean tray.
3. It then should be placed eating side up into flatware holders and run through the dish machine again.
4. A clean empty cylinder should then be placed on the full flatware holder and inverted so that the handles are exposed.

Transparency - 11

Pot Washing and Hand Dishwashing Procedures: Pot washing and hand dishwashing can be one of the most difficult and important jobs in the kitchen. It must be done correctly to prevent the spread of germs.

Slide - 37

For washing, a three compartment sink must be used. One compartment for wash water and one for rinse water and the third for a sanitizing agent which will kill many of the germs.

When washing there are several points to remember:
1. Use the proper soap in the correct amounts.
2. Always use hot water.
3. Let dishes stand in sanitizing solution for at least one minute.

4. Do not use steel wool; it may break and get into the food.
5. Let the pots air dry on a clean counter.

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Always wash pots, pans and dishes as soon as possible. The should be scraped and rinsed with water before washing. Rinse with cold water for protein foods such as eggs, milk, and cheese. Use warm water for starchy foods such as cereals and noodles.

Always wipe the pot and pan area when you have finished. Make sure to clean out drains and sinks carefully.

Sanitation of dishes is an important part in the operation of the school cafeteria It is necessary that you know the correct procedures and that you follow them carefully. This will assure good health and appetizing trays for the students.

C. Large Equipment

As we have seen so far, good sanitation practices apply to all areas of the school foodservice system. This includes the cleaning and maintenance of large equipment.

It is important that the equipment used in food production be kept clean and free from dirt and germs. Some types of large equipment used in the kitchen are: stoves; ovens; grease hoods; steam tables; steam kettles; food slicer; refrigerators; and freezers.

Transparency - 12

It is important that the equipment be kept clean because:
1. It comes in direct contact with food and if dirty can contaminate it . . .
2. It helps it perform better and last longer.
3. It can save money be preventing needless repair or replacement.

When you buy a new car you want to wash and polish it as often as possible. The same care should be taken with equipment used in the kitchen. There are some basic principles that should be followed when cleaning equipment.

Tips for cleaning equipment:
1. Shut off machine and pull out the plug when cleaning. This is a safety to prevent a serious accident. Do not pull out the plug by the cord.
2. Make sure that the equipment is cool to the touch before cleaning. It is very easy to be burned if you are not careful.

1. Pay special attention to cleaning grooves and corners. This is where food and bacteria can accumulate easily.
4. Avoid using steel wool or abrasive cleaners on stainless steel. It scratches the surface and these grooves can collect bacteria.

Types of large equipment:

1. Stoves - should be cleaned thoroughly every day. Spills should be wiped up immediately. Stove tops should be kept free from grease. Grease can catch on fire easily.

2. Ovens - should be cleaned once a day to prevent grease build-up. The outside should be wiped down when the oven is cool. A grease cleaner should be used on the inside when necessary.

3. Steam Tables - should be kept spotless. Remember to make sure that the steam table has been turned off and is cool to the touch. Steam tables should be scrubbed every day. Remember to clean the sneeze guards as well. Slide - 39 Slide - 40

4. Steam Kettles - are a wonderful time and space saver. They prevent having large pots on the stove top. A steam kettle should be treated with care. Always soak the kettle after every use and then scrub it with a nylon brush to remove food particles. The same care that is used for the steam kettle should also be used for the tilting fry pan.

5. Grease Hoods - large hoods over stoves and fryers filter the air to remove grease particles. The hood, as well as the filters, should be kept clean because both can be a major fire hazard. The filters should be soaked at least once a week or run through the dishwasher as often as possible. Remember, that these filters should be cleaned to prevent a hazard.

6. Food Slicers - should be handled with great care. They should be cleaned well after every use. The slicer should be disassembled carefully and blade, guard and other detachable parts should be removed. Do not place it in the sink for someone else to clean because they might get cut. Allow the parts to air dry. Wipe the machine with a sanitizing agent. Slide - 41

7. Refrigerators and Freezers - Refrigerators should be kept spotless--inside and outside. Every day they should be checked for food which is outdated and any that must be thrown away. Remember to price all items also. The racks should be removed and scrubbed once a week. Don't overlook the doors, hinges and roof of the refrigerator. Use a detergent to clean the refrigerator. Do not use steel wool as it can scratch the surface. Walk-in refrigerators should be cleaned as often as possible. The racks should be removed and the refrigerator floor and walls should be scrubbed. Walk-in freezers shouls be kept free from ice build-up. They should be cleaned at least once a year, removing all racks and scrubbing walls, ceiling, and floor. The freezer floor Slide - 42 Slide - 43

should be washed often. The condensing units of refrigerators or freezers are responsible for making them cold. If the condensers are not kept clean, they will be more expensive to operate and more likely to break down.

8. Lighting - This is not really large equipment, but it is just as important. The lighting in the kitchen should be bright enough to have the entire kitchen well lit. All work areas should be especially well lit. Shields must be on all lights to prevent anything falling from the lights in to the food or equipment. If a light would break, the light shield would prevent the broken glass from falling onto the food, floor, equipment and personnel. All the light shields and fixtures should be periodically cleaned and checked because they do collect alot of dust particles.

Large equipment is expensive to maintain and replace. You, as the foodservice employee, must respect this equipment and make sure that it is clean at all times. A cleaning schedule should be posted in the kitchen to assure that all of the areas of the kitchen are being kept clean. A cleaning schedule specifies which person is responsible for cleaning which area, and when that person is to clean it. Cleaning schedules prevent confusion and prevent areas from being overlooked. Dirt, if allowed to accumulate, is much more difficult to remove when the kitchen is not regularly cleaned.

CLEAN AS YOU GO is a good motto to remember.

XI. Rodent and Insect Control

Even with the utmost care taken to guard against the entry of rodents and insects, you may find them in food establishments and they may remain undiscovered for some time. Rats, mice and roaches may ride into the establishment concealed in supplies. Of course, this is not likely to happen when manufacturers, wholsalers, and distributors practice control measures, too.

Sometimes through carelessness - a door propped open while bringing supplies, a torn screen, the exhaust fan screen left out of place when the fan is stopped - these germ-bearing pests invade a place. Because of these possibilities, remember to:

1. Check supplies routinely upon delivery and just before using. When contamination is suspected, set such supplies aside for return or destruction, as the case may be.

. Control insects and rodents. Screen all doors, windows and other openings. Have doors tight fitting and keep them closed. Keep your facilities neat and clean - inside and out. Clean behind stoves and sinks very carefully because roaches live in warm, damp places. The use of pesticides may be necessary. These must be used with caution. Consult the Health Department on serious infestations. Keep rodents out of the facilities. Plug openings in foundations of ducts, and other openings through which rats and mice might enter. Keep garbage cans clean and keep them covered. Food attracts insects and rodents.

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3. Store garbage and refuse. Keep garbage stored outside in tightly covered containers. Containers in the kitchen need to be covered and need to be washed after emptying. The use of standard, galvanized garbage containers or approved bulk containers are recommended for garbage storage. Remove garbage and refuse to the disposal site at least once each day. Maintain container storage area in a neat, clean condition. Garbage attracts flies and rodents. Be certain there are enough containers, they are kept covered and are cleaned thoroughly and often. Bulk containers are recommended when five or more standard garbage containers are needed.

Slide - 45

4. Store packed foods such as flour and sugar in metal containers or in rodent proof containers or storerooms. Remember, rodent dropping are easily visible, whereas stain from the rodent's liquid waste may escape detection. Store food containers on racks at least six inches off of the floor. Besides the danger of contamination under discussion, foods on the floor are subject to contamination from sewage back-flow and floor cleaning operations and provide harborage for rats.

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5. Rotate food supplies. Do not keep flour, cereals or dried fruit for long periods. In larger operations, purchases of such foods should be for a period of not over 6 months but preferable for 30 days or less.

Remember, if poisons and toxins are used for rodent and insect control, they must be stored separate from foods.

XII. Conclusion

In conclusion of our workshop, I would like for you to take another quiz on sanitation.

Distribute quizzes, answer sheets.

The same rules are to be followed as before.
Please begin taking your quiz.

Transparency - 3
Allow approximately 25 minutes for foodservice employees to take the quiz.

If everyone is finished taking the quiz, you can pass the quiz to the end of the row and someone will pick it up.

Pick up quizzes.

In summary of the workshop, it is up to you as a foodservice worker to learn about sanitation and practice it to be able to prepare and serve wholesome food. You are a vital part of foodservice to help protect food and the health of the consumer.

Thank you for allowing me to conduct this workshop with you.

A handout of a summary of the workshop will be given to you as you leave.

Give handouts to each food-service employee as they exit out.

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SANITATION WORKSHOP

GENERAL SANITATION PRACTICES
for the use in the
SCHOOL CAFETERIA

PRESENTED BY

MARY SUZANNE LOGNION

AUGUST 3, 1982

Purpose of Workshop: To introduce and familiarize the foodservice managers and foodservice workers with general sanitation practices for use in the school cafeterias.

An important obligation of the foodservice industry is preparing and serving wholesome food to the public. This is an obligation that can be fulfilled only if personnel in every establishment understand what sanitation is, appreciate its importance, and practice it at all times. Practicing sanitation calls for applying sanitary measures at every stage of an operation to achieve cleanliness and to protect the health of the consumer.

Types of Food Germs:

1. Salmonella - spread by contaminated utensils or work surfaces not cleaned before re-use; Food contaminated by unwashed hands and by flies; also by raw meat and poultry.

2. Clostridium Botulinum - spread by improperly processed canned foods.

3. Staphylococcus - spread by food contaminated by persons with boils, infected wounds and sores, or unwashed hands.

4. Clostridium Perfringens - spread by food that has been precooked, inadequately cooled, then inadequately reheated.

5. Trichinosis - spread by improperly cooked pork or infected wild animals.

Temperature - Danger Zone

The danger zone for food is 45°F to 140°F. Between these two temperatures, this is the ideal zone for bacteria to grow.

3 Basic Rules for Keeping and Handling Food are:

1. Keep food clean.

2. Keep food hot - 140°F and above.

3. Keep food cold - 45° and below.

4. When in doubt - throw it out!

Foods can be easily contaminated when in the danger zone for too long a period. Foods need to be consumed within 1 - 1 1/2 hours if in the danger zone.

Store cooked food by cooling down within 1 1/2 hours below 45*F, as quickly as possible. This can be accomplished by use of shallow pans, agitation, or quick chilling.

When reheating food: HEAT to KILL to ELIMINATE.

Use thermometers for checking temperatures:

1. Stick thermometer - used to check the internal temperature of all types of food whether it is hot or cold.

2. Temperature gauges on the refrigerators and freezers.

3. Meat thermometers - which are used when cooking meats.

4. Temperatures gauges which can hang or sit on the shelves of the refrigerators or freezers.

Food Storage

3 types of food storage:

1. Dry Storage.

2. Refrigeration.

3. Freezing.

All food must be kept off the floor by at least 6 inches. This should be in a clean, dry location.

Refrigerator temperature should never go above 45*F.

Freezer temperature should never go above 0*F.

All foods should be covered, labeled and dated.

Frozen foods to be thawed, should be thawed in the refrigerator -- not left out in the air. When thawing, meat is exposed to the air, the inside part of the meat remains cold for a long time, but the outside parts of the meat warm up quickly and bacteria will begin to grow there. In the refrigerator all portions of the meat will remain cold until it is thawed out completely.

Handling of Food

There are several ways that bacteria can contaminate food. Some are:

1. Improper food storage.

2. Use of dirty dishes, utensils, and equipment.

3. Contact with rodents and bugs.

4. Direct contact with people who have dirty hands or infections.

Crosscontamination is the process whereby a food is contaminated by some other source than its own. Foods need to be kept separate to prevent germs from "hitch-hiking" around.

Personal Hygiene

Personal hygiene is a most important subject for foodservice employees for two reasons: first, good personal hygiene makes it possible for people to have a high level of health so that they mey more effectively, and efficiently perform their job; second and most significantly, it helps in preventing the spread of disease in food establishments.

Personal hygiene is the name of a group of practices we can do every day to make us healthier, stronger, and more useful, regardless of where we work or what we do.

At work, there are several things you must be careful to do so that you won't spread germs:

1. Be free of skin lesions and other infections.

2. Practice personal cleanliness: Bathe, use deordorant, wear clean uniforms, clean and arrange hair, wear hair nets totally covering hair.

3. When at work control bad hand habits. Do not scratch head or other body parts, play with hair, pick pimples, and so forth. If you accidentally do these things, wash hands thoroughly afterwards.

4. If you must cough or sneeze, try to get away from food, cover mouth and nose, and wash hands thoroughly afterwards.

5. Hands should be washed frequently and after each of the following activities: going to the bathroom; smoking; handling boxes, crates, and other soiled objects; handling raw meat, poultry, shell eggs, fish, or shellfish; handling garbage; handling money; handling anything soiled.

6. Keep hands and fingers out of food; do not taste food from fingers; use a clean tasting spoon each time. Never lick fingers.

7. Use utensils for preparing food as much as is possible. Be sure that utensils are clean.

8. No smoking or gum chewing in food preparation and service areas.

9. Avoid touching parts of china and eating utensils that will be touched by the customer's mouth. Pick up serving and eating utensils by their handles and glasses by their bases.

10. Handle plates in a sanitary manner; the thumb should touch the rim of the plate only, never the plate itself or the food on it.

11. Use plastic disposable gloves if food must be manipulated by hand and when serving. Dispose of used gloves.

12. Remove apron when leaving work area (to go to the bathroom, outside, etc.).

REMEMBER. . . THINK CLEAN . . . ACT CLEAN . . . BE CLEAN . . .

Cleaning Equipment

Just as good grooming is important, cleanliness in the kitchen and of the equipment is just as important. Sanitation includes keeping the kitchen orderly and free from dirt and harmful bacteria. It is essential in a kitchen that good sanitation practices are followed. Dirty work areas and dirty equipment will contaminate food and spread.

It is very easy to overlook many places where dirt and germs can collect. Watch out for dark, warm places where they can hide.

Some places in the kitchen that collect dirt and germs easily are: Hair, body, hands, dishes and silverware, countertops, refrigerators, meat slicers, pushcarts, utensils, inside drawers, and cutting boards.

All of the equipment which is used in the kitchen should be kept spotless.

All equipment and utensils need to be cleaned and sanitized when used. This is done by washing and using a sanitizing agent. If equipment can be unassembled, this must be done for cleaning.

CLEAN AS YOU GO. This helps to make the job easier. A clean kitchen is an organized kitchen.

Proper dishwashing requires:

1. Hot water at proper temperatures.

2. Detergent in the proper amounts.

For pot washing, a three compartment sink should be used. The first compartment with the wash water, the second with the rinse, and the third with the sanitizing agent to help kill many of the germs.

It is important that the equipment be kept clean because:

1. It come in direct contact with food and if dirty can contaminate it . . .

2. It helps it perform better and last longer.

3. It can save money by preventing needless repair or replacement.

Pest and Insect Control

1. Check supplies routinely upon delivery and just before using it to be sure there are no signs of rodents and insects.

2. Control insects and rodent. Keep facilities neat and clean - inside and out. Use pesticides with caution as necessary. Consult the Health Department on serious infestations.

3. Keep garbage can clean and keep them covered. Food attracts insects and rodents.

4. Store sacked foods such as flour and sugar in metal containers or in rodent proof containers or storerooms.

5. Rotate food supplies. Do not keep flour, cereals or dried fruit for long periods of time.

6. If poisons and toxins are used for rodent and insect control, they must be stored separate from foods.

It is up to you as a foodservice worker to lear about sanitation and practice it to be able to prepare and serve wholesome food. You are a vital part of foodservice to help protect food and the health of the consumer.

APPENDIX B

SANITATION CHECKLIST

School: _____

Type: _____ Manager _____ Manager and Worker

ITEM	SATISFACTORY	UNSATISFACTORY	REMARKS
FOOD:			
1. Source: Sound Condition, No Spoilage			
2. Original Container, Proberly Labeled			
FOOD PROTECTION:			
1. Potentially Hazardous Food Neets Temperature Requirements During Storage, Preparation, Display, Service, Transportation			
2. Facilities To Maintain Product Temperature			
3. Thermometers Provided And Conspicuous			
4. Potentially Hazardous Food Properly Thawed			
5. Unwrapped and Potentially Hazardous Food Not Re-served			
6. Food Protection During Storage, Preparation, Display, Service, Transportation			
7. Handling Of Food Minimized			
8. In Use, Food Dispensing Utensils Properly Stored			
PERSONNEL			
1. Personnel With Infections Restricted			
2. Hands Washed And Cleaned, Good Hygienic Practices			
3. Clean Clothes, Hair Restraints			
FOOD EQUIPMENT AND UTENSILS			
1. Food Contact Surfaces: Designated, Constructed, Maintained, Installed, Located			
2. Non-Food Contact Surfaces: Designed, Constructed, Maintained, Installed, Located			
3. Dishwashing Facilities: Designed, Constructed, Maintained, Installed, Located, Operated			
4. Accurate Thermometers, Chemical Test Kits Provided, Gauge Cock (¼" IPS Valve)			
5. Pre-Flushed, Scraped, Soaked			
6. Wash, Rinse Water: Clean Proper Temperature			
7. Sanitization Rinse: Clean, Temperature, Concentration, Exposure Time, Equipment. Utensils Sanitized			
8. Wiping Cloths: Clean, Stored, Restricted			
9. Food Contact Surfaces of Equipment And Utensils Clean, Free Of Abrasives, Detergents			

ITEM	SATISFACTORY	UNSATISFACTORY	REMARKS
10. Non-Food Contact Surfaces Of Equipment And Utensils Clean			
11. Storage, Handling Of Clean Equipment/Utensils			
12. Single-Service Articles, Storage, Dispensing, Used			
13. No Re-Use Of Single Service Articles			
WATER: 1. Water Source, Safe: Hot And Cold Under Pressure			
PLUMBING: 1. Installed, Maintained			
2. Cross-Connection, Back Siphonage, Back-Flow			
TOILET AND HANDWASHING FACILITIES: 1. Number, Convenient, Accessible, Designed, Installed			
2. Toilet Rooms Enclosed, Selfclosing Doors, Fixtures, Good Repair, Clean: Hand Cleanser, Sanitary Towels/Tissue/Handdrying Devices Provided, Proper Waste Receptacles			
GARBAGE AND REFUSE DISPOSAL: 1. Containers Or Receptacles, Covered: Adequate Number, Insect/Rodent Proof, Frequency, Clean			
2. Outside Storage Area Enclosures Properly Constructed, Clean; Controlled Incineration			
INSECT, RODENT, ANIMAL CONTROL: 1. Presence of Insect/Rodents - Outer Openings Protected, No Birds, Turtles, Other Animals			
FLOORS, WALLS AND CEILINGS: 1. Floors: Constructed, Drained, Clean, Good Repair, Covering Installation, Dustless Cleaning Methods			
2. Walls, Ceiling, Attached Equipment: Constructed, Good Repair, Clean Surfaces, Dustless Cleaning Methods			
LIGHTING: 1. Lighting Provided As Required, Fixtures Shielded			
VENTILATION: 1. Rooms And Equipment Vented As Required			
OTHER OPERATIONS: 1. Necessary Toxic Items Properly Stored, Labeled, Used			
2. Premises Maintained, Free Of Litter, Unnecessary Articles, Cleaning Maintenance Equipment Properly Stored, Authorized Personnel			

Adapted from: FOOD SERVICE ESTABLISHMENT INSPECTION REPORT
Department of Health and Human Resources - State of Louisiana

APPENDIX C

SANITATION QUIZ

Choose the correct answer for the following:

1. Perishable foods prepared in large quantities should be rapidly cooled, utilizing which of the following method(s)?
   a) shallow pans.
   b) agitation.
   c) quick chilling.
   d) none of the above.
   e) all of the above.

2. Which area(s) should be avoided for food and food equipment storage?
   a) refrigerator - below 45°F.
   b) clean, dry storeroom.
   c) laundry room with detergents and chemicals.
   d) none of the above.

3. The danger zone for food is between which temperatures?
   a) 32° - 140°
   b) 45° - 140°
   c) 50° - 135°
   d) 40° - 100°

4. The most desirable method of thawing food is
   a) at room temperature.
   b) under hot (above 70°F) running water.
   c) in the refrigerator.
   d) all of the above.

5. Multi-use utensils need to be
   a) cleaned after each use.
   b) washed after each use.
   c) rinsed after each use.
   d) sanitized after each use.
   e) all of the above.

6. Frozen food should be kept frozen and should be stored at a temperature of:
   a) 0°F or above.
   b) 0°F or below.
   c) 32°F or below.
   d) 32°F or above.

7. Which of the following is false?
   a) The outer clothing of all employees shall be clean.
   b) Employees shall use effective hair restraints to prevent the contamination of food or food-contact surfaces.
   c) Employees shall consume food only in designated dining areas.
   d) Employees may use tobacco in any form while engaged in food preparation or service.
   e) none of the above.

8. Perishable food after preparation should be rapidly cooled to an internal temperature of
   a) -5°F or below.
   b) 32°F or below.
   c) 0°F or below.
   d) none of the above.

9. Washing hands when working with food or food-contact surfaces should be done
   a) before handling any food.
   b) after visiting the restroom.
   c) after sneezing.
   d) all of the above.

10. Which of the following is not a good food storage covering?
   a) glass.
   b) plastic.
   c) cloth.
   d) stainless steel.
   e) none of the above.

11. Cleaned and sanitized utensils and equipment should be stored
   a) on the floor in a damp location.
   b) at least 6 inches above the floor in a clean, dry location.
   c) 2 feet above the floor in a clean, dry location.
   d) on the floor in a clean location.

12. Glasses, cups, and plates should be stored
   a) inverted (top side down).
   b) upright (top side up).
   c) upright (top side up) in an open area.
   d) all of the above.

13. To prevent crosscontamination of food
   a) keep raw foods and cooked foods together.
   b) use the same cutting board when handling raw and cooked foods.
   c) keep raw foods and cooked foods separate.
   d) all of the above.

14. Cooked foods not immediately served
   a) offer no hazard in the transmission of foodborne disease.
   b) if properly protected, need no refrigeration.
   c) should be cooled quickly and stored at 45°F until served.
   d) should be discarded.
   e) can be kept indefinitely at normal refrigeration temperatures.

15. Food handlers with boils or infected wounds should
   a) be assigned jobs where there is little likelihood of transmission of infection.
   b) not be allowed to work.
   c) be allowed to work with no restrictions.
   d) be allowed to work with no restrictions if the lesion is bandaged.
   e) be discharged.

Answer each of the following as either TRUE or FALSE:

16. Food should never be stored with cleaning compounds.

17. Freezing foods kills germs.

18. Spoiled food always smells bad.

19. A dented can may be a sign of food spoilage.

20. There are several kinds of bacteria that will contaminate food and cause illness.

21. Washing your hands kills all germs.

22. Salmonella food infection can be caused by food handlers who do not wash their hands properly after a trip to the bathroom.

23. Detergents will kill germs.

24. Busting your nose while handling food may contaminate the food.

25. A sanitizing agent kills some germs.

26. A hot pan of food should sit out several hours to cool before being put in the refrigerator for storage.

27. Hot foods should be kept at 140°F or higher, and cold foods at 45°F or lower to prevent food spoilage.

28. The proper use of chemicals is all that is necessary to control cockroaches and other rodents in a food service establishment.

29. A foodservice establishment that has the latest and newest of equipment can be assured of being a clean establishment.

30. Many of the chemicals used for cleaning and sanitizing are toxic and can make a person ill.

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