FOOD-BORNE DISEASES IN THE NAVY — A TRAINING PROGRAM FOR FOOD SERVICE PERSONNEL AS A PREVENTIVE MEASURE*

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From the need for intensive training in food sanitation in the Navy has evolved a program of in-service courses at various levels of Navy life and for various degrees of specialization of assignments, as well as of organized classes at civilian schools which Navy personnel may attend. The principle behind such training is the development of proper attitudes toward safe food handling rather than the rote memorizing of facts. Such "attitude-formation" methods are used for food-service workers, and training of professional scope for potential instructors. Visual aids and classroom discussion techniques are also used.

The announced purpose of this talk is to acquaint you with the food service employee training which we conduct in the Navy. To establish a foundation for such training, I must dwell upon the need for training and the problems out of which this need has arisen. Because of some controversial opinions which I shall state, I feel compelled to tell you a story of a "squirrel law." Down where I come from in Alabama we have a squirrel law. Half of the people are for this law and half are against it. During a certain campaign speech made by an old friend of mine who was running for state senator, he asked if anyone in the audience had a question. One of the old farmers down in the front row stood up and said, "Yeah, how do you stand on this squirrel law?" My friend's supporters were scared to death because they knew he would say the wrong thing, but my friend replied simply, "Glad you asked me that question. I understand that half of my friends are for it and half are against it, and I want it definitely understood that I'm for my friends." I hope that when the discussions on the philosophy of our training in the Navy are over we will all still be friends even though we may have somewhat of a "squirrel law" here to discuss.

As you know, the term "diarrhea" is not the name of a disease but rather describes a group of symptoms which may be due to many causes. There is little doubt that the incidence of diarrheal diseases among military groups had a profound influence on early warfare and most certainly on the progress of civilization. At the beginning of the 20th century rates for diarrheal diseases had been considerably reduced and a definite downward trend established. In figure 1, it appears that the reduction in diarrheal disease rates slowed down considerably about 1913.

Food Infection

The important factor here is that a considerable portion of these diseases remaining which held the rates to their 1913 level are of the food-borne group. Historically, we can see that since 1861 distilled water has been used aboard ships and since 1892 the use of filtered water ashore has been commonplace. Chlorinated water had its beginning in 1908. All these factors are largely responsible for the decrease in diarrheal diseases from the period 1892 to 1913 as indicated in figure 1. Why then since the purification of drinking water was essentially an accomplished fact as far as the Navy was concerned in 1913 did the diarrheal diseases continue at a rate of between 10 to 21 per 1,000 strength? Obviously causes other than polluted water must be sought.
Among these causes we may include the eating of food contaminated with organisms of the typhoid, dysentery or Salmonella groups or with any of the classic food poisoning organisms. A graph of typhoid in the Navy is a most revealing thing for it shows that prior to 1913 typhoid infections accounted for an exceedingly large portion of the diarrheas. In 1913 with the advent of typhoid vaccination in the Navy the rates for this disease fell off and have remained at a negligible figure.\(^1\)

The urgent need of a specific means of immunization against dysentery is quite obvious. From the current dysentery rates it is obvious that many ships of our fleet are well seeded with dysentery organisms, in many cases this organism being \textit{Shigella flexneri III}. Many serious outbreaks in which the \textit{Shigella III} organism has either been confirmed or highly suspected have been reported recently, involving from ten percent to as much as seventy percent of a crew. The obvious result of a heavy carrier population may be seen in such cases where a generalized attack among crew members of a ship will subside until major complement changes are made. These replacements are usually susceptible individuals and when they come in contact with the pre-existing carrier group another round or explosive outbreak of the infection should be expected and usually occurs. There are many modes of transmission, as we all know, including among the most important such vehicles as food, water and common objects.

As a matter of interest I might mention that a vaccine against the \textit{Shigella flexneri III} organisms has been developed and is currently being used in the Pacific Fleet in ships of the battle and carrier class. Replacements to these ships and all other such ships which join the Pacific Fleet are being vaccinated so that spread of dysentery among newly arriving populations may be controlled in view of the serious results arising from the disability of large percentages of a ship's complement.

\textbf{FOOD POISONING}

Increased emphasis has been put on several phases of sanitation and hygiene. In trying to define the problem areas and the need for sanitation training I have dwelled primarily on the dysentery group of diseases. We must not forget food poisoning. The status of food poisoning incidence has changed little. In a recent two-month period there were 1,400 cases of food poisoning reported. These cases occurring in seventeen isolated outbreaks. The seriousness of these outbreaks cannot be over-emphasized. Here are two examples that will emphasize this point.

Some time ago on the West Coast two combat teams of marines were formed for a sham battle. The plan was for these two groups to go into the "boon-docks" for a few days and for one team to defend an important objective and for the other team to attack it. The commanding officer of the defensive team had been in such war games before and was quite sure that the general attack would be launched against him at dawn of the next day. All preparations were completed. He even decreed that his men should have a good pre-dawn breakfast, and accordingly ordered that hash should be prepared and kept warm for an early serving. The attack came well after the sun was in the sky and as the attackers approached the east under perfect tactical conditions, they met almost no opposition. They took the objective with ease. As they approached the objective they beheld a sorry sight. The judges of the sham battle awarded the victory to the attackers. They should have charged it to staphylococcus enterotoxin which caused the defeat. How many victories that could be charged to the staphylococcus occurred in the jungles and on the atolls of the South Pacific during World War II we will never know.

The second example involves a four-motored plane which very fortunately landed safely on an island in the middle Pacific. The pilot, co-pilots and navigator were all sick with salmonellosis, fever, diarr-

rhea, nausea and vomiting. Turkey sandwiches eaten on Guam the day before were suspected. The incubation period of about 18 hours had enabled the plane and its group to take off from Guam and Kwajalein over the Pacific. A functioning automatic pilot plus perseverance pulled them through.

I can cite a third example, that of one of our smaller ships operating on the East Coast. Though not food poisoning, this will emphasize the seriousness of all diarrheal disease outbreaks. When all but three of the ship's complement became ill simultaneously with diarrhea, the ship ran aground. This explosive outbreak was traced to highly polluted water of undetermined etiology due to lack of proper back-flow protection.

The fact has been clearly demonstrated in the foregoing accounts of outbreaks that by their very nature, enteric diseases such as food poisoning and dysentery are hazardous to military units and threaten the success of military operations. I mentioned the fact that over a recent two-month period 1,400 cases of food poisoning had been reported. The Navy requires that all food poisoning outbreaks be recorded and when five or more cases occur, they must be reported by dispatch and followed by a complete epidemiological report. At times the number affected is small and few or none require admission to the sick list so that the medical officer fails to recognize the significance of the outbreak. More often than not the causative organism or suspected food is not reported, or if reported, substantiation is not given.

In many cases the numbers involved in an outbreak may be given as rough estimates, such as 25 percent of a ship's complement or one-half of the personnel eating the noon meal. Such figures obviously cannot be reduced to statistical values, thus actual admissions as reported in monthly statistical reports fail to record the vast number of such cases incapacitated for several hours but not admitted to the sick list.

Table 1 and figure 2 indicate that the enteric group of diseases are of much greater economic importance than would seem apparent since the admissions to the sick list do not nearly approximate the actual number of outbreaks or the numbers involved in those outbreaks, the high ratio being 23.6:1 in 1950. Furthermore, it must be remembered that even those numbers in such reports do not include personnel who are mildly sick. These numbers will never be known.

**Training Emphasis**

We can see by this point the need for intensive training in food sanitation in the Navy. Although I am going to give you a few details about the existing program, more important I hope to convey to you the newer philosophy in preventive medicine training, specifically in food service personnel training as it is visualized to be conducted by our Bureau. This modern trend in educational technique which we call "attitude development" is aimed at the basic roots of man's behavior and applies to military and civilian employees alike.

As you may assume, all Navy training is centered around maintaining the fighting efficiency of the man of the fleet. By saying this I don't wish to exclude those persons who support the fighting man of the fleet, for they must be considered to be as important as the one who mans the guns. We are interested not only in the enlisted group but in the commissioned officers of the Navy. Even further, our work encompasses nearly 10,000 civilian food workers of the Navy Department. The training of which I will speak is both professional and attitude-forming in scope. The professional training is aimed at the potential instructor group and the attitude-forming aimed at the food worker group. The food workers' training is built about a framework of "attitude-development".

Anatole France one said, "Let our teaching be full of ideas. Hitherto it has been stuffed only with facts". We are trying to unstuff our training program and to pass on ideas for "attitude-development".

John Ruskin said, if I may quote once more, that "education does not mean teaching people to know what they do not know. It means..."
teaching them to behave as they do not behave.

Research has found, you and I have found in discussions with others that by and large, people are aware of the basic principles of good environmental sanitation and personal hygiene in many cases. These principles are contrary to the early teaching to which people have been exposed through family, school and associates, and yet these people recognize such principles. They know what to do; yet they do not behave in the proper manner. Their behavior in this case is dictated by past experience and attitudes which have been formed from the time of their birth until you and I see them in training groups. Attitudes are powerful animals. It is our attitude toward personal hygiene which dictates whether we brush our teeth after each meal, whether we do it before breakfast or after breakfast; it is our attitude toward our work which dictates whether we do a complete job, and so on. Generally, where attitudes are concerned we have found — at least if we gave them a chance to discuss the problem — that a large number of food service workers would realize that they know the right thing to do but are prevented from doing that right thing by their blind attitude which, unknown to them, prevents logical thinking.

It is our aim in the “attitude-development” phase of preventive medicine training to change attitudes from improper to proper. This change of attitudes is based solely on the information which is inherent in the brain of each individual in our training program. How can this best be done? Our experience indicates that the group discussion meeting is the best and most readily available tool for all instructors in the field. Our concept of group discussion does not include the overbearing or impatient instructor who is the informant to the group and merely suggests a principle and then asks the group to “parrot” back answers, but rather the true group leader (and these people can be developed from raw material) who simply suggests an area of discussion and as obvious and basic principles are developed, brings them out into the open so that everyone can see them, analyze them, and appreciate their value. In some cases we have found that it is necessary to supply resource material. A good series of visual aids have been used as resource material, not with intent in mind to teach but rather to suggest to the mind of each individual discussion possibilities. For the more advanced audience we use textbooks and other reference material which is understandable to them and to which they can refer as problems arise in their minds. Generally, the instructor tries not to answer these problems as they arise but suggests ways and means by which the student himself can find his answers.

Most of this work to date in developing this improved training technique has been devoted to organizing basic or advanced training schools. From the time a Navy man first enters the Service and attends a recruit training camp, he is given food sanitation instruction. At present, four hours of classroom discussion, as opposed to lecture, are given to all recruits in recruit training commands. This group, my friends, represents a tremendous number of responsible individuals thinking about food sanitation.

To tell you a bit about our food sanitation program for recruits I would say that we have omitted “facts” from the instruction. When a recruit leaves the four hours of instruction, unless he asks a specific question and finds the answer, he doesn’t know the required rinse temperature in good dishwashing operation; he doesn’t know the temperature below which a haemolytic strain of streptococcus will grow; he doesn’t even know which foods should be refrigerated and which should not. He does know, however, and we have proven this with tests and retests, that clean hands, a clean body, and careful, clean personal practices in preparing, handling, or serving food is important to his own health and that of his shipmates; and he does know that each dishwashing machine is different in operation and that when on the job he can get instruction as to proper temperatures and times of washing; and he knows that the cooks in the galleys are specialists in food service and that they have information pertaining to the right foods to keep cold and those to throw away. In experimental groups with this type of training we have developed new attitudes in this field toward which the recruit has never given much thought because he has never made himself realize the importance of good food sanitation. An evaluation of this type training is being made by actual observation on the job.

Leaving the recruit level, we next progress to the commissary school. This type school is classed as a Class “A” training school. To be sure, these are the people who will actually cook and bake and physically prepare the food for the Navy. Preceding their professional training in cooking techniques, their attitudes are further developed in the proper personal and sanitary practices that make for excellent food service, and this, once developed, is followed by technical information on times and temperatures, germs and equipment. Technical information is much better understood and longer retained when a sound and healthy attitude toward the general field of sanitation is present. Eleven hours are utilized to train and develop the proper attitudes toward food sanitation in these students in the commissary school.

A final step and one in which further progress is now being made in the food sanitation in-service training program, the center of our current “attitude development” program, lies in the training for professional food workers in the Navy. These people may be civilian employees or Navy cooks and bakers or master-at-arms in the galleys and sculleries.
This program began in January of 1949 at which time the Secretary of the Navy directed that a basic six-hour course be given all food service personnel in the Naval establishment. The Surgeon General of the Navy then issued a circular letter which gave details of this in-service training program. The training is given on a continual district-wide basis under the supervision of the naval district preventive medicine officer and/or the director of training in each naval district. First, all supervisory personnel and instructors were given the appropriate training. This training ranged from a minimum eight hours required up to one week’s training from four to six hours per day.

Then the basic training course for all food service workers was given by these trained instructors. During 1950, 14,353 personnel have been trained out of a total of 20,850 of food personnel. This mandatory program did not include fleet units* however, one school was set up in each naval district to be run on a continual basis. These schools are available to the men of the fleet. Fleet commanders then took the initiative and required the training program to be extended to activities afloat, and where naval district training courses are not available the ship’s medical department personnel give the required courses.

I am very pleased to announce at this point that the sister services, the Army and the Air Force, now require that all food service personnel receive a minimum of eight hours training in food sanitation and an eight-hour refresher course to be given each year.

A word at this point on the source of Navy instructors who organize and conduct these courses of which I have spoken would be appropriate. By and large, the instructors represent two groups of naval personnel and one group of civilians. Officers of the Medical Service Corps and of the Hospital Corps and enlisted men of the Hospital

*Shipboard training now mandatory.

Corps especially trained in sanitation are the most commonly found instructors in this program. Additional civilian professional instructors from the Works Improvement Program are used to some degree. The Navy instructors may be trained in any one of several types of schools.

The Medical Department sponsors both the basic and the advanced Hospital Corps School. In the basic Hospital Corps School, also a Class “A” school, potential hospital corpsmen attending receive 32 hours in classroom instruction in preventive medicine subjects with emphasis on food sanitation. These hospital corpsmen may well be the sanitation workers of the future and are often called upon to conduct in-service training programs in the Navy. The advanced Hospital Corps School is for chiefs and first class petty officers who will serve on ships and stations independent of a medical officer. These men are given 14 hours of training in environmental sanitation and preventive medicine with emphasis on teaching food sanitation.

The Medical Department also conducts a specialty course called, “The Environmental Sanitation Technician Course” for Chief and First Class Petty Officers. This course is currently given at the Naval Hospital in Oakland, California. The five-month curriculum includes such subjects as: public health administration, vital statistics, epidemiology, rodent and insect control, general sanitation, and communicable disease control. Each student receives an excellent short course in instructor-training with emphasis on teaching food sanitation. As with most professional courses it includes not only classroom work but actual field experience and observation, and classes in food sanitation are actually taught by these students. Their record to this date has been magnificent. In fact, the Environmental Sanitation School at Oakland is now recognized work whereby the students may obtain college credits towards a degree which they may later seek. At the beginning of the Korean Campaign a total of 39 EST’s were available. Since that time 4 additional men have been trained. We are now producing 20 well-trained men each two and one-half months. However, it is planned to extend the course to nine months as soon as the emergency situation permits. The individuals now in this school, when graduated, are eligible provided they meet other requirements to take the examination for sanitarian registration in the State of California.

Medical Department instructors for these food sanitation courses may be further trained in an institution of higher education. Each year a specially selected group of commissioned and warrant officers of the Hospital Corps and officers of the Medical Service Corps have an opportunity to attend a one semester short course at the University of California in Berkeley to further develop their professional knowledge and aptitudes in the environmental sanitation field. This course is similar in scope to the sanitarians’ short course as given by the same university. It is felt by the Bureau of Medicine and Surgery that such men, although few in number, should be trained as competent professional specialists, and the record of their work to date is the record of advancement in the general sanitation phases of the Bureau’s activity. This group supervises the food sanitation training program in all naval district activities in the capacity of assistants to the District Medical Officers for Preventive Medicine. The Naval School of Hospital Administration at the National Naval Medical Center is including a section on the administrative activities involved in serving a safe nutritional ration. Although not directly connected with the food service training program I might mention that all young medical officers upon entering the Navy and attending the Naval Medical School for indoctrination are given certain phases of the preventive medicine program in or-
der to make them aware of the problems existing in this field and to give them the foundation for participation in the preventive medicine program of the activity and cooperation with the local health department personnel wherever they may be assigned. This group also receives special training in conducting food sanitation programs. In addition, a newly established six-month course for epidemiologists at the Naval Medical School has just begun, and the outlook for the future is bright. The medical officers who attend this course should be competent to direct an effective preventive medicine program in the field.

It would be amiss not to mention the six Epidemic Disease Control Units which we have within the continental limits of the United States and in the 14th Naval District and two Fleet Epidemic Disease Control Units in the Pacific area. These Units provide excellent laboratory service devoted to preventing communicable disease outbreaks. They are equipped to handle routine examinations of milk and milk products and water testing. The personnel in these Units are especially trained to conduct food sanitation programs.

IMPROVED GUIDE

We are not entirely satisfied with our training program as it is presently being conducted. In my few remaining minutes I will endeavor to outline how we hope to stimulate and improve our in-service training program. The U. S. Public Health Service in cooperation with the Bureau of Medicine and Surgery has prepared a new "Instructor's Guide—Sanitary Food Service" which presents an entire course in food sanitation based on the group discussion technique; this course is based on research findings. It differs considerably from the interim edition of "Instructor's Guide—Sanitary Food Service" which was a pamphlet as you will remember. It differs considerably from the rough work copy which many of you received and on which you have offered many excellent comments. The new book will number in excess of 150 pages and, I think, will prove of valuable assistance to all of us engaged in food sanitation training. Galley proofs of this manual have been reviewed and returned to the Government Printing Office. The new manual should be available during the latter part of January. When it is released it is planned that a team consisting of U. S. Public Health Service, Navy, and possibly representatives of the Army and Air Force will visit approximately twelve central locations throughout the United States and demonstrate the use of this new teaching technique. It is planned to invite representatives from each regional public health area, each state and large city within the twelve principal areas to be visited. It is hoped that, as a result of this traveling team, food sanitation training can be stimulated to a new high throughout the country and result in a considerable reduction in extra-cantonment health hazards to those in military service during this emergency period.*

In closing I would like to tell you a little about our dreams and plans for the future. It has been said that in the world of the future we'll need guns of smaller and men of larger calibre. As regards the guns, I'll leave that subject to those who plan such things. We feel, however, that the men of the future—and those are the men that we are working with now—will develop into better and more useful members of society as a result of the training which we are now giving and which we plan. Concerning the enlisted Navy man you have seen as the story has unfolded here that he is hit with various phases of food sanitation training as he enters the Navy. He is accepted again in specialty schools and again on active duty when out of school. It is our premise that every Navy man at one time or another in his career will be responsible in some way or another in some phase of food service. Each man in the Navy must have an awareness of the health problems involved in that part of his activity and plans include expansion of all such training to reach increasing numbers of personnel.

In a nutshell that is our future plan—to expand and expand and eventually have a "junior-junior" food sanitarian incorporate in every man in the Navy. We hope further that we can indoctrinate every civilian employed by the Navy Department to be constantly aware of those factors in his environment which affect his health and well-being.

The Navy is aware of and operates under the definition of health as given by Dr. C. E. A. Winslow. It goes somewhat like this: "True health is that state of positive health which results in physical, emotional, and social well-being and not merely in the absence of disease or infirmity." Operating under that principle and endeavoring to teach people to behave as they do not behave, the Navy is trying to do its share in the building of that ultimate state of worldwide positive health so that man throughout his life may enjoy good health.