Editorial

HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP) SYSTEM : A PUBLIC HEALTH NEED FOR THE ARMED FORCES

Brig VW TILAK^{*}, vsm, Lt Col RAJVIR BHALWAR⁺

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Food-borne illnesses are a major cause of mortality and morbidity in all societies. The Indian Armed Forces have always given high priority to the prevention and control of these diseases. The four conventional methods used for this have their own advantages and limitations.

(a) Surveillance of facilities & equipment used : Over the past 150 years, science of public health has taught that facilities like potable water, plumbing and sewage system, and good buildings are essential for prevention of food borne diseases. It is difficult to provide these facilities in semi-permanent or temporary locations. Even in permanent locations they require ongoing and committed maintenance. Finally, while they do help in preventing entry of disease organisms into the food items, they do not guarantee microbial safety, if at all a disease agent enters any food item [1].

(b) Surveillance of food handlers : Regular medical examination of food handlers has been vigorously used in the services. This includes clinical examination and diagnostic procedures like stool examination for parasites and enteropathogenic bacteria. These procedures give immense satisfaction to the doctors but they have limitations. Firstly, people diagnosed as "Free from infection" (FFI) on the day of an examination may be in the incubatory or very mild phase of a disease. Secondly, the infections may be acquired between two successive medical examinations. Finally, many organisms transmitted by food (e.g. *C. perfringens*, *S. aureus* etc) are seldom sought while many of the ones that are sought have hardly

any relevance as far as contamination of food is concerned (e.g. *A. lumbricoides*, *A. duodenale* etc). For these reasons, periodic medical or microbiological examinations have not been found as an important method even by the WHO [2].

(c) Surveillance of food items : These activities involve measurement of certain physical, chemical and microbiological properties of food items. This method is ideal for evaluation of drinking water. However, as far as food items are concerned, there are practical disadvantages of collecting and examining enough samples so as to obtain meaningful information, besides constraints of high cost.

(d) Surveillance of food-borne illnesses : This aspect has the limitation that it is only the severe or laboratory confirmed part of the spectrum of food borne illnesses that is likely to be reported, thus making the information unrepresentative and scanty.

The Hazard Appraisal Critical Control Point (HACCP) System : An alternative

Each of the four approaches being used in the Armed Forces has its own limitations which persist even when they are combined. It is more pertinent to emphasize on actual food-preparation operations rather than on physical facilities or inspections of food handlers. For this, the HACCP system is a recent development which has been recommended by the WHO [2], as well as by specialists in food-hygiene [3]. It offers a systematic approach to the control of microbiological hazards in foods thus bypassing shortcomings inherent in

^{*}Consultant and Head, ⁺Reader, Department of Preventive and Social Medicine, AFMC, Pune - 40.

routine public health inspections.

For developing the HACCP system in the Armed Forces, it is desirable to have a team incorporating the public health specialist, microbiologist and local administrative authority. The steps in planning and organizing the system are as follows:

(a) *Hazard Analysis (HA)* : This includes identification of hazardous operations during food preparation, wherein there is a high probability of contamination, growth or survival of micro organisms or toxins in the food item. For this purpose, a list of the dishes prepared in the eating establishment is made and all the food handlers, and supervisory staff are asked the details of every step involved in the preparation of each dish, starting from procurement of raw food items till actual consumption. This is followed by detailed observation of the process of preparation for each food item, finally developing a "flow-chart" [4].

One of the key issues is the measurement of temperature and holding time of the dishes during the preparation. Temperature should be measured using a long bayonet type thermocouple inserted into the items being heated or reheated as well as those being cooled. This temperature, along with the time taken at each step will give an idea whether a food item could permit microbial survival and multiplication or toxin production. If one suspects that any step could have permitted such survival or growth the food samples should be collected at the appropriate steps and analyzed.

(b) *Identifying the critical control points (CCPs)* : Based on the flow chart, incorporating time-temperature details (and microbiological results) at each step, one can identify the CCPs. These CCPs are marked for each dish.

(c) *Specification of control criteria at a particular CCP* : Criteria are those which clearly define the limits of a physical, chemical or biological characteristic. It is necessary to select appropriate criteria to ensure that the hazard would have been adequately controlled at the particular CCP. The choice of control criteria will depend on their usefulness, cost and feasibility and quality.

(d) *Monitoring the control criteria* : This is the last but a critical step. One has to clearly specify responsibilities as far as monitoring the criteria for control are concerned. The methods for monitoring

the control criteria could be observations, physical facts, or chemical findings and so on. It should be ensured that the person who is going to monitor these criteria is capable of detecting them and taking corrective action.

An example of application of HACCP system in real-life, in respect of a mutton dish, has been presented in another article in this issue (Bhalwar et al, MJAFI 1996; 52 : 100-4).

Relevance of HACCP system to the Indian Armed Forces

In the Indian Armed Forces, where dishes would be just a few in number (say, 40 or 50) irrespective of the geographical location where personnel are deployed, once an HACCP system for each dish has been developed, the same monitoring criteria for control can be applied with slight local modifications. The advantage would be that instead of a routine inspection of cook houses and food handlers, the monitoring of a few, specifically identified criteria can be done daily after minimal training. As far as preventing food borne diseases is concerned, it stands to reason that a daily surveillance, using few specific criteria (as in the HACCP approach) would be more useful as compared to a monthly surveillance using non-specific criteria. The need, however, is not to straight away implement this new concept but to study its feasibility in the Armed Forces at few randomly selected eating establishments. Till now, very few studies have explored the applicability of HACCP system in our service setting [4] and it would be worthwhile exploring this area further because the approach holds its own promises, with very simple intervention procedures.

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