

Introduction to the Teaching Package

Importance of food safety for nutritionists and other public health professionals

a. Introduction

Malnutrition is one of the most serious problems facing the world today. As well as its effects on the individual, it inhibits social and economic development and thus, has an impact on the whole community. Diarrhoea, which has a synergistic relationship with nutritional status, kills millions of children in developing countries. 159 countries participating in the International Conference on Nutrition in Rome reaffirmed the importance of overcoming these problems. This was a call for action, not only to nutritionists, but to public health professionals of all disciplines.

Malnutrition cannot be eliminated merely by increasing or altering food supplies. Its causes are complex and interdependent, and extend to food quality and safety. Today, many governments, recognising the importance of providing safe, nutritious food, have put control systems in place to protect consumers and promote trade. These include laws to ensure food quality and safety.

However, government actions alone cannot prevent foodborne disease. The Joint FAO/WHO Expert Committee on Food Safety has defined food safety as "all conditions necessary during the production, processing, storage, distribution, and preparation of food to ensure that it is safe, sound, wholesome, and fit for human consumption". Since food is processed/handled in the home and in food service establishments, people must be taught about food safety.

Strategies for ensuring food safety have to focus on several areas. These are described in the following sections.

b. Hazards related to food

Biological hazards. Each year, an estimated 1.8 million children die and millions more suffer from malnutrition due to frequent episodes of diarrhoea. This problem has been linked to poor water quality and inadequate sanitation but food is now recognised as a major transmission route; up to 70% of all cases by one estimate (2). In industrialised countries, despite the progress made since the beginning of this century in general sanitation levels, diarrhoeal diseases are increasing and are widespread (3). Most of the gastro-enterites in industrialised countries are caused by *Campylobacter jejuni* and *Salmonella spp.* (4, 5). The traditional pathogens of the faecal-oral route such as *Salmonella typhi*, *Shigella spp.* and *Vibrio cholerae* are usually traced to travellers from developing countries.

The link between contaminated food and diarrhoeal diseases is well established for industrialised countries (3). Studies in developing countries show a similar situation (6, 7, 8); for instance complementary foods are often contaminated with pathogenic strains of *E. coli* (9, 10), a major cause of infant diarrhoea.

In the industrialised world, changes in patterns of foodborne disease are linked to changes in what people eat and how they prepare it (11). For example, drinking raw milk for "health" reasons has caused campylobacteriosis and salmonellosis, and anisakiasis in North America has been linked to increased sushi consumption. Changing food habits in non-industrialised countries may lead to similar problems.

Prevention of foodborne diseases is important because they have debilitating effects and thus an impact on short- and long-term nutritional status (12).

Chemical hazards. To be nutritious and safe, food must be free not only of microbiological hazards but also from synthetic and natural chemical contaminants. Many countries have introduced legislation related to the problem of food adulteration and the use of pesticides, hormones, antibiotics and other man-made chemicals. Food additives such as sweeteners, colorants, antioxidants and other chemicals used to improve quality, safety or shelf-life have been regulated nationally and internationally, especially by the Codex Alimentarius. Concern for the environment has prompted legislation concerning heavy metals and radioisotopes. Developing countries also have problems linked with local customs, such as the use of glaze containing lead oxide in artisanal pottery.

Food adulteration is still a problem in some developing countries. In Indonesia, some beverages sold by street vendors contain textile dyes or prohibited colours (13).

Many foods contain natural toxins or anti-nutritional factors. For example, cassava (*Manihot esculenta*, Kranz) contains cyanogenic glucosides that must be removed from the tuber before consumption (14).

Nutritional inadequacies. Foods can pose a health hazard when an essential nutrient, such as iron, iodine and vitamin A, is missing or is not present in amounts sufficient to meet dietary intake requirements. Similarly, food processing may decrease vitamins and other nutrients in raw commodities, so the food must be enriched. Many countries require the use of fortified foods, such as salt and flour.

Food allergies and intolerances. Some people are sensitive to food ingredients that present no risk to the general population. Hypersensitivity to sulphite is well documented and even a small amount can trigger a life-threatening reaction. Some people are sensitive to natural products such as peanuts, or components in foods such as gluten in wheat.

c. The use of knowledge about food safety

Knowledge of foodborne diseases is used to develop prevention strategies. Intervention can take place at all levels of food processing, from cultivation and rearing, through harvesting or slaughter, processing, distribution and storage, and final preparation in institutions, restaurants and the home.

Public health professionals with a thorough understanding of foodborne disease can play a major role in preventing foodborne diseases. They should learn about problems related to local food habits, social conditions and religious practices. For

example, in some developing countries, street food, which is associated with numerous chemical and microbiological hazards, is a significant portion of the household diet (15).

They must also know how to determine where contamination can occur, or microorganisms survive and grow, and how to prevent this from happening. The Hazard Analysis Critical Control Point (HACCP) approach, as explained in this course, is the means to enhance microbiological safety applied in combination with Good Hygienic Practice (16).

This course has been developed to address these requirements. We hope that you will find it useful.

References

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Course design

Modular design

The eleven modules of this course begin by discussing the nature of microorganisms and other hazards, move on to factors affecting microbial behaviour and survival, and then to the identification and control of hazards in food and food processing and preparation.

The modular design allows the course to be adapted to local needs. It was first prepared for nutritionists in South East Asia attending the M.Sc. course on Community Nutrition at the University of Jakarta, Indonesia, but it can be adapted to other regions and courses for other professionals (food and public health inspectors, nurses, home economists etc.)

Practical orientation

This course emphasises knowledge and skills that can be used to recognise unsafe food and preparation practices, and shows how to apply this knowledge to develop intervention strategies.

Interactive approach

Since an interactive approach is essential to encourage and involve the students and help them acquire skills, the students should work in groups for the field and classroom exercises.

Evaluation

Course evaluations by the students and the teachers will be used as a basis for improvements.

Specific objectives

At the end of the course, participants will:

- Understand what safe foods are and how food safety can be achieved.
- Recognise unsafe foods and preparation practices.
- Understand the effect of infection and intoxication on nutrition.
- Be able to intervene in preventing foodborne diseases.
- Be able to teach the basic principles to others.