

ESTIMATION OF TRACE METALS IN CANNED
FOODS AND NATURAL WATERS

DISSERTATION ON THE RESEARCH PROJECT
SUBMITTED AS A PARTIAL FULFILMENT
FOR THE
MASTER'S DEGREE IN SCIENCE
(ANALYTICAL CHEMISTRY)

BY

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UNDER

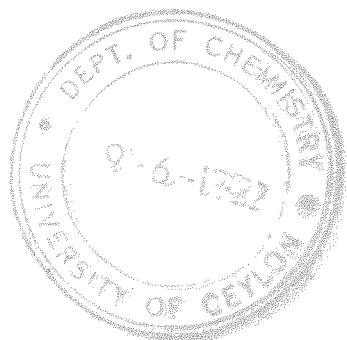
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I N T R O D U C T I O N

1.1. General:

In U.K. the need for a national programme of food surveillance was realized after the discovery of methyl - mercury compounds in a range of species of fish. Because methyl mercury compounds had been shown to be the causative agent in the aetiology of Minamata disease (1). Therefore it was necessary to obtain data as quickly as possible to assess the possible health significance to fish consumers. Since this time, support for a nationally co-ordinated programme of food monitoring and surveillance has continued to grow as more and more use has been made of the data that have been generated.

Sri Lanka, a third world country still does not have such programmes of food monitoring and surveillance.

From a comparison of the incidence of chronic disease amongst populations and of the changes observed in the patterns of disease which occur when these populations resettles in other parts of the world, there is a good epidemiological evidence that the diet is one of the most important factors which predispose individuals to chronic disease particularly in the incidence of cancer. Whether the factors responsible for these effects are major or minor components of the diet is not known. If scientific progress is to be made to determine what in the diet are the com-

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positional factors which may be the cause of disease, basic information on the chemical composition of food will be necessary to test any hypothesis. One of the most important objectives of a food surveillance programme is to attempt to obtain such data, and to observe whether or not there are significant trends in the intakes of individual components of the diet amongst selected populations. These data may be used to risk assessment, which in turn are the basis for deciding whether or not there should be controls on the amounts of the toxin present in food, and to decide on the most appropriate methods of control.

The enormous advances in the analysis of trace substances in food which have occurred within the last decade have been in the application of improved gas chromatography, mass spectrometry, high performance liquid chromatography atomic absorption and differential pulse polarography techniques which have enabled individual compounds to be measured at the parts per 10^6 - 10^9 level. Much of the impetus for the development of these techniques came from the need to determine the presence or absence of chemicals which have been approved for the production or the manufacture of foods.

The analytical techniques required for regulatory purposes have been developed up to a sensitivity where very low levels of toxic substances can be detected in food substances which are an inherent component or are foreign contaminants of that food.