

CONSULTATIONS AND WORKSHOPS

Fermentation: Assessment and research

**Report of a Joint FAO/WHO Workshop on
fermentation as a household technology
to improve food safety**

**in collaboration with the
Department of Health, Republic of South Africa**

Pretoria, South Africa, 11–15 December 1995



**FOOD SAFETY UNIT
DIVISION OF FOOD AND NUTRITION
WORLD HEALTH ORGANIZATION**

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the 1990s, the number of people in the UK who are employed in the public sector has increased by 1.5 million, from 2.5 million in 1980 to 4 million in 1995. The public sector has become a major employer in the UK, and its growth has been a major factor in the overall growth of the economy.

The public sector has also become a major employer of women. In 1980, women made up 40% of the public sector workforce, and by 1995, this figure had risen to 50%. This increase in the number of women in the public sector has been a major factor in the overall increase in the number of women in the workforce. The public sector has also become a major employer of young people. In 1980, young people made up 10% of the public sector workforce, and by 1995, this figure had risen to 20%.

The public sector has also become a major employer of people with disabilities. In 1980, people with disabilities made up 1% of the public sector workforce, and by 1995, this figure had risen to 5%. This increase in the number of people with disabilities in the public sector has been a major factor in the overall increase in the number of people with disabilities in the workforce.

The public sector has also become a major employer of people from ethnic minorities. In 1980, people from ethnic minorities made up 1% of the public sector workforce, and by 1995, this figure had risen to 5%. This increase in the number of people from ethnic minorities in the public sector has been a major factor in the overall increase in the number of people from ethnic minorities in the workforce.

The public sector has also become a major employer of people who are over 50 years of age. In 1980, people over 50 years of age made up 10% of the public sector workforce, and by 1995, this figure had risen to 20%. This increase in the number of people over 50 years of age in the public sector has been a major factor in the overall increase in the number of people over 50 years of age in the workforce.

The public sector has also become a major employer of people who are under 25 years of age. In 1980, people under 25 years of age made up 10% of the public sector workforce, and by 1995, this figure had risen to 20%. This increase in the number of people under 25 years of age in the public sector has been a major factor in the overall increase in the number of people under 25 years of age in the workforce.

The public sector has also become a major employer of people who are over 65 years of age. In 1980, people over 65 years of age made up 10% of the public sector workforce, and by 1995, this figure had risen to 20%. This increase in the number of people over 65 years of age in the public sector has been a major factor in the overall increase in the number of people over 65 years of age in the workforce.

The public sector has also become a major employer of people who are under 18 years of age. In 1980, people under 18 years of age made up 10% of the public sector workforce, and by 1995, this figure had risen to 20%. This increase in the number of people under 18 years of age in the public sector has been a major factor in the overall increase in the number of people under 18 years of age in the workforce.

The public sector has also become a major employer of people who are over 75 years of age. In 1980, people over 75 years of age made up 10% of the public sector workforce, and by 1995, this figure had risen to 20%. This increase in the number of people over 75 years of age in the public sector has been a major factor in the overall increase in the number of people over 75 years of age in the workforce.

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1. INTRODUCTION

Fermentation is one of the oldest technologies used for food preservation. Over the centuries, it has evolved and has been refined and diversified. Today a large variety of foods are derived from this technology which is used in households, small-scale food industries and large commercial enterprises. Foods so produced form a major part of the human diet all over the world, and in some regions, mainly in African countries, the technology is also used to prepare foods for infants and young children.

In the past, traditional fermentation technologies were based on experiences accumulated by consecutive generations of food producers, as a result of trial and error. Only recently has science and technology started to contribute to a better understanding of the underlying principles of fermentation processes and of the requirements for quality and safety. However, in many instances, food fermentation practices, especially at the household level, do not benefit yet from advances in science and technology. Since the days of Louis Pasteur who pointed out the importance of hygiene in relation to fermentation, it is known that this technology is readily influenced by various factors during processing, and that if it is not applied correctly the safety and/or quality of the final product may be jeopardized. Because of the ineffective foodborne disease surveillance programmes in most countries, in particular developing countries, many cases of foodborne diseases do not come to the notice of public health authorities. Nevertheless, it has been possible to trace some foodborne disease outbreaks to fermented foods and to the inappropriate application of this technology.

On the other hand, fermentation is of economic importance as a method of food preservation in areas where preservation techniques such as cold storage (refrigeration) or hot-holding cannot be used due to lack of facilities and resources. For such situations, fermentation has been considered as an affordable technology for the safe preservation of foods, in particular weaning foods. In developing countries, as a result of poor hygienic handling and inadequate preservation, weaning foods are often contaminated and are a major cause of diarrhoea and associated malnutrition.

With these considerations in mind, the Food and Agriculture Organization of the United Nations and the World Health Organization organized a Workshop to assess fermentation as a household technology for improving food safety. The Workshop was held in Pretoria from 11-15 December 1995 in collaboration with the Department of Health of the Republic of South Africa (RSA). The aims of the Workshop were: (i) to assess the risk and benefits associated with current household fermentation practices, with specific emphasis on the food safety aspects; (ii) to outline improvements which can be achieved by process development and education of food handlers; and (iii) to identify gaps in the existing knowledge and priorities for research.

The Workshop was opened by Dr Jocelyn Webster from the Division of Food Technology of the Council for Scientific and Industrial Research (CSIR), Republic of South Africa, who welcomed the participants to Pretoria. Dr Webster emphasized the need for collaboration between international organizations and South African research organizations, universities and government departments to ensure information, research and technology transfer which address key health, nutritional and food security issues in South Africa. Dr Theo van de Venter, Director of Food and Chemicals, Department of Health, RSA then gave a brief overview of the country's Programme for Reconstruction and Development which places specific emphasis on the underdeveloped and underprivileged communities. The objective of the Workshop, therefore, met one of the current concerns in the RSA, that is, to meet the basic needs of the population.

Dr D.L. Tembo, the WHO Liaison Officer *ad interim* in the RSA, welcomed the participants to the Workshop on behalf of the Directors-General of the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO). Dr Tembo stated that FAO and WHO were particularly pleased to organize the Workshop in Africa. He pointed out that the International Conference on Nutrition (Rome, December 1992) had expressly recommended that high priority be given to problems encountered in the African continent, and it had recommended that action should be taken to promote sound weaning practices by encouraging the use of nutritionally adequate, safe and appropriately processed, locally-available foods. He added that fermentation is a common practice in the preparation of weaning foods in many African countries, and said that the problem of diarrhoeal diseases in infants and young children is also a dominant problem and one of massive proportions.

Dr Tembo thanked the participants and representatives of international organizations for having accepted the invitation of FAO and WHO to participate in the Workshop and gratefully acknowledged the contribution of the International Foundation for Science which supported several participants. Special recognition was also given to the Department of Health of the RSA and the CSIR for hosting the Workshop.

Dr Olusola Oyewole was elected Chairman of the Workshop, Dr Fernando Quevedo as Vice-Chairman and Dr Robert Nout as Rapporteur. The deliberations of the Workshop were based on a number of background papers (listed in Annex 1) and the work carried out by

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