16. IOFI GUIDELINES FOR ENZYMATIC AND MICROBIOLOGICAL PROCESSES FOR THE PRODUCTION OF FLAVOURINGS

16.1 Introduction

The purpose of these Guidelines is to assure the food industry and the ultimate consumer of food of the quality, safety and compliance with legislation of flavourings produced by enzymatic and microbiological processes. National regulations, if in existence, will always take precedence over these Guidelines. This includes the existence of specific definitions, rulings and officially condoned practices.

16.2 Scope

These Guidelines deal with enzymatic and microbiological processes used for the production of flavourings. These Guidelines do not apply to single chemically defined substances produced by these methods, provided that they comply with existing purity requirements (e.g. as reported in JECFA specifications) and are devoid of detectable residual enzymatic or microbiological activity.

16.3 Definition

Flavourings produced by enzymatic and microbiological processes are concentrated preparations, with or without non-flavouring food ingredients, used to impart flavour. They are produced by submitting a substrate or substrates to the action of enzymes or micro-organisms.

16.4 Basic Standards of Good Manufacturing Practice

16.4.1 **T**he requirements laid down in Chapter 7 of the IOFI Code of Practice are also applicable to flavourings produced by enzymatic or microbiological processes.

16.4.2 Flavourings produced by enzymatic and microbiological processes shall be prepared in accordance with the Codex Alimentarius General Principles of Food Hygiene (CAC/RCP 1)1969, Rev.4-2003)

16.5 Production of Flavourings by Enzymatic or Microbiological Processes- See also 13.4

Flavourings produced by enzymatic or microbiological processes shall be prepared from or in the presence of one or more of the following and in accordance with the conditions cited hereafter:

16.5.1 Substrates

16.5.1.1 Source materials normally considered as foods.

16.5.1.2 Source materials not normally considered as foods

16.5.1.3 Isolated constituents of foods.

16.5.1.4 Isolated constituents of source materials not normally considered as foods

16.5.1.5 **Note:** Materials added to the substrate necessary for the growth and function of the organism(s) such as co-factors, minerals, nutrients, vitamins, hormones, pH adjusting agents and electromagnetic radiation are not restricted in origin, but they may not exceed the levels required for the purpose of maintaining the growth and function of the organism(s) or parts thereof.

16.5.2 Enzymes

16.5.2.1 Enzymes obtained from source materials which are normally considered as foods, traditionally accepted constituents of food, or normally used in the preparation of food.

16.5.2.2 Other enzymes

16.5.3 Micro-organisms

16.5.3.1 Micro-organisms that traditionally accepted constituents of food or that are traditionally used in the preparation of food.

16.5.3.2 Other micro-organisms

16.5.4 Non-flavouring food ingredients

16.5.4.1 Substances listed as non-flavouring food ingredients in Annex I of the IOFI Code of Practice.

16.5.5 Production Conditions

16.5.5.1 Enzymes (16.5.2) and micro-organisms (16.5.3) shall be used either as such or immobilised on a carrier. The carrier shall not release harmful substances.

16.5.5.2 Enzymes (16.5.2) and micro-organisms (16.5.3) shall be used as part of a fermentation medium, or in a more purified form.

16.5.5.3 The substrates (16.5.1) (see also 14.4) may be processed in the presence of enzymes (16.5.2) or micro-organisms (16.5.3). Non-flavouring food ingredients (16.5.4) may be present provided that they are added subsequent to enzymatic or microbiological processing, or provided that they are not modified in any way by such processing in accordance with the relevant requirements.

16.5.5.4 Enzymes (16.5.2) shall be separated from the flavouring, or inactivated, once the process is terminated.

16.5.5.5 Micro-organisms (16.5.2) shall be separated from the flavouring, or inactivated or destroyed once the process is terminated.

16.5.5.6 Micro-organisms shall not be used under conditions where they lead to products containing toxins or antibiotics.

16.5.5.7 Other materials: Materials such as co-factors, minerals, nutrients, feed stock, vitamins, hormones may be added only if they are necessary for the growth and function of the organism(s) or parts thereof, but their use may not exceed the levels required to maintain growth and function.

16.6 General Requirements

The safety in use of flavourings produced with the following materials and processes should be adequately established:

Materials or processes described above and specifically for the following:

- Substrates described under 16.5.1.2. and 16.5.1.4 and/or
- Enzymes described under 16.5.2.2 and/or
- Micro-organisms described under 16.5.3.2 and/or which may contain incompletely inactivated enzymes (see 16.5.5.4) and/or micro-organisms (see 16.5.5.5)

16.7 Labeling

In the absence of specific national regulations, the labeling of flavourings produced by enzymatic or microbiological processes can be considered as natural, provided the substrates from which they are derived are also natural (See 13.4.2).