# PERMANENT INTERNATIONAL BUREAU OF ANALYTICAL CHEMISTRY OF HUMAN AND ANIMAL FOODS

The PERMANENT INTERNATIONAL BUREAU OF ANALYTICAL CHEMISTRY OF HUMAN AND ANIMAL FOODS (18, Avenue de Villars, Paris VII) desires information in regard to the official methods employed in each country for the analysis of food products and their components.

The International Bureau desires to be kept informed of the principal difficulties encountered in the application of the methods and the interpretation of the results as well as of the studies in course which are directed towards improvement of the methods.

In order to facilitate the comparison of the information obtained it is requested that the replies be submitted in accordance with the following outline which is based upon a chemical classification rather than on the components of the products.

## I. METHOD OF TAKING STANDARD SAMPLES

Preparation of average samples, their preservation and mode of employment for analysis.

## II. FUNDAMENTAL METHODS OF ANALYSIS. CALCULATION OF ERRORS AND APPROXIMATION

Fundamental macro- and micro-methods to be listed successively with their fields of applications, their degree of accuracy and comparative value, application of statistical methods in the evaluation of the results.

*Physical macro- and micro-methods* (optic, polarographic, electrometric, spectrographic electrophotometric-colorimetry, opacimetry, etc., manometric, densimetric, etc.).

*Physico-chemical macro- and micro-methods* (chromatographic).

*Chemical macro- and micro-methods.*

*Biological macro- and micro-methods.*

*Physiological, etc.*

## III. SPECIAL METHODS IN PARTICULAR CASES

Application of the above methods to the study and determination of inorganic, organic constituents and organized components of food stuffs.

The methods used in each case to be prescribed as well as the variations to which the fundamental methods are subject in each case. In addition the methods which permit the revelation of frauds and adulterations in particular cases are indicated (for example: detection of added water in milk or wine and the presence of added sugar in wine, etc.).

### A. Inorganic constituents

Study of the elements and components entering into the composition of foods.

### Mineral constituents

1. Determination of water and dry solids.
2. Determination of ash, mineral elements, trace elements, normal, accidental or added, useful or harmful (iron, copper, bromide, boron, etc.).

### B. Organic constituents

1. *Nitrogenous compounds*

Their different forms (ammonia, total nitrogen, protein nitrogen, amino nitrogen and nitrogen of amino, purines, alkaloids, their determination and mode of expression.)

2. *Alcohols, aldehydes and ketones*

Determination of ethyl, methyl, higher, etc. alcohols.
Determination of polyols: glycerol (consideration special for fats and glycerol of fermentation).

Sorbit (especially in fruit juices).
Separation and determination of aldehydes and ketones.
Give particular attention to brandy, liqueurs and fruit juice.

3. *Glucides (carbohydrates) and glucide compounds*

Determination of glucose, fructose, saccharose, lactose, maltose, dextrine and undetermined reducing substances.
Determination of pectic substances — determination of gelifying power.
Determination of uronic acid.
Determination of cellulose (in flours, per example).

4. *Organic acids*

Identification and determination of organic acids (malic, tartaric, citric, succinic, etc.) in fruit juices and fermented products.

5. *Lipids (fats)*

Identification and determination of the principal acids in fats.
Determination of the principal indexes (iodine, sulfocyanide, acetyl, brom, etc.).
Unsaponifiable constituents of fats (carbures, sterols, etc.).
Glycerol (see B, 2 : alcohols).

6. *Amino-acids, peptides and proteins*

Identification, separation and determination of the essential amino acids.
Separation and determination of proteins.

7. *Vitamins*

Methods of determination of different vitamins — Comparative value of the methods.

8. *Ferments*

Analysis of ferment preparations. Fermentation tests and their relation to the quality and preservation of foods.

9. *Hormones of foods*

10. *Biotics and antibiotics*

11. *Toxins*

12. *Essences, natural and synthetic*

C. Organic products

Yeasts, bacteria, molds.

1. *Yeasts contained in food stuffs or utilized in their preparation*

2. *Useful bacteria*

3. *Harmful bacteria*
Contamination and bacterial alteration of food stuffs.

4. *Molds*

IV. SPECIAL TECHNOLOGY

1. *Condiments, sweeting agents, aromatics and analogous substances*

2. *Artificial and natural coloring matters*

3. *Agglutinents and emulsifying agents*

4. *Antiseptics, preservative agents, insecticides*

5. *Diverse.*

Received January 20th, 1948