ANALYSIS OF FOOD PRODUCTS

Food analysis is the discipline dealing with the development, application and study of analytical procedures for characterizing the properties of foods and their constituents. **Moreover**, These analytical procedures are used to provide information about a wide variety of different characteristics of foods, including their composition, structure, physicochemical properties and sensory attributes. This information is critical to our rational understanding of the factors that determine the properties of foods, **as well as** to our ability to economically produce foods that are consistently safe, nutritious **and** desirable and for consumers to make informed choices about their diet.

1.1. Reasons for Analyzing Foods

Foods are analyzed by scientists working in all of the major sectors of the food industry including food manufacturers, ingredient suppliers, analytical service laboratories, government laboratories, and University research laboratories.

1.1.1. Government Regulations and Recommendations

Government regulations and recommendations are designed to maintain the general quality of the food supply, to ensure the food industry provides consumers with foods that are wholesome and safe, to inform consumers about the nutritional composition of foods **so that** they can make knowledgeable choices about their diet, to enable fair competition amongst food companies, and to eliminate economic fraud. There are a number of Government Departments Responsible for regulating the composition and quality of foods and they are responsible for regulating particular sectors of the food industry and forpublishing documents that contain detailed information about the regulations and recommendations pertaining to the foods produced within those sectors. These documents can be purchased from the government or obtained on-line from the appropriate website.

Standards

Government agencies have specified a number of voluntary and mandatory standards concerning the composition, quality, inspection, and labeling of specific food products.

Mandatory Standards:

- **Standards of Identity**. These regulations specify the type and amounts of ingredients that certain foods must contain if they are to be called by a particular name on the food label. For some foods there is a maximum or minimum concentration of a certain component that they must contain, e.g., peanut butter must be less than 55% fat, ice-cream must be greater than 10% milk fat, cheddar cheese must be greater than 50% milk fat and less than 39% moisture.

- **Standards of Quality**. Standards of quality have been defined for certain foods (e.g., canned fruits and vegetables) to set minimum requirements on the color, tenderness, mass and freedom from defects.
- **Standards of Fill-of-Container**. These standards state how full a container must be to avoid consumer deception, as well as specifying how the degree of fill is measured.

Voluntary Standards:

- **Standards of Grade.** A number of foods, including meat, dairy products and eggs, are graded according to their quality, e.g. from standard to excellent. For example meats can be graded as prime, choice, select, standard etc according to their origin, tenderness, juiciness, flavor and appearance. This service is requested and paid for by the food producer.

Nutritional Labeling

In 1990, the US government passed the Nutritional Labeling and Education Act (NLEA), which revised the regulations pertaining to the nutritional labeling of foods, and made it mandatory for almost all food products to have standardized nutritional labels. One of the major reasons for introducing these regulations was so that consumers could make informed choices about their diet. Nutritional labels state the total calorific value of the food, as well as total fat, saturated fat, cholesterol, sodium, carbohydrate, dietary fiber, sugars, protein, vitamins, calcium and iron. The label may also contain information about nutrient content claims (such as low fat, low sodium high fiber fat free etc), **although** government regulations stipulate the minimum or maximum amounts of specific food components that a food must contain if it is to be given one of these nutrient content descriptors..

1.1.2. Food Safety

One of the most important reasons for analyzing foods from both the consumers and the manufacturers standpoint is to ensure that they are safe. It would be economically disastrous, as well as being rather unpleasant to consumers, if a food manufacturer sold a product that was harmful or toxic. A food may be considered to be unsafe because it contains harmful microorganisms (e.g., Listeria, Salmonella), toxic chemicals (e.g., pesticides, herbicides) **or** extraneous matter (e.g., glass, wood, metal, insect matter). It is **therefore** important that food manufacturers do everything they can to ensure that these harmful substances are not present, or that they are effectively eliminated before the food is consumed.

1.1.3. Quality control

The food industry is highly competitive and food manufacturers are continually trying to increase their market-share and profits. To do this they must ensure that their products are of higher quality, less expensive, and more desirable than their competitors, **whilst** ensuring that they are safe and nutritious. To meet these rigorous standards food manufacturers need analytical

techniques to analyze food materials before, during and after the manufacturing process to ensure that the final product meets the desired standards.

For this reason, there is an increasing tendency in the food industry to use analytical techniques which are capable of rapidly measuring the properties of foods on-line, without having to remove a sample from the process. These techniques allow problems to be determined much more quickly and therefore lead to improved product quality and less waste.

1.1.4. Research and Development

In recent years, there have been significant changes in the preferences of consumers for foods that are healthier, higher quality, lower cost and more exotic. **Consequently**, individual food manufacturers must respond rapidly to these changes in order to remain competitive within the food industry. To meet these demands food manufacturers often employ a number of scientists whose primary objective is to carry out research that will lead to the development of new products, the improvement of existing products and the reduction of manufacturing costs.

Many scientists working in universities, government research laboratories and large food companies carry out basic research. Experiments are designed to provide information that leads to a better understanding of the role that different ingredients and processing operations play in determining the overall properties of foods. Research is mainly directed towards investigating the structure and interaction of food ingredients, and how they are effected by changes in environment, such as temperature, pressure and mechanical agitation.

Sensory Attributes

Ultimately, the quality and desirability of a food product is determined by its interaction with the sensory organs of human beings, e.g., vision, taste, smell, feel and hearing. **For this reason** the sensory properties of new or improved foods are usually tested by human beings to ensure that they have acceptable and desirable properties before they are launched onto the market. Even so, individuals' perceptions of sensory attributes are often fairly subjective, being influenced by such factors as current trends, nutritional education, climate, age, health, and social, cultural and religious patterns. To minimize the effects of such factors a number of procedures have been developed to obtain statistically relevant information. **For example**, foods are often tested on statistically large groups of untrained consumers to determine their reaction to a new or improved product before full-scale marketing or further development. **Alternatively**, selected individuals may be trained so that they can reliably detect small differences in specific qualities of particular food products, e.g., the mint flavor of a chewing gum.

Although sensory analysis is often the ultimate test for the acceptance or rejection of a particular food product, there are a number of disadvantages: it is time consuming and expensive to carry out, tests are not objective, it cannot be used on materials that contain poisons or toxins, and it cannot be used to provide information about the safety, composition or nutritional value of a food. For these reasons objective analytical tests, which can be performed in a laboratory using

standardized equipment and procedures, are often preferred for testing food product properties that are related to specific sensory attributes.

ACTIVITIES

1) **COMPLETE THE SENTENCES WITH IDEAS FROM THE TEXT**

   Food manufacturers- Development- information - study application-suppliers – labs- labels - mandatory - microorganisms -quality -extraneous matter – research – toxic chemicals- quality control -information of nutritional value

2) Food analysis is the discipline that studies the ……,…… and……..of analytical procedures to provide information about the food we eat.
3) Food can be analyzed by……, …… And ……
4) One of the mandatory standards is to include……about ingredients in the food ……
5) One voluntary standard of analysis is measuring the products according to their …… such as prime, choice, select, standard, etc
6) In USA it is ……to have standardized nutritional labels in all products.
7) A food product is considered harmful or toxic if they include……., ……or……
8) ……is important to ensure that the product meets the desired standards.
9) ……is essential to develop new products to provide information to understand better the product to improve it and reduce manufacturing costs.
10) Objective analytical tests are preferred to sensory attributes because they cannot provide……

2) Match the words with their translation

RESEARCH	**ETIQUETA**
PROCEDURE	**LEY**
MANUFACTURERS	**PROCEDIMIENTO**
REGULATIONS	**CONTENIDO GRASO**
MANDATORY	**DAÑINO-PERJUDICIAL**
FAT	**INVESTIGACIÓN**
LABEL	**OBLIGATORIO**
ACT	**FABRICANTES**
HARMFUL	**MEDIDAS**
STANDARDS	**NORMAS**
WASTE	**HUMEDAD**
MOISTURE	**DESPERDICIO**
TENDERNESS	**TERNURA**