

Could traditional foods and diets meet modern processing technology?

Editorial

Traditional foods are widely consumed by large numbers of populations, and have been/are being under investigation to explore the possibilities of producing them by modern processing procedures. In most of cases, such products are produced by extensive trials and without predictive models for describing the changes of various components as well as process parameters and properties of materials and products. So, there is still a need for research on such products in order to further investigate their production process, to analyze their production stages, to determine their characteristics, in order to become possible the development of novel/innovative products using flexible equipment, to maintain or improve their sensory and nutritional characteristics and to improve their safety and stability. Consequently, of great importance is the study and development of products, which on one hand contribute to a better diet and on the other hand leads to increased demand for certain agricultural products and accordingly to long-term profit of producers and food processors. On this aspect let's take into consideration two examples based on cereals.

Cereals, pseudocereals, legumes vegetables and fruits, in general, play an important role in human nutrition and also contain constituents that have health benefits for humans, such as antioxidants and anti-disease factors. In addition, they constitute the foods with high content in carbohydrates, proteins, lipids and dietary fibre, while some of them have higher content of amino acids (e.g., pseudocereals) and constituents such as resistant starch which allow withdrawal of oral hypoglycemic agents. Furthermore, cereal products, along with fruits, vegetables and legumes constitute a great part of the Mediterranean diet.

Many attempts have been made and are being made to convince especially young consumers to establish Mediterranean diet. Lifestyle has driven consumers away from traditional meals and young people exclude many legumes and vegetables from their diet. Among others, extrusion technology could contribute to this direction through the production of extruded snack foods based on cereals and vegetables, fruits or legumes, which are highly acceptable, and meet consumer's demands and imaginations. In addition, it should be noted that the global snack food market is ever-changing, while extruded snacks have the greatest potential for growth.

Fermented foods occupy a significant part of human diet worldwide. It is known that many of the fermentations are rarely completely understood; however, fermented foods upon consumption by humans, often introduce microflora that offers a number of benefits. Many fermented foods are produced using traditional processes with transfer of knowledge and methodologies from generation to generation. Research and developments have led to optimization and up scaling of several fermentation processes; for some of them starter cultures were developed, leading to improved and reproducible product quality.

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Evangelos S Lazos

Department of Food Technology, Technological Educational Institute of Athens, Greece

Correspondence: Evangelos S Lazos, Department of Food Technology, Technological Educational Institute of Athens, Agiou Spyridonos St, Egaleo 12210, Athens, Greece, Tel +30 210 5385537, +30 210 5385551, Fax +30 210 5907897, Email elazos@teiath.gr

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Cereal-based fermented foods are in many cases produced by very complex microbial populations, in which bacteria, yeasts and moulds co-exist and interact in the same substrate. Cereal/vegetable/milk fermented products fulfill consumers' demands for high nutritional quality and easy to use food products. The microbial ecology of these foods has been studied and a number of microbial species have been identified. However, a difficulty exists into transferring findings in practice. Apart from being labour intensive, the production of such products lead to the loss of nutritional and organoleptic characteristics due to very long time and uncontrolled conditions during preparation. Therefore, control of production parameters and the development of modern technology with the standardization of products and/or the production of novel products will lead to an improved quality and a cost reduction. Such a success will definitely lead to product industrialisation.

In almost cases, cereal-based fermented foods are sun-dried. Hence, these products suffer from the disadvantages of sun-dried foods, though an interesting part of these products preparation is the continuation of the fermentation (secondary fermentation) until the water activity attained does not permit further microorganism growth. Research on technical drying has to solve the problem of volatile loss, which affect and determine the characteristics and acceptance of these products. Further, research on other techniques, for example extrusion process, could help in producing final products with an improvement in nutritive value, color, flavor and bioactive substances via incorporation, during fermentation, of fruits, vegetables and legumes, with concurrent reduction in production cost due to the use of flexible equipment. In this way, higher "added value" will be given in various agricultural products, such as cereals, pseudocereals, legumes, vegetables and fruits.

To sum up, food processing through research could provide:

- i. Models for properties and process description.
- ii. Answers on structure formation and the ability of a priori design of food products with unique textures/structures and formulations.
- iii. Novel/innovative fermented products produced through the study of artificial drying and utilization of versatile process such as extrusion.
- iv. New knowledge on flavouring and bio actives in cereal based fermented foods and correlation with process/process parameters and sensory attributes.
- v. New technology development for the commercial production of traditional fermented food products.
- vi. Highly acceptable and/or novel products being part of the Mediterranean diet.

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Conflict of interest

Author declares that there is no conflict of interest.