



Evaluation of New Food Processing Technologies from Consumer Perspective

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Abstract

New processed food types, such as beverages, fast foods, canned foods, cheeses, infused oils, frying oils etc., and processing technologies of foods are present in very wide range. All of these new food types or processing technologies are developed to increase profit which is the basic aim of producing firm. These new technologies should have at least one different beneficial property for producer and/or consumer. Nutritional and toxicological characteristics of new process technology are one of the most important features that concern the consumers. This editorial was focused on possible positive and negative characteristics of new food technologies from consumer perspective.

Introduction

All businesses or factories are established to make a profit. Moreover, researchers or personnel of this factories work to reduce the production cost and/or increase the profit. Of course, all of the food producers have same aim for maximizing their profits. According to this aim they work on new food processing technologies. Few of the most commonly used methods among them are reduction of quantity or price of input and production of high value-added products. Some of them show valuable effort for sustainability, environmental protection, healthy nutrition, easier life and easy accessibility. In this editorial, positive and negative sides of new food processing technologies are discussed from nutritional perspective.

Cost reduction works

Cost reduction works contains low input use such as raw material, energy, water, worker or time and use of cheaper raw materials instead of expensive raw materials. Low raw material, water or energy uses are important for sustainable world but not directly in relation with nutrition. Cheaper raw material usage is one of the most important cost reduction methods, especially for factories producing in large quantities. According to food regulation and standards, criteria of raw food materials were determined. Factories

must obey these standards and regulations during purchase of raw material. Raw materials that do not comply with standards or regulations, even if they are cheap, must be rejected. Therefore, use of cheaper raw materials does not pose a threat to consumer health.

Uses of genetically modified organism or conventional agriculture of crop production or animal husbandry can reduce the cost of raw material in food industry. Certainly, these new technologies at primary production of raw food materials have been discussed on their health effect on consumers. It is a matter of controversy as to the consumption of food produced using such raw materials may cause health problems to consumer in future.

Input of comparatively cheaper food additives such as colorings or flavorings instead of expensive raw food material or raw material reduction in formulation can be an alternative for cost reduction. These additives cause question marks in the minds of consumers. These additives must be used under specified limits in regulations. Food inspection activities of government have vital importance for consumer safety in this regard. Also, consumers' preferences should be more unpretentious, for example preferring food that does not contain colorants. In this way, producers will be encouraged to produce more natural products.

The price of energy is an important expense and comes after raw material cost in food industries. High energy consuming processes are used for thermal processing steps such as pasteurization or sterilization, drying, evaporation, and cooking. According to process types, other energy consuming steps are heating for fermentation, sorting, size reduction, mixing, filling, packaging etc. which have lower energy consumption than thermal processing steps. Reductions in energy consumption in thermal processing steps mostly comply with short time but efficient application by using new process technologies. High temperature and low time applications for pasteurization or commercial sterilization are widely used in food industries. Also, some new and thermal processes such as microwave pasteurization and non-thermal processes such as pulsed electric fields, ionizing radiation and high-pressure processing were researched to find applications in food industries. All of these technologies had advantages for both energy efficiency of process and prevention nutrient losses of foods because of lower application of heat. Therefore, these mentioned new technologies have advantages in nutrient point of view.

Novel non-thermal technologies such as pulsed electric fields, pulsed light treatment, high pressure processing and ionizing radiation among others have the ability to inactivate microorganisms at near-ambient temperatures avoiding thermal degradation of the food components and consequently preserving the sensory and nutritional quality of the food products.

Food preservative additives are also used alone or in combination with thermal processes. Uses of these preservatives have advantages for reducing energy consumption and loss of nutrient but they create negative thoughts in consumers.

Reduction of the number of workers does not only reduce the production cost but also reduces contamination caused by worker. Thus, increase in automation and reduction in number of workers will be beneficial for hygienic food production. Hygienic production not only attracts consumer to favorable hygienic conditions but also hygienic production provide lower thermal application need, lesser preservative requirement and longer shelf life which are also favorable for consumer.

Production of high value added products

Food science and technology, makes it possible to produce attractive foods with innovative ideas. Attractive foods can be defined as foods that have one or more positive characteristics such as higher nutritive values, higher sensory scores, low sodium, sodium free, lower calorie, low fat, high fiber, high antioxidant, high phenol, additive free,

preservative free, longer shelf life, easy consumption, ready to eat, simple preparation or higher functional content. These foods have similar production costs with ordinary foods; however, they have higher selling prices. Because of the mentioned characteristics, consumers are willing to buy by paying higher price. It is possible that some of these new ideas or technologies can have one or more negative properties. Nevertheless, evaluation of their functionality and nutrition quality outweighs negative properties in general. Thus, high value-added products have beneficial effect on consumer nutrition.

Low fat or low-calorie foods support body weight control by reduced calorie consumption without reducing intake of other nutrients. Consumption of high fiber, phenol and/or antioxidant containing foods is important for both body weight control and healthy life. These foods should not be thought as drug but is should be used in diet for healthy nutrient and disease prevention for life.

New thermal or non-thermal pasteurization techniques of foods reduce or eliminate used heat which retains beneficial, heat sensitive, content of foods and makes it possible to reach to food within more natural form and higher beneficial content.

New pasteurization and packaging technologies reduce or eliminate the need of preservatives in foods which are based on the prevention of microbial growth or the microbial, chemical and physical inactivation. Although food additives are allowed to use within certain limits, reducing their consumption may be important for total toxicity.

Some new food additives especially the ones that increase the nutritional content as well as some of the new additives with natural or artificial source such as gelatin agents, preservatives, stabilizers can find uses after safety studies. However, there is a fear that negative consequences on long term may occur when exposed on regular basis, such as 10, 20 or 50 years of regular consumption.

New developments on food technology are possible with developments in food science. Food science have rapidly developed in last 10 years and methods for detection of additives, adulterations, harmful and beneficial components, residues etc. improved; thus, previously undetectable contents or ingredients in foods can be determined in detail now. In addition, the absorption and bioavailability of these contents by biological tissues can be determined in more detail now. These new opportunities in food and nutrition science give more information about foods and their bioavailability. This verified scientific information gives chance to consumer in selecting food objectively.

New food technology and science also provide conditions to retain the freshness of food with extended shelf life. This does not only increase the shelf life but also reduce the cost of reclaim due to expired shelf life, eases storage and access to food.

Conclusion

Consumption of fresh, natural and beneficial food has gained importance in recent years due to the increasing knowledge about health and nutrition. High profit aim of food industry and high nutritional value, safety requirement

and fresh characteristics demand of consumer should be meet at appropriate point. Novel technologies take place in every part of life which makes life easier and enjoyable. Novel or new technologies in food industry also have same effect on consumer by improving nutritive values, sensory properties, ease of use and shelf life of foods. All developed new technologies must guarantee the safety requirements specified in national and global regulations before they are used in food industry. Scientific publications show that new food technology has great potential to produce or improve the safety, nutrition and overall quality of foods that meet the expectations of consumers.