



E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(1): 2313-2315
Received: 07-11-2019
Accepted: 09-12-2019

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Processing and mechanization of Indian traditional food products

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Abstract

Foods/dishes that are passed through generations or which have been consumed many generations. Traditional foods are traditional in nature, and may have a historic precedent in a national dish, regional cuisine or local cuisine. These foods are not only free from additives, chemicals and many of the things we find in food today, but they were exceptionally nourishing. Indian Traditional food consists of a wide variety of regional and traditional cuisines native to the Indian subcontinent. Given the range of diversity in soil type, climate, culture, ethnic groups, and occupations, these cuisines vary substantially from each other and use locally available spices, herbs, vegetables and fruits. These foods are also recognized as functional foods. The Indian dietary pattern and the traditional foods evolved are based on the indigenous ayurvedic system of medicine, which admit natural ways of achieving physical and mental wellness. Traditionally, the product is prepared in batch. The process is very slow, labour intensive, results non-uniform quality of product, results unhygienic production of the product, having short shelf-life. Looking to these limitations, mechanization is the right solution which may result in production of traditional food products with uniform quality with better sensory and rheological attributes and at a larger scale of operation. This may also reduce the cost of energy and labor per unit production of the item. It also helps our traditional foods to establish in global market.

Keywords: Indian traditional food, ethnic, mechanization, Indian cuisine, functional food

Introduction

Ethnic or Traditional foods are defined as foods originating from a heritage and culture of an ethnic group who use their knowledge of local ingredients of plants and/or animal sources. For example, Hindu food from India, Maori food from New Zealand, and Masai food from Kenya are all considered ethnic foods. Thus, in a broader sense, ethnic food can be defined as an ethnic group's or a country's cuisine that is culturally and socially accepted by consumers outside of the respective ethnic group. People from various countries are eager to introduce their own ethnic food to people from around the world. This usually begins with preparing the food and ends with eating it. Although each country's food has its own story, including its history and its nutritional benefits, there is a lack of information about ethnic food because of scant research being conducted in this area (Dae Young Kwon).

Indian traditional food Consists of a wide variety of regional and traditional cuisines native to the Indian subcontinent, which Give the wide range of diversity in soil type, climate, culture, ethnic groups, and occupations, these cuisines vary substantially from each other and use locally available spices, herbs, vegetables and fruits. Traditional Indian foods have been prepared for many years and preparation varies across the country. Traditional knowledge about processing of food, its preservation techniques, and their therapeutic effects have been established for many generations in India. Food systems can deliver numerous biological functions through dietary components in the human body. Indian traditional foods are also recognized as functional foods because of the presence of functional components such as body-healing chemicals, antioxidants, dietary fibers, and probiotics. These functional molecules help in weight management and blood sugar level balance and support immunity of the body. (Hotz C).

Ancient India seems to have realized the importance of health and wellness much ahead of its time. The Indian dietary pattern and the traditional foods evolved are based on the indigenous ayurvedic system of medicine, which confesses natural ways of achieving physical and mental wellness. Traditional Indian food formulations show ingenuity in the choice of ingredients and additives with critical attention to wholesome nutrition beyond taste. Indian cuisines have great aromas and in-depth taste profiles, which are derived from a complex combination of spices and preparation techniques. The well-balanced Indian meal contains all the six defined tastes, namely sweet, sour, salty, spicy, bitter, and astringent.

Indian cooking principles go beyond the balancing of tastes; however Traditional Indian food formulations show ingenuity in the choice of ingredients and additives with adequate attention to wholesome nutrition and tastes. Another feature of traditional Indian foods is the effective utilization of natural resources and minimization of waste. Indian traditional foods can be classified into eight broad categories: (1) processed grain products, (2) fermented foods, (3) dehydrated products, (4) pickles, chutneys, sauces, and relishes, (5) ground spice and spice mixtures, (6) fried food products, (7) dairy products, and (8) confections and sweets. (Srinivasan).

Traditional Indian food products such as shrikhand, dhokla, papad, wadi, petha, amavat, fermented foods such as idli, dosa have come a long way in providing nutrition, functionality and taste but due to liberalized market and lack of investment in small sector rural industries many traditional products of India are largely bygone. A major portion of the food processing industry in India is unorganized and the varied traditional products are prepared at small scale only. These products need special protection, investment for up-scaling and conferred geographical indications for more popularity (Rewa and Jagbir).

Mechanization of Indian Traditional Food Product

Mechanization is the process of introducing a machine to do something that used to be done by hand. Traditionally, the product is prepared in batch. The process is very slow, labour intensive, results non-uniform quality of product. The conditions prevailing during its manufacture using conventional methods leads to unhygienic production of the product, having short shelf-life.

Looking to the limitations of conventional method, mechanization is the right solution which may result in production of traditional food products with uniform quality with better sensory and rheological attributes and at a larger scale of operation. This may also reduce the cost of energy and labor per unit production of the item.

Vyas *et al.* (2011) ^[9] developed Batch type halwasan making machine based on the principle of SSHE. Halwasan is the traditional Indian sweet from Khambhat (Cambay) area of Gujarat. It is made from germinated broken wheat, edible gum, sugar and split milk. It has a fudge like texture and is gooey (Soft and sticky). It is a healthy sweet dish. Mechanized method is same like a traditional method but with the controlled temp and steam pressure and scraper with different speed as per the stages is used to remove lumps and burning. In mechanized process there are three stages which include coagulation, cooking and sugar addition, crystallization and sugar addition. The sensory score of 92/100 as compared to sensory score 86/100 of *Halwasan* made by traditional/conventional method. The cost of processing in BHM is almost half than conventional method. The keeping quality at room temperature of *Halwasan* made by using BHM is 20-22 days compared to 8-10 days made by conventional method. The profit margin is around 90-100%.

Sabu *et al.* (2017) ^[3] Developed the Automated Appam Maker. Appam is a type of pancake, made with fermented rice batter and coconut milk. Its origine might be Sri Lanka or the south India. Traditional method involve Pouring, spreading, cooking and the removal of cooked food by manually. In mechanized, Pouring and spreading are done simultaneously. The open end of the hose is connected to a circular disc. The disc is connected to a motor. The microcontroller run the motor and opens the valve simultaneously and the

programming is done to rotate the disc 360°. Therefore, the batter gets spread in a circular manner. Then the pan has to be rotated 120° clockwise to place it above the LPG burner for cooking. (Cooking time controlled by manually). Then the pan is tilted at 180° by microcontroller for removal the Appam. This type of Appam maker can be used for mass catering for household and restaurants by minimizing the making cost, making time and thereby improving the efficiency with optimum energy consumption ensuring better usability, safety, improved handling easiness and hygiene.

Patil *et al.*, (2017) ^[4] developed chapatti making machine. Mechanized method involves Mixing, Sheeting/rolling (1.5mm thickness) by dough pieces are passed under pressing rollers, sheeted dough is passed under a rotory die and cut to get circular shapes (150mm dia) and Baking on hot plate at 200–210 °C for 1–2 min and puffed over a live flame or coal fire for few seconds. This will be best suitable for hotels, local mess or hostel, catering service etc with high productivity, reduce human interference and high efficiency.

Kumar *et al.* (2017) ^[7] designed ANARSA making machine. In Anarsa machine, the process starts with the making sheets of the pre-processed dough and ends by frying. In Sheeter the dough is made into a thin sheet with having thickness of about 7mm. The roller cutter has the template of required shape and size of Anarsa about 70mm, then fried in fryer having separate arrangement for tilting and last the press is used to remove the excess oil.

Velpula *et al.* (2017) ^[5] compare the Traditional and Mechanized manufacturing of Rawa Barfi. Difference between the traditional and mechanized method is only that, the traditional method used iron kadai for roasting of rava while mechanized method used SSHE with LPG fuel supple. Traditional method or halwais used full fat milk while mechanized method used Skim milk powder (SMP) for making of barfi Traditional method uses whole suger and mechanized method used sugar syrup concentration of 60°Bx. The overall heat transfer coefficients of open type SSHE obtained was 453.05 W/m²K. The LPG fuel consumption and thermal efficiency of open type SSHE during manufacture of rava burfi was 0.22 kg fuel/batch and 31.00% respectively. The manufacture of rava burfi in open type SSHE has consumed 251Wh electrical power. Sensory attributes of rava burfi manufactured using SMP in open type SSHE were at par ($P > 0.05$) with control product prepared by the traditional method. Cost estimated for manufacture of rava burfi/kg in SSHE was Rs 168.37 in which the raw material cost was 96.54% and processing cost was 3.64%.

Meganathan *et al.* (2018) ^[6] developed Automatic dosa making machine. The dosa making process consist of three main assemblys. They are Heating assembly, pouring assembly and rotating assembly. In heating assembly, the rotating pan is heated by using gas power. The batter is poured on the rotating pan using pouring assembly. The pouring batter is heated by gas power and after this, the dosa is removed from the rotating pan.

Mechanical processing Equipments

There are various kind of food processing equipments are available in market which we can use or modified that food processing equipment according to the product for mechanization of Indian traditional food products.

If we will see the Indian traditions food, the curries are very impotent in any regional dish. So the cutting is the basic operation in making of curry or salad. So we can use size reduction equipment like cutting (knife, slicer, dicers, mincer)

machine. Crushing machine (mills and grinders) we can use for making of flour from any cereals or grounded spices in our traditional food. Agglomeration equipment can use for conversion of khoa into gulabjamun, laddu making, or mixing process like instant drinks, soup mix or seasoning of spices. Homogenizer can be use for traditional juices and beverages. Mixing machine can be use for dry mixing of flour, pulses, spices mixes, instant dry mixes of Indian traditional food products and wet mixing machine can be use for better preparation of dosa, Idli and dhokla. Forming can be use for making of laddu, ghughra, sev, chakri, gathiya etc. Separation machine can be use for flour sieving, separation of whey from chhanna using filtration. Heat transfer equipment can be use for cooking and boiling of traditional food, baking (Bati), roasting (Chapati, Khakhra), frying (sev, chakli, samosa etc). Evaporators can be use for the partial removal of water in basundi, kheer, chatni etc. Dehydrators can use for dehydration of fruits and vegetables, aap papad, juice powder etc.

Conclusion

According to Dr Ved Prakash, Ex-Director of Central Food Technology Research Institute (CFTRI) Mysore, of more than 3000 traditional foods in India, only 100 are in existence today. There is so much diversity in traditional foods of India because the regional health foods have evolved according to the climate, culture, and cropping practices of a particular region. Moreover, certain foods have become more popular in certain region according to the health condition of a population such as lactose intolerance in Bengal leads to popularization of lactose-free dairy sweets. A national research project in India is recommended to scientifically document the health benefits of traditional and ayurvedic health foods across various regions so that a database can be created for preservation of knowledge on processing, preservation and dietary guidelines on traditional and ayurvedic foods for the benefit of both the Indian and international communities. It also helps our traditional foods to establish in global market.

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