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Processing and value addition of Solanaceous vegetables

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Abstract

The improvement of vegetable product is always essential as it's far help is bringing up long lifestyles of the greens and it additionally enhance the fine of vegetable by means of the addition of fee in it. This paper consists of processing and fee addition of different veggies. In India there are numerous sorts of underneath-utilized vegetable are available because they are not utilising well despite the fact that they have very high nutritive value. these crops have high capacity in retaining sustainability in terms of economic system of united states. some of the vegetables are underneath estimate in terms of processing despite the fact that they have got high processing capability. This review deliver information about processing of some of the primary vegetable vegetation and it additionally cover processed product of this veggies.

Keywords: Tomato, potato, vegetables and processing

Introduction

India is the one of the pinnacle greens generating u.s. in the international. veggies are exact supply for nutritional vitamins inclusive of vitamins, fibers and minerals. In fresh vegetable the moisture content is greater than 80% (Orsat *et al.*, 2006) [60]. sparkling vegetables are more nutritive than processed ones. Greens whose roots and tubers are devour are exceptional supply of energy, herbal nutrients and minerals. In inexperienced leafy veggies like spinach (*Spinacia oleracea*), amaranthus (*Amaranthus viridis*), bathua (*Chenopodium album*), mint (*Mentha spicata*) etc. together with carrot are rich supply for Beta carotene that is an vital antioxidant. Beta carotene is the most important precursor of vitamin A. vitamin A is essential for the ordinary increase. Deficiency of nutrition A decrease degrees in the blood and low degree in serum.

In step with capita intake of vegetable in India is lower than every day requirement. It happens due to excessive publish-harvest losses (20-40%) of end result and veggies in India. it's far found that the current reputation in availability of vegetables best meet 1/2 of the requirement of vitamins and minerals. consequently, it's miles important to strategies the to be had veggies so it's far important to adapt the machine of processing of greens by developing such techniques, which is simple to perform as well as also can produce economic high-quality product. this could also ensure the availability of vegetable in offseason all over the yr. In India much less than 2% of the vegetables from general manufacturing is processed and in Brazil the 70% and in Malaysia round 83%. one of the maximum common strategies for preservation of vegetables is dehydration. warm air drying with the aid of conventional tray drier or vacuum drier and sun drying may be used for dehydration of greens. Dehydrated types of vegetables are ate up in several bureaucracy, without affecting its nutrient cost.

Today cultivation of culmination and veggies are very essential. because it facilitates in producing employment at some point of the 12 months, it also used as a medium for foreign exchange. end result and veggies have excessive nutritive cost, in order that they play essential function to combat hunger. culmination and greens are properly supply for vital minerals, nutrients, dietary fiber, supply complicated carbohydrates and proteins.

Powdered veggies which include tomato (*Solanum lycopersicum*), carrot (*Daucus carota* subsp. *Sativus*) and leaves of fenugreek (*Trigonella foenum-graecum*) required easy technology for practise.

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And they're utilized in incorporated in traditional meals arrangements, in this way every price is introduced in the product and nutrient cost additionally maintained. because of submit harvest losses of veggies because of poor management, the losses of farm produce are very excessive. In research it turned into recorded that seventy five.000-1,00,000 crore in line with 12 months losses are reason due to submit harvest management of food commodities.

In case of veggies and fruits which includes mango (*Mangifera indica* L.) and amla (*Embllica officinalis* L.) pickling is accomplished. Pickling of cucumber is made in Africa, Asia, Europe, and Latin the us (Steinkraus 2002). Khalpi is a cucumber pickle popular during summer months in Nepal (Dahal *et al.*, 2005) [57]. Number of methods is used for the cause of pickling, however the maximum common approach is setting the vegetable in 5% salt.

It is able to be seen that in the method of garage of goods in canned there may be low loss of Ascorbic acid (<15%) comper to that of clean and frozen merchandise. In several take a look at that there's no statistically extensive losses of ascorbic acid occur all through garage of canned green beans at room temperature, and one look at confirmed a moderate lack of 6% after 18 months of storage of canned inexperienced beans (Marchesini *et al.*, 1975) [54], (Elkins 1979) [27] and (Fadel and Miller 1983) [2].

In India most greens are processed with a view to prevent it from publish-harvest losses. It also helps the vegetables to be prevented from not only physiological or chemical spoliation it additionally saves it from microbial spoilage. it's miles vital to save you greens from spoilage due to moisture, enzymes or packaging. essentially, fee addition is the manner to convert vegetable produce to a extra treasured product from its authentic state. The fee of changed product is termed as value addition. In these days's global vegetable farming is crucial supply of employment as it provides employment for the duration of the year. And adding fee is also very vital for employment. In time period of nutrient vegetables are important supply of nutrient and helps in maintaining sturdy metabolism

Potato (solanum tuberosum)

Potato (*solanum tuberosum*) is a tuberous, starchy herbaceous annual vegetable belong to family Solanaceae. It is world fourth largest food crop followed after maize, wheat and rice. It is also known as king is vegetables. It is staple food in many parts of the world grown for its edible tubers and

contributes substantially to the world's caloric intake ("PotatoPro," 2017) contributing around 2% of the world's dietary energy supply. Agriculture Cooperation and Farmers Welfare, out of total vegetable production of 175008 million tonnes within the year 2016-17, potato accounts for around 27% i.e. 46546 million tonnes (Horticultural Statistics at a Glance 2017) [40]. Product of potato which is commercially use as popular food is potato chips.

Potato chips

The most preferred variety of potato for the preparation of chips are Kufri Chipsona-1 and Kufri Chipsona-2. This variety is ideal for the preparation of potato chips. Potato chips are thin, fried, baked popular able to eat snacks used both in domestic also as in nutriment at restaurants. 100 g potato chips provide about 547 calories of energy with a fat content of 37.47 g, total carbohydrate 49.74 g, protein 6.56

g alongside Sodium (525 mg) and potassium (1642 mg). As per ("Potato Chips - India | Statista Market Forecast," 2019) [63]. Preparation of potato chips include following steps:



Fig 1: Potato Chips

- Fresh potato free from any deformities are taken and peeled then washed.
- Then the washed potatoes sliced in 1.5-2.0 mm into slices.
- Then the surface starch is removed with water.
- Then the sliced are blanched in predicament at 60-80 °C for 2-3 min.
- Then surface dry them.
- Then fry the dried slices at 180 °C till they become golden.
- Obtained chips are salted or spiced and packed in bags within the presence of nitrogen gas.

Canned potatoes

For the purpose of Canning of potatoes, the preferred potatoes are immature and small. In case of larger tuber, first they cut into small pieces then they canned (Thapa and Thapa, 2019). The processes of canning include following steps:

- Fresh potato peeled and wash.
- Then blanching is done for 4-5 min of potatoes.
- The blanched potatoes then filled in can at the rate of 500 g per A21/2 size can along with 2% brine leaving about 0.8 cm.
- Now, the cans are expose to heat till the temperature reach 80 °C which help in removal of air from it.

In final step the cans are sealed and sterilized at 10 psi for 45 minutes and cooled.

Tomato (*Solanum lycopersicum*)

Tomato is ranked second among the vegetables in terms of production. Averagely about 10,800 tons of tomatoes are exported annually from India. Nearly 7.1 million tons of tomato is produced annually from 5.4 lakh hectares in India. Tomatoes are generally come under vegetable because of its

low sugar content. It is good source of vitamins, minerals and other useful substances like fiber essential for good health.

It contains over 80 nutrients beneficial to human (Potty, 2009) [65]. It contains lycopene and beta-carotene pigment. Potty (2009) [65] emphasized that lycopene is also linked to improve skin health by virtue of its ability to protect against undesirable UV ray exposure. Value addition to tomato with processing can be done by converting them in other product through different processes these products are Tomato power, Tomato juice, Tomato puree and Tomato ketchup.

Tomato power

The variety which is used for the production of powder is Country tomato (Namdhaari). It found in the selected area. Tomato first washed then seeds of the fruit is removed then let them dry in sun. Then the dried tomatoes were powdered. Products of tomato standardized using powder of tomato.



Fig 2: Tomato power

Tomato juice

For the preparation of tomato juice fully ripe well-developed colored tomatoes are use. They washed thoroughly then they trimmed then steamed then with the help of knives cut them in small pieces.

The pieces which are crushed are heated in the steam jacketed kettle till they become soft. Then the pulp is removed from the tomatoes. It will separate juice from seeds with the help of sieve. Then add sugar with salt@ 1% and heated to 85-90 °C. Then bottle the hot juice and sealed immediately and processed sterilized in boiling water for about 30 minutes and cooled (Grandillo *et al.*,1999) [37].



Fig 3: Tomato Juice

Tomato puree

For the preparation of puree, the juice should concentrate under vacuum to about 9-12% total solid to get tomato puree. Then the product is filled in bottles and put the bottles in boiling water for 30 min and then let them cool (Freeman *et al.*, 2011) [30].



Fig 4: Tomato Puree

Tomato ketchup

For the preparation of ketchup, the juice of tomato is used. The juice concentrate with salt, sugar, spices, etc. the spices which are use cloves, cardamom, pepper, cinnamon and other ingredients etc. are tied loosely within a muslin cloth and placed in boiling juice in steam Jacketed Kettle. Later sugar, salt and acetic acid are added. Then it is concentrated to 28 to 30% solids in which 12% are tomato solids. The final product is then preserved by the addition of sodium benzoate @ 750 ppm. Then ketchup is filled in hot clean dry bottles and processed in boiling water for 30 min then cooled at room temperature.



Fig 5: Concentrates & Paste

Conclusion

In conclusion, both potatoes and tomatoes play significant roles in global agriculture and food supply. Potatoes, a staple food and major contributor to the world's caloric intake, are versatile and used in various forms, notably in potato chips and canned potatoes. The meticulous preparation process of these products highlights their commercial importance. Similarly, tomatoes, rich in

essential nutrients, are extensively processed into products such as powder, juice, puree, and ketchup, demonstrating their versatility and nutritional value. Both vegetables not only support dietary needs but also contribute substantially to the agricultural economy, showcasing their indispensable roles in sustaining and enhancing food security worldwide.

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