

TARO FOOD PRODUCTS

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Abstract

Taro is a tropical root crop grown in Hawaii with a promising future. Now, the potential of taro has been under-estimated. This presentation reviews briefly (a) the cultural practices in Hawaii, (b) the availability of taro-based products, (c) other available technologies in processing taro, (d) problems involved in processing taro, (e) some prospective taro products, and (f) some recommendations to make taro the star of agri-business in Hawaii and the Pacific.

Introduction

Taro is a tropical root crop that can be grown easily. We can cultivate taro either under wet-land conditions or under dry-land conditions given adequate irrigation or rainfall. In the old days, Hawaiians grew taro under wet-land condition and they harvested them for the preparation of poi (taro paste). The practice is still carried on nowadays in Hawaii. Consumers with Hawaiian ancestry prefer poi and it is indispensable in occasions such as luaus (feasts). However, the gradual decrease of available wet-land in Hawaii and the hard work involved in the production of this crop has endangered the production of wet-land taro. Taro growers are currently attempting the production of poi taro under dry-land conditions with irrigation and mechanization.

Under dry-land conditions, taro growers can produce another taro crop successfully in Hawaii. This is the Chinese or Bunlong taro. It is gaining considerable interest among the farmers because of the simpler growing conditions and better profit as compared to the poi taro. In Hawaii, Chinese taro is consumed mainly in the form of deep-fried taro chips (a snack product) and deep-fried baskets (shredded taro molded into basket shape and then deep-fried) in restaurants. Other ways of consuming taro in Hawaii include steamed taro cakes, taro batter, taro bread or rolls, taro pancakes and taro chunks in casserole. However, the limited consumption and use of taro in Hawaii and the limited export marketing connections are not good enough to attract the farmers to increase their production. We have to develop other forms of consumption and uses, and a diversified marketing strategy to promote taro in the agricultural segment of the Hawaii economy. The increased export potential of fresh taro to the West Coast and Canada, and the development of taro-based food products in Hawaii are two of the more promising alternatives. In this presentation, I will discuss the taro-based products only.

Availability of Taro-Based Food Products

We process taro into various types of products and marketed them in Hawaii. Those which use taro as the main ingredient include poi in the bag, poi in the jar (baby food), dehydrated poi, deep-fried taro chips (snack) and taro baskets (found mostly in the restaurants). Other products such as taro bread or rolls, taro pancakes, and kulolo (a type of fudge-like candy) use taro as one of the main ingredients in their formulations. Improvements on existing technologies definitely can make the products more attractive to the consumers.

In other countries, other forms of taro such as taro flakes (Taiwan), frozen taro chunks (China), dried taro chips (Fiji and Western Samoa) and frozen taro cake (Taiwan) are available.

Other Available Technologies in Processing Taro

Researchers have conducted studies on the use of taro as food ingredient, in canned products and extruded pasta products. These include the manufacturing of baby food type products, taro flour, taro meal or grits, canned taro, extruded products (rice, noodles and macaroni), fermented alcoholic beverage and gum replacer. However, food processors have not considered these for commercial applications.

Problems Involved in Processing Taro

Even though taro corms have been available for years and have been processed into a few products, it is one of those crops which is not readily adapted to modern processing technologies. From the food technologist's standpoint, there are several major problems which we must overcome in order to fully utilize this particular crop (the corms) for processing in Hawaii.

- (a) Shape of the corms. Taro corms do not present a uniformed shape at harvest, thus making it difficult for mechanical peeling and marketing. Currently, taro farmers are throwing away about 30% of their harvest because they are too small for the fresh market. The processors would not take them either.
- (b) Internal color of the corm. Internal color of raw taro corms ranges from white, yellow, pink to a combination of colors and varies depending on cultural practices. Upon heating, the color may be creamy white, grayish purple, bright yellow or a combination of colors depending on the cultivar. This is a problem shared by both producers and processors. Poi manufacturers like their products as purple-colored as possible. Deep-fried taro chips should be light in color with or without the purple specks. Food ingredient manufacturers probably would like to have the color of taro flour or taro gums as light as possible.
- (c) Texture of the corm. The texture of taro corms varies within themselves after cooking. The outer portions are not as starchy as the center portions. They also differ in specific gravity. This particular phenomenon poses a serious problem if we want to process the taro corms into chunks and patties with uniform texture.
- (d) The acidity principle - or itchy reaction to consumption of taro. One of the major problems in using taro as a food crop is the presence of the acidity principle in the corms and the leaves. The degree of acidity varies with cultivars. The exact nature of the acidity principle is not well understood. Proper heating can inactivate this acidity principle. However, no detailed information is available on the amount of heat required and its mechanism for this inactivation. Nor does there exist an objective method for the determination of this acidity principle. Taste is the only method by which we can determine acidity at this time. The absence of these information hinders the development of taro-based products, as the acidity principle must be inactivated before consumption or a non-acrid taro is available.
- (e) Physiol-chemical properties of the major components in taro. Starch is the major component in taro corms besides water. It is known that taro starch granules are relatively small as compared to the other starches. However, no systematical studies on the physiol-chemical nature of this starch are available. In addition, taro flour contains about 10% mucilage. The physiol-chemical properties of this taro mucilage have not been systematically studied either. The lack of information in these areas hinders the prospective utilization of taro as a food ingredient and other industrial applications.
- (f) Changes during post-harvest handling and storage. The shelf-life of fresh taro corms ranges from two or three weeks to several months depending on the source of information. There is no literature available on the systematical studies of the handling and storage of taro corms. Information on changes during post-harvest handling and storage of taro is crucial to the development of new markets for fresh taro corms and the processing of taro corms into other products.

Prospective Taro Food Products

There are several products which can be considered if we want to promote the increased utilization of taro in Hawaii or the Pacific Islands, provided the above-mentioned problems have been resolved.

- (a) Ready-to-eat taro chunks and patties. Pacific Islanders consume considerable amount of taro in baked or boiled form with or without coconut cream. With the upgrading of living style, it is desirable to have ready-to-eat taro chunks and patties available for the residents in the Pacific Islands and those living elsewhere. This can eliminate the problem of handing a large corm at the household level. Food service establishments can also increase the use of these products in their menus if they are available.
- (b) Taro flour as a food ingredient. Taro corms which are not suitable for the fresh market or for the taro chip industry can be converted to taro flour. The taro flour can then be used in other food formulations such as taro bread, taro cookies, kulolo, baby food, pasta, instant or flavored poi, or other products.
- (c) Taro starch. Because of the small granular size, taro starch may lend itself to specialty markets such as the food, plastic or cosmetic industries. There should be some opportunities available if its physiol-chemical properties are known.
- (d) Taro mucilage. Taro contain about 10% mucilage on a dry weight basis. This mucilage may have some potential in the gum or dietary fiber market if its physiol-chemical properties have been known.
- (e) Taro peels. The peels generated from the production of taro food products must be fully utilized in order to maximize the use of the taro corm. The peels may be used as animal feed, to generate bio-energy, or dried to a mulch for the agriculture industry.

- (f) Taro leaves. One of the major vegetables in the Pacific Islands is taro leaf. Currently, we use taro leaves produced in Hawaii mainly for the lau-laus (vegetable wrapping for meats during cooking). The Western Samoans produce canned 'palusami' or taro leaves in coconut cream. We must explore the production of processed taro leaves now so that the technologies and markets will be readily available when the production of taro leaves exceeds our local market demand.

Conclusion

In conclusion, I must say that we don't know much about taro and it has been under-utilized even though this crop has been available for all these years. It has the potential of becoming one of the most profitable crops in Hawaii. In order to achieve this goal, we must form a 'taro research team' to cover the different aspects of taro, from production, harvesting, handling, processing, marketing, to consumption and utilization. The industry, government and academics must work together to solicit enough funding for the different tasks involved and plan to make taro the star in Hawaii and the Pacific agribusiness.

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