



CURRENT ISSUES OF FOOD IN INDONESIA

Editors:

Meta Mahendradatta

Winiati P. Rahayu

Umar Santoso

Giyatmi

Ardiansyah

Dwi Larasatie Nur Fibri

Feri Kusnandar

Yuli Witono



INDONESIAN ASSOCIATION OF FOOD TECHNOLOGISTS
2020

CURRENT ISSUES OF FOOD IN INDONESIA

Tim Editor:

Meta Mahendradatta

Winiati P. Rahayu

Umar Santoso

Giyatmi

Ardiansyah

Dwi Larasatie Nur Fibri

Feri Kusnandar

Yuli Witono

Tata Letak : deeje

Desain Sampul : Februadi Bastian

Diterbitkan pertama kali dalam bahasa Inggris oleh PATPI, bekerja sama dengan Interlude, 2020

Yogyakarta

Interlude

Cetakan I, September 2020

xiv+196 hlm; 15 × 23

ISBN: 978-623-7676-57-7

PATPI

Perhimpunan Ahli Teknologi Pangan Indonesia

Interlude

Sumber Kulon, RT 03 RW 30, Kalitirto

Berbah, Sleman, Daerah Istimewa Yogyakarta

Tlp/WA: 0822 8157 2158

Pos-el: Interludepenerbit@gmail.com

(III-6)

**TEMPE AND CHEESE-BASED SAGA
(*Adenanthera pavonina*, L)
AS A FEASIBLE AND QUALITY FOOD***

Abu Amar

Email: abu.amar@iti.ac.id

IAFT - Jakarta Branch

Processed food products made from raw nuts such as soybeans are popular in Indonesia. Many variations of the product, such as soymilk, tofu, tempe with processed food product derivatives, such tempe chips, tempe crackers, tempe milk, tempe burgers, and tempe nugget. Not only tempe, but also soy sauce and tauco. Besides soybean as a raw material of tempe, various kinds of peanuts such as gude bean (*Cajanus cajas*), walnut bean (*Psophocarpus tetragonolobus*), koro bean (*Canavalia gladiata*), mung bean (*Mucuna pruriens*, L) lamtoro (*Leucaena leucocephala*, L), munggur seed or trembesi (*Albizia saman*) and saga bean (*Adenanthera pavonina*, L) have been widely used by the community. This is supported by some researches on tempe made from raw nuts by several researchers with variation of the results. But in general, all these processed products can be consumed and are also feasible to consume, even the nutritional quality is not inferior when compare to tempe.

* This article has been published in "Pangan Indonesia Berkualitas, 2018" in Bahasa Indonesia

Some entrepreneurs of food products made from raw tempe have tried to switch to other plants that look like soybean called lupine (*Lupinus luteus*). This is done, because if there are restrictions on importing soybeans, they have prepared a replacement with Lupine plant. It is known that Lupine plants are also similar to soybeans. This plant has grown rapidly in Australia since the early 19th century, initially to meet the needs of animal feed. Thus, this lupine plant usually lives in a subtropical country. This plant is more possible to develop in Indonesia, but it needs a lot of energy. It is to be noted that lupine plant is similar to soybeans, also its habitats and requirements to grow, so lupin can be planted only on certain soils in Indonesia. Thus, the tree saga (*Adenanthetra pavonina*, L), tree-shaped and living on various soil types in Indonesia, is still more possible to be developed. Therefore, saga tree plants should be developed and utilized as an alternative source of vegetable protein.

Saga tempe

Tempe is one of the typical Indonesian food, processed and developed into a variety of different products. Tempe made from soybean is developed perfectly by government, society and industry. This is due to some researches on tempe which approve that tempe has good nutritional content. Tempe and tofu are two processed products of soybean seeds that have been attached to this nation. Many variations of processed tempe, there are Malang tempe chips, Purwokerto tempe chips, and there is also Purwokerto mendoan tempe. These show that the type of processed tempe into a fast food product is more diverse. Tempe based on saga bean seed can be developed and processed as well as tempe. This is evidenced by many studies that have utilized the saga seed as raw material of tempe with nutrient content that is not inferior to the nutritional value of tempe. The productivity of this plant is quite promising, because along the year, it can produce an old saga seed, and protein content is proportional to soybeans.

The processing of saga tempe is exactly the same as tempe; the difference is that the saga seed has a very thick and hard seed shell so to get the endosperm to be easily processed into tempe it should be soaked for more than 20 hours, and should be boiled that takes a long time for at least one hour with boiling water. Other processes are the same, followed by the separation of the seed shell and endosperm, then soak it to achieve a certain pH of 5.5 value, so that the mold of *Rhizopus oryzae* and *Rhizopus oligosporus* to be inoculated will grow easily. The seed is then washed, steamed for a certain time to sterilize and cooled to 35° C. The next stage is inoculation with mold of tempe is on the surface of endosperm, followed by packaging using leaf or plastic. The use of banana leaf produces more aromatically flavor and aroma, because its packaging during fermentation effects on mold growth. The excessive beany flavor of saga is reduced during the fermentation process by using banana leaves as the packaging material. This flavor is a weakness of the saga bean, but all kinds of peanuts have distinctive beany flavors; sharp, medium, or light ones.

The disadvantage of sharp odor of the saga bean can be reduced by the addition of NaHCO₃ during the cooking of the saga bean. Saga bean as raw material of tempe has the advantage that its seeds have enough sterol or it is also called as phytosterol that reaches 2% with details of β -sitosterol and stigmatosterol on their oil. Even if fermented with the right fungus it is possible that the long-chain fatty acids of C20, C22, and C24 increase the phytosterol compounds in the saga bean. Evidently the people in the Fiji Islands who consume grain seeds including saga seed (*Adenanthera pavonina*, L) show the lowered risk of heart attack. The content of total protein and dissolved protein in tempe saga is comparable with protein from soybean tempe, especially vitamin α -tocopherol is also high in saga bean that reaches 152mg/kg. Therefore, tree saga plant is potentially developed to meet the needs of raw materials of tempe.

Fresh cheese-based saga milk (Saga fresh cheese)

If a lot of soybeans are produced into soy milk, then the analogy can also be made for saga bean to produce saga milk. This is easy to understand, because the technology is exactly the same way of producing soy milk for saga milk, i.e. soaking, boiling and making saga milk by extraction. Temperature of extraction plays an important role in determining the results. The seeds of the boiled saga and that have been peeled until clean, can be directly extracted by using water at 80° C to optimize the extract obtained. Similarly, anti-nutritional substances in saga milk can also be eliminated during processing. If produced into fresh cheese or even ripening cheese, saga milk can replace 50% cow's milk in the process of making cheese.

Cheese produced has the functional properties, chemical and physical properties equivalent to fresh cheese in general, such as ricotta or cheese smeared on the surface of plain bread. The aroma and the taste are of cheese, but dominated by the smell of nuts. If stored for one to two months even at 5°C, this saga milk-based fresh cheese has a characteristic that is easy to be smeared on the surface of bread, or its spread ability is good enough. But the softness of saga cheese texture is still less than the cow's milk-based fresh cheese. This saga fresh cheese product is worth considering to meet the vegetarian group that loves vegetable protein. Production of saga fresh cheese is one of the concrete forms of implementation of Law No. 18 of 2012 on Food. Further it is described in Chapter IV of Article 12 on the Availability of Food. Hopefully, through the diversification of vegetable protein sources that exist in saga bean we have been able to create quality foods made from local raw that lead to food self-sufficiency.