

## The potential of growol as healthy traditional food: a mini review

\*Nur Fitriana, I., Marwanti and Pamadhi, H.

Home Economics Postgraduate Program, Yogyakarta State University, Colombo Street no.1, Karang Malang, Caturtunggal, Depok, Sleman, Yogyakarta 55281, Indonesia

### Article history:

Received: 3 August 2021

Received in revised form: 15 September 2021

Accepted: 19 January 2022

Available Online: 8 March 2023

### Keywords:

Growol,  
Cassava,  
Healthy Food,  
Traditional Food

### DOI:

[https://doi.org/10.26656/fr.2017.7\(2\).482](https://doi.org/10.26656/fr.2017.7(2).482)

### Abstract

This study aimed to describe the benefits of growol as a healthy traditional food is made from fermented cassava. Cassava is a popular and abundant nutritional food in Indonesia, and it can be used as a healthy alternative to rice due to its high carbohydrate content. Cassava is also used in the production of growol, healthy traditional food prepared through a fermentation process. Stripping, cutting, soaking (fermentation), pressing, grinding, steaming and moulding are all steps in the process of making growol. Besengek tempeh, pentho and kethak are commonly served as side dishes. In the fermentation process, lactic acid bacteria (LAB) is used, which is good for digestion and may prevent diarrhoea. Growol is useful for patients with diabetes and dyslipidemia since it contains a lot of minerals, fibre, and carbohydrates, and has a low glycemic index. In addition to its health benefits, growol is quite inexpensive, making it affordable to the general public. Growol's popularity, on the other hand, is declining, owing to young people's dislike of its sour and bland flavour. In fact, further innovations are required to increase its popularity through an efficient processing method. Growol flour, bakpia growol, and sweet growol are examples of innovative processing methods for this traditional food. This study aimed to describe the benefits of growol as a healthy traditional food.

### 1. Introduction

Cassava is a carbohydrate-rich traditional dish that can be used instead of rice as a source of carbohydrates. Cassava contains 60% water, 25% to 35% starch, protein, minerals, fibre, calcium, and phosphate, as well as other nutrients. Cassava has 154 calories, 36.8 g of carbohydrate, 1.0 g of protein, 0.3 g of fat, and 0.9 g of fibre. Because of its vitamins and minerals, cassava is valuable to people who suffer from anaemia and a deficiency of vitamins A and C. It also contains a low glycemic index, a lot of soluble fibre, and probiotic potential (Roch, 2006). According to Roch (2016), cassava production in Indonesia grew from 1980 to 2016 and is expected to continue to rise in the next years. Cassava was harvested on 1.11 million hectares in 2016, with a national production of 25 million tons, resulting in a productivity level of 20.23 tons/ha. The high productivity level of cassava in Indonesia makes it one of the most important export food commodities. Cassava flour, shredded cassava, and cassava pellets are among the products exported from Indonesia. This demonstrates that cassava production in Indonesia has a lot of potential, both in terms of land area and productivity.

Cassava is a popular food in Indonesia, along with a variety of processed foods, one of which is growol (Figure 1). It is well-known as a fermented cassava-based traditional food from Kulon Progo, Yogyakarta, Indonesia. Growol has a bland or even sour flavour, depending on how long it has been fermented. Growol is an alternative to rice for the inhabitants of Kulon Progo, who eat it with besengek tempeh, pentho, and kethak. Growol is still processed traditionally and packaged in banana leaves, as it has been for centuries. Even though growol has many health benefits, the younger generation dislikes it because of its bland taste and sour flavour. Growol includes lactic acid bacteria (LAB), which can help to avoid diarrhoea and has a low glycemic index,



Figure 1. Growol

\*Corresponding author.

Email: [isna.trian@gmail.com](mailto:isna.trian@gmail.com)

making it suitable for treating and preventing diabetes and dyslipidemia (Puspaningtyas *et al.*, 2019). This review will look at the history of growol, its production method, and its health benefits of growol.

## 2. History of growol

Growol is a fermented cassava-based local food. Residents of Kulon Progo eat growol with besengek tempeh as a side dish, according to the Centhini book Volume 5 published in 1814. Besengek tempeh is a Kulon Progo traditional food produced with tempeh and coconut milk. Growol is also served with pentho and kethak, two more side dishes (Figure 2). Pentho is made of grated coconut, spices, and an egg that has been formed into a round shape and fried. Kethak, on the other hand, is manufactured from the material left behind following the distillation of coconut oil. Cassava, the main ingredient in this traditional food, flourishes on the arid soil of Kulon Progo, where groundwater is scarce. When there was a famine (food shortage), farmers used cassava instead of rice. Cassava is a high-carbohydrate food, which is used as the community's staple diet, along with rice. Growol's typical texture is determined by such crucial ingredients. In a nutshell, cassava has a high water content, causing it to smell and stale quickly (Ministry of Education and Culture, 2019).



Figure 2. Growol with a variety of side dishes (besengek tempeh, pentho and kethak)

## 3. The process of making growol

Growol is made through a four-day process that begins with soaking, then draining and crushing before steaming. *Coryneform*, *Streptococcus*, *Bacillus*, *Actinobacter*, *Lactobacillus*, and yeast are the bacteria involved in the soaking process. The main *lactic acid bacteria*, which have anaerobic, amyolytic, and fermentative qualities, develop during the fermentation process (Suharni, 1984). During the fermentation process of growol, cassava (*Manihot utilissima*) is washed and soaked for three days. After three days, it was thoroughly cleaned and milled. After that, the cassava was cooked and wrapped in plastic or bamboo baskets (Ministry of Education and Culture, 2019). According to the Kulon Progo Regency's Department of Agriculture and Food, the following is a general description of how to create

growol. To remove cassava peel and dirt, the cassava was stripped and sliced. Cassava was washed to remove dirt and harmful chemicals, which was done by manually rubbing its texture until it was clean. After soaking it for 2-3 days in a bucket of water, it had a soft texture and a sour smell. Cleaning the cassava surface was also necessary to remove any unpleasant odours and dissolve any dangerous toxins. The following step was to press the growol to reduce the amount of water in it, resulting in a soft texture and a long-lasting product. The cassava texture was delicate and smooth after the milling process. Finally, growol was cooked for 15 to 40 mins and served in a bamboo mould on top of banana leaves. This technique necessitates a pressing step to create a dense texture (Figure 3).

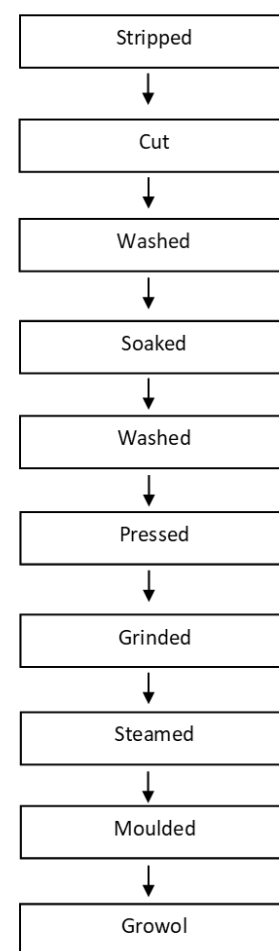


Figure 3. Flow chart of the making process of growol

## 4. Characteristics of growol and its processing innovation

Growol is white, has a soft texture, has a bland flavour and is wrapped in banana leaves. A fermentation process can cause a sour flavour. As a result, the younger generation dislikes growol (Luwihana and Wariyah, 2014). Therefore, to be accepted by all age groups, growol processing must be innovative. Growol flour, growol noodle, and sweet growol are examples of growol processing advances (Luwihana and Wariyah,

2014; Kanetro and Yulianti, 2018). Luwihana and Wariyah (2014) conducted a study that altered growol to make it sweeter. To make sweet growol, brown sugar was added to the growol while it was soaked (fermenting). As this research proves, residents may be encouraged to raise growol production from 50 kg to 500 kg per day. According to Afrianto and Wariyah's research (2020), the type of cassava used to make growol has an impact on the final yield of growol. Panellists preferred growol made from cassava from the "meni variety" that was fermented for four days. Growol made of "meni cassava" is white, sweet, and flavourless. However, if the fermentation takes too long, the acidity of the growol will be affected, and the panellists will dislike it. Another invention on growol was carried out by Nurkhayatun and Kanetro (2018), who turned growol into bakpia by combining wheat flour and growol flour (50% : 50%) with 30% mung bean flour. Growol processing innovation is crucial in preserving growol production.

## 5. Growol as a potential healthy food

The primary bacteria involved in the production of growol are *Lactobacillus plantarum* and *Lactobacillus rhamnosus*. Growol is a probiotic and prebiotic supplement that can be used as a functional food to help prevent diarrhoea (Nugraheni, 2011). Probiotics and prebiotics are a synergistic combination that can maintain a healthy digestive system (Eni et al., 2010). Furthermore, prebiotics aid in weight loss, body fat reduction, and body regulation of food intake (Sari and Puspaningtyas, 2019). Eni et al. (2010) found a link between the frequency of growol consumption and the occurrence of diarrhoea in 472 children under the age of five at the Galur public health centre in Kulon Progo. The bigger the amount of growol consumed, the lower the risk of diarrhoea. Respondents who did not take growol had a 47.4% higher chance of having diarrhoea than those who did. Growol's prebiotic content, according to Puspaningtyas et al. (2019), can be used as a functional food for illness treatment and prevention. In that study, researchers discovered that fermenting cassava into growol enhanced carbohydrate content, total sugar content, sucrose, and total dietary fibre content while decreasing sugar reduction. Aside from the health benefits, the cost of growol is also relatively low. 1 quintal of cassava yields 25 growols in 500 g packages for IDR 5,000 each and 28 growols in 1.000 g packages for IDR 16,000 each (Department of Agriculture and Food of Kulon Progo Regency, 2018).

Growol is not the only traditional food that is good for digestion, tempeh is another traditional food that has the same benefit. Tempeh is an Indonesian traditional

food made from fermented soybeans and a mould called *Rhizopus* sp. During the fermentation process, the mould produces *hyphae* that cover the surface of the soybean with white thread. *Hyphae* also produce *mycelium*, which is used to bind soybean seeds together, resulting in compact structures and solid textures (Astawan et al., 2013). According to Nugraheni (2013), in newborns and toddlers with malnutrition and diarrhoea, tempeh is simpler to digest and absorb than soybean. Giving tempeh to patients can help them gain weight and recover from diarrhoea quickly. According to Suliantari et al. (2015), who conducted a study on tempeh in Bogor, Indonesia, tempeh contains bacteria that aid in the fermentation process. Mould, yeast, and *lactic acid bacteria* are the culprits. *Rhizopus oligosporus* moulds are used in tempeh fermentation, while *Candida famata*, *Candida lusitanae*, and *Candida pelliculosa* yeasts are also used. Furthermore, *Lactic acid bacteria (LAB)* in tempeh are *Lactobacillus plantarum* I, *L. fermentum* I, *L. brevis* I, *Lactococcus lactis* ssp *lactis* and *Leuconostoc mesenteroides* ssp *mesenteroides*.

Growol and tempeh are both traditional Indonesian foods, although tempeh is preferred and more popular than growol in terms of existential values. Rather than growol, Indonesians now eat tempeh on a daily basis. As growol production in the Kulon Progo region is very low, and its processing is still done traditionally, it is often overlooked. As a result, the topic of growol's potential as a nutritious meal should be discussed with communities that consume growol for health reasons.

## 6. Conclusion

In Indonesia, cassava is a popular food ingredient. Carbohydrates, protein, fibre, and minerals are all found in cassava. Cassava is processed into a variety of foods in Indonesia, one of which is growol. Growol is a fermented cassava-based traditional food. Growol is from the Indonesian regency of Kulon Progo. Starting with the process of stripping cassava, cutting, soaking, washing, crushing, steaming, and moulding, the process of creating growol takes four days. Growol is high in prebiotics and probiotics, which help to prevent diarrhoea. Growol also has a reduced sugar content, which is beneficial to patients with diabetes and dyslipidemia. Growol has the potential to be healthy traditional food, but due to its sour flavour and bland taste, many people dislike it. To ensure that growol is accepted by the community, various processes of processing innovation are carried out. Sweet growol, flour growol, noodle growol, and bakpia growol are all products of these innovations.

## Conflict of interest

Authors declare no conflict of interest.

## Acknowledgments

The authors would like to express their gratitude to Mr. Anselmus Sudirman from Universitas Sarjanawiyata Tamansiswa, Yogyakarta, Indonesia, for his assistance, advice, and revisions in the preparation of this article.

## References

- Afrianto, S. and Wariyah, C. (2020). The characteristics of growol made with varieties of cassava (*Manihot esculenta crantz*) and fermentation time. *AgriTECH*, 40(3), 254-261. <https://doi.org/10.22146/agritech.50228>
- Astawan, M., Wresdiyati, T., Widowati, S., Bintari, S.H. and Ichسانی, N. (2013). Physicochemical characteristics and functional properties of tempeh produced from various soybean varieties. *Food Journal*, 22(3), 241-252.
- Department of Agriculture and Food of Kulon Progo Regency (DAFKPR). (2018). Grow with growol. Retrieved from May 1, 2021 from DAFKPR website: <https://pertanian.kulonprogokab.go.id/detil/284/grow-with-growol>
- Eni, R.A., Lestari, L.A. and Juffrie, M. (2010). The frequency of growol consumption is related to the incidence of diarrhoea in the Galur II Health Center, Galur District, Kulonprogo Regency, DIY Province. *Indonesian Journal of Clinical Nutrition*, 7(1), 27. <https://doi.org/10.22146/ijcn.17612>
- Kanetro, B. and Yulianti, P.D. (2018). Effect of types and concentrations of growol flour on physical, chemical and preferred levels of dry noodles, presented at Mercubuana Yogyakarta University, Yogyakarta. Yogyakarta, Indonesia: Mercubuana University.
- Ministry of Education and Culture (MEC). (2019). Growol. Retrieved from June 5, 2021 from MEC website: <https://warisankultur.kemdikbud.go.id/newdetail&detailTetap=1213>
- Nugraheni, M. (2011). Potential of fermented foods as functional foods, presented at UNY Journal, Yogyakarta, 2011. Yogyakarta, Indonesia: UNY Journal.
- Nurkhatun, S. and Kanetro, B. (2018). The effect of wheat flour substitution and types of growol flour on physical, chemical properties and levels of bakpia growol's preference. *E-Journal of Mercubuana Yogya*, 2018, 180-186.
- Puspaningtyas, D.E., Sari, P.M., Kusuma, N.H. and Helsius S.B.D. (2019). Analysis of growol prebiotic potential: a study based on changes in food carbohydrates. *The Indonesian Journal of Nutrition*, 42(2), 83. <https://doi.org/10.36457/gizindo.v42i2.390>
- Roch, W. (2016). Outlook for agricultural commodities for food crops sub-sector. Jakarta, Indonesia: Ministry of Agriculture.
- Sari, P.M. and Puspaningtyas, D.E. (2019). Traditional milk from cassava against *Lactobacillus sp.* and *Escherichia coli*. *Indonesian Nutrition Sciences*, 2 (2), 101-106. <https://doi.org/10.35842/ilgi.v2i2.89>
- Suliantari, Suryaatmadja, S.L. and Kusumaningrum, H. (2015). Microbial content and diversity of some tempeh from Bogor region, presented at IPB Seminar, Bogor. Bogor, Indonesia: IPB University.
- Luwihana, S. and Wariyah, C. (2014). Sweet Growol Processing and Packaging Improvement, presented at Yogyakarta State University 50<sup>th</sup> anniversary, Yogyakarta. Yogyakarta, Indonesia: Yogyakarta State University.
- Suharni, T.T. (1984). Formation of organic acids by bacteria that play a role in a fermented cassava product. Yogyakarta, Indonesia: Gadjah Mada University.