A PROCESS FOR PRODUCING AN INSTANT CHOCOLATE AROMATIC RED RICE (*Oryza sativa L.*) PORRIDGE

Technical Field of the Utility Model

The utility model relates to a chocolate rice porridge, particularly to a process for making instant chocolate aromatic red rice porridge. The process employs freeze-thawing method which enhances the nutritional value of the rice porridge while eliminating the need for artificial additives. It is healthy and nutritious, high in carbohydrates, dietary fiber, and protein. It is a suitable food product during long travels and can be distributed during calamities.

Background of the Utility Model

Rice is one of the important foods in human diet, rice grains sustain two thirds of the world's population approximately 2.5 billion people (Khir et al., 2019). Aromatic brown rice has a distinctive flavor and aroma that is often described as nutty, popcorn-like, or floral. Basmati and jasmine rice are two of the most popular varieties of aromatic rice. Brown rice is a type of grain that contains antioxidant, rich in fiber, vitamins, and minerals which can prevent various degenerative diseases.

Brown rice is not as widely used as white rice mainly in developing countries where it requires more cooking time and less accessible. But in terms of its health benefits, brown rice becomes more popular as a healthy option due to its nutrients, eating more whole grains such as brown rice can reduced the risk of heart disease by up to 22% and reduce the risk of having stroke by up to 12% (Juber et al., 2022). In the present consumers are more concerned on the health benefits of every product that they buy in the market due to health concerns.

A study conducted in the Philippines utilized red rice in the development of instant chocolate red rice porridge however, it fails to disclose the process on how the chocolate red rice porridge is developed.

Utility model PH22020000172U1 discloses a process of producing ready-to-eat sweet chocolate rice porridge that would introduce a nutritious meal for breakfast or snack time, thereby giving a healthy alternative or substitute to instant noodles or canned foods. The process of producing ready-to-eat sweet chocolate rice porridge comprises the steps of: a. preparing the

ingredients consisting of washed and water-soaked rice, coconut milk, pure tablea and brown sugar; b. precooking a liquid mixture prepared by combining fresh coconut milk, pure tablea, brown sugar and water; c. filling a retortable stand-up pouch with water-soaked rice; d. adding the pre-cooked liquid mixture in the stand-up pouch filled with water-soaked rice; and e. thermal processing of the filled stand-up pouch in a vertical non-agitating water retort for an hour at 116˚C.

Utility model PH22021050804U1 discloses a process of preparing sweet chocolate rice (Oryza sativa) porridge or "champorado" in pouch which comprises the steps of (1) partial cooking of rice in flavoring and thickening solutions, (2) mixing of the dry ingredients, (3) filling of pouches with partially cooked rice, mixed dry ingredients and other ingredients, (4) sealing and (5) thermal processing. The product obtainable by this process is a shelf-stable, ready-to-eat sweet chocolate rice porridge.

Despite the increasing demand for the development of functional foods with enhanced nutritional profiles, existing methods of producing chocolate rice porridge from red rice do not fully address the need for nutrient retention and additive-free formulation. The technical problem addressed by this utility model is the lack of a method that both preserves the nutritional integrity of red rice and enhances the functional quality of chocolate rice porridge without relying on artificial additives. This present utility model solves this by employing a freeze-thawing method, that naturally improves texture, shelf life, and nutrient availability.

SUMMARY OF THE UTILITY MODEL

It is the object of the present utility model to provide a process for making an instant chocolate aromatic red rice comprising the steps of preparing ingredients which includes unpolished red rice, refined white sugar, cocoa powder, powdered coconut milk, and glutinous flour, washing the unpolished red rice with tap water until impurities are completely removed, soaking of said washed rice in water with 1:3 rice-to-water ratio for a minimum of 10 minutes at room temperature, cooking of said soaked rice in low heat until the grains swell, spreading said cooked rice in a thin layer container to cool at room temperature, freezing said cooled rice at 20°C for at least 24 hours, thawing said frozen rice at room temperature, drying said thawed rice in an oven

at 65°C for 8 to 12 hours or until dry, packing said dried rice in a stand-up resealable pouch, sealing said stand-up resealable pouch, mixing the refined white sugar, cocoa powder, powdered coconut milk, and glutinous flour in a separate container, transferring said mixture into a separate pouch distinct from the pouch containing the dried red rice, and sealing said pouch using a vacuum sealer. The said process produces a healthy snack with high dietary fiber and antioxidant. Through the process of freeze-thawing, the problem on the absence of method that effectively preserves nutrient is addressed as it enhances the nutritional value of the rice porridge while eliminating the need for artificial additives. The resulting porridge is healthy and nutritious, high in carbohydrates, dietary fiber, and protein and can serve as snack during long travels and can be distributed during calamities.

DETAILED DESCRIPTION OF THE UTILITY MODEL

The present utility model discloses a process for making an instant chocolate aromatic red rice comprising the steps of preparing ingredients which includes unpolished red rice, refined white sugar, cocoa powder, powdered coconut milk, and glutinous flour, washing the unpolished red rice with tap water until impurities are completely removed, soaking of said washed rice in water with 1:3 rice-to-water ratio for a minimum of 10 minutes at room temperature, cooking of said soaked rice in low heat until the grains swell, spreading said cooked rice in a thin layer container to cool at room temperature, freezing said cooled rice at 20°C for at least 24 hours, thawing said frozen rice at room temperature, drying said thawed rice in an oven at 65°C for 8 to 12 hours or until dry, packing said dried rice in a stand-up resealable pouch, sealing said stand-up resealable pouch, mixing the refined white sugar, cocoa powder, powdered coconut milk, and glutinous flour in a separate container, transferring said mixture into a separate pouch distinct from the pouch containing the dried red rice, and sealing said pouch using a vacuum sealer.

The regular glutinous white rice *(Oryza sativa var. glutinosa)* used in traditional chocolate rice porridge was replaced with special purpose rice particularly, red rice which is grown and cultivated in the Central Luzon State University (CLSU). The rice porridge is a good and healthy option during breakfast, snacks, and cold weather that can be a great alternative to instant noodles and canned foods. They are high in carbohydrates, dietary fiber, and protein from the

aromatic red rice. It is a suitable food product during long travels and can be distributed during calamities.

The rice porridge is made out of 47.88% unpolished red rice, 31.91% refined white sugar, 12.23% cocoa powder, 5.32% powdered coconut milk, and 2.66% glutinous flour. The ingredients for the rice porridge are indigenous and available year-round. It is packed in a resealable stand-up plastic bag to ensure its freshness and each bag weighs 150 grams.

The products are evaluated to determine their physicochemical contents, microbial analysis, sensory evaluation, proximate and nutrient analysis. The sensory evaluation showed that the mean value of all the attributes lies within the range of more than 5 indicating that the respondents like all the evaluated attributes and they will definitely buy the product. All attributes lied on neutral scale meaning that all attributes of the rice porridge are not less or too much.

For the proximate analysis, the result showed that the rice porridge had ash content of 1.72%; moisture content, 5.66%; crude protein, 9.88%; and crude fat, 6.69%. It also had a microbial load of >650,000 estimated aerobic plate count (EAPC), <10 yeast and mold (YM), colony-forming unit per gram (CFU/g), <10 E. coli, CFU/g and Salmonella (presumptive). Yeast and molds presented acceptable results based on the standard given by Food and Drug Administration (2013) which is ≤10,000 CFU/g. Results showed that the developed rice porridge was negative for the presence of E. coli and Salmonella. This means that the samples were free from Salmonella and any coliforms, like E. coli which is the main concern of public health.

The nutrient content of the rice porridge is also analyzed, each pack contains total fat (10mg), sodium (25 mg), total carbohydrates (114 g), sugar (36 g), dietary fiber (21 g), protein (15g), Ca (26 mg) and Iron (6 mg). Moreover, based on nutrient analysis, it is packed with energy and has essential nutrients such as carbohydrates, protein, mineral and fiber that our body needs. It is much higher than the other brands in terms of carbohydrates, protein, mineral and dietary fiber.

This utility model addresses the absence of a method that effectively preserves the nutritional value of red rice while improving the functional quality of chocolate rice porridge without the use of artificial additives. By utilizing a freeze-thawing technique, it naturally enhances texture, extends shelf life, and boosts nutrient availability.