SPECIFICATION

Process of Making Cookies Using Cocoyam (*Xanthosoma sagittifolium* (L.) *Schott*) Flour and Desiccated Coconut

Technical Field of the Utility Model

The utility model relates to the field of food processing and manufacturing. Specifically, it pertains to a method of producing cookies that utilizes cocoyam (*Xanthosoma sagittifolium*) flour and desiccated coconut, aimed at improving product variety through the integration of locally available agricultural resources.

Background of the Utility Model

Cocoyam (*Xanthosoma sagittifolium* (L.) *Schott*), locally referred to as “karlang” in Eastern Visayas, is a fast-growing, resilient, and highly nutritious root crop widely cultivated across the Philippines. It can be grown year-round and typically yields ten or more corms per plant, which are either sold fresh or processed through peeling, drying, or freezing (Kennedy & Talsma, 2019). Cocoyam is known for its high content of carbohydrates, dietary fiber, starch, vitamins, and minerals, which makes it a suitable candidate for improving the nutritional value of processed food products. Despite its availability and nutritional potential, cocoyam remains underutilized in commercial bakery applications and processed snack formulations.

Coconut-based ingredients, such as desiccated coconut, are commonly used in the bakery sector due to their desirable flavor, aroma, and texture. Coconut cookies, traditionally made with all-purpose flour, sugar, eggs, and

butter, are widely consumed snacks. However, these conventional cookies are typically low in dietary fiber and do not capitalize on the health benefits offered by local root crops such as cocoyam. Incorporating cocoyam into baked products can help address this gap, but the level and method of inclusion must be carefully formulated to maintain sensory quality.

Prior art has explored various formulations using root crops and alternative flours to enhance the nutritional content of cookies. For example, Chinese patent CN105594821A discloses cookies made with 500–600 parts cassava flour, aiming to fully replace wheat flour to lower costs and improve fiber content (https://patents.google.com/patent/CN105594821A/en). Other research reports blending cocoyam with malted soybean in ratios of 95:5 to 85:15, showing acceptable sensory and nutritional outcomes (https://africanscholarpub.com/ajsitr/article/view/148). A study using cocoyam, sorghum, and pigeon pea flour—where cocoyam made up 16.7% of the formulation—demonstrated improved protein content and quality (https://pmc.ncbi.nlm.nih.gov/articles/PMC3951563). Additionally, cookies formulated with cocoyam or plantain flour have been found to increase dietary fiber by 20–30% compared to standard wheat-based cookies (https://onlinelibrary.wiley.com/doi/10.1155/2023/6762289). However, these studies also noted that high substitution levels often negatively impacted taste, texture, and visual appeal.

Despite these advances, no prior art specifically discloses a composition and process for cocoyam-coconut cookies that retains all-purpose flour as the primary structure while incorporating measured amounts of cocoyam flour and desiccated coconut. This utility model addresses that gap by offering a novel

formulation and preparation method that enhances nutritional value through the inclusion of cocoyam and coconut while preserving desirable sensory attributes.

This utility model has practical applications in community livelihood programs, school-based food production, health-oriented microenterprises, and small- to medium-scale bakeries. The potential markets for this product include nutrition-conscious consumers, public school feeding programs, rural cooperatives, and enterprises promoting value-added products from indigenous crops. Additionally, due to its unique local ingredients and appealing flavor profile, cocoyam-coconut cookies can also serve as excellent *pasalubong* or souvenir items that can be marketed in *pasalubong* centers and regional food specialty shops, supporting tourism and regional pride.

Summary of the Utility Model

The primary object of this utility model is to provide a cookie composition and process that incorporates cocoyam flour and desiccated coconut in defined proportions to improve the nutritional value and market potential of a conventional flour-based cookie.

This utility model was developed to address the underutilization of cocoyam (*Xanthosoma sagittifolium* (L.) *Schott*), a nutrient-rich local crop, in commercially viable food products. Traditional cookies rely heavily on refined wheat flour and offer limited nutritional value, while high substitution of alternative flours often compromises taste and texture. The utility model solves this problem by formulating a cookie with 10% cocoyam flour and 15%

desiccated coconut by weight—enhancing dietary fiber, micronutrients, and local crop utilization—without altering the cookie's sensory acceptability.

The disclosed process outlines simple and replicable baking steps that are suitable for small-scale production, making the product accessible to local bakers, food entrepreneurs, and community-based processors. Beneficiaries of this utility model include farmers growing cocoyam and coconut, small to medium food processors, and consumers seeking affordable and healthier snack alternatives. Furthermore, the finished product is suitable for commercialization in local markets, tourist destinations, and pasalubong centers, providing economic opportunities for rural enterprises.

Detailed Description of the Utility Model

The present utility model relates to a cookie composition and its preparation process, particularly to cookies made using cocoyam (*Xanthosoma sagittifolium* (L.) *Schott)* flour and desiccated coconut (*Cocos nucifera*). In this formulation, all-purpose flour serves as the primary base, while cocoyam flour and desiccated coconut are introduced as a value-adding component. This utility model supports the use of locally available crops like cocoyam and coconut in commercial baked products.

The standard composition of the cocoyam-coconut cookie includes 20.5% all-purpose flour, 10% cocoyam flour, 15% desiccated coconut, 14% whole egg, 24.17% white sugar, 0.33% baking powder, and 16% softened butter. To prepare the cookies, all ingredients are first accurately measured. The softened butter is creamed in a large mixing bowl until it becomes smooth. In a separate container, the dry ingredients, comprising all-purpose flour,

cocoyam flour, white sugar, baking powder, and desiccated coconut are thoroughly mixed until evenly distributed. This dry mixture is then added to the butter while stirring continuously. The whole egg is added during mixing to help bind the ingredients. The resulting dough is mixed for approximately five minutes, either manually or using a mixer set on low speed, until a uniform and workable consistency is achieved. The dough is then portioned and shaped into individual cookie pieces, arranged on a baking sheet lined with parchment paper, and baked in a preheated oven at 170°C to 180°C for about 20 minutes or until golden brown. The cookies are cooled after baking and are ready for consumption or packaging.

In one embodiment of the utility model, the formulation is scaled to produce a total of 1 kilogram of cookie dough. Based on the percentage composition, the specific weights of the ingredients are as follows: 205 grams of all-purpose flour (20.5%), 100 grams of cocoyam (*Xanthosoma sagittifolium* (L.) *Schott*) flour (10%), 150 grams of desiccated coconut (*Cocos nucifera*) (15%), 140 grams of whole egg (14%), 241.7 grams of white sugar (24.17%), 3.3 grams of baking powder (0.33%), and 160 grams of softened butter (16%). The procedure remains unchanged: the butter is creamed, the dry ingredients are mixed and added to the butter, the egg is incorporated, and the mixture is stirred into a cohesive dough. The dough is shaped, baked at 170°C to 180°C for 20 minutes, cooled, and made ready for packaging or serving.

Based on 1 kilogram of total cookie dough

To begin the process of making cocoyam-coconut cookies, prepare and accurately measure all the required ingredients using a digital kitchen scale to ensure precision. The ingredients for a 1-kilogram batch are as follows: 205

grams of all-purpose flour, 100 grams of cocoyam flour, 150 grams of desiccated coconut, 140 grams of whole egg (approximately 2 to 3 medium-sized eggs), 241.7 grams of white sugar, 3.3 grams of baking powder (around ½ teaspoon), and 160 grams of softened butter. Make sure the butter is softened at room temperature to ease the mixing process. Also, sift the all-purpose flour, cocoyam flour, and baking powder to remove any lumps and to aerate the mixture, which will contribute to a lighter cookie texture.

Begin the mixing process by creaming the butter. Place the 160 grams of softened butter into a large mixing bowl and beat it using a wooden spoon or an electric hand mixer on medium speed for about 2 to 3 minutes or until the texture becomes smooth, creamy, and slightly pale in color. This step is crucial as it incorporates air into the butter, helping to improve the cookie's final texture. Next, gradually add the white sugar (241.7 grams) to the creamed butter while continuing to mix. Beat the butter and sugar mixture for another 2 to 3 minutes until it becomes light and fluffy. Proper creaming helps in the even distribution of sugar and enhances the spread and texture of the cookies during baking. Once the butter and sugar are creamed together, add the whole eggs (140 grams) into the mixture. Crack the eggs into a separate bowl to check for shells or spoilage, then add them to the creamed butter and sugar mixture. Mix thoroughly for another 1 to 2 minutes until the egg is fully incorporated and the mixture appears cohesive and slightly glossy.

In a separate bowl, combine all the dry ingredients: 205 grams of all-purpose flour, 100 grams of cocoyam flour, 3.3 grams of baking powder, and 150 grams of desiccated coconut. Mix these dry ingredients with a whisk or spoon to ensure even distribution of the leavening agent and coconut flakes

throughout the flour mixture. Once well-mixed, gradually incorporate the dry mixture into the wet mixture (the butter, sugar, and egg blend). Add the dry ingredients in parts, mixing slowly using a spatula or mixer on low speed after each addition to avoid flour spillage and to ensure that all ingredients are thoroughly combined.

Continue mixing the dough until no visible traces of flour remain and the texture of the dough is smooth, soft, and pliable. Be careful not to overmix at this stage, as excessive mixing may develop gluten in the flour, resulting in tough cookies. Once the dough reaches the desired consistency, prepare a baking tray by lining it with parchment paper or lightly greasing it with butter or baking spray. Use a spoon or cookie scoop to portion the dough into evenly sized balls or drop them directly onto the tray, leaving about 1.5 to 2 inches of space between each cookie to allow for expansion during baking. Flatten each dough portion slightly with the back of a spoon or your palm if a flatter cookie is preferred.

Preheat a conventional oven to 170°C to 180°C (338°F to 356°F) for at least 10 minutes to ensure even baking temperature. Place the tray with the cookie dough into the center rack of the preheated oven and bake for approximately 18 to 20 minutes or until the edges turn golden brown and the center is firm to the touch. Baking times may vary depending on oven type and cookie size, so observe the cookies closely near the end of the baking period to prevent overbaking.

After baking, remove the tray from the oven and allow the cookies to cool on the tray for about 5 minutes to firm up. Then, carefully transfer the cookies

to a wire rack to cool completely. Once fully cooled, the cookies can be packed in airtight containers or packaging materials suitable for storage or distribution.