

A Study on a Series of Toon Cookies Production Process and Recipe

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Abstract: Research to determine the production process and recipe of toon cookies, to remove the bitterness of toon, research and analysis of different people for the taste test of toon cookies, to further determine the feasibility of the product. The parsnip leaves are thick, and the leaf buds are very tender, and the young buds and young leaves are fragrant and refreshing, so they can be eaten as a vegetable with a strong fragrance and are much richer in nutrients than other vegetables. One of the additives, erythritol, helps the body's blood sugar balance. Modern medical research shows that the decoction of Tsubaki has obvious apparent and bactericidal effects on *Staphylococcus aureus*, *pneumococcus*, *dysentery bacillus*, *typhoid bacillus*, *Escherichia coli* and *Pseudomonas aeruginosa*.

Keywords: toon, de-bittering, cookie

1. Introduction

Today's cookie varieties are developing toward casual and functional foods, which are popular because of their storage resistance, easy portability and diverse flavors. However, most cookies are not suitable for some specific groups of people due to their unreasonable formula, high sugar content, high-calorie content, single function, many kinds of food additives and high-fat content^[1]. The nutritional value of wild vegetables is more elevated than ordinary vegetables, with unique flavor, natural pollution-free, safe without pesticide residues, high nutritional value, medicinal food and other characteristics, known as healthy food and green food. China is one of the regions with the most extended history of fantastic vegetable utilization, with abundant wild vegetable resources, wide distribution and profound cultural heritage.

Toon is a kind of wild vegetable, containing fat, crude fiber, iron, carotene, nicotinic acid and toonin, which is not only nutritious, delicious tasty, but also contains unique physiological active substances, and is an essential raw material for the development of Chinese herbal medicine and functional food. The high medicinal value of the toon makes it a prized delicacy at banquets. The cookies are made by combining the refreshing and nutritious wild vegetable toon with delicious and convenient cookies, extracting the essence of wild vegetable juice, and using erythritol instead of white sugar^[2], resulting in light and low-fat cookies, which are richer in nutrients than commercially available cookies, making them not only delicious and nourishing, but also less oil and lower calories for a healthy diet.



Figure 1: Schematic diagram of toon cookies

2. Materials and Methods

2.1. Biscuit Recipe

Each group of experiments was prepared in components by weight: 30 to 45 components of whole wheat flour, 12 to 25 components of fresh toon sprouts, 25 to 30 components of eggs, 1 to 2 components of baking soda, 2 to 3 components of erythritol, 1 to 3 components of shortening, 25 to 30 components of orange juice, 1 to 3 components of butter, 2 to 6 components of vanilla powder, 1 to 2 components of β -cyclodextrin, 1 to 2 components of salt, 15 to 25 components, soybean flour 15-25 components, grapefruit jam 5-10 components, wheat flour 35-45 components, oats 15-20 parts, quinoa 3-7 components.

2.2. Biscuit Making Method

(1) Select fresh toon sprouts and blanch them by heating them in boiling water until they are half cooked.

(2) soak the toon sprouts treated by step (1) and 2 to 4 parts of cation exchange resin together in 25 to 45 parts of water for 8 to 15 minutes, then rinse and dealkalize the toon sprouts with tap water.

(3) place the toon sprouts treated by step (2) in 25 to 45 parts of water while adding 2 to 4 parts of 2.0% resin, keeping the temperature at 8 to 12 °C for 50 to 70 minutes, and then wash and rub with pure water to remove the bitter juice.

(4) Extract the juice from the toon buds treated in step (3), take the juice and mix it with the low gluten flour, egg, malt flour and erythritol, then mix it with baking soda, vanilla powder, salt, β -cyclodextrin, shortening and orange juice to make a sticky consistency, press it into shape and bake it at a temperature of 250 to 320 degrees Celsius until it is cooked.

3. Toon Cookies Main Ingredients Functional Description

Orange juice: it is appetizing, moistens the lungs, dissolves phlegm and relieves cough, and can help block the formation of carcinogenic nitrosamines in toon.

Grapefruit jam: in the process of potassium supplementation, it also has a specific effect on sodium excretion. Its rich insulin-like composition can effectively lower blood sugar and blood lipids, and can also strengthen the stomach and cleanse the intestines. The particular aromatic esters it also contains have a perfect insect repellent effect^[3].

Whole wheat flour: rich in a large amount of fiber, not absorbed by the intestines but can assist in intestinal peristalsis. Whole wheat flour is fat-free, low in calories, rich in complex carbohydrates, and a natural source of water-soluble dietary fiber^[4].

Soybean flour: contains a variety of essential nutrients, including calcium and phosphorus. To prevent osteoporosis in the elderly, and phosphorus is beneficial to people with neurological weakness and physical weakness. And the dietary fiber in soybeans can strengthen the spleen and promote dampness, relieving weakness of the spleen and stomach and lack of qi and blood^[5].

Oats: which are rich in linoleic acid, can account for 35% to 52% of all unsaturated fatty acids. Oats are rich in dietary fiber and satiety, suitable for slim people.

Quinoa: protein content is comparable to beef, and in addition to essential amino acids for humans, it also contains lysine, which is not found in most crops. As a whole grain whole nutrition complete protein alkaline food, the sugar and fat content and calories are at low level, a low fructose and low glucose food^[6].

Toon Biscuit: As the main raw material, toon contains 9.8 grams of protein per 100 grams, which is the highest among vegetables, and also rich in calcium and vitamin C, phosphorus, carotene and iron, B vitamins and other nutrients. Therefore, this product has the efficacy of clearing heat and detoxifying, strengthening the stomach and appetite.



Figure 2: Toon cookie packaging three-dimensional schematic diagram

4. Toon Cookie Series Derivative Products Raw Material Ratio Determination

Experimental example 1: Toon cookies for a general population

Material preparation: low gluten flour, fresh toon sprouts, eggs, baking soda, erythritol, shortening, orange juice, malt powder, vanilla powder, β -cyclodextrin, salt, butter

Implementation steps.

(1) Selecting fresh toon sprouts and blanching them by heating them in boiling water until they are half cooked.

(2) soak the toon sprouts treated by step (1) and cation exchange resin together in 30 parts of water for 10 minutes, then rinse and de-alkalize the toon sprouts with tap water.

(3) put the toon sprouts treated by step (2) in the water while adding 2.0% of resin, keeping the temperature at 10°C for 60 minutes, then wash and rub with pure water to remove the bitter juice.

(4) extract the juice from the toon sprouts treated in step (3), take the juice and mix it with low gluten flour, eggs, malt flour, butter, and erythritol, then mix it with baking soda, vanilla powder, salt, β -cyclodextrin, shortening, and orange juice to make a sticky consistency, press it into shape and bake it at a temperature of 290 to 300 degrees Celsius until it is cooked.

The resins described in steps (2) and (3) above are AMBERLITE XAD-16HP large pore-sized adsorbent resin.



Figure 3: Schematic diagram of toon cookie production process1

Experiment example 2: Toon cookies for intestinal roundworm disease

Material preparation: Compare with Experiment Example 1, replace butter with canola oil and add grapefruit jam.

Implementation steps.

Steps (1-3) as in Experimental Example 1.

Juice the toon buds treated in step (3), take the juice and mix with a low gluten flour, eggs, malt

flour, erythritol, canola oil, then mix with baking soda, vanilla powder, salt, β -cyclodextrin, shortening, orange juice to form a sticky consistency, press and bake at 250-260 degrees, bake until cooked; then add grapefruit jam to make Sandwich cookies.



Figure 4: Schematic diagram of toon cookie production process2.

Experiment Example 3: Toon cookies for middle-aged and elderly men

Material preparation: compare with Experiment Example 1 by replacing low gluten flour with whole wheat flour and adding soybean flour.

Implementation steps.

Steps (1-3) as in Experimental Example 1.

Juice the toon sprouts treated in step (3), take the juice and liquid and mix with whole wheat flour, malt flour, soybean flour, eggs, butter and erythritol, then mix and stir with baking soda, shortening, grass flour, β -cyclic dextrin, salt and orange juice to form a sticky consistency, press and shape and bake at 250 to 260 degrees, until cooked.



Figure 5: Schematic diagram of toon cookie production process3.

Experiment 4: Toon cookies for female lovers

Material preparation: compare with Experiment Example 1 to replace low gluten flour with whole wheat flour, replace malt flour and vanilla flour with wheat flour, add oats and quinoa

Implementation steps.

Steps (1-3) same as practical example 1.

(4) by step (3) processing toon sprouts juice, take its juice and liquid with whole wheat flour, wheat flour, oats, quinoa, eggs, butter, granulated erythritol mix and stir, then with baking soda, shortening, orange juice stir modulation into a sticky shape, press molding and baking, temperature 220 ~ 230 degrees, bake until cooked; then add grapefruit jam to make sandwich cookies.

5. Consumer Taste Feedback

5.1. Questionnaire

According to different suitable groups of people, they are using different ingredients ratio,

consumer taste feedback on the product. In the research and sampling of toon cookie series products, questionnaires were distributed and collected, and the specific style of questionnaires is as follows.

Toon cookie series product research	
1. Your age group	<input type="checkbox"/> Under 18 years old <input type="checkbox"/> 18-25 years old <input type="checkbox"/> 26-35 years old <input type="checkbox"/> 36-50 years old <input type="checkbox"/> Over 50 years old
2. Your gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
3. Which of our products do you prefer?	<input type="checkbox"/> For general public <input type="checkbox"/> Intestinal roundworm disease applicable type <input type="checkbox"/> For middle-aged and elderly men <input type="checkbox"/> Suitable for women who love beauty
4. How do you rate the taste of our products?	

Figure 6: Example of a research questionnaire for a toon cookie series.

5.2. Consumer Taste Feedback

The analysis of the questionnaire collection shows that:

Percentage distribution of consumer taste evaluation keywords

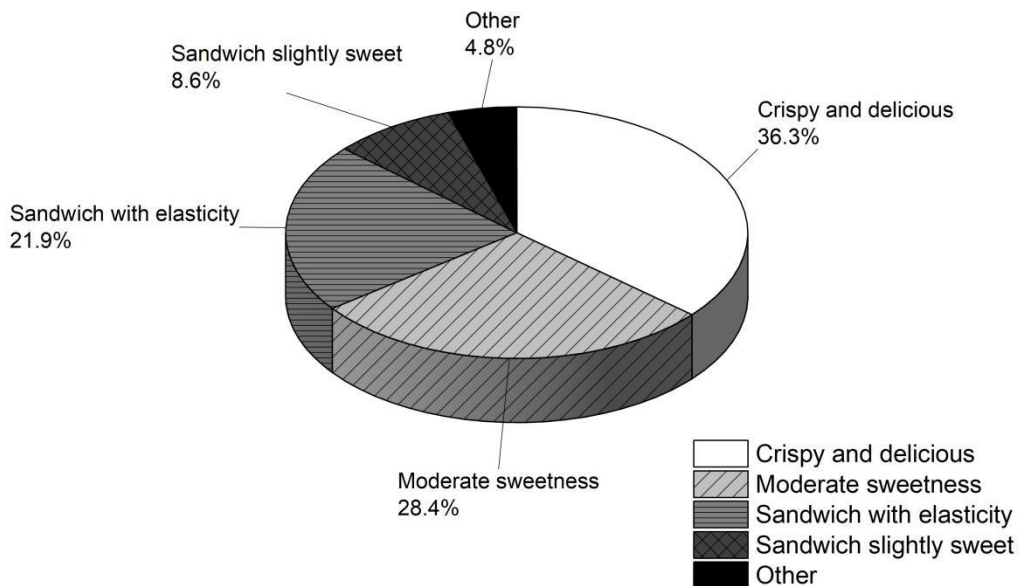


Figure 7: Percentage distribution of consumer taste evaluation keywords.

According to the questionnaire data: from the keywords of consumers' taste evaluation of toon

cookie series products, the bitterness removal technology of this product achieves the purpose. It not only removes the bitter taste of wild toon, but also retains the original nutrients as much as possible, and replaces white sugar with erythritol, which still has a slightly sweet taste while reducing sucrose intake and controlling blood sugar and blood pressure, which is in line with the public taste and can be promoted and sold.

6. Conclusion

With the support and encouragement of the national policy, the implementation of this product could lead to local farmers harvesting wild vegetables accordingly by acquiring them, and even reach the scale of artificial cultivation in the future when the demand is high. Through this series of industrial chain transformations, the farmers' income will be increased, and it will become a driving force to get rid of poverty. The toon cookies described in this paper use a bittering process to remove the bitter taste carried by the toon itself, while retaining the original nutrients. From the perspective of Chinese medicine, The Chinese toon is pungent, bitter and flat. For people who suffer from summer dampness, nausea, vomiting, loss of appetite, diarrhea, swollen and painful limbs, and lack of food and drink, proper consumption of Chinese toon is good for dispelling summer dampness and improving appetite. The cookie is very rich in carbohydrates, which is also an essential nutrient for the body, providing the body with the calories it needs, as well as regulating fat metabolism and replenishing the dietary fiber the body needs. This product also adopts erythritol instead of white sugar, which ensures sweetness and lowers blood pressure instead of rising after consumption, helping the body's blood sugar balance. At present, this product has applied for one patent for invention (actual trial stage; patent number: 202010528216.0) and one patent for design (patent number: ZL 2020 3 0294679.6). The product has a reasonable formula, the taste meets the needs of most people, and its low salt content, low-fat content, low calories, and good taste make it suitable for all kinds of people to eat.



Figure 8: Toon cookie packaging plane diagram.

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