

Leavened bread and donut made of rice flour

Rice consumption in Korea is decreasing due to the people's shift in preference towards simple western food, the increase in the number of working women who are unable to do home cooking, and the change in young people's eating culture more inclined toward exotic restaurants and fast-food stores. Thus, it is necessary to revive rice consumption in the country by developing various rice food products that suit the Korean people's taste, such as by using rice flour as a substitute for wheat flour.

Rice can be processed into various forms of pre-mixture to make breads and cookies. The tastes and functions of rice products can be enhanced by adding natural coloring materials. To promote rice consumption, various breads and donuts were made using a mixture of wheat and rice flour. By measuring the level of acceptance in terms of appearance and taste, standard recipes for proper mixing ratios were developed.

In this study, four colors of paprika powder (red, orange, yellow, and green) were used as sources of natural colors. While high quality paprika of good commercial value is desirable, low quality paprika can also be used for the purpose.



Fig. 1. Donut made of rice flour



Fig. 2. Cookie made of rice flour



Fig. 3. Donut made of multi-purpose pre-mixture with natural coloring

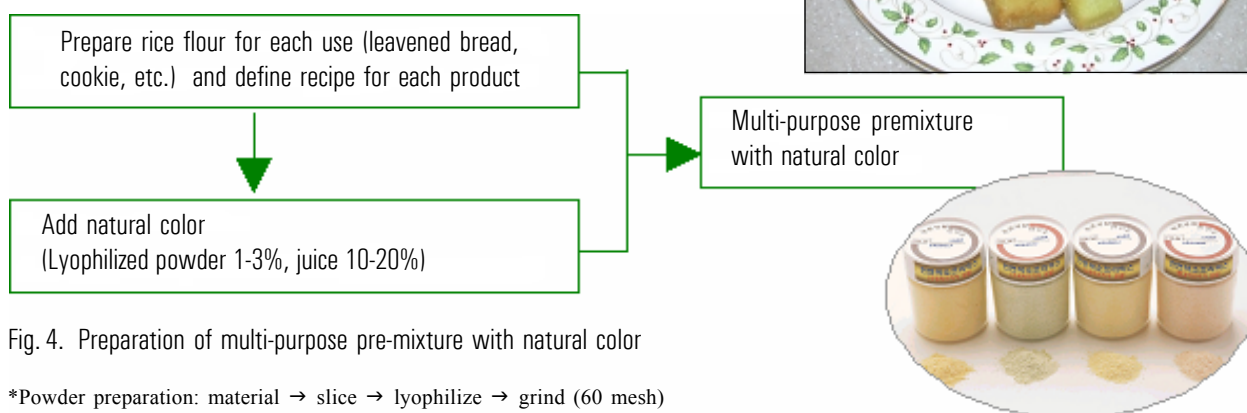


Fig. 4. Preparation of multi-purpose pre-mixture with natural color

*Powder preparation: material → slice → lyophilize → grind (60 mesh)
Juice preparation: material → slice → squeeze

Cooperating agency for this topic:

Preparation

The first step is to develop standard recipes for rice flour foods (bread, donut, cookie, etc.) using paprika powder to come up with five different colors. Based on the results of a sensory test, the optimal rice flour proportions as substitute for wheat flour are 15-30% for bread, 20-60% for donut, and 20% for quick bread. In these mixtures, the final products (Figs. 1-3) proved to be excellent in taste and quality. The pre-mixture with the right combination of rice, wheat, and paprika powder can be prepared in advance of making the final products (Fig. 4). A suitable pre-mixture can be selected for each

product, and other flavoring materials such as milk, butter, etc. can be added to make the breads and cookies more tasty and acceptable.

Benefits

The addition of rice flour as substitute for wheat flour may increase the cost of breads and cookies. However, the use of low-quality paprika can provide highly functional natural coloring and essential nutrients. More importantly, the fundamental benefit of this technology is the increase in rice consumption, and a decrease in Korea's wheat importation (Fig. 5).

When making a leavened bread at home without using natural color pre-mixture, follow the recipe below:

| Ingredients | Amount (g) | | | Procedure |
|-----------------|------------------|------------------|------------------|---|
| | 20% | 40% | 60% | |
| Strong flour | 430 | 330 | 230 | 1. Sieve strong flour and rice flour with the use of sieve #3 2. Add all ingredients (sugar, salt, yeast, dry milk, milk, and egg) except butter to the sieved flour, mix, add butter softened at normal temperature, and knead dough. 3. Leaven for 40 minutes (in a warm place). 4. Take out the dough, remove air, form donut and arrange on a tray with enough space, and cover with wet cotton cloth for around 20 minutes to prevent drying and further leavening. 5. Fry in oil at 170°C, turning it over until the surface color turns light brown, then put sugar and cinnamon powder on the surface. 6. Put bean jam filling inside the donut for a better, more appetizing taste. |
| Rice flour | 100 | 200 | 300 | |
| Milk | 280 | 260 | 240 | |
| Egg | 50 | 50 | 50 | |
| Dry milk | 15 | 15 | 15 | |
| Salt | 5 | 5 | 5 | |
| Sugar | 15 | 15 | 15 | |
| Butter | 65 | 65 | 65 | |
| Yeast | 7 | 7 | 7 | |
| Cinnamon powder | Desired quantity | Desired quantity | Desired quantity | |



Fig. 5. Educating consumers how to make rice flour products