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Pasta from Organic Jasmine Rice

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Abstract

Pasta processing from organic jasmine rice was the aim of the utilization of organic agricultural produce considering environmental awareness, natural balance and biological diversity. The pasta was pesticide free which of benefit to manufacturer's and consumer's health and has no adverse effect to the environment. Product development from organic agriculture focuses on value added, creation of a new product for the market and protecting consumer's health. For the manufacturing of pasta from organic jasmine rice and the development of its formula, it was determined that the product needed 200 g organic jasmine rice flour, 50 g organic wheat flour, 12.5 g organic tapioca flour, 110 g organic chicken egg, 11 g organic olive oil, 5 g salt and 70 g water. To manufacture dry pasta, the dough was kneaded, made into pasta sheet in pasta machine, simmered in boiling water and dried at 60 °C in a hot air oven for 6 h. After that, the nutritive value was determined. It was found that pasta from organic jasmine rice contained 85.4% carbohydrates, 8.4% fat, 3.0% of moisture, 2.0% proteins and 1.1% fibers respectively. The study of shelf life of pasta at room temperature for 3 months showed that the product color had not changed. However, the moisture and water contents increased slightly. For total microbial and yeast count, it was found that the product was meeting the food safety levels.

Keywords: Pasta, Organic Jasmine rice

Introduction

The guidance for the utilization of organic agricultural product such as processing pasta from organic jasmine rice is one more way to add value for organic agricultural product and new product in market also get one more way for consumer that maintains one's health. Composition of pasta feature with wheat flour by majority that imported from

foreign. If the pasta formula is developed by using Thai jasmine rice flour, it will be a way for using benefit from rice flour and reducing to use wheat flour from abroad.

The pasta is the dough which produce from Durum wheat. Durum wheat is hard type of wheat flour with high protein and fiber (Sumon, 2005) and also one of the most popular food in Mediterranean area, Italian and another country at Western Europe. There are two main types of pasta. First, fresh pasta (non-durum) which mixed with egg, fresh pasta flour and olive oil. After this pasta were done, turn press to thin sheet and cut to line shape or another shape of the fact that fresh pasta can preserve only a few day so it most common fresh pasta can be for homemade. The second, dried pasta which made from Salimona flour ground from Durum wheat and mixed with water. Durum is high gluten, tightly flour so it can made to many shape (Chada and Sangsome, 2002)

In wheat flour, there are two types of protein that assemble by suitable portion are Glutenin and Gliadin. When flour begin insoluble in water with suitable water will composite "gluten". Type of gluten are elasticity and tough, gluten is store of gas to produce necessity framework of products (Jintana and Orn-anong, 1996). Gluten from vegetation kind of paddy like wheat, barley, oat and rye even if gluten give benefit and worth to body but a gluten is one kind of allergen can case of wicked thing. The development of food product from rice flour with out of gluten will be one more way for consumer who have an allergy with gluten from wheat flour.

Yaowaluck and Somrak (2004) studied about quantity of chili and basil leaves to added to pasta that suitable for added to pasta found pasta chili and basil leaves get extreme agree with quantity at 1:4. Tipawan and Ploy-thip (2004) studied about quantity of beetroot that suitable with pasta by studied quantity of beetroot juice replace to water in all ingredient and added beetroot flesh in differ amount found that pasta add 22.50 % beetroot got extreme agree. Narumon and Nuntinee (2003) found that pasta which added 10%garlic got extreme agree. Siripan and Karuna((2003) studied about brown rice flour to produced ready to eat pasta with freezing depression by used brown rice flour replace bread flour. It was found that pasta with added more brown rice flour take time for scald will lower by step from sensory evaluation 25% brown rice flour pasta got extreme overall likely, Proximate evaluation of 25% brown rice flour pasta found that moisture, protein, fat, fiber and ashes were 14.35, 20.14, 5.12, 1.08 and 0.82 respectively. Sensory evaluation of brown rice pasta packed in thick plastic bag polypropylene not differ with pasta that did not freezing depression by significance ($p \leq 0.05$).

Materials and Methods

Preparation of organic jasmine rice flour

Soaked organic jasmine rice and kept at 10 °C one night, grinded it with grinder by mix with water in ratio of rice per water at 1: 2 for 5 minutes. Then organic jasmine rice flour was dried by Binder FED 720 at 60 °C for 6 hours. Organic jasmine rice flour was grinded by grinder after that passed through sieve shaker size 70 Mesh.

Pasta preparation and cooking

Sake rice flour, wheat Flour, tapioca flour and salt together then slope on ingredient into a slope, added an egg, thrashed mixture by paddle (Kenwood) by minimum power for 1 minutes after that added water, thrashed again for 2 minutes. Added olive oil,

thrashed mixture by minimum power for 3 minutes after that thrashed mixture by hand for 5 minutes. So leaved its for 15 minutes after that put in to pasta machine (AMPIA 150) number 1 and 3. Scatter over mixture by tapioca flour for be a dry face powder. Boiled raw pasta for 4 minutes, next washed with cold water and waited for drain. Dried fresh pasta in hot air oven (Binder FED 720) at 60 °C for 6 hours. Then dehydrate pasta was kept at close box. To revert (to original condition) pasta by added 250 g dried pasta in 2 liter boiled water for 15 minutes then pick up and passed pasta by cold water immediately. Pasta was drained before sensory evaluation.

Proximate analysis and physical property

Analysis dried pasta for moisture content by hot air oven (Binder FED 115) (AOAC, 1990), the protein content by Foss 2508 machine (AOAC 1990), the water activity (a_w) by Aqua lab, the total fat content by Foss Total Fat 2055 (AOAC, 1990), the crude fiber content by Foss fiber M16 (AOAC, 1990), the ashes content by oven carbolite (AOAC, 1990), the carbohydrate content by calculation and detected color by compare with Muncell book.

Analysis of the microbial quality

Quantitative analysis of aerobic plate count (APC) and Yeast and Molds by FDA-BAM (2001) method.

Sensory evaluation

Sensory evaluation of this research by 30 panelists. Evaluated color, aroma, flavor, texture and overall likely by 9-point Hedonic Scale. Compared of this sensory evaluation is Randomized Complete Block Design RCBD, Analysis of variance in ANOVA and analysis Least Significant Difference (LSD) at statistical significance 95%

The study of standard formula of pasta

Experimental design for find the best standard formula to produce pasta from 6 standard formula at table 1. Produced pasta from process above, to compare for find the best type of pasta.

Table 1 Standard formula of pasta

Material	Weight (g)					
	formula 1	formula 2	formula 3	formula 4	formula 5	formula 6
Wheat flour	250	250	250	260	250	170
Egg	50	30	110	124	110	80
		(egg yolk)				
Olive oil	1	20	15	-	11	-
Water	70	85	-	20	70	-
Salt	5	5	5	6	5	10
Sugar	-	-	-	-	-	25
Garlic	-	-	-	-	-	10
Soy sauce	-	-	-	-	-	25

Appropriate amount of rice flour to replace wheat flour.

Select the best standard formula from table 1 to produce organic jasmine rice pasta by replace wheat flour according to jasmine rice flour on appropriate amount for produce

pasta, used wet jasmine rice flour then analysis the preference from panelist by sensory evaluation tests.

Appropriate amount of tapioca flour to organic jasmine rice pasta.

Select the best standard formula from table 1 to produce pasta from organic jasmine rice then add tropical flour into formula by used 5% and 10% from whole flour and study preference by observe.

Proximate analysis.

Proximate analysis from organic jasmine rice pasta was determined in terms of assess nitrated value excepted protein, fat, moisture, ashes, fiber and carbohydrate.

Shelf life of product.

Organic jasmine rice pasta was dried by hot air oven in 60 °C for 6 hours. Packed dried pasta by thick plastic in a vacuum condition. Keep an example product at room temperature then record all difference between keep in 0, 1, 2 and 3 month. Quality of pasta in form of aerobic plate count, yeast & mold, water activity and color was examined

Results and Discussion

Standard formula of pasta

From an analysis of result, formula number 5 was selected, because this formula was the best characteristic pasta. Type of pasta color was yellow; little smell of flour – olive oil, after scald, pasta texture was soft and tough. When bake pasta to dried at 60 °C found that pasta was little broken while another formula of pasta was broke and easy to worn.

Appropriate amount of rice flour to replace wheat flour

Pasta was produced followed number 5 formula in table 1. For replace wheat flour according to jasmine rice flour on appropriate amount by 40, 60, 80, and 100% to found a high amount in used rice flour to replace wheat flour to produced jasmine rice pasta by wet flour and evaluate apparent type result test. Sensory evaluation result test showed on table 2.

Table 2 Sensory evaluation of pasta from appropriate amount of rice flour to replace wheat flour in difference quantity.

Qualification	Average Score			
	treatment 1 (replace 40 %)	treatment 2 (replace 60 %)	treatment 3 (replace 80 %)	treatment 4 (replace 100 %)
color	<u>6.90^a</u>	6.63 ^b	6.62 ^b	6.26 ^c
aroma	6.85 ^b	<u>7.90^a</u>	<u>7.90^a</u>	7.85 ^a
flavor	7.10 ^b	7.87 ^a	<u>7.88^a</u>	7.80 ^a
texture	<u>7.50^a</u>	7.40 ^a	7.35 ^a	6.45 ^b
Overall liking	<u>7.30^a</u>	7.27 ^a	7.25 ^a	6.85 ^b

Notice: Values within rows followed by a difference letter are difference ($p \leq 0.05$).

The result test found that panelists marked a first formula in color, texture and overall likely very much. On the average the texture and overall likely not differ with formula 2 and 3 and panelist mark an aroma from formula 2 and 3 very much. Even 4 formula also. Side of flavor 3 formula get mark very much but not differ with formula 2 and 4. Side of overall linking found that an appropriate highest amount of rice flour to replace wheat flour by taste from panelist agree with 3 formula replace 80% . From result test show in the table 2 found that amount of rice flour replace wheat flour by 80% can replace in highest because 100% of rice flour replace to wheat flour pasta became rough, after scald type of pasta have soft, not tough and easy to worn. Type of pasta after bake was broken, easy to worn but owing to toughness type of pasta not reach as expected so have to develop in next level.

Appropriate amount of tapioca flour to add into organic jasmine rice pasta formula

After adding tapioca flour into pasta composition at the portion of 5% and 10% of flour in formula. The results was found that adding 5% tapioca flour made to color of pasta became yellowing, an aroma have smell of flour and olive oil. Type of pasta after scald was long, soft and tough but after baked type of pasta was not broken. Adding 10% tapioca flour was same quality but texture of pasta was hard. So, an appropriate of tapioca to add in pasta is 5%.

Proximate analysis

Dried pasta from selected formula was used to study proximate composition. The results showed on table 3

Table 3 Proximate compositions of raw pasta from organic jasmine rice

Compositions	Quantity (%)
Carbohydrate	84.39
Total fat	8.40
Moisture	3.03
Protein	2.03
Fiber	1.13
Ashes	1.02

Shelf life of pasta from organic jasmine rice

The results of quality of pasta from organic jasmine rice stored at room temperature for 3 months are showed in table 4

Table 4 Shelf life of raw pasta from organic jasmine rice at room temperature

Storage time (month)	Quality					
	Color (Hue Value/Chroma)	Moisture (%)	Aw	APC (CFU/g)	Yeast&Mold (CFU/g)	
0	2.5Y 8/4	3.08	0.50	<25	<25	
1	2.5Y 8/4	3.10	0.56	<25	<25	
2	2.5Y 8/4	3.25	0.61	<25	<25	
3	2.5Y 8/4	3.50	0.64	<25	<25	

The study of shelf life of pasta at room temperature for 3 months showed that the product color had not changed. However, the moisture and water contents increased slightly. For total microbial and yeast count, it was found that the product was meeting the food safety levels. In

a result of this product was baked to dried form so water activity value lower than 0.7. Therefore microorganism can not grow up in a little moisture. (Bussakorn, 2007)

Conclusion

Formula of pasta from organic jasmine rice compost of 250 g rice flour (43.6%), 50 g wheat flour(10.9%), 12.5 g tapioca flour(2.7%), 110 g chicken egg(24%), 11 g olive oil (2.4%), 5 g Salt (1.1%) and 70 g water (15.3%). Pasta from organic jasmine rice contained 85.4% carbohydrates, 8.4% fat, 3.0% of moisture, 2.0% proteins and 1.1% fibers respectively. The study of shelf life of pasta at room temperature for 3 months showed that the product color had not changed, the moisture and water contents increased slightly, total microbial and yeast count was meeting the food safety levels.

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