Nutritional Quality of Fish Mixed with Algae Tofu

Onuma Kamdaeng

Food Industry and Service

Suan Sunandha Rajabhat University

Abstract

Fish mixed with algae tofu (FAT) was developed to increase the nutrition and to valuate the tufu. FAT was an alternative for healthy consumers. It was prepared from soybean (500 g), mackerel (75 g), algae (25 g), egg albumin powder (7.5g), potato starch (5 g), $MgSO_4$ (25 g), salt (7.5 g), pepper (2.5 g), sugar (5 g), and water (2,500 g). Then they were fried at 150 ^{o}C for 1 min. The chemical quality of FAT had moisture, carbohydrate, protein, fat, ash, fiber and calcium were 75.37%, 6.06%, 15.46%, 1.42%, 1.61%, 1.99%, and 1.56 mg/100 g., respectively. The microbial counts were less than 10 CFU/g

Equipment and methods

Equipment

1. Materials in production

1.1 Raw material in production

1.1.1 Soy bean (type Chiang Mai 60)

1.1.2 Fish (Japanese Threadfin Bream, Purple-Spotted Big eye, Mackerel)

1.1.3 Algae (Porphyra)

1.1.4 Soy bean oil

1.1.5.Salt

1.1.6 Pepper

1.1.7 Sugar

1.1.8 Potato starch

1.1.9.Egg albumin powder

1.2 Chemical

1.2.1 Magnesium sulfate

1.3 Equipment in production

1.3.1 Manufacturing soy milk

1.3.2 Centrifuge

1.3.3 Mixer

1.3.4 Electric deep fryer

1.3.5 Vacuum packaging Machine

1.3.6 Wood type for a tofu

1.3.7 Some whites

1.3.8 Bag vacuum

2. The quality analysis equipment

2.1 Quality equipment in the chemical analysis

2.1.1 Hot air oven

2.1.2 Desecrator cabinet

2.1.3 Kjeidahl protein and nitrogen determination

2.1.4 Rapid distillations for NH3, Alcohol, SO2, Phenol and Cyanide

2.1.5 Soxhlet fat determination Rapid and traditional

2.1.6 Furnance

2.2.The microbial quality analysis tools.

2.2.1 Autoclave

2.2.2 Incubator

2.2.3 Petrifilm Aerobic Count Plate and Petrifilm Yeast and Mold

2.2.4 Tube Mixer

Methods

Fish mixed with algae tofu (FAT) was prepared from previous directions. Fried and not fried FAT were analyzed by chemical and microbiological quality. The chemical and microbiological quality of commercial tofu (Plain tofu and Fish tofu in market) was compared with FAT.

Fig. 1. Fish mixed Algae Tofu (left is raw and right is fried)

Results and Discussion

Table of Fish mixed with algae tofu, Chemical quality and Microorganisms quality.

Factor of product quality	Plain tofu	Fish tofu in market	Fish mixed with algae tofu	
			Raw	Fried
Chemical quality				
Moisture	70.9[3]	76.32[1]	75.37[1]	60.00[1]
Carbohydrate	6.0[3]	6.68[1]	6.06[1]	15.46[1]
Protein	12.5[3]	13.08[1]	13.55[1]	17.98[1]
Fat	8.1[3]	0.15[1]	1.42[1]	2.24[1]
Ash	–[3]	1.69[1]	1.61[1]	2.53[1]
Crude fiber	–[3]	2.08[1]	1.99[1]	1.79[1]
Calcium	1.88[3]	0.97[1]	1.56[1]	1.38[1]
Microorganisms quality				
Total plate count (CFU/g)		<10[2]	<10[1]	<10[1]
Yeast and mold (CFU/g)		<10[2]	<10[1]	<10[1]
E.coli		–[1]	–[1]	–[1]

Source: [1] Analyzed for Physical, Nutritional and Microorganisms

[2] Nutrition label of Fish mixed tofu in market

[3] Nutritional quality table. (1987)

From this experiment, the moisture and fibers of FAT (fried and not fried) were reduced. The increased concentration of albumin powder (egg white powder or dried egg white), potato starch, and other ingredient were affected to the quantity of carbohydrate, protein, fat, and ash (Table 1). The sensory test of the commercial tofu and FAT showed difference. The commercial tofu had texture, elasticity, smoothy, tasty, and fish smelly more than FAT. The sweety and nutty of FAT were less than the commercial tofu. Therefore, FAT was the suitable product for the healthy consumers.

The total microbial counts of FAT was less than 5×10^4 CFU/g. Standards of industry of soft tofu and Soy Bean Paste were recommend. The total microbial counts were not more than 5×10^4 and 1×10^2 CFU/g, respectively. Thus, FAT was a safety product which was developed as an alternative for healthy consumers.

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