

Development of Iron- and Vitamin A-Rich Dim Sum from Gourami (*Osphronemus goramy*) and Chicken Liver for Women of Reproductive Age

Adinda Sekar Damar Putri, Muhammad Aries, Zuraidah Nasution*

¹Bachelor of Nutritional Science, Department of Community Nutrition, Faculty of Human Ecology, IPB University, Bogor 16680, Indonesia

²Department of Community Nutrition, Faculty of Human Ecology, IPB University, Bogor 16680, Indonesia

ABSTRACT

This study aims to develop and investigate the nutritional value of gourami dim sum products with chicken liver substitution. The research phase includes formulation and nutrient content analysis. Based on the results, one serving of selected formula of gourami dim sum can provide 6.4% to 7.1% of the energy requirement. The dim sum can be claimed as a low in fat and high in iron and vitamin A product.

Keywords: chicken liver, gourami, iron, vitamin A, women of reproductive age

INTRODUCTION

The nutritional problem that occurs in women of reproductive age is a lack of intake of macronutrients, vitamins, and minerals. Gourami contains palmitic acid, EPA, and DHA, which are equally present in both fresh and steamed gouramis (Pratama *et al.* 2018). Chicken liver is one of the rich sources of iron and vitamin A. One hundred grams of chicken liver contains 15.8 mg of iron and 4,957 RE of vitamin A (MoH RI 2019). However, chicken liver is less preferred because of its sensory characteristics (Milachati & Adi 2018). This study aimed to develop dim sum with gourami and chicken liver. This is expected to be able to provide a product with good nutrition profile, especially for women of reproductive age.

METHODS

This research on gourami dim sum is an experimental study with a Completely Randomized Design (CRD). The research was conducted from April to October 2022. The analysis were conducted at the Department of Community Nutrition, IPB University. Samples were prepared from four gourami-chicken liver combinations with ratios of 100:0, 91:9, 82:18 and 73:17. Analyses were performed for moisture and ash content (gravimetry method), protein content (Kjeldahl method), fat content

(Soxhlet method), carbohydrate content (by difference), iron content (Atomic Absorption spectrophotometry), and vitamin A (UV-Vis spectrophotometry). Contribution to the nutrition label reference is calculated according to the Regulation of the Head of the Indonesian Food and Drug Authority No. 9 of 2016 on Food Labeling Reference (TIFDA 2016). Nutrition and health claims were estimated based on the Indonesian Food and Drug Authority Regulation No. 1 of 2022 on Label Claims and Processed Food Advertising. Statistical analysis was performed using the Analysis of Variance followed by Duncan's multiple range test at $\alpha=0.05$.

RESULTS AND DISCUSSION

The substitution of gourami by chicken liver in the F0 gave a protein result that was significantly different from that in the F3 ($p<0.05$). The protein content of gourami is known to be 18.7–20.7%, while the protein content in chicken liver is known to be 27.4 g/100 g (MoH RI 2019). The results of the analysis of gourami dim sum with chicken liver substitution are shown in Table 1.

There was a significant difference between F3 and the other sample. The fat content of gourami ranges from 2.2 to 2.8%, while the fat content of chicken liver is 16.1 g/100 g (MoH RI 2019). An increase in the chicken liver proportion contribute to an increase in the fat content of the product.

*Corresponding Author: tel: +6289655603663, email: zuraidah.nasution@apps.ipb.ac.id

(Received 26-06-2023; Revised 16-07-2023; Accepted 22-07-2023; Published 30-12-2023)

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License

The results showed that there was a significant difference in the iron content of the four formulas. The increase in iron content was due to the increased composition of chicken liver in the dim sum formula.

In addition to the proximate analysis, the samples were also subjected to a sensory acceptance test. The results showed that the most preferred formula was F2. This sample was further analysed for vitamin A following the method of Rutkowski *et al.* (2006). The results of

the vitamin A analysis in the preferred formula were 975.08 µg/100 g. One hundred grams of chicken liver contains 4,957 µg/100 g (MoH RI 2019). The high content of vitamin A was due to vitamin A content of the raw material.

According to the fat, iron and vitamin A content in the selected formula, the product can be claimed as a low in fat and high in iron and vitamin A. Table 2 shows the claims based on the Nutrition Label Reference of the general group for the selected formula.

Table 1. Nutrient content of gourami dim sum with chicken liver substitute

Parameter	F0 (100:0)	F1 (91:9)	F2 (82:18)	F3 (73:27)
Moisture (g/100 g)	63.83±2.47 ^a	63.72±0.79 ^a	65.04±0.19 ^a	63.16±0.61 ^a
Ash (g/100 g)	1.95±0.02 ^a	2.12±0.01 ^a	1.98±0.04 ^a	2.05±1.27 ^a
Protein (g/100 g)	8.80±0.50 ^b	9.53±0.28 ^{ab}	9.81±0.41 ^{ab}	10.76±0.56 ^a
Fat (g/100 g)	2.40±0.15 ^b	2.58±0.08 ^b	2.56±0.02 ^b	2.94±0.05 ^a
Carbohydrate (g/100 g)	23.02±1.84 ^a	22.06±0.42 ^a	20.60±0.21 ^a	21.09±0.13 ^a
Iron (mg/100 g)	2.61±0.23 ^d	6.51±0.45 ^c	7.46±0.07 ^b	9.24±0.30 ^a

Treatment Fn (xy): A mixture of x% gourami and y% chicken liver

Values in the same row with the same letter are not significantly different ($p>0.05$)

Table 2. Claims for the nutritient content of gourami dim sum containing chicken liver substitute

Parameter	Nutritient content (per 100 g)	Nutrition label reference (General group)	Percentage	Nutritient claim
Energy (kcal/100 g)	145	2150	6.7	
Protein (g/100 g)	9.8	60	16.4	
Fat (g/100 g)	2.5	67	3.8	Low in*
Carbohydrate (g/100 g)	20.6	325	6.3	
Iron (mg/100 g)	7.46	18	33.9	High in*
Vitamin A (RE/100 g)	975.08	600	162.5	High in*

*Based on the Regulation of the Head of the Indonesian Food and Drug Authority No. 1 of 2022 (TIFDA 2022)

CONCLUSION

The F2 (91:9) of gourami dim sum with chicken liver provides 6.4 to 7.1% of energy per serving, making it suitable as a snack for women of reproductive age. This formula can be claimed as a low in fat and high in iron and vitamin A product.

DECLARATION OF CONFLICT OF INTERESTS

The authors have no conflict of interest.

REFERENCES

- [MoH RI] Ministry of Health Republic of Indonesia. 2019. Indonesian Food Composition. Jakarta (ID): MoH RI.
- Milachati AR, Adi AC. 2018. Kaldu instan dengan substitusi tepung hati ayam sebagai alternatif bumbu untuk mencegah anemia. *Amerta Nutrition* 2 (1):74–82. <https://doi.org/10.20473/amnt.v2i1.2018.74-82>
- Pratama RI, Rostini I, Rochima E. 2018. Profil asam amino, asam lemak dan komponen volatil ikan gurami segar (*Osporonemus gourami*) dan kukus. *Jurnal Pengolahan Hasil Perikanan Indonesia* 21(2):218–231. <https://doi.org/10.17844/jphpi.v21i2.22842>
- Rutkowski M, Grzegorzcyk K, Gendek E, Kedziora J. 2006. Laboratory convenient modification of bessey method of vitamin A determination in blood plasma. *J Physiol Pharm* 57(Supp 2):221.
- [TIFDA] The Indonesian Food and Drug Authority. 2016. The Regulation of The Head of the Indonesian Food and Drug Authority No. 9 of 2016 on Food Labelling Reference. Jakarta (ID): The Indonesian Food and Drug Authority.
- [TIFDA] The Indonesian Food and Drug Authority. 2022. The Indonesian Food and Drug Authority Regulation No. 1 of 2022 on Label Claims and Processed Food Advertising. Jakarta (ID): The Indonesian Food and Drug Authority.