Bantara Journal of Animal Science *p ISSN : 2656-9701*
Vol. 5, No. 2, Oktober 2023, DOI : 10.32585/bjas.v5i2.4942 *e ISSN : 2657-1587*

Chemical Analysis of Chicken Sempol for Food Safety Program in Karanganyar Regency

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Abstract

This aims study to evaluate chemical composition of chicken sempol in Karanganyar Regency. The sampling location of the research was carried out at sempol A sellers (Karanganyar Square area), sempol B (Pujasera Streetfood area), sempol C (Jl. Lawu area). The research method used a Complete Randomized Design (RAL) with 3 treatments and 4 repeats. Sampling was carried out by nonprobability sampling and research method with descriptive quantitative analysis. Data analysis in this study used Analysis of Variance (ANOVA). The findings demonstrate significant ($P<0.05$) variations in protein content, water content, carbohydrate content, fat content and boraks and formalin analysis the chicken sempol. The highest chemical content of sempol is carbohydrate which is 51,12% in sempol A. The highest water content in sempol A (48.73%), the highest protein content in sempol C (10.76%), carbohydrate content A (51.12%), the highest fat content in sempol B (11.87%). Chemical quality tests reveal protein content at 9.59%, water content at 47.77%, carbohydrate content at 47.17%, fat content at 9.21%, the result and discussion of boraks and formalin on sempols is negative (-). Sempol ayam at traders in Karanganyar has different chemical characteristics. This study concludes that chicken sempol with chemical quality can provide information on the quality of food or processed products that are good for consumers so as to increase the nutritional value of food products.

Keywords : chicken sempol ,chemical analysis, karanganyar regency, chemical characteristics, chemical composition

Introduction

The livestock industry is engaged in several business segments, one of which is the livestock product processing business. Livestock products that are developing today are meat, chicken meat for example can be processed into several food products that are in demand by consumers. Meat is one of the processed livestock ingredients that has a high protein content (Garindra, et al., 2020). One of the processed meat products is a sempol product made from processed chicken meat. In addition to chicken meat, the composition of sempol comes from beef and fish. Sempol is a snack that has a low amount of protein, making it suitable as a snack (Nurtanti, et al., 2023). Sempol is a snack originating from Malang City with basic ingredients of tapioca flour, meat and seasonings.

This sempol snack is widely found in East Java and Central Java. Sempol has a characteristic chewy, oval shape, pierced with sticks or skewers. The processing of sempol is done by initially steaming the dough, then after the steaming is cooked, the sempol is fried with a beaten egg until cooked (Syah, 2022). Sempol is widely sold in various cities with a variety of

presentations. Both packaged in the form of frozen food and processed as snacks today. The process of frying sempol can have an influence on amino acid damage so that there will be changes in the chemical composition of sempol. Sempol is found in many hawker vendors in schools, city park areas, restaurants to roadsides by street vendors. Sempol traders in Karanganyar Regency are found in many playgrounds, street food, school areas and squares. Based on field observations, sempol traders in Karanganyar Regency on average have different sempol producers and of course have a diversity of chemical quality of sempol in Karanganyar Regency. The chemical quality of sempol can be seen from the content of water, protein, carbohydrates and fat. The chemical quality of sempol pentig is known because it is related to the food safety of the snack. Food safety must be considered properly, this is because it has an important role in health, growth, maintenance and intelligence level of a person. Based on the background, it is necessary to conduct an assessment of the chemical quality of sempol in Karanganyar Regency.

Materials and Methods

The sampling location of the research was carried out at sempol A sellers (Karanganyar Square area), sempol B (Pujasera Streetfood area), sempol C (Jl. Lawu area). Chemical quality test research is carried out at the Laboratory, Faculty of Science and Technology, University of Muhammadiyah Karanganyar. The study was conducted on Oktober 2023. The research method used a Complete Randomized Design (RAL) with 3 treatments and 4 repeats. Sampling was carried out by nonprobability sampling and research analysis was carried out in a quantitative descriptive manner.

Chemical quality testing of sempol uses the following calculation methods (SNI, 2014):
Water content: The moisture content calculation is calculated using the oven method based on the sample weight lost during the heating process at a temperature.

Protein content: The calculation of protein content in sempol is calculated from the product of nitrogen by 6.25.
Protein content :
(v1-v2) x 0.014 x fk x 100% / w
sample Information:
fk = Conversion factor (6.25)
w = sample weight
Carbohydrate content:

The carbohydrate content test is carried out bydifference, with the calculation of the results of a 100% reduction with water content, protein content, and fat content.
Fat content:

Test fat content using HCI which is then extracted using a petroleumeter. The petroleumeter extract obtained was then evaporated to dry and then gravimetrically calculated fat content .

Data analysis in this study used Analysis of Variance (ANOVA) (Safitri, et al., 2019). If the results of the analysis show Fcalculate < F table 0.05, then there is no real difference (P>0.05), and if the F calculate value >F table 0.05, then the real difference (P<0.05). Further tests in this study used the Duncan Multiple Distance Test (UJBD).
Boraks Analysis Procedure (Winarsih, 2018) :
a. Weigh the sample as much as 5 grams then dissolve in aquadest as much as 25 ml.
b. Strain or centrifuge the solution above, then take 1 ml put into a test tube.
c. Add 1 ml of 0.2% liquid curcumin solution, then dilute with ethanol to a volume of 10 ml.
d. Read the absorbance of the sample using a spectrophotometer at a wavelength of 510 nm.

Formalin Analysis Procedure: Weigh the sample as much as 5 grams then dissolve it in 25 ml of aquadest. Strain or centrifuge the solution above then take 1 ml of stir in a test tube. Add 2 ml of schifs reagent, heat in a waterbath with a temperature of 60 C for 5 minutes.

Results and Discussion

Figure 1. Average value of sempol chemical content in Karanganyar Regency Based on the results in table 1, the results of the water content in sempol showed a real difference (P<0.05). The highest water content in sempol A with a value of 48.73%. The water content in sempol is influenced by tapioca flour which has water-binding properties (Nurtanti,2023). Sempol protein levels showed markedly different results (P<0.05). Tapioca flour can increase water perfectly and is not easily released, so that the moisture content increases (Halid, et al., 2023). The average protein content of sempol had the lowest value of 9.59%. Different protein content in sempol is influenced by the way of frying sempol between different traders (Madin, et al.,2022), the protein content in sempol is also influenced by the use of water when the boiling process can dissolve protein. In the analysis of sempol carbohydrate content has a real difference (P<0.05). The content of carbohydrate levels in sempol is influenced by tapioca flour raw materials. The carbohydrate is also influenced by the quality and content of tapioca flour (Safitri, et al., 2019). The results of the analysis of fat content in sempol showed real different results (P<0.05). Factors that affect fat content are influenced by the fat content in the meat ingredients used in making sempol (Wodi, et al., 2019).

Table 1. The Results of Chemical Tests Sempol in Karanganyar Regency

Parameter (%)	Treatment		
	HIS	SB	SC
Up to air	48.73±4.32A	46.45±4.63A	48,14±4,68b
Up to protein	9.26±1.47A	8.76±0.39A	10,76±0,66b
Up to carbohydrate	51.12±0.56A	47.24±1.58A	43,16±1,4b
Fat rate	5.48±0.24A	11,87±0,47b	10.28 ±0.28C

The results of borax analysis from various treatments of sempol products in Karanganyar District showed no borax content in samples. If sempol contains borax then when consumed in large quantities it will be dangerous in the body for health because borax can be toxic in the body (Suseno, 2019). Based on the results of these data, it can be concluded that there is no borax chemical content in chicken sempol in Karanganyar District. This can reassure people for food safety.

Table 2. The Results of Boraks Analysis Sempol in Karanganyar Regency

Sample	Boraks			
	Repeat 1	Repeat 2	Repeat 3	Repeat 4
A1	Negative (-)	Negative (-)	Negative (-)	Negative (-)
A2	Negative (-)	Negative (-)	Negative (-)	Negative (-)
A3	Negative (-)	Negative (-)	Negative (-)	Negative (-)
B1	Negative (-)	Negative (-)	Negative (-)	Negative (-)
B2	Negative (-)	Negative (-)	Negative (-)	Negative (-)
B3	Negative (-)	Negative (-)	Negative (-)	Negative (-)
C1	Negative](-)	Negative (-)	Negative (-)	Negative (-)
C2	Negative (-)	Negative (-)	Negative (-)	Negative (-)
C3	Negative (-)	Negative (-)	Negative (-)	Negative (-)

Table 2. The Results of Formalin Analysis Sempol in Karanganyar Regency

Sample	Formalin			
	Repeat 1	**Repeat 2**	**Repeat 3**	**Repeat 4**
A1	Negative (-)	Negative (-)	Negative (-)	Negative (-)
A2	Negative (-)	Negative (-)	Negative (-)	Negative (-)
A3	Negative (-)	Negative (-)	Negative (-)	Negative (-)
B1	Negative (-)	Negative (-)	Negative (-)	Negative (-)
B2	Negative (-)	Negative (-)	Negative (-)	Negative (-)
B3	Negative (-)	Negative (-)	Negative (-)	Negative (-)
C1	Negative](-)	Negative (-)	Negative (-)	Negative (-)
C2	Negative (-)	Negative (-)	Negative (-)	Negative (-)
C3	Negative (-)	Negative (-)	Negative (-)	Negative (-)

The results of formalin test analysis from various sempol product treatments in Karanganyar District showed that there was no formalin material content contained in samples. In the opinion of Fauziyya dan Saputro (2020), revealed that formalin is widely used in various food products because of the failure of producers to minimize production costs without considering the risk to consumer health considering that formalin is consumed continuously through foods containing formalin can cause dizziness, nausea, vomiting, nervous disorders, depression and even death. Based on the results of these data, it can be concluded that in Karanganyar District there is no formalin chemical content in samples. This can convince the public for the use of food safety (Saputra, et al., 2019).

Conclusion

Based on the results and discussion of the research, it can be concluded that sempol products in Karanganyar Regency have different chemical contents in each trader. The highest chemical content of sempol is carbohydrate which is 51,12% in sempol A. The highest water content in sempol A (48.73%), the highest protein content in sempol C (10.76%), carbohydrate content A (51.12%), the highest fat content in sempol B (11.87%). Chemical quality tests reveal protein content at 9.59%, water content at 47.77%, carbohydrate content at 47.17%, fat content at 9.21%, the result and discussion of boraks and formalin on sempols is negative (-).In this study, there was no borax and formalin content in chicken sempol samples in Karanganyar District

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