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Chemical Content and Sensory Characteristics of Herbal Chicken Essence from Indonesia

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ABSTRACT

The purpose was to determine the chemical content (water, protein, fat, ash, and carbohydrate) and sensory characteristics of Herbal Chicken Essence (HCE), a functional drink containing chilcken extract, from Indonesia. The experimental design was factorial and completely randomized with two replicates. There are four formulas in this study, namely F1 (broiler chicken and coconut sugar), F2 (broiler chicken and coconut sugar), F3 (IPB D1 chicken and palm sugar), and F4 (IPB D1 chicken and coconut sugar). The chemical content data were analyzed using a two-way ANOVA. Panelists used in the sensory tests included 30 participants. There was a significant effect ($p<0.05$) of chicken and sugar substitution on water, ash, protein, and carbohydrate contents. Formula 2 (broiler chicken and coconut sugar) is the most preferred in almost all sensory attributes (aroma, taste, mouthfeel, aftertaste, and overall acceptance) because the sour taste found in coconut sugar is able to suppress the fishy taste found in HCE. The substitution of the chicken breed and sugar in the HCE formulations affected the chemical content and sensory characteristics.

Keywords: chicken type, chemical characteristics, herb chicken essence, sensory characteristics, sugar type

INTRODUCTION

Fatigue is prevalent in modern society. An active lifestyle, high-stress levels, lack of rest, and lack of physical activity further aggravate this condition. When this condition is left in a healthy state, one effort to overcome it is through food modification. Chicken Essence (CE) is a traditional Chinese beverage that is beneficial to the health of the body. It contains bioactive components that are beneficial in relieving stress and fatigue (Huang *et al.* 2014). CE sold in the market has a very fishy taste and is less sensorially acceptable. Herbal Chicken Essence (HCE), a functional beverage from Indonesia, still has obstacles, including sensory value and nutritional content, which are not optimal. This study was conducted to develop HCE with good chemical and sensory content. The purpose was to determine the chemical content (water, protein, fat, ash, and carbohydrate) and sensory characteristics of HCE from Indonesia.

METHODS

This study is an experimental study. It used a completely randomized factorial design consisting of two factors: types of chicken (broiler and IPB D1) and sugar (Palm and coconut). The study was conducted from April 2022 to November 2022. The processes of production of herbal chicken essence and proximate and organoleptic analysis were conducted in the Nutrition Analysis Laboratory, Department of Community Nutrition, Faculty of Human Ecology, IPB University. Data collection and analysis were performed using Microsoft Excel and IBM SPSS for Windows version 16. Chemical analysis results were analyzed using ANOVA ($p=0.05$), followed by Duncan's post-hoc test

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with a 95% confidence interval. The panelists used in this study included 30 people. The sensory attributes analyzed included color, odor, viscosity, taste, mouthfeel, aftertaste, and overall. The organoleptic data of the products were analyzed descriptively. Ethical approval for this study was granted by the Health Research Ethics Committee of Tanjung Karang Health Polytechnic, Ministry of Health of the Republic of Indonesia, with reference number 007/KEPK-TJK/I/2023.

RESULTS AND DISCUSSION

Nutrient composition

Table 1 shows the proximate analyses of four HCE formulations. The energy of water, protein, fat, and ash contents were: 81.84–117.28 kcal/100 g; 70.86–79.26% (wb); 0.8–1.57% (wb); 0.33–0.64% (wb); and 0.49–0.66% (wb).

The results showed that formulation F3 had the highest ash content, formula F1 had the highest protein content, and formulation F2 had the highest fat content. There were significant differences ($p<0.05$) in the water content, protein content, and carbohydrate content of each formulation. The difference in moisture content may be due to the type of chicken and sugar used in the formulation. Dal Bosco *et al.* (2014) and Abdullah *et al.* (2010) stated that the age of slaughter and type of chicken can affect the moisture content of processed carcasses. The difference in protein content of each formulation was thought to be influenced by the extraction technique and composition of chicken meat in each different chicken type. The difference in carbohydrate content in HCE was influenced by the content of sugar and honey and the composition of chicken meat.

Sensory characteristics

The herbal chicken essence was subjected to sensory analysis. The type of chicken and sugar had a significant effect ($p<0.05$) on the level of panelist preference for color, aroma, and aftertaste attributes of HCE, but it did not have a significant effect ($p>0.05$) on viscosity, taste, mouthfeel, and overall acceptability. Based on the trend data, F2 was the most preferred for almost all the data evaluation parameters presented in Table 2. The color of herbal chicken juice was influenced by the interaction of chicken and sugar used in this study. The color of HCE was influenced by the Maillard reaction that occurs during the sugar manufacturing process. Melanoidins are formed during the heating process of carbohydrates and contribute to several physical and chemical properties of foods, such as color, aroma, and texture (Brudzynski & Miotto 2011). HCE, which used ingredients such as ginger, trigonal bee honey, and sugar, developed the aroma of ginger, not the aroma of chicken.

Table 1. The result of proximate analysis of herbal chicken essence

Sample	Water Content (%)	Ash content (%)	Protein (%)	Energy from fat (kcal/100 g)	Fat content (%)	Total energy (kcal/100 g)	Carbohydrate (%)
F1	75.34±3.56^{ab}	0.66±0.032	1.57±1.57^{a}	4.07±0.82	0.45±0.09	98.21	21.97±3.67^{ab}
F2	70.86±1.57^{a}	0.62±0.21	1.25±1.25^{b}	5.74±5.17	0.64±0.58	117.28	26.63±1.00^{b}
F3	79.26±0.60^{b}	0.74±0.53	1.15±1.15^{b}	3.22±2.16	0.36±0.24	81.84	18.5±0.52^{a}
F4	78.92±3.18^{b}	0.49±0.042	0.80±0.31^{c}	3.02±2.13	0.33±-0.23	84.61	19.49±2.78^{a}

F1: Broiler breed-palm sugar; F2: Broiler breed-coconut sugar; F3: IPB D1 chicken-palm sugar; F4: IPB D1 chicken–coconut sugar

Table 2. Sensory analysis of herb chicken essence drinks

Formula	Atribute						
	Color	Aroma	Viscocity	Taste	Mouthfeel	Aftertaste	Overall
F1	5.61±1.49^{a}	5.81±1.45^{a}	6.54±1.59	5.85±1.65	5.75±1.64	5.69±1.64^{a}	6.12±1.44
F2	7.17±1.20^{b}	6.91±1.42^{b}	7.02±1.04	6.79±1.47	6.59±1.35	6.52±1.35^{b}	6.94±1.28
F3	5.73±1.21^{a}	5.73± 1.74 a	6.71 ± 1.20	6.05±1.73	5.84±1.67	5.55±1.67^{a}	6.29±1.49
F4	5.81±1.85^{a}	5.98±1.84 a	6.50±1.32	5.87±1.78	5.62±1.55	5.68±1.55^{a}	5.94±1.56

Taste characteristics ranging from 1: Disliked extremely; 2: Disliked very much; 3: Disliked moderately; 4: Disliked slightly; 5: Neither liked or disliked; 6: Liked slightly; 7: Like moderately; 8: Liked very much; 9: Liked very extremely

CONCLUSION

The type of chicken and the type of sugar used in the formulation of herbal chicken essence affect the sensory attributes of color, aroma, and aftertaste. However, it does not affect the sensory attributes of viscosity, taste, mouthfeel, and overall acceptability. These results support previous findings that the type of chicken and sugar used in the formulation affect the nutritional content and sensory attributes of herbal chicken essence.

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DECLARATION OF CONFLICT OF INTERESTS

The authors have no conflict of interest to declare.

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