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The Effect of Using Secang (*Caesalpinia secang* Linn) Infusion on the Organoleptic Quality of Chicken Sausage

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ABSTRACT

This study aims to determine the effect of using Secang infusion (*Caesalpinia secang* Linn) on the organoleptic quality of chicken sausages and determine the optimal level of adding Secang infusion on the organoleptic quality of chicken sausages. This research was carried out in 30 days at the Laboratory of the Faculty of Animal Husbandry, University of Jambi. This study used a randomized block design (RBD) which consisted of 4 treatments and 30 replications (panelists). The concentration of Secang infusion used was 0%, 5%, 10%, and 15%. The variables observed in this study were the value of organoleptic quality, which included color, aroma, taste, texture, and elasticity. The data obtained were analyzed by analysis of variance (ANOVA). If it had a significant effect, it continued with Duncan's test. The results showed that the use of Secang infusion on chicken sausage had a very significant effect ($P<0.01$) on color but had no effect ($P>0.05$) on aroma, taste, texture, and elasticity. The higher the concentration of Secang infusion, the more preferred the sausage color will be. It can be concluded that the processing of chicken sausage with the addition of Secang infusion at 10% and 15% level produced the preferred color of the panelist's preference level compared tothe 0% and 5% levels. Still, the addition of Secang in the processing of chicken sausage did not make a difference to the level of preference for aroma, taste, texture, and suppleness.

Keywords: chicken sausage, Secang infusion, natural coloring, organoleptic

INTRODUCTION

Chicken meat is a source of animal food that contains high levels of nutrition in the form of protein and energy, carbohydrates, fats, minerals, and other substances that are useful for the body. Chicken meat has a delicious taste, and the price is also relatively low, so it is widely consumed by the public (Hidayat et al., 2016).

Chicken meat is easily subjected to microbiological damage because of its high nutritional and water content (Kurniawanet al., 2010). Chicken meat damage is caused by microbes such as changes in shape, the presence of mucus, and changes in texture, causing odor and taste (Mielmann, 2006). Livestock products have a high risk of bacterial contamination, so proper handling is needed to extend the shelf life of meat (Rahayu, 2006). Therefore, treatments that can be used to extend the shelf life of meat include cooling, freezing, heating, drying, and processing.

One of the processed products known to the broader community is sausage. The use of meat in the manufacture of sausages because it has a considerable influence on the stability of the emulsion and the properties of the resulting sausage products (Winanti, 2013). Sausage is a processed food made from mashed meat mixed with spices. In general, sausages are made from chicken, fish, and beef.

A product's quality can be determined from several aspects, including looking at the quality or organoleptic properties. The product's nature or quality can be determined based on sensory properties, such as color, aroma, texture, taste, and elasticity. But beforeother factors are considered, color is decisive and the first appearance. The color ofa food product plays a vital role in consumer product acceptance. Color is the most accessible sensory property for consumers to detect compared to other sensory properties such as texture and flavor (Winarno, 2008).

Types of synthetic dyes (artificial) are more often used to manufacture sausages than natural dyes. However, due to diseases caused by synthetic dyes, the attention to using natural dyes for food is increasing. Natural dyes are safe for food and do not cause health problems. One of the natural dyes that have long beenused in Asia to give food products an attractive red color is Secang. Secang wood, when boiled, will give a pink color. Secang wood is also efficacious as a preservative, antioxidant, and antibacterial to reduce bacteria in food (Indah et al., 2016).

Therefore, in this study, Secang will be used as a natural dye in the manufacture of

chicken sausages; it is suspected that the addition of Secang will affect the organoleptic quality of chicken sausages in terms of antioxidant activity, brazilin as

A natural dye owned by Secang wood gives a red dye, essential oil as a type of essential oil contained in Secang wood. Its central nature is to give rise to a distinctive and unique aroma. Secangwood also gives an attractive color to be used as a natural dye. Secang wood contains flavonoids, tannins, brazilin, essential oils, and others (Karlina et al., 2016), as was done by (Elisa, 2019) for goat milk yogurt products that useSecang infusion up to a level of 15% to obtain the best quality yogurt.

Based on the above, a study was conducted to determine the effect of using Secang (*Caesalpinia Secang* Linn) infusion on the organoleptic quality of chicken sausages and determining the most optimal level of adding Secang infusion on the organoleptic quality of meatsausages.

MATERIALS AND METHODS

This research was conducted at the Laboratory of the Faculty of Animal Husbandry, Jambi University. The materials used in the study were 1.2 kg of chicken meat, 120 gr of skim milk, 120 gr of tapioca flour, 240 gr of wheat flour, 90 gr of a cup of infusion, 360 gr of ice water, 36 gr of salt, four eggs, 12 gr of garlic and 9.6 gr of pepper. For the organoleptic test, the materials used were mineral water, coffee, and white bread.

The tools include food processors, analytical scales, collagen casings, stuffer molds, knives, cutting boards, steamers, basins, bowls, cloth napkins, digital thermometers, plates, spoons, and gas stoves. For the organoleptic test, the tools used were stationary, scoring paper, and tissue.

Making Secang infusion

In this research, Secang wood was extracted using the foundation method; Secang wood was put into a pot, added with distilled waterwith a ratio of 1:10. Then it was heated at 90°C for a specific time, namely 20 minutes (Rakhmayanti andHastuti, 2008).

The Secang wood is washed clean, and the size is reduced by cutting. The chopped Secangwood is put into a pot filled with water with a ratioof 1:10, then heated and stirred at 90º for 20 minutes, then removed and left to cool; separate the Secang wood from the Secang infusion using a filter, and the Secang infusion is ready to use.

Making chicken sausages starts with the clean chicken meat being cut into small pieces and chopped, then the meat is ground with a food processor for 1 x 20 seconds. Furthermore, the meat is added with seasonings such as shallots,salt and pepper, tapioca flour, wheat flour,and skim milk. Then add ice water, eggs, and cup infusion according to treatment, then grind for 2 x 20 seconds. After the dough is homogeneous, it is stored in the refrigerator for 30 minutes. Next, put the dough into the stuffer, put it in the sausage casing, and tie it with twine. And steamed to an internal temperature of 86°C for 30 minutes. After cooking, the sausages are air-dried until cold. After chilling, carry out organoleptic tests, which include color, aroma, taste and texture, and the elasticity of the chicken sausage according to the treatment by the panelists.

Organoleptic or sensory test, or sensory test, is a way of testing using the human senses as the primary tool for measuring the acceptability of products. Organoleptic testing is used to assess sausages to determine preference for the product. The next step is the implementation of the organoleptic test for chicken sausages.

Preparing sausages that have been cooked, then place them in 4 parts/pieces on a styrofoam plate. Then give a code to each sausage according to the treatment that has been determined. Before carrying out the test, explain the organoleptic testing procedures to the panelists. Further testing by the panelists according to the observed variables (color, texture, aroma, taste, and elasticity). Assessment of organoleptic quality.

Variables observed

The variables observed in this study were organoleptic tests (color, aroma, taste, texture, and elasticity). The data were obtained after testing 30 semi-trained panelists.

As a reference in organoleptic research, theobserved variables were carried out using the hedonic scale. According to Larasati et al. (2018), Organoleptic testing is based on the preference test method (hedonic test) using five hedonic scales.

Research design

The design used was RBD (Randomized Block Design) with four treatments and 30 replication groups based on panelists.

The treatment in this experiment was the use of Secang infusion concentration which consisted of 4 levels, namely:

T0: Chicken sausage without the addition of 0% Secang infusion
T1: Chicken sausage with the addition of 5% Secang infusion
T2: Chicken sausage with the addition of 10% Secang infusion
T3: Chicken sausage with the addition of 15% Secang infusion

Data analysis

The data was processed by analysis of variance (ANOVA). If the treatment significantly affected the observed variables, it continued with Duncan's test (Montolalu et al., 2013).

RESULTS AND DISCUSSION

Secang bioactive components

One medicinal plant with high antioxidant activity is Secang (*Caesalpinia secang* L.). The red dye contained in Secang is known as a brazilin group compound. It is an antioxidant compound with catechol in its chemical structure. It can protect the body from poisoning due to free radicals Bae et al. (2005), which has been researched by Setiawan et al. (2018). Table 1 shows that the ethanol extract of Secang wood contains flavonoid glycosides, free flavonoids, alkaloids, and polyphenols.

Table 1. Table of phytochemical screening results of ethanol extract of Secang wood

No	Chemical Group Content	Results
1	Flavonoid glycosides	+
2	Free flavonoids	+
3	Alkaloids	+
4	Polyphenols	+
5	Tannins	-
6	Saponins	-
7	Essential oil	-

Source: Setiawan et al. (2018)

Chicken sausage preference

Based on the data and results of calculations using analysis of variance (ANOVA), the average preference, which includes color, aroma, taste, texture, and elasticity of each treatment, can be seen in table 2.

Chicken sausage color

Based on the analysis of variance, it was shown that the use of Secang infusion had a very significant ($P<0.01$) effect on the preference for sausage color. The results of Duncan's analysis showed that the results between the P3 and P2 treatments were the same but different from the P0 and P1 treatments. The treatment using Secang infusion at levels of 10% and 15% gave the color preferred by the panelists compared to levels of 0% and 5%. Because Secang wood contains a brazilin compound that can produce a red color, the use of Secang infusion can give color to chicken sausages. The higher the concentration of Secang infusion, the redder the color pigment produced by the sausage. Secang infusion can be an alternative ingredient that produces red as a substitute for artificial coloring in manufacturing chicken sausages.

According to Indah et al. (2016), Secang wood is a non-synthetic material that can be used as a natural dye and produces a red pigment when boiled. Secang wood which has a colored pigment caused by the presence of brazilin compounds, gives the coloring from dark orange to deep red (Rina, 2013). Color is a part of product appearance and an important sensory assessment parameter because it is the first sensory assessment property consumers see (Rauf et al., 2017).

Chicken sausage aroma

On the taste of chicken sausage, based on the analysis of variance, it was shown that the treatment of using Secang infusion on chicken sausage had no significant effect ($P>0.05$) on the liking of the resulting sausage aroma. Secang infusion does not give a specific aroma because the concentration used is low, so the panelists' does not smell. Adding a small percentage of Secang infusion compared to other ingredients and spices results in the same total revenue. Bina et al. (2014) stated that the aroma of food ingredients is caused mainly by complex, volatile compounds derived from added spices. Aroma is one of the judgments of food by the sense of smell. The aroma is produced from a combination of food ingredients (Dewi, 2018).

Table 2. Mean value preference for color, taste, and flavor of chicken sausage

Variable	Treatment				Desc
	P0	P1	P2	P3	
Color	3.50[b]±0.73	3.40[b]±0.72	3.90[a]±0.88	4.03[a]±0.80	P<0.01
Taste	3.36±1.03	3.70±0.91	3.93±0.94	3.50±0.93	P>0.05
Flavor	3.66±0.99	3.80±0.84	4.13±0.73	3.70±0.98	P>0.05

Description: Different superscript letters in the same row indicate significant differences (P<0.01).

Table 3. Means of texture and elasticity of chicken sausage

Variable	Treatment				Desc
	P0	P1	P2	P3	
Texture	3.26±0.98	3.60±0.89	3.30±1.05	3.76±0.62	P>0.05
Elasticity	3.36±0.55	3.40±0.56	3.43±0.81	3.76±0.77	P>0.05

Description: No significant differences (P>0.05).

Chicken sausage flavor

On the taste of chicken sausages, it can be seen that the treatment of using Secang infusion on chicken sausages had no significant effect (P>0.05) on the preference for the taste of the resulting sausages. It shows that the use of Secang infusion does not affect the taste of the resulting sausage. Although Secang contains tannin, it cannot influence the product's taste because the mixture of other ingredients from making sausages dominates the taste of the sausage. Research conducted by Winarti and Sembiring (1998) showed that by boiling for 20 minutes, a tannin content of 0.137% was obtained. Rauf et al. (2017) stated that taste is an essential criterion in assessing a food product that involvesa lot of the sense of taste, namely the tongue. Taste is formed from sensations that come from a combination of forming ingredients and their composition in a food product that is captured by the sense of taste and is one of the supports for the quality of a product.

Chicken sausage texture

The use of Secang infusion in several levels did not affect the texture of the chicken sausage (P>0.05). It is because sausages without the use of Secang infusion and sausages with the use of Secang infusion have relatively the same texture. It is due to the small percentage of Secang infusion compared to other ingredients and seasonings. The addition of skimmed milk and wheat flour can increase the water-holding capacity so that the texture of thechicken sausage becomes softer. It follows Palandeng et al. (2016) that fillers contain many carbohydrates. In general, fillers added to processed meat mixture aim to increase the water binding capacity; water and fillers are formed optimally and can improve texture. Bulkaini et al. (2019) state that texture is a sensory property of meat related to the smoothness of the sausage. The texture is an essential characteristic in determining the quality of a food

Chicken sausage elasticity

The use of Secang infusion on chicken sausage meat had no significant effect (P>0.05) on the firmness of the sausages. The results showed that the elasticity of chicken meat sausages was not different. It was suspected that adding Secang infusion from 0% to 15% resulted in the same total acceptance. In the manufacture of sausages, oneof the ingredients used is tapioca flour, where tapioca flour is added to the sausage dough as a filler which has little effect on emulsification. Adding tapioca flour can help increase the water binding capacity during processing and as a chewing agent. It follows Saragih et al. (2008) that tapioca flour functions as a filler and thickener, improves emulsion stability, reduces shrinkage during cooking, improves sliced properties, and enhances flavor. Tapioca flour contains high amylopectin, does not clump easily, has high adhesive power, and is tasteless. Riyadi and Atmaka (2010) stated that elasticity is one of the determining factors for consumer preference. Elasticity is measured based on the material's ability to perform elastic deformation.

CONCLUSION

The use of Secang infusion in processing chicken meat sausages with a concentration of 10% and 15% produces the preferred color. However, it did not make a difference in the level of preference for aroma, taste, texture, and elasticity.

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REFERENCES

Bae, I. K., H. Y. Min, A. R. Han, E. K. Seo, and S. K. Lee. 2005. Suppression of lipopolysaccharide-induced expression of inducible nitric oxide synthase by brazilin in RAW 264.7 macrophage cells. European Journal of Pharmacology 513(3): 237-242.

Bina L.N., Y.S. Darmanto, Putut H.R. 2014. Pengaruh Penambahan Keraginan, Egg White, dan Isolat Protein Kedelai terhadap Kualitas Gel Surimi Ikan Kursi (*Nemipterus nematophores*). Jurnal Pengolahan dan Bioteknologi Hasil Perikanan. 4: 1-9.

Bulkaini, D. Kisworo, dan M. Yasin. 2019. Karakteristik Fisik dan Nilai Organoleptik Sosis Daging Kuda Berdasarkan Level Subtitusi Tepung Tapioka. Jurnal Veteriner 20: 548-557. DOI: https://doi.org/10.19087/jveteriner.2019.20.4.548

Dewi, D. P. 2018. Substitusi Tepung Daun Kelor (*Moringa oleifera* L.) pada Cookies Terhadap Sifat Fisik, Sifat Organoleptik, Kadar Proksimat, dan Kadar Fe. Ilmu Gizi Indonesia 1: 104–112. DOI: https://doi.org/10.35842/ilgi.v1i2.22

Elisa, N. A. D. 2019. Potensi Penggunaan Pewarna Alami Kayu Secang (*Caesalpinia secang* Liin) terhadap Kualitas Organoleptik dan Total Asam Yoghurt Susu Kambing. Skripsi. Program Studi Gizi.

Hidayat, R. A. Setiawan, dan E. Nofyan. 2016. Pemanfaatan Limbah Kulit Pisang Lilin (*Musa paradisiaca*) sebagai Pakan Alternatif Ayam Pedaging (*Gallus galus domesticus*). Jurnal Peternakan Sriwijaya 5 (1):1-9.

Indah, N., Tamrin, dan M. Z Muzakkar. 2016. Pengaruh Suhu dan Lama Pemanasan Sirup dengan Pewarna Alami Kayu Secang (*Caesalpinia secang* Linn) terhadap Karakteristik. Journal Sains Dan Teknologi Pangan, 1:144–150. DOI: http://dx.doi.org/10.33772/jstp.v1i2.1270

Karlina, Y., P. Adirestuti, D. M. Agustini, N. L. Fadhillah, dan D. Malita. 2016. Pengujian Potensi Antijamur Ekstrak Air Kayu Secang terhadap *Aspergillus niger* dan Candida albicans. Chimica et Natura Acta 4: 84–87. DOI: 10.24198/cna. v4.n2.10676

Kurniawan, N.P, D. Septinova, dan K. Adhianto. 2010. Kualitas Fisik Daging Sapi dari tempat Pemotongan Hewan di Bandar Lampung. Universitas Lampung, Lampung. Jurnal Ilmiah Peternakan Terpadu 2 (3): 133-137. DOI: http://dx.doi.org/10.23960/jipt.v2i3.p%25p

Larasati, K., P. Patang, dan L. Lahming. 2018. Analisis Kandungan Kadar Serat dan Karakteristik Sosis Tempe dengan Fortifikasi Karagenan serta Penggunaan Tepung Terigu sebagai Bahan Pengikat. Jurnal Pendidikan Teknologi Pertanian. 3 (1): 67-77. DOI: https://doi.org/10.26858/jptp.v3i1.5199

Mielmann, A. 2006. Food spoilage characteristics of Chrysebacterium species. Thesis. Department of Microbial, Biochemical and Food Biotechnology Faculty of Natural and Agricultural Sciences, University of the Free State.

Montolalu, S., N. Lontaan, S. Sakul, dan A.D.P. Mirah. 2013. Sifat Fisiko-Kimia dan mutu Organoleptik Bakso Broiler dengan Menggunakan Tepung Ubi Jalar (*Ipomoea batatas* L). Jurnal Zootek 32: 1-13 DOI: https://doi.org/10.35792/zot.32.5.2013.986

Palandeng, F.C., L.C. Mandey, dan F. Lumoindong. 2016. Karakteristik fisiko-kimia dan sensori sosis ayam petelur afkir yang difortifikasi dengan pasta dari wortel (*Daucus carota* L). Jurnal Ilmu dan Teknologi Pangan 4(2), 19-28.

Rahayu, E. S. 2006. Amankan Produk Pangan Kita: Bebaskan dari Cemaran Berbahaya. Apresiasi Peningkatan Mutu Hasil Olahan Pertanian. Dinas Pertanian Propinsi DIY dan Kelompok Pemerhati Keamanan Mikrobiologi Produk Pangan. Yogyakarta.

Rakhmayanti, R.D., dan R.T. Hastuti. 2008. Formulasi Hard Candy Ekstrak Kayu Secang (*Caesalpinia Secang* Linn). Jurnal Ikra-Ith Teknologi. 3: 1–6.

Rauf, A., U. Pato, dan D.F. Ayu. 2017. Aktivitas Antioksidan Dan Penerimaan Panelis Teh Bubuk Daun Alpukat (*Persea americana* Mill.) Berdasarkan Letak Daun Pada Ranting Antioxidant. Jom Faperta. 4: 72–76.

Rina, O. 2013. Identifikasi Senyawa Aktif dalam Ekstrak Etanol Kayu Secang (*Caesalpinia secang* Linn). Prosiding Semirata FMIPA Universitas Lampung. Lampung.

Riyadi, N.H., dan W. Atmaka. 2010. Diversifikasi dan Karakterisasi Citarasa Bakso Ikan Tenggiri (*Scomberomus commerson*) dengan Penambahan Asap Cair Tempurung Kelapa. Jurnal Teknologi Hasil Pertanian. 3: 1-4 DOI: https://doi.org/10.20961/jthp.v0i0.13612.

Saragih, B., O. Ferry, dan A. Sanova. 2008. Kajian Pemanfaatan Tepung Bonggol Pisang (*Musa paradisiaca* Linn.) sebagai Substitusi Tepung Terigu dalam Pembuatan Mie Basah. Jurnal Teknologi Pertanian 3: 63-67.

Setiawan, F., O. Yunita, dan A. Kurniawan. 2018. Uji Aktivitas Antioksidan Ekstrak Etanol Kayu Secang (*Caesalpinia secang*) Menggunakan Metode DPPH, ABTS, dan FRAP. MPI Media Pharmaceutica Indonesiana 2 (2): 82-89.

Winanti E. R., Andriani, M. A. M., dan Nurhartadi, E. 2013. Pengaruh Penambahan Bit (*Beta vulgaris*) Sebagai Pewarna Alami terhadap Karakteristik Fisikokimia dan Sensori Sosis Daging Sapi. Jurnal Teknosains Pangan 2(4): 18-24.

Winarno, F. G. 2008. Kimia Pangan dan Gizi. Gramedia Pustaka Utama. Jakarta.

Winarti, C. 2012. Pengaruh Cara dan Lama Ekstraksi terhadap Kadar Tannin Ekstrak Kayu Secang (*Vasesalpina sappan* Linn). Balai Penelitian Tanaman Rempah dan Obat. Bogor.