

Quality of Physical and Sensory of Super-native Chicken Breast Marinated with Herbs and Spices with Different Levels of Marination Concentration

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(received 11-09-2022; revised 11-11-2022; accepted 7-12-2022)

ABSTRAK

Oktafa H, Prayitno AH, Handayani HT. 2023. Kualitas fisik dan sensori daging dada ayam kampung super yang dimarinasi dengan konsentrasi marinasi yang berbeda. JITV 28(1):76-85. DOI: <http://dx.doi.org/10.14334/jitv.v28i1.3092>.

Ayam kampung super adalah ayam hasil persilangan antara ayam kampung jantan dan ayam petelur. Diversifikasi produk olahan daging ayam kampung super dapat dikembangkan menjadi produk *ready to cook* dengan cara dimarinasi bumbu dan rempah lokal. Penelitian ini bertujuan untuk mengetahui pengaruh konsentrasi marinasi bumbu dan rempah lokal yang berbeda terhadap kualitas fisik dan sensori daging ayam kampung super. Materi penelitian terdiri atas daging dada ayam kampung super, bubuk cabai, gula, garam, lada, bawang putih, kayu manis, minyak kelapa sawit, air jeruk nipis, monosodium glutamat, dan jahe. Perlakuan level konsentrasi marinasi yaitu 10, 20, dan 30% dari bobot daging. Parameter kualitas fisik yang diuji yaitu warna, nilai pH, kadar air, susut masak, daya ikat air, rendemen, dan keempukan. Setiap perlakuan terdiri dari 3 ulangan. Kualitas sensori diuji dengan uji mutu hedonik oleh 40 panelis tidak terlatih. Parameter mutu hedonik yang diuji yaitu warna, aroma, rasa, tekstur, keempukan, dan *juiciness*. Data hasil uji kualitas fisik dianalisis dengan analisis variansi pola searah dan hasil uji mutu hedonik dianalisis dengan analisis non parametrik melalui uji Hedonic Kruskal-Wallis dan jika terdapat perbedaan yang nyata ($P<0,05$) diuji lanjut dengan uji Duncan's New Multiple Range Test. Hasil penelitian menunjukkan bahwa level konsentrasi marinasi bumbu dan rempah lokal yang berbeda dapat mempengaruhi kualitas fisik (*redness*, nilai pH, dan kadar air) dan sensori (warna dan tekstur) daging dada ayam kampung super. Konsentrasi marinasi bumbu dan rempah lokal level 20% merupakan perlakuan terbaik berdasarkan mutu hedonik menurut penilaian panelis karena memiliki tekstur daging yang halus dengan skor 3.98.

Kata Kunci: Rempah Lokal, Daging Dada, Kualitas Fisik, Marinasi, Sensori

ABSTRACT

Oktafa H, Prayitno AH, Handayani HT. 2023. The physical and sensory quality of super-native chicken breast marinated with herbs and spices with different levels of marination concentration. JITV 28(1):76-85. DOI: <http://dx.doi.org/10.14334/jitv.v28i1.3092>.

Super-native chickens result from crosses between male native chickens and laying hens. The diversification of processed products from super-native chicken can be developed into ready-to-cook products by marinating them with local herbs and spices. This research was conducted on the effect of marination concentrations of different local herbs and spices on the hedonic quality of super-native chicken breast. The research material consisted of super-native chicken breast, chili powder, sugar, salt, pepper, garlic, cinnamon, palm oil, lime juice, monosodium glutamate, and ginger. The treatment levels of marination concentration were 10, 20, and 30% of the weight of the meat. Physical quality parameters tested were color, pH value, moisture, cooking loss, water-holding capacity, yield, and hardness. Each treatment consisted of 3 replications. In addition, sensory quality was tested by a hedonic quality test by 40 untrained panelists. The hedonic quality parameters tested were color, flavor, taste, texture, tenderness, and juiciness. The data from the physical quality test were analyzed by analysis of variance. The hedonic quality test results were analyzed by non-parametric analysis through the Kruskal-Wallis hedonic test. If there was a significant difference ($P<0.05$), the test was continued with Duncan's New Multiple Range Test. The results showed that the concentration level of different local herbs and spices marination could affect the physical quality (*redness*, pH value, and moisture) and sensory (color and texture) of super-native chicken breast. The marination concentration of local herbs and spices at 20% level was the best treatment based on hedonic quality with a smooth meat texture and a score of 3.98.

Key Words: Local Spices, Breast Meat, Physical Quality, Marination, Sensory

INTRODUCTION

Super-native chickens result from crosses between male native chickens and laying hens (Pakaya et al.

2019). Super-native chickens are already known by the Indonesian people as a meat producer with a slaughter weight of around 1.2 kg (Jacob et al. 2019). Therefore, maintaining super-native chickens is relatively more

manageable, and the nutritional requirements do not have to be high-cost (Aziz 2019). Super-native chicken is trendy for consumption by the people of Indonesia because it is known to be tastier and lower in fat and cholesterol. Super-native chicken has a high nutritional content and a delicious taste resembling native chicken (Lestari et al. 2022). In addition, super-native chickens require a shorter maintenance time when compared to native chickens, which is around 60-65 days to get a weight of about 1 kg (Aziz 2019).

The percentage of the super-native chicken carcass is around 68.40-70.08% (Tahalele et al. 2018). Super-native chicken meat as a source of Indonesian animal germplasm continues to be developed into ready-to-cook products. The demand for super-native chicken products in a ready-to-cook state continues to increase (Jacob et al. 2019; Lestari et al. 2022) due to the Covid-19 pandemic. Ready-to-cook (RTC) products that are currently trending are marinated chicken products. Ready-to-cook products have become popular with the Indonesian people because of restrictions during the Covid-19 pandemic, making it easier for the cooking process.

Chicken meat and its products are widely liked and consumed by the community because they are rich in the nutrients they need (Zelpina et al. 2020). The meat industry has for decades been applying marinade technology (O'Neill et al. 2019). Marinating technology is soaking meat in a seasoned liquid called marinade (Augustyńska-Prejsnar et al. 2023). A marinade is a seasoned solution that functions as a meat marinade, usually used to improve the taste, impression of juice, and tenderness of meat after cooking (Sengun et al. 2021). The role and perception of the marinade have changed from being a flavoring and tenderizing agent to increasing meat yield and quality. A marinade is also applied to meat products as a preservative and to enhance color (O'Neill et al. 2019). In addition, marinating meat can increase its tenderness of meat (Latoch 2020).

Marinade ingredients that can be used are local herbs and spices, widely available in Indonesia as a source of local potential. Local herbs and spices such as chili powder, sugar, salt, pepper, garlic, cinnamon, palm oil, lime juice, and ginger have been extensively studied separately for marinades and flavorings in meat processing. Marinating technology can also increase food safety and add value to the product (Nurwantoro et al. 2012). The principle of marinating technology is soaking meat in a marinade containing certain ingredients so that slow passive transport of the marinade material into the meat by osmosis occurs (Sengun et al. 2021). The increase in the taste and tenderness of the meat due to the marinade process is caused by the rise in the water-holding capacity of the meat (Patriani & Hafid 2021).

Applying marinating technology to meat can improve the panelists' taste, tenderness, and acceptability (Gómez et al. 2020). Local herbs and spices have the potential to be used simultaneously as ingredients for marinating super-native chicken. Breast meat is one of the most preferred parts of meat by some consumers (Devatkal et al. 2019). Chicken breast meat is usually marinated to increase the tenderness and juiciness of the meat (Singh & Deshpande 2019). So far, no one has evaluated the application of local herbs and spices to the hedonic quality of super-native chicken breast. The hedonic quality test of a food ingredient is an indicator that can show consumer acceptance of the product (Harahap 2017). Therefore, this study was conducted to know the effect of marinating local herbs and spices with different concentrations on the physical quality and sensory of super-native chicken breast.

MATERIALS AND METHODS

Materials

The material used in this study consisted of super-native chicken breast, chili powder, sugar, salt, pepper, garlic, cinnamon, palm oil, lime juice, ginger, and monosodium glutamate (MSG). The tools used in this study consisted of a pH meter, color reader, oven, water bath, and texture analyzer.

Methods

This research consists of several stages. First, this research started with marinade preparation, meat preparation, marinating process, cooking, physical quality, and sensory evaluation.

Preparation of meat

A total of 20 kg of super-native chicken breast meat used in this study came from super-native chicken (unisex) obtained from local farms in Jember.

Preparation of marinade

The marinade formulation was prepared according to Oktafa et al. (2022). The marinade formulation used in this study used herbs and spices, which included: 12% chili powder, 12.25% sugar, 8% salt, 1% pepper, 17% garlic, 0.25% cinnamon, 25% palm oil, 10% lime juice, 12% MSG, and 2.5% ginger.

Table 1. Hedonic quality assessment score of chicken breast marinated with local herbs and spices with different concentrations.

Score	Variable					
	Color	Flavor	Taste	Texture	Tenderness	Juiciness
1	White	Very unscented	Not very tasty	Very rough	Not very tender	Very dry
2	Pale	Doesn't smell good	Not tasty	Rough	Not tender	Dry
3	Pink	Slightly delicious	Slightly tasty	Slightly smooth	Slightly tender	Slightly juicy
4	Bright red	Delicious	Tasty	Smooth	Tender	Juicy
5	Dark red	Very delicious	Very tasty	Very smooth	Very tender	So juicy

Marinating process

The marinating process was prepared according to Oktafa et al. (2021). Super-native chicken breast mixed with marinade with concentration levels: 10, 20, and 30% of the total weight of the meat. Marinate the chicken breast until it is evenly distributed. Vacuum-packed chicken breast, then marinated for 60 minutes.

Cooking process

The cooking process was made according to Oktafa et al. (2021). The marinated chicken breast was steamed for 45 minutes, and after the meat was cooked, it was cooled at room temperature before the panelists evaluated the hedonic quality.

Physical quality test

Physical quality parameters tested were color (Park et al. 2021), pH value, moisture (Zhang et al. 2018), cooking loss, water-holding capacity (Luckose & Pandey 2014), cooking yield (Niu et al. 2020), and hardness (Pöldvere et al. 2014).

Sensory quality test

The cooked, super-native chicken breast marinated was evaluated for hedonic quality by 40 untrained panelists, according to Sujarwanta et al. (2019). The hedonic quality parameters evaluated by the panelists were: color, flavor, taste, texture, tenderness, and juiciness (O'Neill et al. 2019). The hedonic quality assessment scores of chicken breast marinated with local herbs and spices with different concentrations were presented in Table 1.

Statistic analysis

The physical quality test was analyzed by analysis of variance. The hedonic quality test was analyzed by

analysis non-parametric test of Hedonic Kruskal-Wallis, and if there was a significant difference ($P < 0.05$), then further tested with Duncan's New Multiple Range Test (Zhang et al. 2018).

RESULTS AND DISCUSSION

Physical quality

Physical quality is one of the important factors that must be considered in producing marinated chicken meat. The physical qualities of marinated meat that need to be considered include color stability, pH value, water-holding capacity, and meat tenderness (Li et al. 2020). In addition, the moisture, cooking loss, and cooking yield of super-native chicken breast marinated were tested in this study. The data on the physical quality test results of super-native chicken breast marinated with local herbs and spices with different concentration levels are presented in Table 2.

Color

One of the qualities of marinated chicken meat is determined by the color of the meat. The results showed that the concentration level of marinade of different local herbs and spices had no significant effect ($P > 0.05$) on L^* (lightness) of marinated chicken meat. The L^* value indicates the lightness of the color of the marinated chicken meat. The L^* value of chicken meat marinated with local herbs and spices ranged from 48.59-50.53. The concentration level of marinade of different local herbs and spices resulted in marinated chicken meat with almost the same lightness of meat color.

The concentration level of marinade of different local herbs and spices significantly ($P < 0.05$) on the a^* (redness) of marinated chicken meat. The a^* value indicates the redness color of the marinated chicken meat. The a^* value of marinated chicken meat ranged from 12.75-15.24. The a^* value of marinated chicken increased with the higher concentration of local spices

and herbs. The highest a^* value was obtained from marinated chicken meat with a concentration level of 30% local spices and herbs marinade. This red color could be due to the chili powder's 30% marinade concentration level, which gave more red color than the 10% and 20% marinade concentration levels. Berry et al. (2019) stated that the color of chili powder is red. The carotenoid content influences the red color of chili powder.

The concentration level of marinade of different local herbs and spices had no significant effect ($P>0.05$) on the b^* (yellowness) of marinated chicken meat. The b^* value indicates the yellowish color of the marinated chicken meat. The b^* value of chicken meat marinated with local herbs and spices ranges from 17.56-18.73. Different levels of concentration of local spices and herbs marinade produce marinated chicken meat with almost the same yellow color as the meat.

Value of pH

The pH value is one factor that needs to be evaluated in processing processed meat products (Imran et al. 2016). The results showed that the concentration level of marinade of different local spices and herbs had a significant effect ($P<0.05$) on the pH value of chicken meat marinated with local spices and herbs. The pH value of chicken meat marinated with local herbs and spices ranges from 5.08-5.24. The pH value of marinated chicken meat is still following previous studies. The results of Ünal et al. (2020) reported that the pH value of marinated chicken meat was around 3.53-5.66.

The pH value is an essential criterion for changing the quality of marinated meat. The lowest pH value was obtained from chicken meat with a concentration level of 30% local marinade and spices. This low pH value could be due to the acidity of local herbs and spices at a marinade concentration of 30% lower than the marinade concentration level of 10 and 20%. Ünal et al. (2020) reported that the difference in the pH value of marinated chicken meat was due to the difference in the pH value of the marinade used. Vlahova-Vangelova & Dragoev (2014) stated that the herbs and spices used as marinades are slightly acidic because they contain polyphenolic compounds.

Moisture

The moisture contained in meat has a significant role in the quality and has economic value for the meat processing industry. The concentration level of marinade of different local spices and herbs had a significant effect ($P<0.05$) on the moisture of marinated chicken meat. The value of moisture of chicken meat

marinated with local herbs and spices ranges from 65.25-71.28%. The value of the moisture of marinated chicken meat is still following previous studies. The results of Gök & Bor (2016) reported that the moisture of marinated chicken meat ranged from 58.85-70.51%. The value of the moisture of the marinated chicken meat decreases as the pH value decreases.

The lowest moisture value was obtained from chicken meat with a concentration level of 30% local marinade and spices. This low moisture could be due to the low pH value of the marinated chicken meat. Ünal et al. (2020) reported that a low pH value causes the meat structure to open, generating more moisture. Therefore, the lower pH value of marinated chicken meat contributes to insufficient water-holding capacity and more water loss.

Water-holding capacity

The water-holding capacity of meat is essential because many physical properties of meat are related to water-holding capacity, such as color and tenderness (Ketnawa & Rawdkuen 2011). The results showed that the concentration level of marinade of different local spices and herbs did not affect the water-holding capacity of marinated chicken meat. The water-holding value of chicken meat marinated with local herbs and spices ranges from 33.06-36.97%. Therefore, the water-holding capacity of marinated chicken meat is higher than in previous studies. The results of Ünal et al. (2020) reported that the water-holding capacity of marinated chicken meat was around 15.14-28.67%.

The concentration level of marinade of different local herbs and spices resulted in marinated chicken meat with almost the same water-holding capacity. Increasing the level of marinade concentration did not change the water-holding capacity of the marinated chicken. The water-holding capacity relates to pH value (Prayitno et al. 2022). The results showed that the water-holding capacity of chicken meat marinated with local herbs and spices decreased as the pH value decreased (Table 2). However, the decrease in the water-holding capacity with different concentration levels of local herbs and spices has the same effect.

Cooking loss

Cooking loss describes the loss of liquid and solutes from meat during cooking and is an essential factor in the meat processing industry (Pathare & Roskilly 2016). The concentration level of different local herbs and spices marinade did not affect the cooking loss of marinated chicken meat. The cooking loss value of marinated chicken meat with local herbs and spices ranges from 28.09-32.30%. The cooking loss value of

marinated chicken meat is still following previous research. The results of Ünal et al. (2020) reported that the cooking loss of marinated chicken meat ranged from 15.19-37.81%. The cooking loss value of marinated chicken meat increased with decreased water-holding capacity (Table 2). However, the increase in cooking loss with different concentration levels of local herbs and spices has the same effect.

The highest cooking loss value was obtained from chicken meat with a concentration level of 30% local marinade and spices. On the other hand, the lowest was from chicken meat with a 10% local spice and marinade concentration. However, the value of cooking loss differs from the concentration level of different local herbs and spices marinade. However, it has the same effect.

Cooking yield

The cooking yield describes the change in the weight of cooked chicken meat due to water loss during the cooking process. The concentration level of marinade of different local spices and herbs did not affect the cooking yield of marinated chicken. The cooking yield value of chicken meat marinated with local herbs and spices ranges from 67.70-71.91%. The cooking yield of marinated chicken can be affected by the cooking loss value. The cooking yield value of marinated chicken meat decreases along with the increasing cooking loss value (Table 2). However, the reduced cooking yield value of marinated chicken meat with different local herbs and spices concentration levels has the same effect.

The highest cooking yield value was obtained from chicken meat with a concentration level of 10% local marinade and spices. On the other hand, the lowest cooking yield value was obtained from chicken meat with a 30% local spice and marinade concentration level. However, the value of cooking yield differs from the concentration level of different local herbs and spices marinade. However, it has the same effect.

Hardness

Hardness is one of the texture properties of meat which is considered an essential attribute of meat consumption (Pathare & Roskilly 2016). The concentration level of marinade of different local spices and herbs did not affect the hardness of the marinated chicken meat. The hardness value of marinated chicken meat and local spices ranges from 79.87-83.58 N. Hardness of marinated chicken meat can be influenced by the value of water-holding capacity. The hardness value of the marinated chicken meat increased along with the decreasing value of the binding capacity (Table 2). However, the increased hardness value of marinated

chicken meat with different concentration levels of local herbs and spices has the same effect.

The hardness value of marinated chicken meat is still following previous research. The results of Ünal et al. (2020) reported that the hardness value of marinated chicken ranged from 60.28-134.18 N. The highest hardness value was obtained from chicken meat with a concentration level of 30% local marinade and spices. The lowest hardness value was obtained from chicken meat with a local marinade and spices concentration level of 10%. However, the hardness value has differences with the concentration level of marinade of different local herbs and spices. However, it has the same effect.

Sensory quality

The hedonic quality test was one of the sensory characteristics of meat products mainly carried out to determine the level of acceptance from panelists of the meat products produced (Prasetyo & Prayitno 2021). The results of the hedonic quality test that have been evaluated by the panelists on super-native chicken breast cooked with local herbs and spices with different concentration levels are presented in Table 3.

Color

Meat color is one of the quality parameters of meat and its processed products (Thangavelu et al. 2019). Color also affects consumer acceptance of the product, where color is the first parameter seen (Saputro & Susanto 2016). The results showed that the concentration level of marinade of different local spices and herbs had a significant effect ($P < 0.05$) on the color of the marinated breast meat. The hedonic quality score of the color of the marinated breast meat ranged from 3.28-3.85, from pink to bright red. The color of the breast meat that had been marinated with local spices and herbs at the marinade concentration level of 10 and 20% did not change significantly, while at the 30% marinade concentration level it had different color changes according to the results of the evaluation by the panelists. This color change could be because, at the 30% marinade concentration level, the chili powder level, which gives a red color, was more than the 10 and 20% marinade concentration levels.

In this study, panelists could significantly distinguish the color of breast meat marinated with local herbs and spices with different levels of marinade concentration visually. The color of the super-native chicken breast can be influenced by the spices used as a marinade, namely red chili powder. Berry et al. (2019) stated that the color of chili powder is red. In addition, the carotenoid content influenced the color of chili powder. Perception of meat color can influence p'anelists'

Table 2. The physical quality of super-native chicken breast marinated with herbs and spices with different levels of marinade concentrations

Variable	Marinade concentration level		
	10%	20%	30%
Color			
L^* ^{ns}	50.45±0.02	48.59±1.44	50.53±1.75
a^*	13.68±0.29 ^{ab}	12.75±1.61 ^a	15.24±0.44 ^b
b^* ^{ns}	17.56±2.33	18.73±0.14	18.32±0.96
Value of pH	5.24±0.03 ^a	5.11±0.05 ^b	5.08±0.06 ^b
Moisture (%)	71.28±0.11 ^c	69.11±0.49 ^b	65.25±1.28 ^a
Water-holding capacity (%) ^{ns}	36.97±2.44	34.47±0.85	33.06±2.56
Cooking loss (%) ^{ns}	28.09±2.97	29.24±4.07	32.30±6.47
Cooking yield (%) ^{ns}	71.91±2.97	70.76±4.07	67.70±6.48
Hardness (N) ^{ns}	79.87±2.96	78.12±3.07	83.58±4.98

^{ns}= Not significant, ^{a-d}, different superscripts at the same row indicate significant differences (P<0.05)

Table 3. The hedonic quality of super-native chicken breast marinated with herbs and spices with different levels of marinade concentrations

Variable	Marinade concentration level		
	10%	20%	30%
Color	3.28±1.13 ^a	3.30±1.13 ^a	3.85±1.05 ^b
Flavor ^{ns}	3.73±0.67	3.78±1.12	3.65±0.76
Taste ^{ns}	3.70±0.82	3.90±0.77	3.78±0.99
Texture	3.53±0.50 ^a	3.98±0.47 ^b	3.73±0.67 ^a
Tenderness	3.70±0.46	3.70±0.82	3.70±0.64
Juiciness ^{ns}	3.38±0.58	3.53±0.71	3.60±0.74

^{ns}= Not significant, ^{a-d}= Different superscripts at the same row indicate significant differences (P<0.05)

panelists' decisions in choosing meat and its processed products (Torrico et al. 2018).

Visually, the panelists were thought to have almost the same perception of the color of the super-native chicken breast, which has been marinated with local herbs and spices at the marinade concentration level of 10 and 20%, while at the 30% marinade concentration level, it shows a significant color change so that the panelists' assessment of the quality score the color of the chicken meat that has been marinated becomes higher.

Flavor

Meat flavor is one of the critical factors in consumer acceptance. Poultry meat flavor is naturally formed through specific processes, such as heating, where various complex chemical reactions occur between nonvolatile precursors from fat tissue and lean tissue

(Purba 2014). The results showed that the concentration level of different local spices and herbs of marinade did not affect marinated breast meat's flavor. The hedonic quality score for the flavor of the marinated breast meat ranged from 3.65-3.78, from slightly delicious to delicious.

Panelists' assessment of the hedonic quality of the aroma of breast meat marinated with local herbs and spices with different levels of marinade concentration did not experience a significant difference; this could be because the panelists had difficulty distinguishing the aroma of breast meat marinated with local herbs and spices at different levels of marinade concentration by smelling it. The flavor of the meat is produced from a combination of various components that stimulate the olfactory receptors in the nasal passages (Torrico et al. 2018), while the flavor-forming compounds derived from local herbs and spices as a marinade for super-native chicken breast with different concentration levels were thought to have almost the same flavor after being

smelled by the panelists, based on this perception, the panelist's assessment of the hedonic quality score of the marinated breast meat flavor was not different for each treatment.

Taste

The taste of meat is a sensory quality of meat related to the sense of taste of consumers. The main flavor components of processed meat, namely in the form of volatile and nonvolatile components, significantly influence the acceptance of processed meat, especially the taste of meat (Purba 2014). The results showed that the concentration level of different local spices and herbs of marinade did not affect the marinated breast meat's taste. The hedonic quality score of the marinated breast meat ranged from 3.70-3.90, from slightly tasty to tasty; this follows the opinion of Melda et al. (2013) which states that the taste of chicken meat is between slightly-tasty to tasty.

Panelists' assessment of the taste of breast meat that had been marinated with local herbs and spices with different levels of marinade concentration did not experience a significant difference; this could be because the panelists had difficulty distinguishing the taste of the marinated breast meat from the marinade of local spices and herbs at different concentration levels by the way they were felt so that increasing the concentration of the marinade of local herbs and spices did not affect the panelists' taste assessment. In addition, the taste of the meat is produced from a combination of various components that stimulate the taste receptors on the tongue (Torrico et al. 2018), while the specific flavoring compounds derived from local herbs and spices as a marinade for super-native chicken breast with different levels of concentration are thought to have almost the same taste after being felt by the panelists, based on that perception, the panelist's assessment of the hedonic quality score of the taste of the marinated meat did not differ for each treatment.

Texture

The texture is a sensory property of meat related to its smoothness of the meat. The texture is also an important parameter of meat and its products that can affect consumer acceptance (Latoch 2020). The results showed that the concentration level of marinade of different local spices and herbs had a significant effect ($P < 0.05$) on the texture of the marinated breast meat. The hedonic quality score of the marinated breast meat texture ranged from 3.53-3.98, which was from slightly smooth to smooth.

In this study, panelists could significantly distinguish the texture of breast meat marinated with

local herbs and spices with different levels of marinade concentration when the meat was chewed; this is because the panelists were able to distinguish the texture of the breast meat that had been marinated with local herbs and spices at different levels of marinade concentration based on the level of softness when chewing the meat for each treatment. Panelists are thought to have different perceptions of the texture of the meat for each treatment even though they use the same piece of meat, namely the breast, which is known to have a smooth texture (Devatkal et al. 2019) that had been marinated differently for each treatment.

Tenderness

Tenderness is the main parameter in determining the meat quality that can be tested through sensory tests (Hussein et al. 2019). According to Dunshea et al. (2021), meat's tenderness can be sensory by chewing. The results showed that the concentration level of marinade of different local spices and herbs did not affect the tenderness of the marinated breast meat. The hedonic quality score of the tenderness of the marinated breast meat is 3.70, from slightly tender to tender. Therefore, tenderness is essential to meat quality (Lapase et al. 2016). According to Oktafa et al. (2022), the overall tenderness of meat involves three aspects: the ease of initial penetration of the teeth, the ease with which the meat is chewed, and the amount of residue left after mastication.

Panelists' assessment of the tenderness of breast meat marinated with local herbs and spices with different levels of marinade concentration did not experience a significant difference; this could be because the panelists had difficulty distinguishing the tenderness of the breast meat which had been marinated with local herbs and spices at different levels of marinade concentration when biting the meat. Furthermore, panelists are thought to have almost the same perception of the level of tenderness of the meat used in this study, namely using breast meat which is known to be tender (Devatkal et al. 2019); so based on this perception, the panelist's assessment of the hedonic quality score of the tenderness of the super-native chicken breast marinated was not different for each treatment.

Juiciness

Juiciness is a sensory property related to the meat's wetness level (Hussein et al. 2019). The results showed that the concentration level of different local herbs and spices marinade did not affect the marinated breast meat's juiciness. The hedonic quality score of the juiciness of the marinated breast meat ranged from 3.38-3.60, from slightly watery to watery. According to

Zhuang & Savage (2013), juiciness is the amount of water from the meat sample during the first five chews. Escobedo Del Bosque et al. (2020) juiciness is the fluid expelled during the first three chews. Juiciness is also defined as water perceived during mastication (Damaziak et al. 2019). The juiciness of meat can also affect individual taste perception (Liu et al. 2022).

Panelists' assessment of the juiciness of breast meat marinated with local herbs and spices with different levels of marinade concentration did not experience a significant difference; this could be because the panelists had difficulty distinguishing the juiciness level of breast meat that had been marinated with local herbs and spices at different levels of marinade concentration when chewing the meat. Panelists are thought to have almost the same perception of the juiciness level of the meat in this study, so based on this perception, the panelists' assessment of the hedonic quality score of the juiciness of marinated super-native chicken breast was not different for each treatment.

CONCLUSION

This study concludes that the concentration level of marinade of different local herbs and spices could affect the physical quality (redness, pH value, and moisture) and sensory (color and texture) of super-native chicken breast. The marinade concentration of local herbs and spices at 20% level was the best treatment based on hedonic quality with a smooth meat texture with a score of 3.98. Based on physical quality, no more water loss during the marinating and cooking.

ACKNOWLEDGMENT

This paper was supported by Pusat Penelitian dan Pengabdian Kepada Masyarakat (P3M) research funds of Politeknik Negeri Jember.

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