Organoleptic properties of Free-range chicken meat with the pineapple fruit juice marination

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Abstract. Pineapple extract can maintain the quality of chicken meat due to the presence of the enzyme bromelain, namely proteolysis. This study aimed to determine how the effect of marinating of young pineapple extracts with different immersion times on the organoleptic properties of Free-range chicken meat. This research was treated without immersion/control (P1), immersion time 45 minutes (P 2), and immersion time 90 minutes (P 3). This study was arranged based on a randomized block design with three treatments using 15 trained panellists. Based on the results obtained, it can be concluded that marination using 3% young pineapple extract has a significant effect (p <0.05) on tenderness, juiciness, and Consistency, but does not have a significant effect (p > 0.05) on colour, Odour, and taste.

1. Introduction
Meat is the body part of poultry that has been slaughtered and is fit for consumption (edible). Meat is one of the poultry products that cannot be separated from human life. As a food ingredient, meat can cause satisfaction or pleasure for those who eat it because it has completed nutritional content such as animal protein, water, energy, minerals, and vitamins, so that the nutritional balance for life can be fulfilled.

Food ingredients derived from poultry in the form of meat contain highly nutritious food ingredients because almost all of the nutrients the human body needs are found in meat. The characteristics of meat are influenced by many factors and these factors can be controlled, manipulated, and controlled or utilized by humans to create optimal usefulness and effectiveness. Color, tenderness, consistency, taste, smell, and freshness are the main factors in determining the characteristics of meat [1,2].

Free-range chicken is one type of poultry that is favored by the community because native chicken meat is savorier and has a distinctive smell [3]. To get it is not difficult, because many free-range chickens are raised by residents, even though in a very simple way. Apart from these reasons, people are also accustomed to consuming free-range chicken compared to purebred chicken. However, free-range chicken which is cut at old age has tough meat, so it requires special treatment in the processing process so that the meat is tender and delicious to eat. Provision of proteolytic enzymes is a special process to soften meat [4]. The compression process can be done using softening agents, including juice
or young pineapple juice [5,6] and papaya latex [7]. Specifically, the use of young pineapple juice is based on the enzyme content of bromelain in the young pineapple plants. Bromelain is an enzyme that has proteolytic properties, namely an enzyme that can hydrolyze protein into simple peptides and amino acids [4,8].

2. Material and methods

The material used in this study was Free-range chicken meat, meat samples were taken from the biceps femoris muscle, which is the large muscle on the lateral (outer) surface of the thigh. Meat samples were taken from 10 Free-range chickens with age around 2-year-old. Pineapple juice obtained from 6 weeks old pineapple will be used as a softener, with the provision of 3% of the sample weight. The location of the meat used is a mixture of breast and thigh meat.

Meanwhile, the tools used are analytical scales, polyethylene plastic, knives, basins, water, suction paper, and writing utensils. This study used a completely randomized design with six replications, with long immersion treatment: Without Soaking (P1), Soaking with pineapple juice at a dose of 1.5% of the weight of the meat (P2), and: Soaking with pineapple juice at a dose of 3.0% by weight of meat (P3). A subsection

2.1. Pineapple juice procedure

Pineapple juice is obtained by washing pineapples, peeling them, then cutting them into small pieces, and blending them. The finished pineapple pulp is pressed or filtered to obtain pineapple juice or liquid. The crude fruit juice obtained is put in a storage tank for further filtering. Meat samples used for serving must be cleaned of connective tissue and adhering fat. The meat that has been prepared is then cut uniformly and then given a treatment, namely smeared with pineapple extract. However, before this process, the final pH of the meat was recorded and the meat samples were evenly pierced with a fork to allow the pineapple juice containing bromelain to seep into the meat. The meat sample was then allowed to stand for the length of soaking determined in the treatment. Then the meat sample is put into a labeled plastic bag. The label given is adjusted according to the treatment combination applied. The sample is put into a plastic bag and then pressed so that there is no direct contact between the meat and water.

2.2. Research design

This research is based on a completely randomized design (CRD). There were three treatments, namely marination without pineapple juice as a control (A1), marination with pineapple juice 1.5% (A2) and marination with 3% pineapple juice (A3). Each treatment was tested by 15 trained panelists as a replication. Data analysis was carried out by variance according to instructions [9], using SPSS software. Continue test using Honestly significant Difference (HSD)

2.3. The observed parameters

The parameters observed were the physical and organoleptic properties of Free-range chicken meat. Physical properties observed was cooking loss, while organoleptic qualities were tenderness, color, Odor, flavor, juiciness, and Consistency. Organoleptic testing (panel test) was carried out by 20 trained panelists according to [10].

2.3.1. Color. The color of raw meat was assessed based on the methods used by [11] and [12] namely from (1) white, (2) pale white, (3) pink, (4) bright red and (5) dark red.

2.3.2. Odor. The scent rating is based on [13] guidelines ranging from (1) highly preferred, (2) preferred, (3) moderately preferred, (4) undesirable, and (5) highly unfavorable.

2.3.3. Consistency. Consistency assessment was carried out based on the criteria of very (1) fine, (2) fine, (3) moderate, (4) rough, and (5) very rough [14].
2.3.4. Taste. Taste assessments based on the guidance of [13] starting from (1) very liked, (2) liked, (3) quite liked, (4) disliked, and (5) very disliked.

2.3.5. Tenderness. Meat tenderness was assessed based on [13] starting from (1) very soft, (2) tender, (3) medium, (4) tough, and (5) very tough.

2.3.6. Juiciness. Oil essence (juiciness) is assessed based on the method by [12], namely from (1) very juicy (very oily), (2) juicy (oily), (3) quite juicy (quite oily), (4) slightly juicy (a little oily) and (5) dry.

3. Results and discussions

The average effect of pineapple juice administration on the average score of colour, Odour, Consistency, taste, tenderness, and juiciness on the independent effect of pineapple juice can be seen in the Table 1.

| Parameter       | Pineapple juice marinated Without pineapple juice (A1) | 1.5% Pineapple juice (A2) | Pineapple juice 3% (A3) |
|-----------------|--------------------------------------------------------|---------------------------|-------------------------|
| Color           | 3.11 ± 0.54                                            | 3.23 ± 0.52               | 3.34 ± 0.58             |
| Odor            | 3.15 ± 0.64                                            | 3.22 ± 0.52               | 3.23 ± 0.48             |
| Consistency     | 3.44± 0.92                                             | 2.92± 0.51                | 2.93± 0.58              |
| Taste           | 3.44± 0.57                                             | 3.27 ± 0.52               | 3.28 ± 0.51             |
| Tenderness      | 3.78± 0.98                                             | 2.30± 0.46                | 2.32± 0.55              |
| Juiciness       | 3.40± 0.88                                             | 2.24± 0.43                | 2.26± 0.74              |

Note: Numbers with different superscripts show a significant effect (P <0.05)

3.1. The Effect of pineapple juice on the colour of free-range chicken meat

The average effect of pineapple fruit juice on colours can be seen in Table 1. Meat colour is an important factor and can affect the interest of meat consumers. Factors that can affect meat colour include feed, species, breed, age, sex, stress (activity level and muscle type), pH, and oxygen. Analysis of statistical variance showed that the use of pineapple extract on meat colour had no significant effect on colour.

This is due to the increasing age of the birds, the darker colour of the meat due to the increase in myoglobin concentration, and perhaps also due to the increase in oxygen during the cleaning and storage of meat, this follows the opinion of Soparano [1] and [5] stating that muscle myoglobin concentration during age can be caused by an increase in myoglobin deposition in the existing red fibres, or an increase in the number of red fibres, pale muscle in the carcass contains anaerobic white fibres with high glycogen content. According to [8] states that muscle colour can be related to the type of muscle fibre.

3.2. The Effect of Pineapple Juice on the Odor of Free-range chicken Meat

The average effect of pineapple juice on odour can be seen in Table 1. Flesh odour is a complex and interrelated sensation, where the smell of cooked meat is influenced by animal age, type of feed, species, sex, poultry, race, length of time and storage conditions of meat after cutting and type, duration and temperature during cooking. Based on the results of the analysis of variance, it shows that the provision of pineapple juice does not have a significant effect, this is due to the influence of cooking meat and meat processing techniques that can cause tissue damage to the meat. According to [15] stated that the Odour of cooked meat is strongly influenced by the length of storage time and the condition of storing the meat after being cut.

3.3. The effect of pineapple juice on the consistency of free-range chicken meat

The average effect of pineapple fruit juice on Consistency can be seen in Table. Meat Consistency is one of the determining factors for meat properties that affects consumer acceptance of meat properties.
Based on the results of the analysis of variance, it shows that the use of pineapple juice has a very significant effect on the Consistency with the BNJ test results showing a very significant difference between the meat that is not given pineapple juice (P1) which produces a Consistency with a score of 3.45. When compared with the meat given pineapple juice (P3) it produces a very smooth Consistency with a score of 2.93. This is following [1] which says that the poultry nation also has a Consistency, including the age of cattle, cooking temperature, and use of tenderizer.

3.4. The Effect of provision of pineapple juice on the taste of free-range chicken meat

The average effect of pineapple juice on the taste of Free-range chicken meat can be seen in Table 1. Based on the analysis of variance, it shows that pineapple juice does not have a significant effect. This is due to the influence of cooking meat, and meat processing techniques that can cause tissue damage to the meat taste is a complex and interrelated sensation, the dominant taste sensations are bitter, sweet, sour and salty, as well as smell, taste is also influenced by the age of the bird, race, length of time, and length of time. The storage conditions for meat after slaughter, as well as the type, duration, and cooking temperature. Provision of pineapple juice can change the taste of the meat; this is as follows [1] which states that the factors that affect rancidity and wanned over flavour include processing which can cause tissue damage and the provision of various additional ingredients containing antioxidants.

3.5. The effect of provision of pineapple juice on tenderness of free-range chicken meat

The average effect of pineapple fruit juice on tenderness can be seen in Table 1. Tenderness is the most important determinant of meat properties. Factors that influence tenderness are classified into antemortem factors such as genetics, including race, species and physiology, age, management, sex and stress factors, and post mortem factors including chilling, refrigeration, withering and freezing methods including cooking methods and adding tenderizing materials [16,17].

Based on the results of the analysis of variance, it showed that the provision of pineapple juice had a very significant effect (P<0.01) on meat tenderness. HSD test results showed a highly significant difference between the meat given pineapple juice 3% (A2) produce tender meat parameters with a score of (2.3 seconds) when compared to meat that is not given pineapple juice (A1) with tough with a score of (3.78). This difference is caused by the provision of pineapple fruit juice which contains the proteolytic enzyme bromelain so that it can break down protein molecules into smaller amino acid molecules and also damage chemical bonds in the meat so that it makes the meat soft [1,18].

3.6. Effect of pineapple juice on the juiciness free-range chicken meat

The average effect of pineapple juice use on juiciness can be seen in Table 1. Based on the results of the analysis of variance showed that the administration of pineapple juice showed a very significant effect (P <0.01) on the juiciness of Free-range chicken meat. The BNJ test results showed a very significant difference between meat that was not given pineapple juice (P1) and meat that was given nasal juice as much as 3 % (P3). Meat that is not given pineapple fruit juice produces meat that has sufficient juice impression with a score of 3.4 while meat that is given pineapple juice with a concentration of 3 % produces meat that has the impression of juicy juice with a score of 2.25. This means that the impression of the Biceps Femoris muscle meat juice increases or the panel score decreases. This difference is due to the content of the enzyme bromelain which is proteolytic in nature so that it can break down protein molecules in intramuscular fat into smaller amino acid molecules. Following the opinion [1,2] and [19] which state that the impression of meat juice is a combination of the two effects namely the impression of fluid released during mastication and saliva produced by flavour factors including intramuscular fat.

4. Conclusions

Based on the results obtained, it can be concluded that marination using 3% young pineapple extract has a significant effect (P<0.05) on tenderness, juiciness, and Consistency, but does not have a significant effect (P>0.05) on colour, Odour, and taste. Further research is needed regarding the properties of Free-range chicken meat using other ingredients.
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