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Drying Bay Leaf Infusion as an Improved the Physicochemical and Organoleptic Quality of Patties

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Abstract

Patties are produced utilizing meat restructuring technology. Beef patty disadvantages include short shelf life and susceptibility to microbial contamination. The medicinal plant known as bay leaf (Syzygium polyanthum) is used in cooking as a flavorful spice and has beneficial uses for health. The purpose of this study is to ascertain the physical and chemical characteristics of beef patties infused with bay leaves. A laboratory experimental approach with a completely randomized design (CRD), 4 treatments, and 5 replications was used. In the initial phase of the experiment, without bay leaf infusion was used as a control (P0), and the amount of bay leaf infusion added to the total amount of meat utilized was 5% (P1), 10% (P2), and 15% (P3). Storage times of 0 hours (T0), 3 hours (T1), 6 hours (T2), and 9 hours (T3) made up the second part of the research procedure. The results of stage 1 demonstrated a highly significant (P<0.05) difference in quality between the beef patties that had been infused with bay leaves. The results of this study suggest that adding a 15% infusion of bay leaves can improves the physicochemical quality of beef patties while allowing them to be kept at room temperature for 9 hours.

Keywords: *Beef, Infused, Microbial Contaminant, Physicochemical, Syzygium polyanthum*

Introduction

Consumers favor beef as an animal protein source because of how wonderful it tastes. Meat is a food component that is nearly inseparable from human life due to its complete nutritional value and its role in manufacturing processed goods. Meat has a nutritional composition of 19% protein, 75% air, 2.5% fat, and 3.5% non-protein components. Meat is an example of fresh food product that is perishable. Given their limited shelf lives, fresh and perishable food goods require more difficult handling. The temperature and handling time are two examples of external elements that can easily destroy foods. To preserve food quality and safety, more processing is required. Technology for meat restructuring can be used to process meat. By minimizing the size of the meat particles and then adding binders, meat restructuring technology enables the improvement of product quality. Semi-finished products can use restructuring technologies to modify their structural and organoleptic characteristics. In order to boost product functionalities and efficiency, restructuring technology may be utilized as well to create goods from low-quality raw materials. The benefits of adding other ingredients to meat products include the ability for improved flavor, increase consumer acceptance, increase the protein and water binding capacity, improve texture, act as a coloring agent, increase stability of frozen products when thawed, and lengthen product shelf life. The required product is reconstructed from meat pieces that have binding agents added. A variety of processed meat products including patties, ham, surimi, and patties can be supported by restructuring meat technology, which makes the product easier to serve and more appealing to consumers.

The ingredients used to make patties are minced meat, binders, fillers, and seasonings. The largest part of the patties is composed from meat, and in order to be considered a high-quality patty, the amount of added animal fat must typically reach 80%. The remaining 20% of the patty is composed of water, binders, and fillers. Patty is a well-known quick snack in the larger population because of its pleasant, delectable, juicy, simple, and delicious qualities. Protein in particular will break down into simpler molecules as a result of microbial activity during storage, and if this process is allowed to continue, it will result in the production of noxious substances such indole, mercaptans, amines, and H2S. Only mercaptans

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and H2S are weak acids among these substances; the others are alkaline and strong bases. The more time meat is left at room temperature, the more microbial activity there will be, which will lead to degradation. An increase in pH and an acceleration of bacterial growth will occur after the breakdown process. Meat must be preserved in order to extend its shelf life due to the development of bacteria in the meat, which causes harm to the flesh. By including spices that contain antioxidants and antimicrobials, meat's shelf life can be increased.

Bay leaf is a species of plant that has a reputation for being used as an antibiotic because it can stop microbial activity. One of the medicinal plants utilized by the community is bay leaf (*Syzygium polyanthum*), which has the power to treat illnesses when it contains alkaloids, flavonoids, saponins, tannins, and steroids. Bay leaves are frequently used in cooking as a flavorful spice and have health benefits, including the ability to lower blood sugar levels. In addition to acting as an antifungal, bay leaf water extract contains tannins, flavonoids, and saponins that have antibacterial properties. The research results of Evendi's analysis in 2017 demonstrated that all bay leaf infusions (*Syzygium polyanthum*) had antibacterial ability as demonstrated by the presence of a clean zone surrounding the paper disk in *Salmonella typhi* and *Escherichia coli* bacterium cultures. Studies on the preservation of meats such beef, lamb, and poultry have used bay leaf infusion (*Syzygium polyanthum*) as a preservative. Bay leaf infusion was applied, and it turned out to have a big impact on the pH, water content, flavor, color, and texture of Bali beef kept at room temperature. Bay leaves are frequently used in traditional diabetic treatments. This involves boiling a few bay leaves in two glasses of water, then adding one full glass of water. In addition, the advantage of this infusion approach is that the equipment employed is easily available. There are tannins, flavonoids, and saponins in bay leaf water extract.

MATERIALS AND METHODS

A. Materials

Beef is the primary component of a patty. Bread flour, ketchup (tomato sauce), onions, salt, ground pepper, and patties are other ingredients. Plantations are where you may get fresh bay leaves. Bay leaf infusion-soaked patty samples, distilled water, pH 7 buffer solution, pH 4 buffer solution, 0.3 N H_2SO_4, 1.5 N NaOH, 0.3 N HCL, acetone, ether solution, concentrated H_2SO_4, 0.1 N H_2SO_4, 40% NaOH, 0.1 N NaOH, Na_2SO_4, and 0.004% DPPH are the materials needed for the test.

B. Tools

The tools used in making the patty were a food processor brand Oxone OX294 Food Processor, digital scales brand Goto, baking sheet, basin, plastic adhesive, two knives, cutting board, gas stove, spoon, fork, Happycall frying pan, and soxlet, while the tools used for testing consists of a yellow AU 001 pH meter, organoleptic questionnaire, object glass, cover glass, particle size analyzer program, petri dish, oven (WTC binder), erlenmeyer (herma), filter paper, spatula.

Table 1 describes how to produce beef patties by soaked them in a bay leaf infusion.

Table 1. Describes How to Produce Beef by Soaked them in a Bay Leaf Infusion

Material Composition (%)	Treatments			
	P0	P1	P2	P3
Beef	85	85	85	85
Salt	3.5	3.5	3.5	3.5
Pepper Powder	2	2	2	2
Onion	3	3	3	3
Ketchup (Tomato Sauce)	2	2	2	2
Powdered Mushroom Broth	0.5	0.5	0.5	0.5
Bread Crumbs	4	4	4	4
Bay Leaf Infusion	0	5	10	15
Total	100	105	110	115

Source: (Research Data, 2023) which has been modified.
Note: Value in % of the total ingredients used

C. Methods

A laboratory experimental design using a completely randomized design (CRD) with 4 treatments and 5 replications was the research methodology used. Bay leaf infusions in varying quantities were used as the treatment. The percentages of employing bay leaf infusion in the treatment were 5%, 10%, and 15%. As a control, patties that were not steeped in the infusion of bay leaves were used (P0). As a point of comparison between the control and the treated patties.

D. Procedures

Preparation of Bay Leaf Infusion

Bay leaf infusion was made by washing fresh bay leaves with running water first, then cutting them into small pieces, and then drying them for 24 hours. Then it was boiled for 10 minutes in boiling water. The concentration of bay leaves used in this study was a ratio of 0% (w/v), 5% (w/v), 10% (w/v), 15% (w/v), namely 0 g, 15 g, 30 g, and 45 g of bay leaves, each boiled in 300 mL of water. After boiling, the water is filtered and cooled. Beef patty samples were then soaked in bay leaf infusion per concentration for 30 minutes and then placed on a stainless steel tray and placed at room temperature, then tested every 3 hours at 0, 3, 6, and 9.

Making Beef Patties

The stages of making the patty begin with making the control or without soaking the bay leaf infusion, then proceed with making the patty by soaking the bay leaf infusion. Making the patty begins with preparing all the ingredients, then weighing all the ingredients including fresh beef, salt, ground pepper, onions, ketchup (tomato sauce), and breadcrumbs. The beef that has been weighed is cut into small pieces and then finely chopped. Mix the minced meat with salt, ground pepper,

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onion, and breadcrumbs in a food processor for about 25 seconds. The homogeneous dough was then printed on a patty mold and then cooked on a grill pan for 10 minutes at 85ºC. The test was carried out by taking a sample of the beef patty that had been made and then soaking it in the bay leaf infusion until all parts of the patty were submerged and then tested.

DATA ANALYSIS

Microsoft Excel was used to tabulate the study's data, and a Completely Randomized Design (CRD) was used for analysis. The Duncan's Multiple Range Test will be used if the effect difference is considerable or very significant. The following is formula applied for statistical analysis:

$$Y_{ij} = \mu + \tau_i + \varepsilon_{ij}$$

Information:
Y_{ij} = observation on treatment i and replication j
μ = general average
τ_i = the effect of the i-j treatment level
ε_{ij} = random effect on treatment i and replication j

RESULTS AND DISCUSSIONS

The Effect of Bay Leaf Infusion on the Physicochemical Quality of Beef Patty

Effect of bay leaf infusion with different concentrations of 0%, 5%, 10%, 15% on physicochemical characteristics (pH, moisture content, water holding capacity, and cooking losses) and sensory evaluation (texture, taste, color, and flavor) patty beef.

A. Effect of Different Concentrations of Bay Leaf Flour Infusion on Beef Patty pH

One of the most crucial factors in industrial-scale food processing is pH since it has an impact on both quality and safety issues. The final quality of food products is influenced by pH, salt absorption, enzyme activity during cooking, and microbial development (Bansal and Veena, 2022). Appendix 11 contains information on the examination of the pH variable on beef patties that have been steeped in bay leaf infusion at various doses. Table 2 below shows the average pH of the beef patty after it has been infused with bay leaves.

Table 2. The Effect of Bay Leaf Infusion on the Mean pH Value of Beef Patty

Treatment	Average Score of pH ± SD
P0	**7,56 ± 0,174[b]**
P1	**7,38 ± 0,096[b]**
P2	**7,36 ± 0,219[b]**
P3	**6,36 ± 0,253[a]**

Note: [a, b] Different superscripts on the same line indicate that the concentration of bay leaf infusion had a significant effect (P<0.05) on the pH of the first phase of the study on beef patties.

The pH of the beef patty was significantly affected by soak in different quantities of bay leaf infusion, according to the results of the analysis of variance (P<0.05). The average pH level of a beef patty that has been infused with bay leaves is displayed in Table 2. The pH range of the beef patty that had been infused with bay leaves was between 6.36% and 7.56%. In this investigation, it was discovered that soaking beef patties in varying amounts of bay leaf infusion had a significant impact on lowering their pH (P<0.05) (Table 2). This suggests that soaking the patty in bay leaf infusion speeds up the process of lowering the pH until it achieves absolute pH. An indicator of the acidity or validity of meat is the amount of acidity (pH). Because the bay leaf infusion has an acidic pH of 5.4 and is submerged in it, the pH of the meat can decrease as a result of the soaking treatment with the infusion of bay leaves. Beef metabolic activities may potentially contribute to the pH drop (Kusumaningrum *et al*., 2013).

B. The Effect of Different Bay Leaf Infusions on Moisture Content of Beef Patty

Microbes can easily harm foods with a higher water content, such as meat, milk, and seafood. One of the factors taken into account to prevent damage to processed meat products is the analysis of water content (Odeyemi *et al*., 2020). Table 3 below shows the results of measuring the average water content of the beef patty after soaking in a bay leaf infusion.

Table 3. The Effect of Soaking Bay Leaves Infusion on the Average Moisture Content of Beef Patty

Treatment	Average Water Content ± SD
P0	**55,99 ± 0,541[a]**
P1	**56,99 ± 0,971[ab]**
P2	**58,56 ± 1,275[bc]**
P3	**59,89 ± 1,678[c]**

Note: [a, b] Different superscripts on the same line indicate that the concentration of bay leaf infusion had a significant effect (P<0.05) on the water content of the first phase of the study on beef patties.

The findings of the analysis of variance revealed that the moisture content of the beef patty was significantly affected (P<0.05) by soaking the bay leaf infusion at various doses. The average amount of water in a beef patty that has been infused with bay leaves is displayed in Table 3. The beef patties that had been infused with bay leaves ranged in water content from 55.99% to 59.89%. The amount of water in the beef patty grows as the percentage of bay leaf infusion does as well. The product's sensory quality and microstructure are impacted by its moisture content (Guo *et al*., 2020). The texture of the product, including its hardness or flexibility, will change as the water content varies. According to (Fiorentini *et al*., 2020), the use of hydrocolloid materials can increase the water content, which enhances the mouthfeel and flavor.

Breadcrumbs are the protein source added to the beef patties. Because protein sources have viscoelastic qualities that enable them to create a network that attaches to meat products, they are typically added to processed meat as a binding agent

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(Fiorentini, *et al*., 2020). A beef patty can retain its moisture content by soaking in a bay leaf infusion. More water is released as the bacteria multiply. Bacterial metabolism produces water, which can lower the meat's water content. The amount of water in the meat increases as the total amount of bacteria increases (Agustina *et al*., 2017). The water content of the beef patty experienced a significant difference as shown in table 3.

C. The Impact of Soaking Bay Leaf Infusion at Different Concentrations on Meat Patty Water Holding Capacity

The ability of meat or products made from processed meat to retain water or water supplied during processing is known as water-holding capability. By soaking beef patties in a bay leaf infusion, the water holding capacity test tries to measure the beef patties' ability to hold water. Because it will affect the product's visual acceptance, cooking loss, yield, and sensory quality, the ability of meat products to bind water must be understood (Warner, 2017). Table 4 shows the findings of the average water retention capacity of a beef patty that has been infused with bay leaves.

Table 4. Effect of Bay Leaf Infusion on Water Holding Capacity of Meat Patty

Treatment	Average Water Holding Capacity (%) ± SD
P0	**13.94 ± 0.659^{a}**
P1	**15.24 ± 1.039^{a}**
P2	**19.79 ± 0.934^{b}**
P3	**23.44 ± 1.681^{c}**

Note: $^{a, b, c}$ = Different superscripts on the same line show that the concentration of bay leaf infusion has a significant effect (P<0.05) on the water-holding capacity of the beef patty.

The findings of the analysis of variance revealed that the water-holding capacity of the beef patty was significantly affected by the addition of varied amounts of bay leaves (P<0.05). Tannins and flavonoids are active elements in bay leaves that have anti-inflammatory properties. *Eugenia polyantha* is another active ingredient that is suspected to have pharmacological benefits. Temperature will reduce the body's ability to store water because it speeds up the transport of water into cells and the denaturation of muscle proteins (Soeparno, 2005). In addition to protein and pH, stress, country, actomyosin formation *(rigormortis)*, temperature, humidity, carcass withering, aging, muscle type and location, species, age, muscle function, feed, and intramuscular fat can all affect the water-holding capacity of meat.

THE IMPACT OF DIFFERENT BEEF LEAF INFUSA CONCENTRATIONS ON THE COLOR OF L*A*B* BEEF PATTY

A colorimeter was used to analyze color. The purpose of the color test is to evaluate the color of the beef patty after it has been infused with bay leaves. Table 5 below shows the typical texture of a beef patty that has been infused with bay leaves.

Table 5. Bay Leaf Infusion's Mean L*a*b* Value Impact on Beef Patty Cooking Losses

Treatment	L* Score ± SD	a* Score ± SD	b* Score ± SD
P0	63.32 ± 3.157^{d}	-0.58 ± 0.346^{a}	13.00 ± 0.598^{b}
P1	58.98 ± 1.162^{c}	2.58 ± 0.314^{b}	14.50 ± 0.819^{c}
P2	52.66 ± 3.557^{b}	4.52 ± 1.011^{c}	13.95 ± 1.391^{bc}
P3	47.35 ± 1.939^{a}	6.74 ± 1.585^{d}	10.98 ± 1.010^{a}

Note: $^{a, b, c, d}$ = Different superscripts on the same line indicated that the concentration of bay leaf infusion had a significant effect (P<0.05) on the L*a*b* color test on the beef patty.

In foods that have been processed, color is crucial. In order to create products with colors that consumers will like, dyes are sometimes added to food products to improve the sensory quality that may alter throughout. In order to achieve color accuracy, colors are classified using the L*a*b color space. The findings of the analysis of variance revealed that the color of the L*a*b* beef patty was significantly affected by the addition of varied amounts of bay leaves (P<0.01). The average L*a*b* color values of beef patties that have been infused with bay leaves are displayed in Table 5. The range of the L* color of the beef patty that had been infused with bay leaves was 47.35% to 63.32%. The findings demonstrated that the L* color of the beef patty dropped as the proportion of bay leaf infusion rose. This was as a result of the product becoming darker as the amount of bay leaf infusion increased.

In processed food products, color is significant. The addition of dyes is done to produce products with colors that customers will like or to enhance the sensory quality of food products that may alter throughout processing. L*a*b color is a color space that is used to categorize colors so that color accuracy can be achieved. The meat of the rejected ducks was initially white, and the pineapple skin extract had a slightly yellowish color, so the soaking process between the meat and the pineapple skin extract caused the meat to tend to be blackish-white. The protein pigment myoglobin is what gives meat its red or white hue The primary factor causing the reduction in meat color is oxidation of the myoglobin protein. The reduction in L* hue was most likely brought on by the heat cooking process. Browning of the product's color results from cooking at high temperatures. The Maillard reaction is what gives the color brown. The loss of L* color is impacted by the browning reaction.

The range of the beef patty's hue a* after being infused with bay leaves was -0.50% to 6.74%. The outcomes demonstrated that increasing the amount of bay leaf infusion led to an increase in the beef patty's color a*. The color of the patty after soaking was most significantly influenced by the bay leaf infusion's concentration; the higher the concentration, the browner the final color. This is due to the fact that the meat turns brownish red due to the polyphenol content found in the tannins and flavanoids in the bay leaf infusion. The beef patty

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that had been infused with bay leaves had a b* color that ranged from 10.98% to 13.00%. The findings demonstrate that the color b* tends to decrease when the amount of bay leaf infusion in the beef patty rises; this is because a heating process can alter the product's color. The reduced solubility of oxygen trapped in the product is another factor that could have an impact on the decline in b* value. Brown metmyoglobin is more likely to occur under anaerobic conditions. Changes in product color will decrease consumer approval, creating issues with product marketing. Increased product color stability may be achieved by using antioxidant sources.

CONCENTRATION OF BREECH LEAF INFUSION HAS AN IMPACT ON BEEF PATTY ORGANOLEPTIC QUALITY

Organoleptic quality was determined by semi-trained panelists scoring the organoleptic questionnaire on a scale of 1 to 5. Using descriptive methodologies, the findings of the evaluation by the five semi-trained panelists will be examined, drawn, and debated. Table 6 displays the average value for each panelist. On the spider graph in Figure 1, the average organoleptic quality scores for the beef patty infused with bay leaf infusion's texture, flavor, color, taste, and overall acceptability are displayed.

Table 6. The average value of bay leaf infusion's impact on organoleptic quality

Treatment	Texture	Flavor	Color	Taste	Overall Acceptance
P0	4,40 ± 0,764[a]	4,44 ± 0,768[a]	4,24 ± 0.779[a]	4,40 ± 0,764[a]	4,44 ± 0,712[a]
P1	4,44 ± 0,651[a]	4,52 ± 0,653[a]	4,44 ± 0.651[a]	4,58 ± 0,653[a]	4,52 ± 0,653[a]
P2	4,50 ± 0,707[a]	4,64 ± 0,712[a]	4,59 ± 0.707[a]	4,60 ± 0,707[a]	4,40 ± 0,707[a]
P3	4,68 ± 0,476[a]	4,72 ± 0,458[a]	4,76 ± 0.436[a]	4,68 ± 0,476[a]	4,60 ± 0,500[a]

Note: [a, b] = The amount of bay leaf infusion had a significant impact (P<0.05) on the panelists' organoleptic testing of the beef patty, according to several superscripts on the same line.

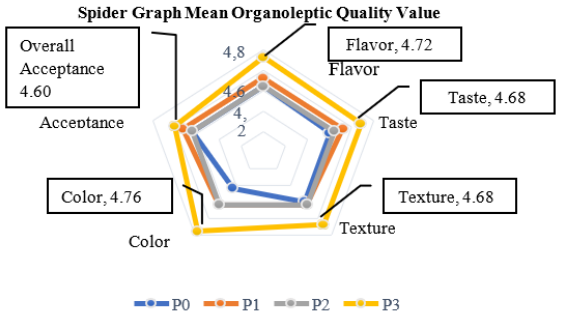

Figure 1. Spider Graph Mean Organoleptic Quality Value

Figure 1: Spider Graph Mean Organoleptic Quality Value of Beef Patty Soaked in Bay Leaf Infusion (Texture, flavor, Color, Taste, and Overall Acceptance) The average organoleptic quality rating is used to create the pentagon form on the spider graph. The average score increases as the pentagon line becomes bigger; conversely, the average score decreases as the pentagon line gets smaller. The beef patty that had been soaked in a 15% concentration of bay leaf infusion received the highest average score based on the evaluation of texture, aroma, color, taste, and overall acceptance (P3), whereas the control treatment (without soaking in bay leaf infusion) received the lowest average score.

THE EFFECT OF DIFFERENT CONCENTRATION OF STEAMING GREEN LEAF INFUSION ON THE ORGANOLEPTICAL VALUE OF BEEF PATTY TEXTURE

The findings of the analysis of variance revealed that the texture of the beef patty based on organoleptic quality was unaffected by the different doses of bay leaf infusion (P>0.05). The range of the average texture rating for a beef patty infused with bay leaves, which ranged from 4.40 to 4.68, shows that the panelists preferred the texture of the beef patty that resulted from a higher bay leaf infusion concentration.

Applying bay leaf infusion to Bali beef at doses of 0%, 5%, 10%, and 15% was used in a related investigation. It is known that the texture of Bali beef varied significantly between concentrations of 0% and 5%, 5% and 10%, and 10% and 15% (P>0.05). Meat softness is influenced by two factors: antemortem and postmortem. Genetics, including nation, species, and physiology, as well as sex, age, management, and stress, are antemortem influences (Amertaningtyas, 2012). Meat's protein structure can be degraded by microbial activity at room temperature, changing the meat's texture.

Bay Leaf Infusion at Different Concentrations and How It Affects Beef Patty Flavor's Organoleptical Value

The research results of the analysis of variance showed that the flavor of the beef patty based on organoleptic quality was significantly influenced by the concentration of bay leaf infusion that was added to the beef patty (P>0.05). Table 7 displays the average rating for each treatment's beef patty scent after it has been infused with bay leaves. The beef patty that had been infused with bay leaves had a flavor score that ranged from 4.44 to 4.72 on average. The average flavor score was 4.72 at P3 with a concentration of 15% bay leaf infusion, and it was 4.44 at P0 without soaking the infusion bay leaf. This shows the panelists prefer the aroma produced by adding more bay leaf infusion to the beef patty. Bay leaves contain essential oils with a strong but not overpowering odour.

In a related study (Suada *et al*., 2018) used immersion of bay leaf infusion on Balinese beef with the treatment of immersion in bay leaf infusion with concentrations (0%, 5%, 10%, and 15%). There was no change in odor due to the tannin content contained in the concentration of 10% and 15% higher bay leaf infusion so that it could inhibit bacteria that easily cause meat to spoil. Tannins can impede the growth of numerous bacteria since they are growth inhibitors. Tannins, which are phenolic chemicals as well, prevent the growth of bacteria by denaturing proteins, lowering surface tension, and increasing bacterial permeability. The inhibition of bacterial cell development and enhanced permeability can ultimately result in cell death (Kusumaningrum *et al*., 2013).

The Impact of Different Soaking Green Leaf Infusion Concentrations on the Organic Value of Beef Patties' Color

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The findings of the analysis of variance revealed that the color of the beef patty based on organoleptic quality was significantly affected by the concentration of bay leaf infusion that was added to the beef patty ($P<0.05$). Table 5 displays the average color rating of the beef patty infused with bay leaves for each of the treatments. The beef patty that had been infused with bay leaves yielded an average color score that ranged from 4.43 to 4.76. The panelists preferred the color of the beef patty that resulted from soaking it in bay leaf infusion at higher concentrations, as evidenced by the highest mean color score at P3 with a concentration of 15%, which was 4.92, and the lowest mean color score at P0 without being soaked in bay leaf infusion, which was 1.36.

THE IMPACT OF VARIOUS STEAMING GREEN LEAF INFUSION CONCENTRATIONS ON THE ORGANOLEPTIC VALUE OF BEEF PATTY TASTE

Use of variance analysis the findings demonstrated that the taste of the beef patty based on organoleptic quality was not significantly affected by the bay leaf infusion at varied doses ($P>0.05$). Table 5 displays the average color rating for each treatment for the beef patty infused with bay leaves. The beef patty that had been infused with bay leaves produced an average flavor rating that ranged from 4.40 to 54.68. The mean color score ranged from 4.40 at P0 without soaking bay leaf infusion to 4.68 at P3 with a concentration of 15% bay leaf infusion. It displayed a greater value as the bay leaf infusion's content rose. This showed that the panelists liked the taste of the beef patty that had a higher percentage of bay leaf infusion.

THE EFFECT OF DIFFERENT CONCENTRATIONS OF SOATING GREEN LEAF INFUSION ON THE ORGANOLEPTICAL VALUE OF OVERALL ACCEPTANCE OF BEEF PATTY

The findings of the analysis of variance revealed that there was no significant difference in the overall acceptability of the beef patty based on organoleptic quality when the beef patty was soaked in bay leaf infusion at various doses ($P>0.05$). Table 5 displays the typical approval rating of the beef patty infused with bay leaves for each treatment. The beef patty infused with bay leaf infusion got an average overall acceptance score that varied from 4.44 to 4.60. With a 15% concentration, P3 had the highest average overall acceptability score (4.60), and P0 had the lowest (4.44), both without soaking bay leaf infusion. It displayed a greater value as the bay leaf infusion's content rose. This showed that the panelists liked the taste of the beef patty that had a higher percentage of bay leaf infusion.

CONCLUSION

The efficacy index test method was used to determine the optimum treatment in the study of creating beef patties by soaking bay leaves infusion. The De Garmo effectiveness index test can determine the optimal course of treatment. By giving a value to each study variable, the best treatment test is used to determine the best treatment as a relevant factor to support judgments. The best and worst values, which are known based on the highest and lowest values of each test parameter, are then computed from the average of each test value that has been obtained. Conversely, for some test parameters, it can be claimed that the smaller value represents the greatest value and the higher value indicates the worst value. The higher value is the best value and the lowest value is the worst value. Each test parameter's variable weight must be calculated in order to determine how much each parameter contributes to the final product's quality. In addition, the normal weight (BN), which is determined by dividing each BV by the sum of BVs, must be calculated.

Using the De Garmo Effectiveness Index Test method, the best treatment for beef patties that had been soaked in a bay leaf infusion was determined in terms of six variables: pH value, water content, water holding capacity, cooking loss, L*a*b* color, and sensory qualities (texture, color, flavor, taste, and overall acceptability). By assigning a value to each test parameter depending on each panelist's interests, five panelists performed the best treatment. The De Garmo effectiveness index test method is used to determine P3 as the optimum treatment. The beef patty that had been soaked in a 15% infusion of bay leaves (P3) had the highest value, according to the data from the study test findings, so it was selected as the best treatment. P3 therapy, which consists of a beef patty infused with bay leaves.

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