

Maceration of Alagaw Leaves (*Premna odorata blanco*) As Curing Agent

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Abstract: This study aimed to develop a curing agent alternative to the synthetic curing agent. Alagaw leaves "*Premna odorata blanco*" has its own property to preserve. Experimental-development method of research using completely randomized design (CRD) and the nine point Hedonic Scale were used in evaluating the product. The sensory qualities of the cured meat applied with alagaw curing agent were evaluated by ten (10) semi-trained panelists in three (3) trials during product formulation, and one hundred (100) consumers to evaluate the acceptability. Analysis and interpretation of data were the mean and the analysis of variant (ANOVA) used as statistical tools set at 0.01 alpha level.

The alagaw curing agent "*Premna odorata blanco*" has a pH of 5 which is acidic in nature in all different oil solvents, and maceration extractions used (olive oil, sunflower oil, and palm oil) with 50% concentration (% = w/v).

The sensory qualities of cured meat with alagaw leaves extraction in sunflower oil appearance found "extremely appealing", while in palm oil "very much pleasant" in the aroma. In terms of taste, olive oil was "extremely delectable" and in texture, olive oil was found to be "very much tender". Regardless of the oil used, Treatment B of 10ml proportion was preferred by the semi-trained panelist which was used for consumer testing. The alagaw in olive oil extraction was liked extremely by the consumers in sensory qualities except in texture.

The shelf-life of the cured meat with macerated Alagaw leaves "*Premna odorata blanco*" as a curing agent when exposed to freezing temperatures (32°F or 0°C) sustained its sensory qualities. The cured meat was observed in the shelf-life and it lasted for 60 days maintaining good sensory qualities without negative changes.

There was a significant difference in sensory qualities of alagaw curing agent in terms of appearance and taste by the semi-trained panelist. However, in terms of aroma and texture, there were no significant differences.

The shelf-life of cured meat with Alagaw leaves "*Premna odorata blanco*" as the curing Agent when exposed to freezing temperature. The cured meat lasted for eight (8) weeks and four (4) days or sixty (60) days. Observation showed that cured meat at room temperature had no molds developed until 15 days, but in the chilling temperature, sliminess and foul odor appeared, with discoloration on the twenty-seventh day, and mold development on the thirtieth day.

The sample meat with alagaw curing agent submitted for E.coli microbial analysis to Negros Prawn Producers Cooperative Analytical for Diagnostic laboratory (NPPC) was within the acceptability level. Likewise, the sample of 200g meat was tested for fat percentage (Soxhlet Extraction method) of 23.90; fiber percentage (lepper modification method) of 1.74; and protein percentage (kjeldahl method) of about 14.71 as per Negros Prawn Producers Cooperative Analytical and Diagnosis Laboratory (NPPC).

Keywords: Maceration, Curing Agent, *Premna odorata blanco*

I. INTRODUCTION

The Philippines has adopted the culture of cured meat as a convenient food, a trend that has spread across the country due to the changing lifestyle. Curing is an ancient form of preserving meat, used for flavoring, coloring, and prolonging shelf life. However, [1] nitrates in high doses can have health and environmental risks Govari and Pexara (2015). [2] Alagaw "*Premna odorata blanco*" the following property the flavone/antimicrobial/anti-inflammatory/chemopreventive. *Premna odorata* (p=0.999) and *Mimosa pudica* (p=0.054) at 5.00 mg/mL concentration exhibited comparable antioxidant activity against the standard antioxidant preservative, butylated hydroxytoluene, using ferric reduction antioxidant power assay Stuart, Jr., G. (2020). [3] Butylated hydroxytoluene (BHT) inhibits autoxidation of unsaturated organic compounds. BHT is used in food, cosmetics and industrial fluids to prevent oxidation and free radical formation ("National Center for Biotechnology Information 2022").

The use of plant-based curing agent has been explored but limited to Alagaw leaf "*Premna odorata blanco*" in hindering or killing the growth of harmful microorganism but not tested or used yet as curing agent.

[4] According to Mollejon (2019) in his study was conducted to determine the present yield, antimicrobial activities and findings of the study showed that alagaw leaf extract has a percentage yield of 11.5%.

[5] The ethanolic extracts of five plants with antimicrobial activities were formulated into suspensions and evaluated for preservative activity using the USP, 2015 guidelines Arollado, E., et. al (2017). The researcher has come up with the idea to conduct research on maceration alagaw ("*Premna odorata blanco*") as a meat curing agent without compromising the quality of the meat, prolonging its shelf life and qualitative properties. Alagaw plant is abundant and locally found, making it an ideal plant-based curing agent.

II. OBJECTIVE OF THE STUDY

This study was conducted to produce maceration of Alagaw leaves as meat curing agent. Specifically, to attain the following:

1. Determine the pH level and the concentration (weight per volume) of the extract from Alagaw leaves "*Premna odorata blanco*" as curing agent.
2. Describe the sensory evaluation of the cooked cured meat in terms of appearance, aroma, taste and texture of the three oils used in maceration of Alagaw leaves in three different treatments considering the variation in the amount as evaluated by semi-trained panelists
3. Find out if there is a significant difference in the sensory qualities of cooked cured meat using the macerated Alagaw leaves "*Premna odorata blanco*" as a meat curing agent with different treatments and proportions in terms of appearance, aroma, taste, and texture.
4. Determine the cured meat's shelf-life with macerated Alagaw leaves "*Premna odorata blanco*" as meat curing agent when exposed to freezer temperature based on its sensory qualities like appearance, odor, and texture.
6. Submit the cured meat of the best treatment of macerated alagaw leaves as curing agent for microbial and proximate analysis.

The significance of the study is most valuable to the following; entrepreneurs, foods/technology teachers, farmers and their family, consumer and future researchers.

III. METHODOLOGY

The study used an experimental method of research. In this study, the experimental method focused on the investigation of the amount of maceration alagaw leaves "*Premna odorata blanco*" as meat curing agent using three types of oil in the maceration process and its application in meat preservation.

In the maceration process, fresh Alagaw leaves infused with three (3) different oil. Treatment A, 100g of Alagaw leaves "*Premna odorata blanco*" to 340ml of Olive Oil, Treatment B, 100g of Alagaw leaves with 340ml Sunflower and the Treatment C, with also same amount of Alagaw leaves infuse to 340ml of palm oil. The study used the same amount of proportion of fresh Alagaw leaves however it varied only in different oil solvent. Maceration is a method of extracting liquids at room temperature. It requires fully submerging a plant in a liquid, such as water, oil, or alcohol (Albrigi, 2016). Therefore, the 100g Alagaw leaves was fully submerged in 340ml of oils in this proportion to get 200ml concentration.

IV. EXPERIMENTAL PROCEDURES

Step 1. Preparing of Alagaw leaves

The fresh alagaw leaves were gathered, washed, drained, sorted and weighed.

Step 2. Maceration Process

The oil were measured, the alagaw leaves were ground coarsely and it was poured in to a sterile jar. The 340 ml of oil was added and was slightly pushed the coarse leaves to submerge in the oil and covered tightly with lid. Let alagaw leaves "*Premna odorata blanco*" rest for three (3) days at room temperature and shake the jar containing alagaw and oil daily. Then, the macerated Alagaw leaves in oil was poured in a sanitized bottle with filtered paper. Then oil passed through the filter until to the last drop. It was gently pressed to drain fully.

Step 3. Procedure in applying maceration of alagaw “*Premna odorata blanco*” as meat curing agent

The materials and ingredients were gathered and weighed. Washed meat. Then all ingredients were mixed and were applied to meat by rubbing it equally. Cured meat was arranged in clean ziploc and it was chilled for three days under number 4 thermostat range within corresponds to -4°F or -2.0°C and transferred into freezer for later used.

Step 4. Procedure in cooking the cured meat

The meat was unpacked and placed in a pan with half cup of water and was boiled using a moderate heat until water evaporated and oil comes out. Add another one fourth of water if needed. Cooked until the meat becomes tender and continue cooking slightly toasted to enhance the flavor and taste.

V. DATA GATHERING PROCEDURE

A pH paper strip was used to determine the pH level of macerated algae leaves curing agent used different oil. the pH test was a dip to the fluid that is measured to determine the acidic and alkaline substances following indicators of different colors on the box. Concentration was measured by $\% = \text{mass/volume} \times 100$ which represented $\% = \text{solute/solution} \times 100$. The instrument used in this study was the Nine (9) Point Hedonic Scale evaluation sheet. It comprises of the variables used such as, appearance, aroma, taste, and texture to evaluate the product maceration of Alagaw leaves “*Premna odorata blanco*” as meat curing agent among the maceration process with different oil such as olive oil, sunflower oil and palm oil. The sensory evaluation were evaluated by ten (10) semi-trained panelists with three (3) replications for the formulation of the product to determine the best measurement of maceration of Alagaw leaves “*Premna odorata blanco*” as meat curing agent applied to meat. The data was gathered and analyzed statistically using the prescribed statistical tools run by the SPSS.

Since it was pandemic the evaluation of the product sample of cured meat with alagaw leaves curing agent was conducted by following pandemic protocol that the evaluators washed and sanitized their hands and following social distancing. Moreover, the evaluators, evaluated the cured meat individually one at a time.

VI. STATISTICAL TOOLS AND ANALYSIS PROCEDURE

The data were subjected to Statistical Package for Social Science (SPSS). Arithmetic of Mean and Analysis of Variance (ANOVA) were the statistical tools in analyzing and interpreting the data. Mean was used to determine the sensory acceptability of three (3) treatment of proportion of maceration Alagaw leaves “*Premna odorata blanco*” as meat curing agent of the used in Three (3) different oil solvent. Analysis of Variance (ANOVA) was used in analyzing the differences among the treatments.

VII. RESULTS AND DISCUSSIONS

Data revealed that Alagaw leaves as curing agent with the used of different oils in 100g solute of Alagaw leaf “*Premna odorata blanco*” with 340ml oil solvent the outcome solution was 200ml curing agent with 5 pH level indicated acidic content that can affect the rate of growth of microbes. [6] In general, microbial growth is still present between level of pH 6-8 Elder and Crowley (2017).

The curing agent has 50% concentration from the result of the used formula of $\% = \text{Mass/Volume} \times 100$ which represents $\% = \text{Solute/Solution} \times 100$. It implies that any of the different oils (340ml) used in the maceration process of 100g Alagaw Leaves produced a 200ml solution of Alagaw curing agent with 50% component of Alagaw Leaves “*Premna odorata blanca*” was extracted. However, the 140ml was absorbed by the alagaw leaves during the maceration process stage.

The Macerated Alagaw curing Agent was measured in varying amount of proportions in three treatments A(5ml),B(10ml) and C(15ml) applied with same amount of pork meat, the sensory qualities were the bases in the evaluation of the semi-skilled panelist during formulation. The 10ml proportion of maceration of Alagaw curing agent in Olive, Sunflower and Palm oil were most preferred by the semi- skilled panelist and it was used during consumer evaluation.

Alagaw curing agent with olive oil maceration with treatment B (10 mL) extraction had the highest mean score of 8.33 with an adjectival description of “Extremely Appealing”, in appearance while the aroma had a mean of 7.90 verbally interpreted as “Very Much Pleasant” and the taste with a mean of 8.33, described as “extremely delectable”. and texture got a mean of 7.90 described as “very much tender”. Olive oil is an important part of a balanced diet and adds deep flavor to food. Specialist can recognize and evaluate its positive and negative attributes. [7] According to “Olivadelsur”

(2017) Bitterness and pungency are positive attributes related to the quality in the virgin and extra virgin olive oils. These attributes are directly linked to the amount of polyphenols present in the olive oil. [8] Olive oil polyphenols have antioxidant, anti-inflammatory, antimicrobial, antiviral, anti-atherogenic, anti-thrombotic, anti-mutagenic and hypoglycemic characteristics (Kabaran, 2018). [9] Phenolics have the capacity of retarding the microbial invasion in some products and avoiding the putrefaction of others, mainly fruits and vegetables and phenolic compounds can play an important role for improving the global assessment and extend the shelf life of commercial products (Martillanes et al., 2016).

However, using sunflower oil, in terms of appearance Treatment B (10 mL) had a mean score of 8.50 described as "Extremely appealing", aroma had a mean of 7.97, taste with a mean of 8.30 with adjectival descriptions of "Extremely Delectable". Likewise, the texture got a mean of 7.93 described as "Very much tender". Sunflower oil fragrance can influence color, taste, and smell, making cooking heat more noticeable.

Using Palm oil solvent, Treatment B (10mL) had the highest mean score of 7.90 described as "very Much Appealing", while the aroma got a mean of 8.00 described as "very much pleasant". In terms of taste, a mean of 7.80 described as "very much delectable" and the texture was 7.80, "very much tender". Palm oil has an earthy taste and silky feel, giving food a luscious, fattier, and creamier taste.

In terms of sensory qualities (appearance, aroma, taste and texture) among different proportions applied to meat among three(3) treatments of proportions treatment B with 10ml Alagaw leaves curing agent macerated among three oils (olive sunflower, and Palm oil) was preferred of semi-skilled panelist.

There was a significant difference in the sensory qualities of the Alagaw leaves (*Premna odorata blanco*) as curing agent in terms of appearance by the semi-trained panelists. The F-value of 13.085 had P; value of 0.000 was less than of the 0.01 alpha level of significant. In terms of Aroma, the F-value was 3.195, which was greater than the alpha level and implied the three treatments in terms of their aroma were the same. Therefore, the null hypothesis was rejected.

Treatments in terms of their taste were significantly different between three (3) treatments of maceration of Alagaw leaves "*Premna odorata blanco*" as meat curing agent. Olive oil has fruitiness, bitterness flavor and pungency, while Sunflower oil has nothing in common with the flavorless refined type used widely for cooking. Palm oil has an earthy taste and silky feel on the tongue, and gives food a luscious, fattier, and creamier taste.

[10] Thus using edible oil used an organic solvent for extraction the active anti-oxidant component from herb and spices. They could represent a valuable natural alternative to synthetic anti-oxidant (Hamed, 2006). According to [11] Albrigi (2016) maceration is an extractive technique that is conducted at room temperature. It consists of immersing a plant in a liquid (water, oil, alcohol, etc.)

The shelf-life of cured meat with Alagaw leaves "*Premna odorata blanco*" as the curing Agent when exposed to freezing temperature. The test was conducted daily to evaluate its sensory qualities, and the cured meat lasted for eight (8) weeks and four (4) days or sixty (60) days. Observation showed that cured meat at room temperature had no molds developed until 15 days, but in the chilling temperature, sliminess and foul odor appeared, discoloration on the twenty-seventh day, and mold development on the thirtieth day.

The sample meat with alagaw curing agent with control # 22-7728 submitted for E.coli microbial analysis to Negros Prawn Producers Cooperative Analytical for Diagnostic laboratory (NPPC) had a result of less than ten CFU/g, which justified within the acceptability level. Likewise, the sample of 200g meat with a control number of 7728 was tested for fat percentage (Soxhlet Extraction method) of 23.90; fiber percentage (lepper modification method) of 1.74; and protein percentage (kjeldahl method) of about 14.71 as per Negros Prawn Producers Cooperative Analytical and Diagnosis Laboratory (NPPC).

VIII. CONCLUSION

Based on the findings of the study the following conclusion were drawn:

Alagaw leaves "*Premna odorata blanco*" are acidic with a 50% weight of volume concentration, which can inhibit the growth of microorganism at a given concentration.

The 10ml proportion of alagaw leaves curing agent was preferred by the semi-expert in curing meat, as it preserved the meat better than other sources of oil. Oil maceration is an effective method of extraction.

Olive oil is the most preferred curing agent for cured cooked meat due to its fruity, pungent taste, anti-oxidant property, and anti- microbial properties.

Alagaw leaves curing agent had a significant difference in appearance and taste, but no significant difference in aroma and texture. When applied to meat, the fragrance of alagaw leaves is dominant and oil serves as a lubricant to tenderized meat.

Alagaw leaves are macerated from different oils to create a meat curing agent with unique characteristics. Olive oil has fruity, bitter and pungent characteristics, acting as a lubricant that prevents food from sticking to the cooking surface and adds flavor, crust and visual appeal.

Alagaw maceration leaves "Premna odorata blanco" as a meat curing agent with different oils and control. Different oils give moisture and give better quality to the end product, making frying/grilling a common practice.

Alagaw leaves can be used as an alternative to synthetic curing agents, preserving sensory qualities and increasing shelf-life.

RECOMMENDATIONS

The following were the recommendations based on the findings and conclusions of the study:

Alagaw leaves can be used as a curing agent due to its acidic content, inhibiting microorganism growth.

Maceration of alagaw leaves as meat curing agent is recommended for 200g of meat.

Macerating alagaw curing agent with olive oil is recommended for making cured meat, but other oils can be used depending on preference and cost.

Further study should be conducted to verify results.

Alagaw leaves "Premna odorata blanco" are accepted as meat curing agent due to their authentic fragrance and flavors.

It is recommended to use different oils (olive oil, sunflower oil, and palm oil) in making maceration of Alagaw leaves "Premna odorata blanco" as a meat curing agent.

Cured meat with Alagaw leaves "Premna odorata blanco" is best consumed after 7 days, but can last up to 60 days. Researchers may conduct a study using another product utilizing an alagaw curing agent to verify efficacy.

Future researchers should conduct microbial analyses to improve product quality and safety, review processes with a focus on hygiene and sanitation, and incorporate CGMP principles.

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