THESIS

EFFECTS OF TEA (C*amellia sinensis*) AS A TENDERIZER ON THE ORGONALEPTIC PROPERTIES, PH VALUE AND TENDERNESS OF GOAT MEAT BREED PERANAKAN ETAWA (*Capra caprahircus*) ON MUSCLE (*Musculus bicep femoris*)

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UNIVERSITAS AIRLANGGA

SURABAYA

2020

ENDORSEMENT FORM

EFFECTS OF TEA (*Camellia sinensis*) AS TENDERIZERS ON THE ORGONALEPTIC PROPERTIES, PH VALUE AND TENDERNESS OF GOAT MEAT BREED PERANAKAN ETAWA (*Capra caprahircus*) ON MUSCLE (*Musculus bicep femoris*)

Thesis

Submitted in partial fulfilment of the requirement for degree of

Bachelor of Veterinary Medicine

at

Faculty of Veterinary Medicine, Universitas Airlangga

By

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Approval of

Supervising Committee,

(Muchammad Yunus, Ph.D., M.Kes.drh)	**(Prof. Dr. Fedik Abdul Rantam, drh)**
Co-Supervisor	**Supervisor**

DECLARATION

I hereby declare that this dissertation, entitled:

EFFECTS OF TEA (*Camellia sinensis*) AS A TENDERIZER ON THE ORGONALEPTIC PROPERTIES, PH VALUE AND TENDERNESS OF GOAT MEAT BREED PERANAKAN ETAWA (*Capra caprahircus*) ON MUSCLE (*Musculus bicep femoris*)

is an authentic and genuine research work carried out by Hasvene Kaur A/P Hemath Singh under the guidance of Prof. Dr. Fedik Abdul Rantam, drh, Senior Lecturer and Vice Dean I University of Airlangga and Muchammad Yunus, Ph.D., M.Kes.drh, Senior lecturer, Department of Parasitology, University of Airlangga. To my knowledge, there has not been a paper drastically alike to obtain a college degree in a certain collage or a paper opinion based written or published by others, except those in writing referred to this paper and mentioned in references.

Surabaya, 10th January 2020

HASVENE KAUR A/P HEMATH SINGH

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Has been assessed in Result Seminar
Date : 30th December 2019

RESULT SEMINAR ASSESSMENT COMMITTEE

Head	: Prof. Sri Agus Sudjarwo, Ph.D., DVM
Secretary	: Dr. Eduardus Bimo Aksono H, M.Kes., DVM
Member	: Dr. Eka Pramyrtha Hestianah, M.Kes., DVM
Supervisor	: Prof. Dr. Fedik Abdul Rantam, DVM
Co-supervisor	: Muchammad Yunus, Ph.D., M.Kes. DVM

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SUMMARY

Hasvene Kaur A/P Hemath Singh, research entitled with Effects Of Tea (*Camellia sinensis*) as Tenderizers on the Orgonaleptic Properties, pH Value and Tenderness of Goat Meat Breed Peranakan Etawa (*Capra caprahircus*) on Muscle (*Musculus bicep femoris*) under the supervision of Prof. Dr. Fedik Abdul Rantam, drh as the head supervisor Muchammad Yunus, Ph.D., M.Kes.drh as the Co-Supervisor.

This study aimed to determine the effects of green tea as tenderizers on the orgonaleptic properties, ph value and tenderness of goat meat breed Peranakan Etawa. The weight meat used in the experiment which was 5.5kg was divided equally into 17 groups which are Sample A, Sample B, Sample C, Sample D and Sample E. With Sample A having 300g and Sample B, Sample C, Sample D and Sample E each having a total of 1.2kg, leaving 400g to spare for and errors made during the duration of the experiment.

Sample B, Sample C and Sample D were then divided again into Sample B1 (300g), B2 (300g), B3 (300g) and B4 (300g). Sample C1 (300g), C2 (300g), C3 (300g) and C4 (300g), Sample D1 (300g), D2 (300g), D3 (300g) and D4 (300g) and Sample E1 (300g), E2 (300g), E3 (300g) and E4 (300g).

Samples with coding alphabet A is to be kept as a control with no mariantion. Samples coding with alphabet B was marinated with 1% of green tea diffusion made with 100 ml distilled water and 1g tea extract, coding with alphabet C was marinated with 2% of tea diffusion made with 100 ml distilled water and 2g tea extract, meat samples coding with alphabet D was marinated with 4% of tea

diffusion made with 100 ml distilled water and 4g tea extract and lastly meat samples with coding E was marinated with 8% of tea diffusion made with 100 ml distilled water and 8 g tea extract. With all samples with coding numeral 1 were marinated for 1 day, coding numeral 2 were marinade for 4 days , coding numeral 3 were marinated for 8 days and coding numeral 4 were marinated for 12 days. This research includes five phases the weighing phase, the diffusion phase, testing of pH value phase, marinating phase, and the last being the oven drying phase.

From the results for the smell test show, In Day 1 and Day 4 the difference in concentration in the tea extract in meat has a different effect of smell in said meat which is shown when in Day 1 $a \leq 0.05$ ($a= 0.026$) and in Day 4 $a \leq 0.05$ ($a = 0.49$). However, Day 8 and Day 12 doesn't show a significant difference effect for the smell in meat in this research because $a \geq 0.05$ (Day 8; $a= 0.099$, Day 12; $a=0.072$).

Results in colour test shows that in day 1 and day 4 the difference in concentration in the tea extract in meat has a different effect of colour in said meat which is shown when in Day 1 $a \leq 0.05$ ($a= 0.024$) and in Day 12 $a \leq 0.05$ ($a = 0.007$). However, Day 4 and Day 8 doesn't show a significant difference effect for the colour in meat in this research because $a \geq 0.05$ (Day 4; $a= 0.064$, Day 8; $a=0.157$).

For the tenderness test, in day 1 the difference in concentration in the tea extract in meat has a different effect of tenderness in said meat which is shown when $a \leq 0.05$ ($a= 0.035$). However, Day 4, Day 8 and Day 12 doesn't have a significant difference effect for the tenderness in meat in this research because $a \geq 0.05$ (Day 4; $a = 0.106$, Day 8; $a= 0.434$, Day 12; $a=0.249$). These results were

almost the same and explained by (N. Maneenin et al., 2010) on their paper regarding Effects of green tea extract on lipid.

As for the taste test, from the results shown, the Control has the results showing, the point of Bland Taste was closest to the Control point followed by the Salty Taste point, Taste of Herbs, Earthy Taste, Savoury Taste and the Furthest away from the Control point was the Sour Taste Point. From this we can conclude that 7 Tenderizers have the highest counting for Earthy Taste that is namely 2% 8 Days, 4% 8 Days, 8% 8 Days, 1% 12 Days, 2% 12 Days, 4% 12 Days and 8% 12 Days. 5 Tenderizers have the highest counting for Salty Taste that is namely 1% 1 Day, 2% 1 Day, 8% 1 Day, 4% 4 Day and 1% 8 Day. 2 Tenderizers had the highest counting for Bland with it being the Control and 4% 1 Day. 1% 4 Day had the highest count for Savoury Taste, 2% 4 Day had the highest counting for Sour Taste and Lastly 8% 4 Day had the highest counting for Taste of Herbs.

From the results stated, tenderizer pH was at a neutral Level for Tea tenderizer at pH 6 beforehand leaving a Mean ± SD of pH 5.88a ± 0.28. After soaking the meat in the tenderizers for an hour, a difference as noticed where the meat in the Tea tenderizer did not divert the pH of the meat with the meat remaining at an average of pH 6.0 pH leaving a Mean ± SD of 5.79a ± 0.25.

Tea tasters use various definitions to assess tea aroma, for example, fresh, sharp, strong, aromatic, fragrant, vivid, deep, medium, delicate, fruity, berry-like, sweetish, burnt, wood-like, rustic, satiated, sultry, smooth, and many others. (Alexandr Ya. et al., 2015). This is due to the fact that aroma is one of the critical aspects of tea quality which can determine acceptance or rejection of a tea before it

is tasted and in this case, the meat it was tenderized with. Early research on tea fragrance can be followed back more than 170 years (Alexandr et al., 2015), Yet no single compound or gathering of mixes has been distinguished as in charge of the full tea smell. It is for the most part trusted that the qualities of different sorts of tea comprise of a parity of confounded blends of fragrance mixes in tea.

This result agreed with the results of Karolina et al., (2011) that the addition of green tea extract to meat helped in prevention of metmyoglobin formation. Also, added tea catechins (0.020%) can delay metmyoglobin formation during display of ground beef under both aerobic and modified atmospheric conditions as reported by (Tang et al., 2006). The color produced using tea and the infusion color are two qualities other than fragrance and taste in the assessment of different sorts of tea. Green tea infusion contains no highly colored items shaped by the oxidation of polyphenolic mixes, and the desired color is greenish or yellowish green without any red or dark colored color. The green color is the fundamental shade of color in the infused leaf and the mixture of green tea. It is for the most part controlled by the chlorophyll content and the proportion of chlorophyll A which is dark green and chlorophyll B which is yellowish-green in shading. (Chaturvedula and Prakash, 2011).

Effect of corrosive marination on connective tissue was substantially less than the impact on myofibrillar proteins. The denaturation temperature is fundamentally less whenever marinated in acid when contrasted with being marinated in water or salt (Aktas and Kaya, 2001). Berge (2001) indicated comparative after effects of a significant decrease in shear force values then little

change in tenderness after some time utilizing lactic acid. This tenderness could be attributed to the results of Ertbjerg et al., 1999 that was taken from Hinkle (2010) who proposed the lysosomal chemicals expanded in movement with capacity time and acid centralization of the soluble fraction. At the point when movement in the soluble fraction expands, it enables more degradation to take places in different parts of the muscle.

Renerr et. al., (1992) has observed pH effect isn't astonishing in light of the fact that low pH favors myoglobin oxidation; taken from (Decker et al, 2010) with an arrival of oxygen, recently bound to haeminic iron, as hydroperoxide (HO•2) and superoxide (O•2−) radicals (Decker et al., 2010) which are very reactive towards lipids and proteins. Superoxide radicals can be dismutated into hydrogen peroxide. Additionally, Kanner and Doll, (1991) said pH decline prompts the release of iron from iron-conveying proteins (ferritin and transferrin); taken from (Decker et al., 2010). This "free iron", additionally called "synergist iron", can respond with hydrogen peroxide to give hydroxyl radicals (OH•) which are likewise engaged with lipid and protein oxidation.

A few studies have proposed tenderness is straightforwardly affected by water holding capacity. Water holding capacity is the measure of water that can be held inside a muscle amid some type of mechanical forces, for example, cutting, tumbling, and so forth. As the enhancement/acid solution is included the myofibrillar protein swell, permitting water into the muscle. Others have noticed this swelling impact in enhancement solutions containing salt and water, maybe

through myofibrillar proteins extraction from muscle microstructure (Mozuriene et al., 2016).

On account of the tea leaves, these metabolites incorporate polyphenolic catechins and theaflavins and the alkaloids caffeine and theobromine which all in all help tenderize the meat (Mendel Friedman, et al 2005). Chaturveda and Prakash (2011) considered from Nakaqawa (1975) that the relationship between the chemical composition and organoleptic properties of different evaluations of green tea. His outcomes demonstrated that the astringency and bitterness of green tea implantation was predominantly controlled by the substance of catechins and other phenolic mixes. Other than catechins and caffeine, some amino acids, (for example, arginine, alanine, and etc) likewise add to the bitterness of green tea mixture.

The umami taste of green tea mixture was appeared to be because of some amino acids, for example, theanine, serine, etc and the sweetness to sugars (Chaturvedula and Prakash, 2011). Due to this meaty taste, when the meat was being tenderized in the tea, it acquired a meatier taste when cooked and tasted my panelist thus labeling it bland (Chaturvedula and Prakash, 2011). Based on the results of the research that has been done, it can be concluded that there is an effect of Effects Of Tea (*Camellia sinensis*) as Tenderizers on the Orgonaleptic Properties, pH Value and Tenderness of Goat Meat Breed Peranakan Etawa (*Capra caprahircus*) on Muscle (*Musculus bicep femoris*) and it can be used as a tenderizer for meat.