

Organoleptic Quality and Microbiological of Barbecue Bali Suckling Pig on Carcass Aging Technique

Ni Luh Putu Sriyani¹, Suarta I Gede¹

¹Faculty of Animal Science Udayana University, Denpasar, Bali.

Author corespondent/e-mail : sriyaninlp@unud.ac.id

Abstract. The aims of the research were to increase quality of barbecue Bali suckling pig on carcass aging technique and to see its pork microbiological quality after aging and to be a product. The aging is a handling fresh pork after slaughtered the animals where it carcass was hung up or frizzed for a certain time on the frozen temperature (0° C). The research design used was Completely Randomized Design with 3 treatments i.e. P0 (Control, fresh carcass without aging), P1 (carcass aging for 1 day, and P2 (carcass aging for 2 days). The aging process was conducted at PT Aroma Duta Rasa, Denpasar. Furthermore, the carcass was processed to be a product called barbecue suckling pig with full of Bali traditional spice. After that, organoleptic quality test was conducted on some semi trained panelists, and microbiological test on eye muscle area. Result analysis of nonparametric of Kruskal Wallis showed that organoleptic variables on general performance, tenderness and it acceptance in general gave significant preferences level ($P < 0.05$) on P1, while variable of colour, aromatic, texture, and taste were no significant different ($P > 0,05$). Total amount of TPC microbial on the P0 was 1.7×10^3 a CFU/g, P1 was 2×10^3 CFU/g and P2 was 2.8×10^3 CFU/g no significant different ($P > 0.05$), while microbial population of *coliform* and *E. Colli* were not found. Base on SNI 3932.2008 that quality of Total Plate Content microbial of meat quality maximum 1×10^6 FCU/g. From all data mentioned above could be concluded that the quality of organoleptic of aging barbecue suckling pig that aging for 1 day was the best But, microbiological quality of the barbecue suckling pig that aging for 1 up to 2 days were still safe to be consumed because their TPC was still less than SNI regulation.

Key words: barbecue Bali suckling pig, aging, pork quality

I. INTRODUCTION

Generally, the area for developing pig farm is ley in Hindu Society houses in Bali. Types of pig that were developed in it i.e. imported pig and local pig (Bali pig). The Bali pig is more prefer by Hindu Bali society as a source of barbecue (particularly suckling pig) compare to imported pig such as Landrace. So that, the development of pig farm in Bali is a good prospect. But, according to research result of [1] that pork

texture of the Bali pig is tougher than that Landrace or the Bali pig pork contains lower tenderness. So, to increase tenderness quality of the pig, it needs aging technique after it slaughtered. Aging is an handling of fresh pork or meat after slaughtered. The pork hung up or frizzed for a certain time on the temperature of frizzling pint (0° C). During aging, enzyme activity is occur where

it capable to break down pork tissue. So that, the water holding capacity of the pork is stronger, more tender and its flavour is also stronger [2]. The preference of consumer to barbecue suckling pig in Bali is high so, it needs some efforts to remedy of products. The aim of the research was to see preferences level of the consumers on barbecue suckling pig that increase its quality through aging technique on its carcass. Product of barbecue suckling pig is a product ready to eat, so research about pathogen bacteria content on barbecue suckling pig that already aging is important to be done to safe the food that consume by consumer.

II. RESEARCH METHOD

Materials and Method

The research materials used the Bali pigs on the age of about 3 months and body weight about 25 kg (used to be barbecue). The pigs used for suckling is the animals which is reared in extensive system or no pen where farmers fed it with what is available around them. Furthermore, after the Bali pig carcass slaughtered, then it aging process conducted through hung up the *thendo archiles* in aging room with temperature of 0° C at PT Aroma Duta Rasa, Denpasar. As soon as possible after the process finished, barbecue suckling pig product made. Furthermore, the product

were tested organoleptic and microbiologically in Laboratory of Animal Products and Microbiology of Faculty of Animal Science, Udayana University.

The research design used was Completely Randomized Design with 3 aging duration treatments as follows:

Treatment 1 (Control): Barbecue suckling pig of fresh carcass

Treatment 2: Barbecue suckling pig of aging carcass for 1 day

Treatment 3: Barbecue suckling pig of aging carcass for 2 days

Organoleptic data was analysed with nonparametric statistic through Hedonic test according to Kruskal and Wallis [3]. If the result of the analysis showed significant different, it would be continued with Mann-Whitney test [4] among 2 treatments. Organoleptic test used 24 persons panellist based on Hedonic scale from 1 to 5. (score 1 = don't like very much, score 2 = don't like, score 3 = normal, score 4 = like, score 5 = like very much). Data microbiology was analysed with Variance Analysis. Formerly, it was trans - formed into logarithm formation. Result analysis that showed significant different was continued with Duncan multiple range test [5]

III. RESULTS AND DISCUSSION

Organoleptic Quality

Preference level of panelist on variable of tenderness occurred significantly on the P1 and P2 compare to P0 (Control). Preference level of panellist to overall acceptance was significant different ($P < 0.05$). The highest preference of the panellist to the barbecue was on P1 treatment, while on variables colour, aromatic, texture and taste not significant on P0 and P2. Pork tenderness increased due to process autolysis caused by activity of proteolysis enzyme in cathepsine form which works on protein of fibrous muscle [2]. This also could be seen on variable of pork texture although it was not significant statistically but, it seen trend increased on preference level of pork texture. Texture and taste of the pork more tenderness on 1 day aging and 2 days aging treatments. One function of cathepsine enzyme is to make wider pork structure to increase it tenderness.

On pork colour variable could be seen that panelist preference increased on 1 day aging treatment although it not significant ($P > 0.05$) but it decreased on 2 days aging treatment [7] said that pork of Bali pig hat aging for 1 day was increased consumers preference to pork colour. During aging, pork colour pigment (myoglobin) linked to oxygen to form

oximyoglobin (bright red blood colour) particularly seen on 1 day aging.treatment. But, if aging hold for long time, the myoglobin would be oxidated to form metmyoglobin where it colour to be brownish. Aging for 2 days may causes oxidation happened that affect decrease of pork colour of barbecue suckling Bali pig.

Trend increasing of aromatic and taste happened during aging for 1 to 2 days. Aging can increase pork palatability due to appearance of aromatic or specific flavor on pork. According to [8] that break down of protein and fat during aging is important to increase aromatic. Overall acceptance was part of pork sensory parameter to consumer levels acceptance for all character of pork sensory. End scored or pork acceptance was based on capability of consumers acceptance generally, and this was used by the researchers to decide which pork is most accepted or preferred by panelists. In this case, the highest acceptance generally was pork of barbecue suckling pig that was aging for 1 day. Colour was the first variable to see by eye self. Colour is important variable in consumers acceptance to a product.

In this research, colour score of barbecue suckling pig product that the most preferred was on aging 1 day because it colour was the best beside other variables such as tenderness, taste, aromatic and

texture that already increased compare to Control (Table 1).

Microbiological Quality

Base on results of the research, comparison of microbial population of barbecue P0 (Control = no aging), 1 and 2 days aging as follows: TPC on P0 treatment was $1,7 \times 10^{3a}$ cfu/g, P1 2×10^3 cfu/g and P2 $2,8 \times 10^3$ cfu/g no significant different ($P > 0.05$). While population of *coliform* dan *E-coli* microbial were not be founded. Barbecue suckling pig product was pig carcass that in

it stomach was filled with traditional bali spice, and then it lies on glowing fire and rotate it continuously for 1.5 to 2 hours (until ready to eat). Heat measurement on barbecue suckling pig was held on the back of it at that time showed temperature for 98°C to 115°C on thermometer scale [9]. This condition caused pathogen bacteria dead (no existed of coliform and *E. coli*). TPC population is still in food safety border line 1×10^6 SNI 2008. This microbiological condition showed that barbecue suckling Bali pig with 1 and 2 days aging were still safe to be consumed (Table 2).

Table 1. Organoleptic quality of barbecue suckling pig that aging in different time

Variable	PO ³	P1	P2
Pork colour ¹	4,04 ^a	4,42 ^a	4,04 ^a
Pork aromatic	3,91 ^a	3,95 ^a	4,29 ^a
Teexture	3,71 ^a	4,08 ^a	4,29 ^a
Taste	3,83 ^a	3,91 ^a	4,08 ^a
Tenderness	3,21 ^a	4,12 ^b	4,17 ^{b2}
Overall acceptance	3,83 ^a	4,37 ^b	3,79 ^b

Information:

- 1) Variable that observe
- 2) Score with different letter showed significant different ($P < 0.05$)
- 3) po = barbecue suckling pig of fresh carcass, P1 = barbecue suckling pig of 1 day aging, P2 = barbecue suckling pig of 2 days aging
- 4) Hedonic scale 1 = don't like very much, 2 = don't like, 3 = normal, 4 = like, 5 = like very much

Table 2. Microbiological population of barbecue suckling pig in different time of aging

Variable	PO ³	P1	P2	SNI Standard 2008
TPC ¹ cfu/g	$1,7 \times 10^{3a2)}$	2×10^{3a}	$2,8 \times 10^{3a}$	1×10^6
Coli form cfu/g	-	-	-	1×10^2
E-Coli cfu/g	-	-	-	1×10^1

Information;

- 1) Variable that observed
- 2) Score with different letter showed significant different ($P < 0.05$)
- 3) po = barbecue suckling pig of fresh carcass, P1 = barbecue suckling pig of 1 day aging, P2 = barbecue suckling pig of 2 days aging

IV. CONCLUSION

From the result of the research could be concluded that organoleptic quality of barbecue suckling pig on 1 day aging was the best. Microbiological quality showed that barbecue suckling Bali pig in 1 and 2 days aging were still safe to be consumed.

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