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CHARACTERISTICS OF BEEF PATTIES INCORPORATED WITH VARIOUS PERCENTAGES OF BANANA BLOSSOM

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Abstract: Banana blossom is the flower of banana plant mostly utilized in limited application on traditional cuisine. Application of banana blossom as an ingredient in beef patties formulation was conducted. Physical quality (moisture, cooking loss, diameter reduction, and L* value) and sensory preference of beef patties treated with various percentages of banana blossom were evaluated. The experiment was divided into 5 treatments i.e. A = 0%, B = 5%, C = 10%, D = 15%, and D = 20% of ground banana blossom. The result showed that the cooking loss was significantly increased by a higher percentage of banana blossom addition ($P < 0.05$), while the result in L* value and color acceptance were decreased ($P < 0.05$). In contrast, the addition of banana blossom did not significantly affect moisture, diameter reduction, taste, aroma, texture, and overall acceptances ($P \geq 0.05$). In conclusion, the addition of up to 15% banana blossom could be applied in beef patties formulation.

Keywords: *Beef patties, burger, banana blossom, physical quality, sensory acceptance*

INTRODUCTION

Various meat products are widely distributed in the market from ethnic food to modern food, from homemade food to fast food, and consumption as dine-in food or take-away food. A burger is a meat product that is popular either as dine-in or take-away. This product commonly consists of a patty, pepper powder, vegetable, mayonnaise, chili and tomato sauces, and bun. Burger could be found sold in a local food stall, food cart, and franchise food courts. Its simplicity in preparation is going well with its various cooking methods. However, the formulation is also a substantial part of providing products fitted with consumer's preferences. Beef might be classified as one of the main ruminants commodities among various types of meat, which gives a significant impact on human life. Hanafi, Novia, and Putra (2020) noted that beef is popular meat used in patties manufacturing besides chicken meat. But, high price and lack of dietary fiber in most meat products are some of the challenges in the meat product industry. Thus, utilizing local food sources to combine or substitute in meat product formulation is interesting to be evaluated. Banana blossom is considered as low calorie and high fiber source for food ingredients (Begum and Deka, 2019). In fact, utilization of banana blossom as a food ingredient is limited, particularly found in local food types. To expand its use and solve common problems in meat products as explained earlier, the application of banana blossom in patties formulation is interesting to be studied. On the other hand, modification in formulation potentially affects the quality characteristics of patties' physicochemical and sensory properties. Evaluation is significant to be conducted to view its effect on moisture, cooking loss, diameter reduction, lightness (L*), and sensory preference and to find out suitable percentage could be used.

METHODOLOGY

Materials

The main ingredients used in this experiment were beef and banana blossom. The beef was bought from Pasar Bandar Buat (a fresh market) in Padang, while banana blossom was obtained from a traditional farm in Kuranji, Padang. Other ingredients consist of tapioca flour, soy protein isolate, konjac powder, salt, sugar, seasoning, ice, and butter were also prepared.

Methods

Patties manufacturing. The manufacturing of patties was adapted from the method of Ramadhan *et al.* (2012) with modification. The beef was transformed into ground meat, while banana blossom was blanched for 15 minutes and subsequently homogenized using a blender. Ground beef (75%) was mixed with other ingredients (5% tapioca flour, 2.5% soy protein isolate, 1% konjac powder, 1.5% salt, 0.5% sugar, 3% seasoning, 9% ice, and 2.5% butter), and then divided into 5 lots. After that, ground banana blossoms were added for each lot (0, 5, 10, 15, and 20 %) and mixed by hand. Then, each lot of batter was divided into a small portion (50 gram/portion) and moulded using a burger maker (HF-100, China) to form raw patties. After 20 hours of frozen, raw patties were cooked for 6 minutes (3 min each side) with melted butter using a griller (GRL-G791, Fomac, China) prior to analysing. Laboratory analyses. The sample was analysed for physicochemical analysis moisture (Association of Official Analytical Chemists, & Horwitz, W., 2000), L* value (Los *et al.*, 2020), cooking loss, and diameter reduction (Dreeling *et al.*, 2000). Sensory preference was developed from the general guidelines of Meilgaard *et al.* (2016). Taste, aroma, color, texture, and overall acceptances were determined by 40 semi-trained panelists using 7-point scale (1 = dislike very much, 2 = dislike moderately, 3 = dislike slightly, 4 = neither like or dislike, 5 = like slightly, 6 = like moderately, 7 = like very much). Statistical analysis. SPSS program was applied for data analysis. Data were subjected to one-way analysis of variance (ANOVA) followed by Duncan at 0.05 significance level.

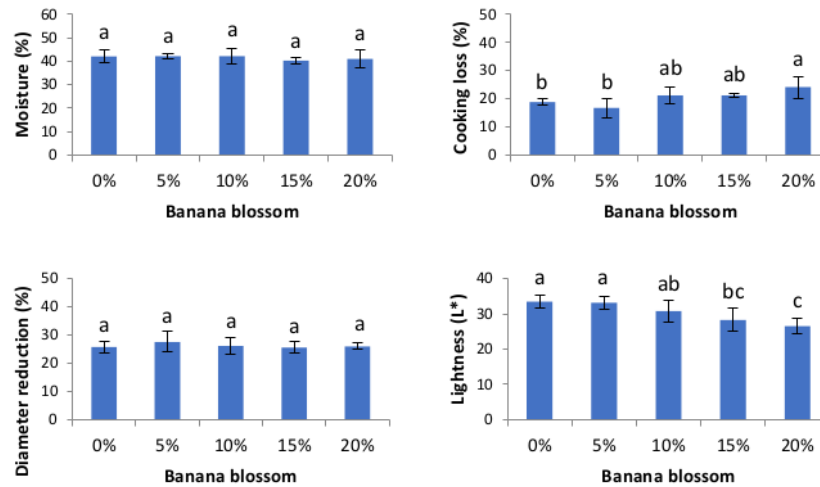
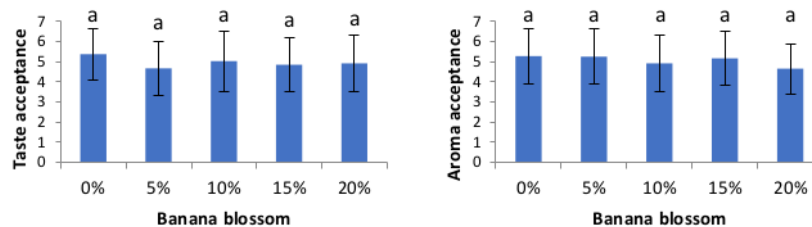


Figure 1. Moisture, lightness, cooking loss, and diameter reduction of patties treated with various percentages of banana blossom



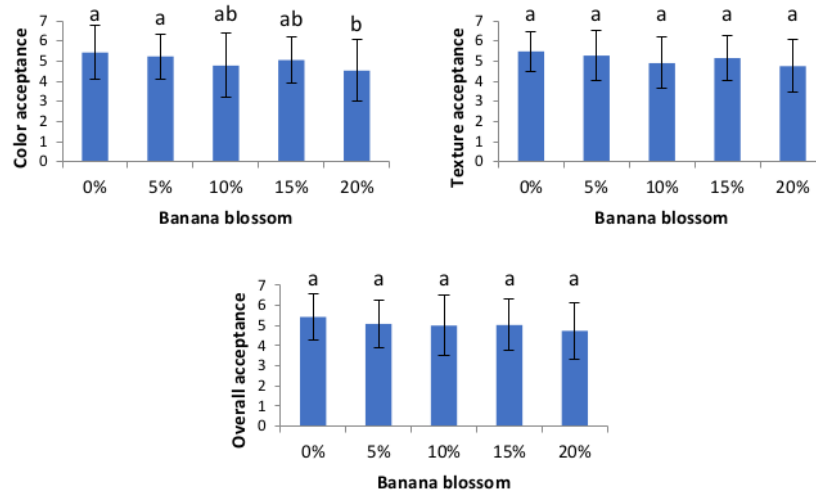


Figure 2. Sensory preference of patties treated with various percentages of banana blossom

FINDINGS

Data of physicochemical characteristics of the sample treated with various percentages of banana blossom are provided in Figure 1. Data showed no significant effect on the moisture content of patties treated with various percentages of banana blossom ($P \geq 0.05$). Even though banana blossom contains a high amount of water, as reported in a reference which contain 92.29-93.73% (Florent *et al.*, 2015), most of the water in banana blossom turn into free water due to blanching and grinding process. This condition caused moisture content release easily during cooking and then the equal quantity of remaining water obtained. A significant increasing effect by a higher percentage of banana blossom used on cooking loss was obtained ($P < 0.05$). This is in concomitant with the release of higher water from a higher percentage of banana blossom. In contrast, a comparable result on diameter reduction among the treated sample was attained. Even though notionally more moisture release during cooking, a higher quantity of non-water component in banana blossom by more banana blossom percentages used in formulation might explain this occurrence. At the same time, there was a significant decrease of lightness (L^*) value of patties by higher addition of banana blossom ($P < 0.05$). This darker color formation might associate with anthocyanin content in the banana blossom. In line with that, Pazminão-Durân *et al.* (2001) highlighted that banana bract composed of 32 mg anthocyanin/g and cyanidine-3-rutinoside is the main type of anthocyanine detected. Moreover, Wickramarachchi and Ranamukhaarachchi (2005) found that rapid reaction between polyphenoloxidase (PPO) and phenolic compound could still result in browning formation in blanched banana blossom. Data of sensory characteristics of the sample treated with various percentages of banana blossom are provided in Figure 2. Color preference was decreased by a higher percentage of banana blossom ($P < 0.05$), while no significant difference in taste, aroma, texture, and overall acceptances obtained ($P \geq 0.05$). Result in color acceptance reflected that darker color in patties prepared with 20% of banana blossom was less preferred by panellists. This is associated with darkening in patties as signifying by the result in lightness (Figure 1). Moreover, comparable results in taste, aroma, texture, and overall acceptances represent the equal distribution of panellist preferences among various percentages of banana blossom used.

CONCLUSION

The addition of banana blossom increase the cooking loss, but decrease the lightness (L^*) value and color acceptance. The treatment applied did not have significant effects on moisture, diameter reduction, aroma, taste, texture, and overall acceptances. The incorporation of 15% banana blossom in the formulation is suitable for patties manufacturing.

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