

Texture Profile and Color Determination on Local and Imported Meat Available in Semarang City, Indonesia

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Abstract

This study was done for analysing the texture profile and colour performance in local and imported meat in Semarang, Indonesia. Two types of available meat were compared in the hardness, cohesiveness, springiness, adhesiveness and the colour L*a*b* performance. Five fresh beef cut of round meats from local and imported meat were used in this experiments. Data were analysed statistically using T-test. The results showed that local beef exhibit higher in the springiness than imported beef resulting in the remarkable differences. The colour analysis showed that imported beef provided remarkable higher in L* value than local beef. Resulting significant differences among two types of beef. As conclusion, these value might provide the notable of differences among local and imported meat and may give preferences status to the user for further application in meat processing.

1. Introduction

Tenderness is important factor as well as colour of meat to determine visual and sensory acceptability resulting the consideration for meat industry to use in their commercial application [1, 2]. The tenderness is influenced by genetics, meat handling, and the process of slaughtering [3]. The tenderization phase is known to be occurred during post-mortem storage [2], therefore the method for storage should be considered.

Meat colour has been widely known not only able to attract consumers preferences but also could be used for determining the changes in the meat composition [4]. Meat colour may be affected by pH and the type of fibre, and also chilling method that may have been treated on the meat [4].

Indonesia has imported beef dominantly from Australia [5] therefore imported beef meat could be easily founded in local market and the price was almost equal to the local beef resulting the reasonable price for all consumers and widely available in market. Since this meat is easily obtained, small scale meat industry was also utilized this meat as sources. However the user of small scale industries pay its preference to use local beef since the differences in appearance was easily recognized.

The objectives of this study were to evaluate the texture and colour on imported and local meat available in local market at Semarang City, Indonesia. This evaluation may provide the beneficial information to the further meat application.



2. Materials and methods

Local beef from Ongole was obtained from slaughter house in Semarang and imported beef from Australia was obtained from local modern market. Both of places were located about 10 km from laboratory. Obtained meat was then prepared for analysis without any preservations. For imported meat, the chilled meat with less than one month of preservation was used.

2.1. Determination of texture profile and colour parameter

Determination of texture was done using texture analyser Brookfield CT-3 to measure the hardness, cohesiveness, springiness, and adhesiveness. To measure the colour of $L^*a^*b^*$, Digital Color Meter software by Macintosh was used. The luminous of lightness was set to 100 lumen. The method for determining texture profile and colour parameter was adopted from other researcher [6].

2.2. Meat sampling

The sampling of meat was done in four weeks and started from August to September 2017. Meat from slaughtering house was obtained from morning slaughtering process (at 03.00 AM) during five days of sampling. Imported meat was also obtained during five days of collection and was immediately thawed for 8 hour prior to the determination of texture and colour.

Data were obtained from three time replication using five time of meat sampling and were analysed using T-test. The calculation was done using open source of R software for Macintosh.

3. Result and Discussion

3.1. Texture profile in local and imported meat

Hardness, cohesiveness, springiness, and adhesiveness from local and imported meat were measured using texture analyser to obtain the data of texture profile. The value of hardness was 0.36 and 0.21 for local and imported meat resulting no remarkable differences (Figure 1). The less notable differences was also found in cohesiveness value; 0.73 and 0.67 for local and imported meat, respectively. It was found that the chilling provided less change in hardness resulting the less change in hardness [7]. This evidence may explain the less differences in both meat sources. The final cohesiveness of common meat product such as sausage was 0.41 [8], so the utilization of both meat are less worries to provide the cohesiveness differences.

The remarkable significant differences was found in springiness that was found a value of 1.97 and 1.08 for local and imported meat, respectively. It seems the storage was contributed to the remarkable value of this springiness however, it was found that the value of springiness close connection to differences in meat composition [7]. This is the evidence that user of small scale meat industry provided its preference to the local meat. The adhesiveness was also found to had remarkable differences among two meat source since the thawing process was conducted in imported meat leading to an elevation in the outflow of protein content and moisture in meat [9].

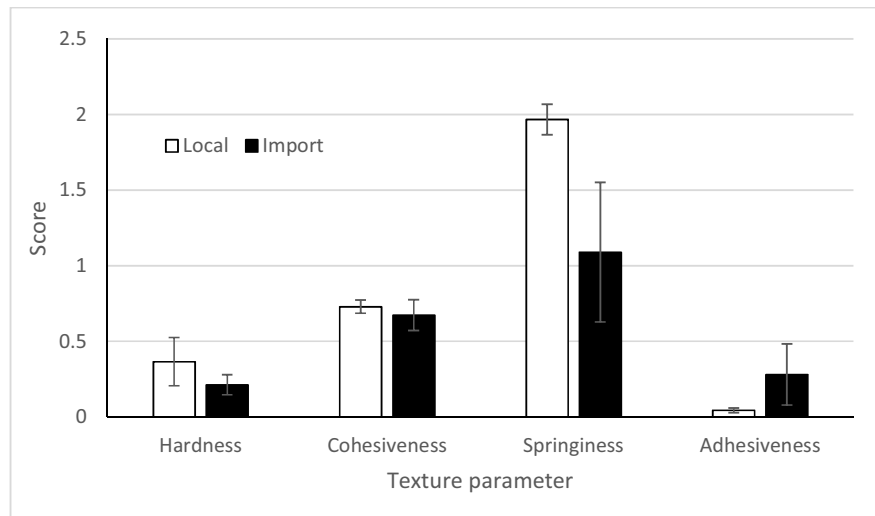


Figure 1. Hardness (N/cm^2), cohesiveness, springiness (cm), adhesiveness (Ns) of local and imported meat available in local market. Data were obtained from the average of 3 times replication and 5 times of sampling. Error bars represents the standard deviation.

3.2. Colour performance of local and imported meat

Colour measurement in sample was expressed as L^* , a^* , and b^* that represented as lightness, redness/greenness, and yellowness/blueness, respectively. The lightness of local meat appeared to be remarkable lower than that of imported meat with the value of 29.20 and 40.29 representing the simple to recognize the source of meat (Figure 2). As 0 value represents as black and 100 as white, the local meat was recognized as darker than imported meat. The lightness tended to low as handling and the manufactured beef might have a value of lightness about 23 [6].

The value of a^* in local and imported meat was 2.08 and 2.17, respectively and the value of b^* was 1.09 and 1.90, respectively. There was no remarkable differences in the value of a^* and b^* between local and imported meat. Since the value of a^* and b^* represents as redness and blueness, respectively, the local and imported meat could not be notified in its redness and blueness. The value of a^* and b^* was reasonable determined since other researcher reported its value as 4.4 and 2.9, respectively [6].

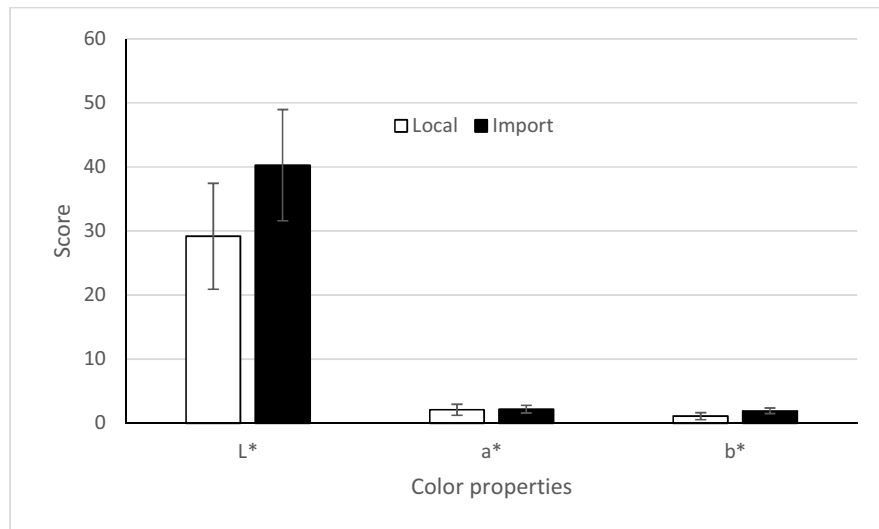


Figure 2. The colour properties of L*a*b* of local and imported meat available in local market. Data were obtained from the average of 3 times replication and 5 times of sampling. Error bars represents the standard deviation.

4. Conclusion

Based on the texture profile, the springiness of local meat showed remarkable higher than imported meat. The local meat showed remarkable darker than imported meat. These value might provide the notable of differences among local and imported meat and may give preferences status to the user for further application in meat processing.

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