A Study of Morphometric-Phenotipic Characteristic of Indonesian Chicken: Kampong, Sentul and Wareng-Tangerang, Based on Discriminant Analysis, Wald-Anderson Criteria and Mahalanobis Minimum Distance*

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ABSTRACT

An observation of linear body sizes was conducted in this study; this includes femur length (X_1), tibia length (X_2), shank length (X_3), shank circle or circumference (X_4), the third finger length (X_5), wing length (X_6), maxilla length (X_7), comb height (X_8) and sternum length (X_9). Grouping or classifying on the basis of morphometric characteristic between Indonesian native chicken: Kampong, Sentul and Wareng-Tangerang, is carried out using discriminant analysis, Wald-Anderson criteria and Mahalanobis minimum distance. Discriminant function equations for Kampong vs Wareng-Tangerang chicken, for males is $Y = 0.07X_1 + 0.29X_2 + 0.004X_3 + 0.38X_4 – 0.51X_5 + 0.04X_6 + 0.27X_7 + 0.27X_9$, and for females is $Y = 0.16X_1 + 0.28X_2 + 0.23X_3 + 0.67X_4 + 0.10X_5 + 0.03X_6 + 0.07X_7 – 0.06X_9$. Several numbers of female from Kampong and Wareng-Tangerang chicken is found not in the right group. In female group, data for Kampong chicken that is group as Wareng-Tangerang is 2.1%; on the other hand, data for Wareng-Tangerang chicken that is classified as Kampong chicken is 2.2%. The Mahalanobis minimum distances for male and female between Kampong and Wareng-Tangerang, respectively are 2.9925 and 2.9864. The greater distance for males indicates a non similarity of morphometric of males is greater than that of females. This means that actual separation for males is easier than that for females for both groups of chicken. The equation of discriminant function for Kampong vs Sentul chicken for males is $Y = 0.12X_1-0.05X_3+0.25X_5-0.12X_8$, and for females is $= 0.0005X_1 + 0.33X_2 + 0.64X_3 + 0.19X_5 – 0.09X_6 – 0.86X_7 – 0.10X_8 - 0.11X_9$. Calculation result at actual group shows that numbers of male and female from Sentul and Kampong chicken are found not to be in the right group. For male group, the data for Sentul chicken that is grouped as Kampong chicken is 4.3%, and for Kampong chicken that is grouped as Sentul chicken is 2.2%. For female group, the data for Sentul chicken that is grouped as Kampong chicken is 11.1%, and for Kampong chicken that is group as Sentul chicken is 5.2%. It is much more difficult to determine the males because of the numbers of determinant variables are smaller. The Mahalanobis minimum distances for males and females of Kampong and Sentul chicken are, respectively, 1.2801 and 1.6900. A non-similarity of morphometric for Kampong vs Sentul indicates that the size of females is greater than that of males. Therefore, actual separation is easier to be done at female group. For Wareng-Tangerang vs Sentul chicken, the discriminant function equation for males is $Y = -0.18X_1 -0.03X_2 + 1.20X_3 + 1.09X_4 + 0.20X_5 -0.36X_6 + 0.06X_7 – 0.54X_8 + 0.11X_9$, and for females is $Y = 0.02X_1 + 0.32X_2 + 0.93X_3 + 1.30X_4 + 0.69X_5 – 0.10X_6 – 0.22X_7 – 0.81X_8 – 0.29X_9$. There is only the male that is found not in the right group. Separation among males is more difficult than separation among females although all of variable observed are determinant variables for both males and females. For males, data for Wareng-Tangerang chicken which is classified as Sentul chicken is 4.3% and for Sentul chicken which is grouped as Wareng-Tangerang is not found. The Mahalanobis minimum distance for males and females between Wareng-Tangerang and Sentul chicken is, respectively, 2,9925 and 2,9864. A greater distance for males demonstrates a non-similarity of morphometric for males that is greater than for females. Actual separation for males should be easier than for females; however, a reverse situation is observed in this experiment. This is because of a similarity in feather colour of Wareng-Tangerang chicken to that of Sentul chicken. In conclusion, the highest distance of a non-similarity of morphometric is caused by the largest numbers of determinant variables; this has increased the accuracy of grouping separation. Wareng-Tangerang chicken is different from Kampong and Sentul chicken. A similarity of morfometry between Kampong and Sentul chicken is closer than that with Wareng-Tangerang. Kampong and Sentul chicken are Indonesian native chicken; however, the Wareng-Tangerang chicken is originated from abroad that have adapted with Indonesian condition.

Key words: discriminant analysis, Wald-Anderson criteria, mahalanobis minimum distance, Kampong chicken, Sentul chicken, Wareng-Tangerang chicken