

## Non-hierarchical cluster analysis for body weight, age at first egg, egg production and egg weight in a laying hen strain.

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The non-hierarchical cluster analyzes by the *k-means* method is a multivariate technique that requires a prior knowledge of the structure of the population. The purpose of this analysis is to identify the best solution in the group's formation, in order to minimize the differences within groups and maximize the differences among the groups. This study aimed to evaluate the genetic pattern between body weight, age at first egg, egg production and egg weight through non-hierarchical k-means cluster analysis, in order to use this analysis as a support in the genetic selection process of laying hen. The analyzed traits were: total egg production, defined as the sum of the number of eggs produced from 19 to 58 weeks of age (TP), partial productions from 19 to 58 weeks, divided into eight partial periods: (19 to 23 weeks of age - P1, 24 to 28 weeks - P2, 29 to 33 weeks - P3, 34 to 38 weeks - P4, 39 to 43 weeks - P5, 44 to 48 weeks - P6, 49 to 53 weeks - P7, and 54 to 58 weeks - P8); age at first egg (AFE); egg weight at 22 (EW22) and 27 (EW27) weeks of age; and body weight at 16 (BW16) and 60 (BW60) weeks of age. The breeding values were obtained by the Restricted Maximum Likelihood Method for one-trait animal model using the WOMBAT software. Non-hierarchical cluster analysis by k-means method was carried out by Statistica 8.0 software. It was observed two clusters of animals using the breeding values of the studied traits. The first cluster presented animals with negative breeding values for body weight (BW16 and BW60) and positive breeding values for egg productions traits (AFE, EW22, EW27, TP and partial productions – P1 to P8). The second cluster was composed by animals with negative breeding values for egg production traits (AFE, EW22, EW27, TP and partial productions – P1 to P8) and positive breeding values for body weight traits (BW16 and BW60). It is recommended to select laying hens pooled in the first cluster since they presented positive breeding values for egg production traits.

**Key Words:** Genetic association, laying hens, multivariate analysis