

Application of multivariate principal component analysis on dimensional reduction of milk composition variables

Authors:

**Alphonsus C^{1*}, Akpa GN¹,
Nwagu BI², Abdullahi I²,
Zanna M³, Ayigun AE³,
Opoola E³, Anos KU³,
Olayinka O³ and Olayinka-
Babawale OI³**

Institution:

1. Animal Science Department, Ahmadu Bello University, Zaria, Nigeria.
2. National Animal Production Research Institute, Shika-Zaria
3. Kabba College of Agriculture, Ahmadu Bello University, Kabba, Nigeria

Corresponding author:
Alphonsus C

ABSTRACT:

Variable selection and dimension reduction are major prerequisites for reliable multivariate regression analysis. Most a times, many variables used as independent variables in a multiple regression display high degree of correlations. This problem is known as multicollinearity. Absence of multicollinearity is essential for multiple regression models, because parameters estimated using multi-collinear data are unstable and can change with slight change in data, hence are unreliable for predicting the future. This paper presents the application of Principal Component Analysis (PCA) on the dimension reduction of milk composition variables. The application of PCA successfully reduced the dimension of the milk composition variables, by grouping the 17 milk composition variables into five principal components (PCs) that were uncorrelated and independent of each other, and explained about 92.38% of the total variation in the milk composition variables.

Keywords:

Principal component analysis, eigenvalues, communality