

Multivariate Analysis of Biometric Traits in Male Katjang-Boer Goat

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INTRODUCTION

- The evaluation of body composition and growth performance is important to assess the animals' potential.
- Body measurements of animals have been widely used to assess the skeletal growth and the changes in animal conformation against age.
- Principal component analysis could be used to determine the factors that explain the highest variation in the dataset over the dependent variable.
- The objective of this study was to determine the relationship of body measurements namely body length (BL), chest depth (CD), chest girth (CG), hip height (HH), height width (HW), shoulder height (SH) and shoulder width (SW) of male Katjang-Boer goat using principal component analysis and correlation analysis.

METHODOLOGY

- Data of body measurements namely body length (BL), chest depth (CD), chest girth (CG), hip height (HH), height width (HW), shoulder height (SH) and shoulder width (SW) of 56 male Katjang-Boer goat were collected monthly from birth until 60-month old .
- Data was analyzed PROC CORR and PROC PRINCOMP for correlation and principal component analysis, respectively using SAS v9.3.

RESULTS AND DISCUSSION

Correlation of BL, CD, CG, HH, HW, SH, SW of male Katjang-Boer goat.

	BL	CD	CG	HH	HW	SH	SW
BL		0.926	0.988	0.997	0.857	0.997	0.847
CD			0.868	0.930	0.987	0.936	0.985
CG				0.989	0.780	0.987	0.769
HH					0.862	0.999	0.853
HW						0.869	0.999
SH							0.861
SW							

Eigenvalues, total variance and factor loadings of the body measurements of male Katjang-Boer goat

	Factor 1	Factor 2	Factor 3	Factor 4
Body Length	0.884	-0.233	-0.151	-0.305
Chest Depth	0.858	0.016	-0.321	0.395
Chest Girth	0.919	-0.041	-0.181	-0.182
Hip Height	0.836	-0.340	0.363	0.141
Hip Width	0.862	0.424	0.176	-0.018
Shoulder Height	0.905	-0.281	0.070	0.035
Shoulder Width	0.852	0.473	0.065	-0.042
% of total variance	76.4	9.37	4.72	4.35

- Four principal components were extracted which contributed to 94.84% of the variability from the original seven traits.
- The first factor accounted for 76.4% of the total variance and was interpreted as a measure of general size. The second factor which explained 9.37 % of the total variance was influenced by HW and SW, while the third factor that accounted for 4.72% of total variance influenced by HH. The fourth factor accounted for 4.35% of total variance and mainly influenced by CD.
- The correlation coefficients of the body measurements ranged from 0.769 to 0.999 where SH-HH and SW-HW showed the highest correlation and SW-CG showed the lowest correlation.

CONCLUSION

- As the conclusion, it is suggested that principal component analysis could be employed in animal breeding and selection as it can reduce the number of parameters to be considered in breed improvement program.