GROWTH CURVE ANALYSIS OF GOAT BREEDS IN SRI LANKA

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Although goat farming is ideal for small-scale livestock farmers in Sri Lanka, growth performance of the present local goat population requires substantial improvement. Before carrying out any genetic improvement program, it is important to comparatively study the growth patterns of the imported and local breeds of goats under the natural field conditions. The main objectives of this analysis were to determine the main factors affecting the size of goats, and model the growth of various breeds of goats available in Sri Lanka.

The information on sex of animal, birth type, and body parameters (weight, height, length and girth) at different ages of goats which belonged to three breeds (Jamunapari, Kottukachchiya and Boer) were extracted from a goat breeding program in Kottukachchiya. The computerized data on body parameters were subjected to ANOVA procedure fitting breed of goat, sex of goats and birth type and their interactions as fixed effects. Five alternative growth equations were fitted for the three breeds separately by using NLIN procedure in SAS software. Prior estimates were given for the three biological parameters for the NLIN procedure. Based on MSE, R^2, AIC, BIC and SBC the best fit model was selected for each breed and the results were used to predict the maturing rate of each breed.

Breed, sex, and birth type were highly significant ($P < 0.05$) on all four body parameters at birth and some effects were non significant ($P > 0.05$) when they achieved maturity. Some significant ($P<0.05$) interaction effects were also present. Although, Boer breed showed the largest body measurements at birth the advantage was negligible when they became adults. The influence of sex was highly significant in goats, while males had larger body measurements from birth to maturity.

All growth curves produced a good fit to the data particularly during the intermediate stage of growth. However, Brody function produced the overall best fit and could be recommended as the most suitable model for growth data of goats. Von Bertalanffy and Gompertz curves converged slowly and Logistic provided poor convergence to all growth data. Richards models failed to converge in most cases possibly due to overparametisation. Jamunapari goat breed gave the highest asymptotic values compared with the other two breeds.