

**ANALYSIS OF INBREEDING LEVELS AND CHARACTERIZATION OF THE  
LACTATION CURVE OF KENYA ALPINE DAIRY GOAT**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE MASTER OF  
SCIENCE DEGREE OF THE UNIVERSITY OF NAIROBI**

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**MSc. (ANIMAL GENETICS AND BREEDING)**

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## DECLARATION

**This thesis is my original work and has not been presented for any degree in any other university or institution.**

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**This thesis has been submitted with the approval as supervisors.**

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## ABSTRACT

This research was aimed at two main objectives: to estimate the level of inbreeding and to characterize the lactation curve in Kenya Alpine dairy goats. The level of inbreeding of the Kenya Alpine dairy goat was investigated by use of Brian Kinghorn's Pedigree viewer<sup>©</sup> software. From 1,067 doe records, various data types were extracted and these additively cumulated to 3,516 records that were used for calculating individual inbreeding coefficients for the period 1999 to 2011 although the animals were first introduced in Kenya in 1990. The rate of inbreeding ( $\Delta F$ ) was estimated as the difference between the individual inbreeding ( $F_t$ ) and the inbreeding of the parents ( $F_{t-1}$ ) divided by  $(1-F_{t-1})$ . The proportion of animals that were inbred increased from 0.00 (average  $F = 0$ ) in 1990 (at which time the  $F$  was assumed to be zero, the animals having come from disparate breeds) to 0.38 in 2011 (average  $F = 0.012$ ). Inbreeding depression on body weight was insignificant ( $P < 0.05$ ). In general the level of inbreeding in this population was very low. Further investigation on the birth weight and weaning weight was carried out. Regression analysis indicated that birth weight ( $p < 0.05$ ) and weaning weight ( $p < 0.01$ ) had improved in inbreds. The decrease in weight at first service and at first kidding was statistically insignificant. Kidding interval increased ( $p < 0.01$ ) due to inbreeding. Rate of decline in weight at first service and at first kidding, was different from zero ( $p < 0.01$ ). Effect of inbreeding on growth and reproductive traits in Kenya Alpine goats was minimal. Weekly data on completed five lactations of 557 does was used to estimate a three-stage least squares lactation curve model for milk production. Persistency was highest in foundation status but pedigree had the highest 17 week total lactation of 108.8kg with a persistency of 4.35. The lactation curve was expressed by the equation:

$$M_t = 968.46e^{-0.011t}$$

$$R^2 = 0.8924$$

This showed that the lactation follows the normal lactation curve of dairy goats.