
Predicting Lactation Records from Test Day Samples in Indigenous and Crossbred Dairy Cattle in Senegal

Lotta Lassila¹, Karen Marshall², Patrick Jolly Ngonu Ema^{3,4}, Isabelle Baltenweck², Jane Poole², Stanly Fon Tebug², Miika Tapio⁵, Ayao Missohou³, Jarmo Juga¹

¹University of Helsinki, Agricultural Sciences, P.O.Box 28, 00014 University of Helsinki, Finland, lotta.lassila@helsinki.fi

²International Livestock research Institute (ILRI), P. O. Box 30709, Nairobi 00100, Kenya

³Interstate School of Veterinary Science and Medicine of Dakar (EISMV), P.O. Box 5077, Dakar (Fann), Senegal

⁴University of Ngaoundere, School of Veterinary Medicine and Science, P.O.Box 454, Ngaoundere, Cameroon

⁵MTT Agrifood Research Finland, Biotechnology and Food Research, 31600 Jokioinen, Finland

Abstract

Demand for milk in Sub-Saharan Africa is rising constantly and small scale dairy producers will continue to be an important part of African agriculture. Farmers in low-input dairy production systems in Senegal currently lack the needed information on the relative production performance of different breed-types to be able to select the best animals for their needs and to feed the cows according to their milk production. The aim of this study is to use different models to estimate lactation curves and predict annual milk yield from test day records for different dairy breeds and crossbreeds.

The Senegal Dairy Genetics project is working in two regions in Senegal (Thies and Diourbal), where there is a mix of both indigenous and non-indigenous dairy animals. In total 239 dairy households and about 3500 dairy animals have been recruited into the project. The data is collected by a team of six field staff (enumerators). The enumerators are each allocated approximately 40 households and they visit these on a rotational basis (about once every 4 to 5 weeks), using questionnaires to collect socio-economic and productivity data. In addition, milk is recorded through direct milk measurements of both morning and evening milk production on the test day. All activities on farm are carried out in the local language of Wolof.

On first four rounds of longitudinal monitoring (September 2013 - February 2014) test day result of milk volume was record-

ed at least once for 984 animals. Of these, 489 animals had the needed information on date of last calving, number of parturitions, age and the breed of the animal, and were included in the analysis.

Animals were grouped according to breeds, based on farmer-given breed-types. The largest group (50%) consisted of Zebu Gobra and Zebu Maure breeds. The other main groups consisted of crosses between zebu and taurine breeds, crosses between taurine breeds or purebred taurines. The most commonly used taurine breeds were Holstein-Friesian and Montbeliard.

Daily milk yield was estimated from morning and evening milkings using a regression model, which took into account stage of lactation and number of parities. The estimated daily milk yield for 365 days of lactation was 2.7 l for first parity and 2.6 l for later parities. For the breed group of Zebu Gobra and Zebu Maure, the estimated average daily milk yield was 2.3 l for first parity and 2.1 l for later parities. The breed group of crosses between Zebu Gobra (25%) and Holstein-Friesian (75%) or Montbeliard (75%) had estimated average daily milk yield of 3.8 l for first parity and the highest estimated average daily milk yield of 4.7 l for later parities.

Keywords:

cattle, dairy breeds, milk yield, lactation curve, Senegal