



Effects of Breed Exoticness and Agroecological Zones on Selected Production and Fertility Traits in Multibreed Dairy Cattle in Kenya

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Introduction

- Mismatch of cattle genotypes to the production environment leads to low dairy production in sub-Saharan Africa
- Most dairy cattle in sub-Saharan Africa are crosses of different breeds
- The region is characterized by different agroecological zones with varied production systems
- Knowledge of genotype by environment interaction important for matching dairy cattle breed to existing distinct production environments
- Research Question: What are the effects of exoticness and agroecological zones on production and fertility traits of multi-breed dairy cattle in Kenya?

Methods

- Milk yield (MY), age at first calving (AFC), and calving interval (CI) data from cattle performing in 3 agroecological zones analyzed
- Animals grouped into two breed classes based on the proportion of exoticness: Exotic Class 1 (EC1) ($\leq 50\%$ exotic) and EC2 ($> 50\%$ exotic)
- Agroecological zones: Semi-arid arable (SAA), semi-arid pasture based (SAP) and semi-humid (SH) environments
- Linear regression models fitted to analyze the effects of exoticness and environment on these traits
- Data adjusted for significant fixed effects such as year-season effects

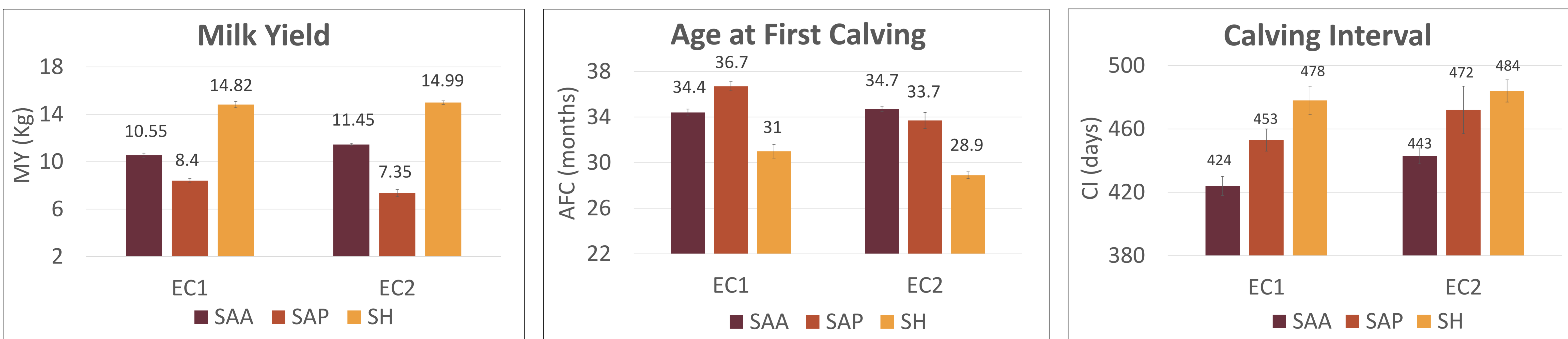


Fig 1: Effect of agroecological zones on milk yield, age at first calving, and calving interval of different cattle genotypes

Results

- EC2 cows had lower AFC and longer CI than EC1 cows
- No difference in MY between two breed groups
- SH favored onset of puberty and highest milk production
- In both breed groups, MY was highest in SH and lowest in SAP environment

Conclusions

- The biophysical variation in agroecological zones and level of exoticness affects performance of multibreed dairy cattle differently
- Thus, they should be factored in when designing genetic improvement programs

Results

- EC1 had largest AFC in the SAP and lowest in the SH environment
- For the EC2, AFC was largest in SAA zone and lowest in the SH environment
- SH environment had the longest CI for both breed groups
- Genotype by environment interaction was significant for AFC and MY