

Suitability assessment of different cattle breeds kept on different feeding regimes for dairy farming in East Africa

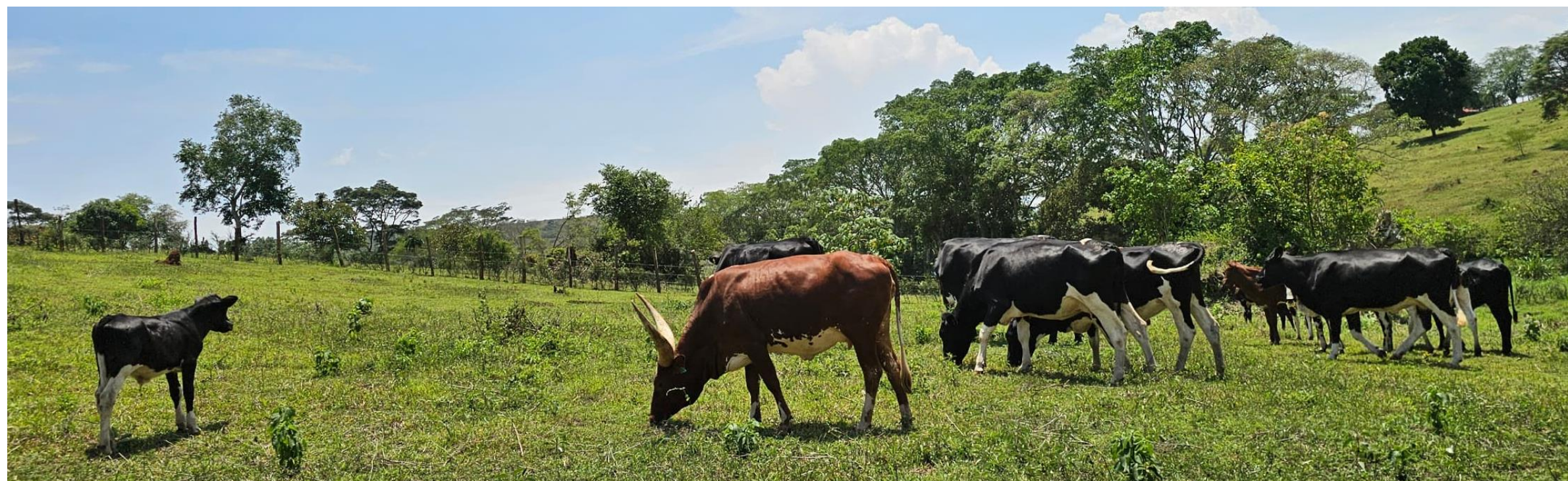
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Introduction

- East Africa (EA) produces 46% of Africa’s cattle milk
- Diverse cattle breeds kept on a wide range of feeding regimes (FR)
- Lifetime suitability of the major cattle breeds under common FR in EA remains unclear



Research question

How suitable are Zebu, FriesianxZebu, & Holstein-Friesian cows for typical feeding regimes in EA?

Methods

The LIVestock SIMulator (LIVSIM) was used for modelling.

LIVSIM parameterization (breeds)

- Holstein-Friesian
- FriesianxZebu
- Zebu

Scenarios (feeding regimes [FR])

- FR1** → full grazing
- FR2** → grazing + dairy meal supplementation
- FR3** → total mixed ration (TMR)

Model simulation (breeds)

- All scenarios for each breed
- Simulation length: 15 years
- Sensitivity analysis: $\pm 10\%$ inputs

Further calculations

- Animal performance
- Net profit estimation

Take home message

Over a cow’s life time in EA:

- Zebus on grazing (FR1)→ most profitable
- Dairy meal supplementation (FR2) did not raise net profit over grazing only
- TMR feeding→ net losses for all breeds

Results

- All three breeds performed best under FR3 (Tab. 1)
- TMR feeding caused negative net profit across all breeds (Fig. 1)

Tab. 1 Lifetime performance and cash flows for three dairy cattle breeds under typical feeding regimes in East Africa

| Parameter | Breed types | Feeding regimes* | | |
|---|-------------------|-------------------|-------------------|-------------------|
| | | FR1 | FR2 | FR3 |
| <i>Number of calvings (n)</i> | Zebu | 3 | 5 | 5 |
| | FriesianxZebu | 2 | 5 | 5 |
| | Holstein-Friesian | 2 | 4 | 5 |
| <i>Carcass weight (kg)</i> | Zebu | 142 | 141 | 145 |
| | FriesianxZebu | 176 | 183 | 180 |
| | Holstein-Friesian | 198 | 195 | 196 |
| <i>Milk yield (kg/lactation)</i> | Zebu | 759 (± 13) | 903 (± 81) | 842 (± 57) |
| | FriesianxZebu | 1247 (± 7) | 1389 (± 56) | 1403 (± 31) |
| | Holstein-Friesian | 1801 (± 28) | 1932 (± 58) | 1984 (± 92) |
| <i>Feed expenses (\$)</i> | Zebu | 366 | 1825 | 5137 |
| | FriesianxZebu | 492 | 1989 | 6342 |
| | Holstein-Friesian | 576 | 1939 | 7067 |
| <i>Income from meat & milk (\$)</i> | Zebu | 1425 | 2273 | 2171 |
| | FriesianxZebu | 1643 | 3361 | 3375 |
| | Holstein-Friesian | 2149 | 3708 | 4545 |

*FR1: Grazing only corresponds, FR2: grazing plus dairy meal supplementation, and FR3: total mixed ration

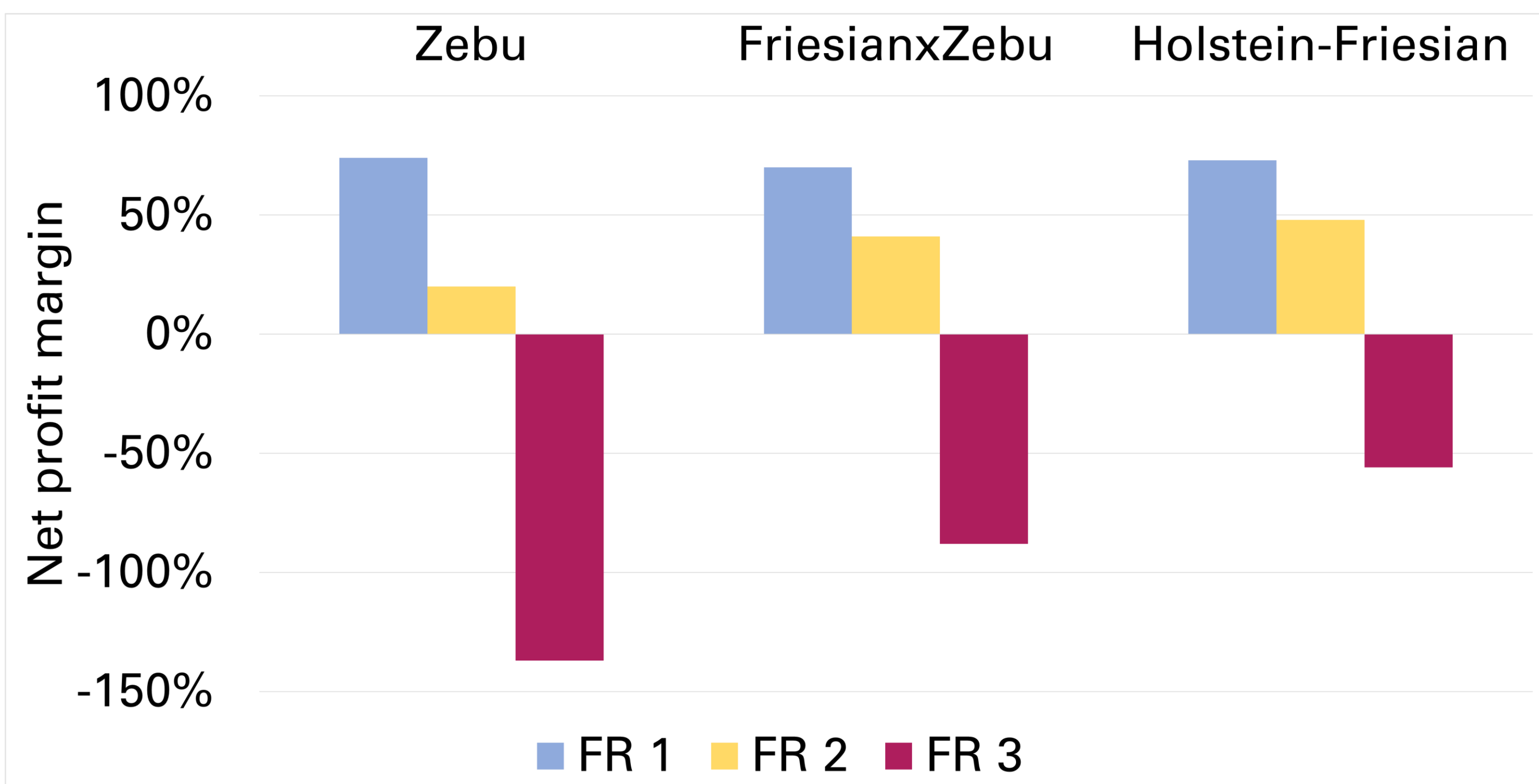


Fig. 1 Lifetime net profit margin for three cattle breeds under typical East African feeding regimes