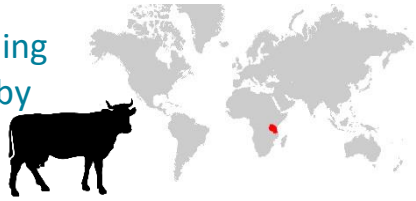
Improving dairy production in the southern highlands of Tanzania

Most milk in Tanzania is produced by cattle in low input, low yielding systems. Dairy production & household income can be increased by using higher yielding breeds and feeding better quality diets.



This factsheet uses production systems from Mbeya as an example of how milk yields and income from dairy production can be improved in the southern highlands.

Current production systems in Mbeya

Most milk in the southern highlands is produced in intensive smallholder production systems. These systems are based on cut and carry of native grasses and crop residues with minimal grazing. Crossbred and improved cattle breeds are common, and milk is sold into formal value chains.

Issues limiting milk production

Animal genetics

Local cattle breeds have low milk yields.

Feed shortages & costs

Seasonal feed shortages. Decreased land area available for grazing. Cost & quality of concentrate feeds is variable.

High animal mortality & low reproduction rates

Largely caused by disease & poor nutrition.

Using models to understand potential impacts

Bio-economic models can be used to simulate and understand the potential effects of changes to production systems. A baseline simulation is created to match current production systems, and different interventions are tested.

Models show what *could* happen, not what *will* happen, so results need to be interpreted with caution. For more information: McDonald et al. (2019).

Modelled baseline household

- 6 Tanzania Shorthorn Zebu cows (local cattle).
- Cows fed native grass + home-grown crop residues in a cut & carry system.
- Model input parameters from references below.

Modelled interventions to increase production

Improved genetics

Local cattle replaced with Friesian cross cattle.

High quality forage

Cows supplemented with high quality, home-grown legume forage.

Supplementation with concentrate

Cows supplemented with purchased concentrates:

- Low concentrate: 3 kg maize bran/cow.day.
- High concentrate: 5 kg maize bran + 1 kg cottonseed cake/cow.day.

Combined interventions

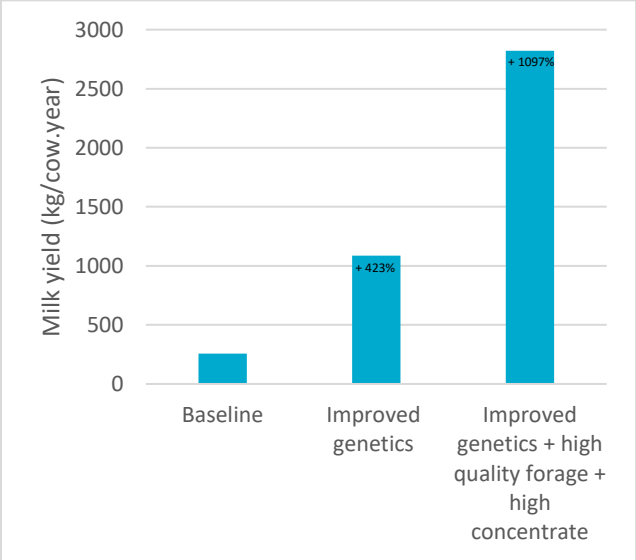
Improved genetics + provision of high quality forage & concentrate.

Interventions can increase production and profitability

Modelled impacts of interventions to dairy production systems in the Mbeya region.

	Herd size (head)	Number of births per year	Number animals sold per year	Adult mortality (%)	Juvenile mortality (%)	Inter-calving interval (m)	Milk yield (kg/cow.year)	Livestock gross margin (Million TZS[1])
Baseline	5.7	2.2	1.3	11.4	20.6	15	257	0.2
Improved genetics + high quality forage	5.5	1.9	0.9	12.8	22.4	17	922	0.9
Improved genetics	5.8	1.8	0.9	10.6	22.4	17	1,087	1.1
Improved genetics + low concentrate	6.8	4.8	3.8	5.0	11.9	12	1,883	5.6
Improved genetics + high quality forage + low concentrate	6.8	4.8	3.8	5.1	13.3	12	2,020	6.2
Improved genetics + high concentrate	6.8	4.8	3.9	5.1	10.5	12	2,632	7.1
Improved genetics + high quality forage + high concentrate	6.8	4.8	3.9	5.1	10.6	12	2,820	7.8

[1] 1 USD ~ 2310 Tanzanian Shilling (TZS)



Modelling of interventions shows the greatest increases in production come from combining multiple interventions.

Key messages

Improved breeds such as Friesian cattle have higher genetic potential but are bigger and have higher nutrition and health care requirements compared to local cattle.

The biggest increases in household income are associated with high individual milk yields combined with improved reproduction and lower mortality rates, resulting in more cows lactating each year and more offspring available for sale.

Combined interventions are more successful than single interventions.

The highest milk yields are achieved when higher yielding cattle breeds are fed high quality diets, particularly concentrate feeds.

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References used to parametrise modelling: Da Silva et al. (2017) Tanzania Livestock Masterplan; Nell et al. (2014) Quick Scan Dairy Sector Tanzania; Kurwijila et al. (2012) The Tanzania Dairy Industry; Katjiuongua and Nelgen (2014) Tanzania smallholder dairy value chain development: situation analysis and trends; Sarwatt and Mollel (2006) Country Pasture/Forage Resource Profiles; Kamugisha et al. (2017) Evaluation of quality beef supply chain efficiency in Tanzania's niche markets: a case study of Arusha and Dar-es-Salam cities; McDonald et al. (2019) The Integrated Analysis Tool (IAT) – A model for the evaluation of crop-livestock and socio-economic interventions in smallholder farming systems.

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