Dairy Production system in Malawi

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OUTLINE

- Overview of dairy industry in Malawi
- Dairy intensification in Malawi
- Challenges in smallholder dairy production systems in Malawi
- Opportunities in smallholder dairying

Overview of dairy industry

Estates

- Semi-intensive to intensive

Commercial farms

- Large herds ~150 to 400
- Specific dairy breeds~ Holstein-Friesian, Jersey
- Intensive production – housing, labour, feed

Overview of dairy industry

Smallholder

- Zero-grazing system

Zero-grazing

- Small herds ~1to 3 animals
- dairy breeds~ Holstein-Friesian, Jersey and crosses
- Semi-intensive production – housing, labour, feed

Overview of dairy industry

Processors

- Small-scale – dairy cooperatives
- Large scale – inadequate milk supply
- pasteurized milk, fermented products

Distributors

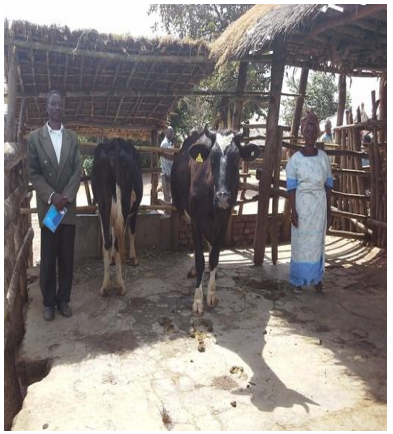
- Various companies~processors, supermarkets
- Farm gate milk price per liter~ $0.24 to 0.49

Consumers

- Urban, peri-urban, rural~ 60% local supply

Characteristics of Smallholder dairying

- Is gender and age compliant
- Non-profit Organisations target even poorest and vulnerable members of the communities
- Hence an intervention that also targets climate change affected areas



Dairy farms	Dairy farmers	
	Male	Female
13,280	8,300 (62.5%)	4,980 (37.5%)

Dairy intensification in Malawi

Dairy intensification strategy

- **Genetic**
  - modern breeding technologies ~ Artificial Insemination
- **Ecological**
  - zero-grazing to promote the well-being, health, and production of dairy cattle
- **Social-economic**
  - capacity building to create an enabling environment for dairy production to thrive

(Chagunda *et al*., 2015, McDermott *et al*., 2010)

Dairy intensification strategy

- Malawi Government established a national artificial insemination (AI) center to produce semen (Banda *et al*., 2012)

- Government and non-state actors imported and distributed Holstein-Friesian and Jersey to smallholder farmers (Baur *et al*., 2017, Chagunda *et al*., 2015).

Government and NGO support

- Training on dairy husbandry
- Support services in health, feeding and breeding

Dairy intensification in Malawi

- Dairy cattle numbers and milk production has been increasing with years
  - **Dairy Cattle population~ 98,144**
- Main goals include;
  - Milk for sale ~ income for livelihood
  - 1 - 2 liters of milk for home consumption
  - Manure for crop farming
- Dairying is included in climate change resilient projects

Dairy production system and productivity

- Wide variation in productivity
  - Current average milk yield/cow/d ~ 10 litres
  - Up to 30 litres per day

- Breeds:
  - Jerseys, Holstein – Friesians and Cross-breds

- **All dairy breeds used for milk production in Malawi perform below potential**

Challenges

- Despite government efforts in intensification, studies indicate
  - decline in milk productivity (≤ 10 liters per cow/day) (Malawi Government, 2022)
  - high calving intervals (> 400 days) (Kawonga *et al*., 2012, Banda *et al*., 2012)

- Decline is due to technical, biological, and infrastructure challenges (Baur *et al*., 2017, Chagunda *et al*., 2015)

Challenges in dairy production systems

- **Technical and biological challenges**
  - inadequate and poor-quality feed
  - high disease prevalence and incidence (Tebug *et al*., 2012, Kawonga *et al*., 2012)
  - low fertility (Banda *et al*., 2012)
  - poor management practices (Kawonga *et al*., 2012)

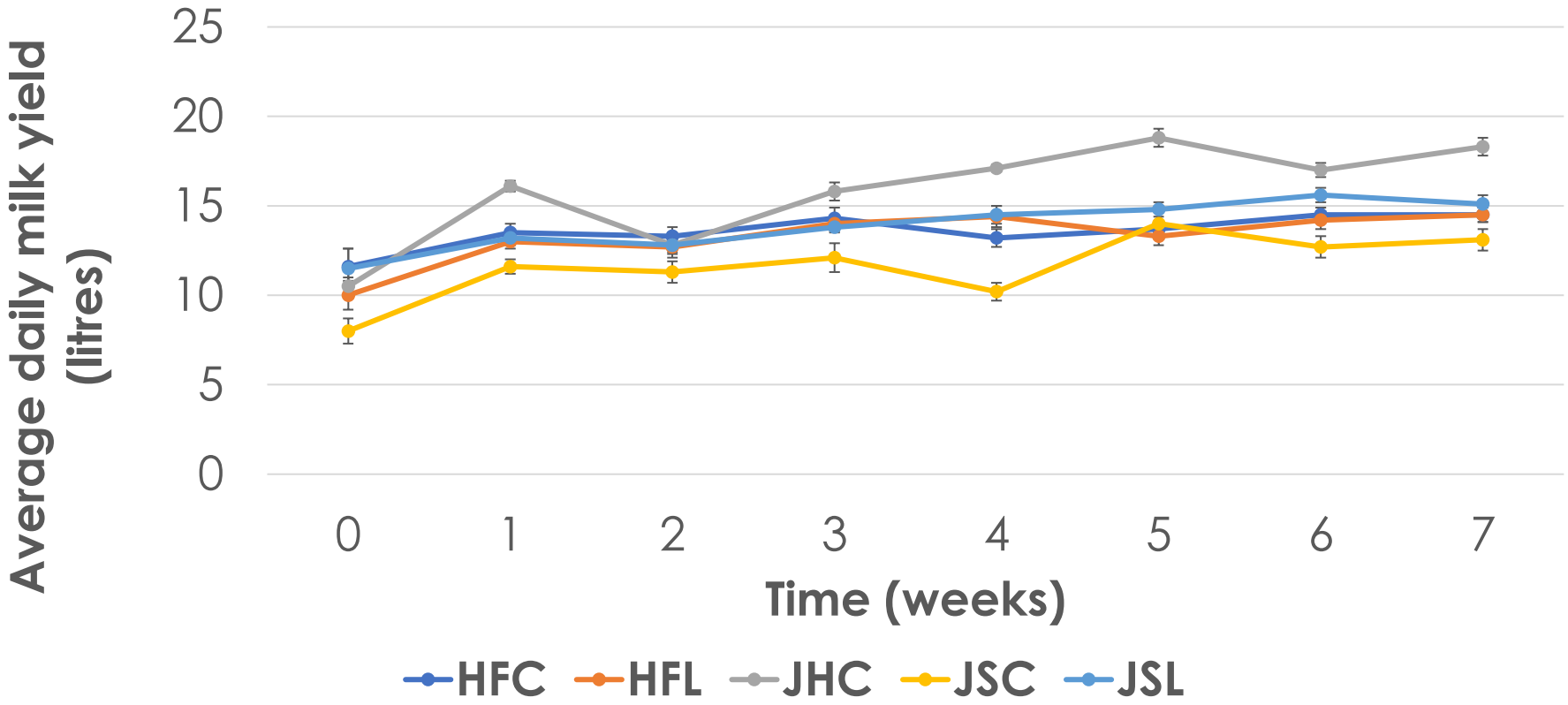
Challenges in dairy production systems

- **Infrastructure challenges**
  - lack of milk cooling facilities, electricity, and water for milk bulking groups
  - lack of labour-saving equipment~feed processing, milking
  - inappropriate housing and farm structures for dairy animals
  - lack of guaranteed milk markets

Climate resilient dairy projects in Malawi

- Integrated crop-dairy systems
- Feed conservation
- Feed production~local ingredients
- Feed profiling
- Breed evaluation

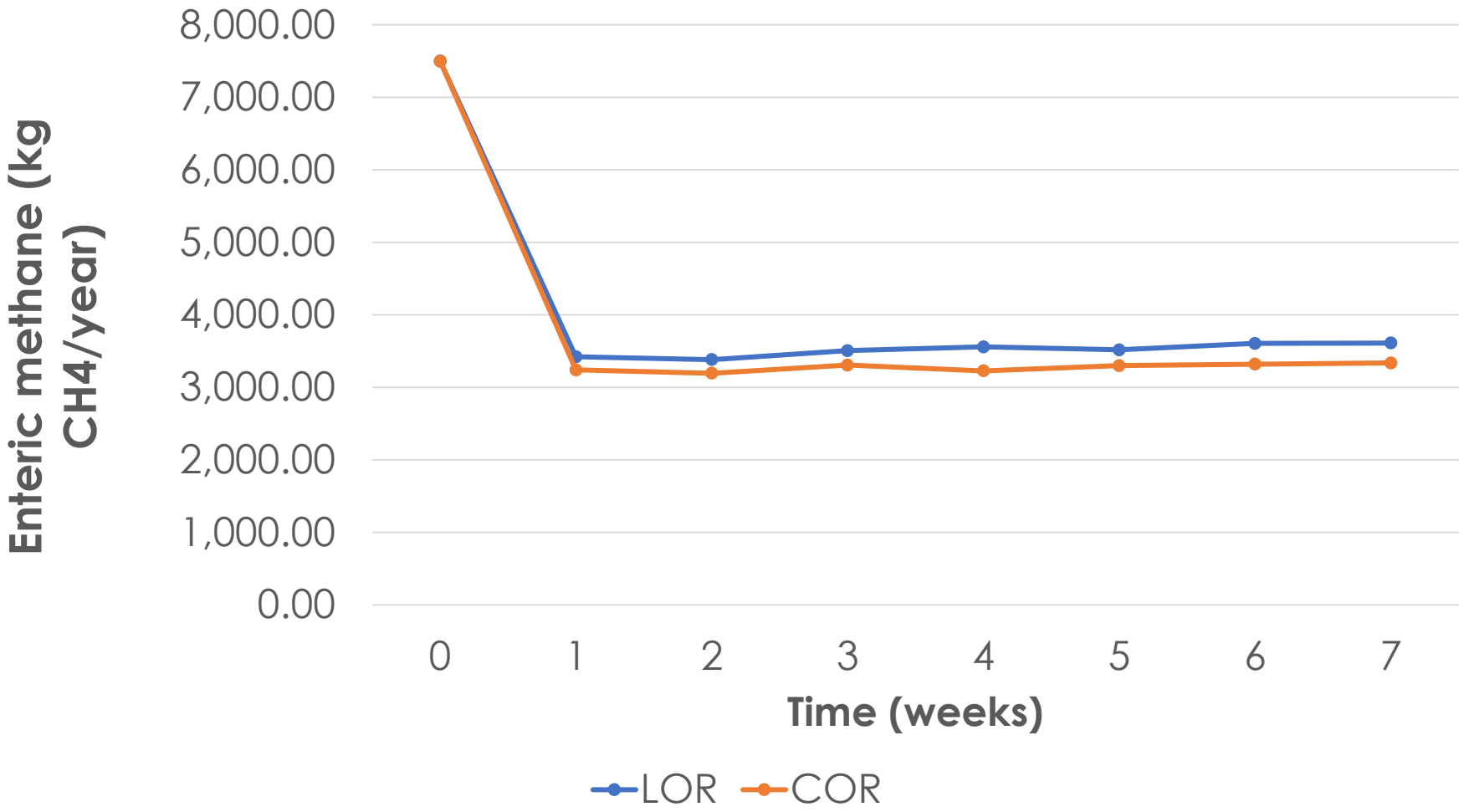
Figure 1: Average daily milk yield from different dairy cattle breeds on commercial and locally made rations in Magomero Milk Bulking Group



. . (HFC= Holstein-Friesian Commercial Ration; HFL= Holstein-Friesian Local Ration; JHC= Jersey-Holstein Commercial Ration; JSC= Jersey Commercial Ration; JSC= Jersey Local Ration)

There was higher variation between breeds where the increase ranged from 25 to 74% with significant differences ($p<0.05$) between breeds

Figure 2: Enteric methane estimates using Global Livestock Environmental Assessment Model (GLEAM-i) in dairy cattle on commercial and locally made rations in Magomero Milk Bulking



COR= commercial ration; LOR= local ration

Figure 3: Profile of local feeds

LOCAL NAME	SCIENTIFIC NAME	FEED TYPE	CP (g/kg)	ADF (g/kg)	ME (MJ/kg DM)	CH_4 (ml/200mg substrate)
Blackjack	*Bidens pilosa*	Shrub	131.6	477.7	4.1	11.0
Khovani	*Commelina banghalensis*	Shrub	91.0	502.4	5.0	13.4
Mamunaligone		Shrub	957.4	448.7	5.2	7.4
Khakhabu	*Richardia scabra*	Shrub	943.3	422.9	4.4	8.0
Leucaena	*Leucaena leucocephala*	Legume	915.1	321.1	5.4	22.6
Binu	*Sesbania sesban*	Legume	945.2	359.1	6.4	24.4

Figure 4: Profile of local feeds

LOCAL NAME	SCIENTIFIC NAME	FEED TYPE	CP (g/kg)	ADF (g/kg)	OMD (g/kg)	CH_4 (ml/200mg substrate)
Napier grass	*Pennisetum purpureum*	Grass	69.2	452.3	309.0	18.8
Pokopoko	*Panicum maximum*	Grass	60.6	352.2	310.2	13.0
Rhodes grass	*Chloris gayana*	Grass	71.3	506.2	405.1	15.9
Star grass	*Cynodon nlemfuensis*	Grass	43.3	360.7	203.6	9.0
Kamata/ Silver leaf	*Desmodium Uncinatum*	Legume forage	147.3	517.1	357.9	23.0

Opportunities in Malawian dairy sector

- Existence of dairy breeds
  - Holstein
  - Jersey
  - Crosses
- High demand for breeding stock
- Government policy~Dairy a flag carrier
- Private sector support ~ veterinary services
- Training institutions ~research

Recommendations

Promote appropriate breed (s) to match smallholder management practices and changing climate

~Jersey

~Crosses Holstein x Malawi Zebu

Promote institutional and community-based breeding programs

Private sector investment ~ labour saving equipment, feed

THANKS FOR LISTENING