Farmers' Willingness to Conserve the Endangered Sheko Breed in Benchi Maji Zone, Ethiopia

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Introduction

- Sheko is one of the recognized Ethiopian cattle breed (Fig. 1)
- Stands out for its trypanotolerance and adaptation to environmental stressors
- One of Africa's "Big Five" vintage cattle breeds with great potential to form the genetic backbone to cope with unpredictable future climate changes
- Currently the breed faces a clear risk of extinction

Study aim:

Assess farmers' preferences for cattle attributes to support the establishment of cost-efficient conservation plans for the local Sheko breed

Figure 1: Sheko cattle

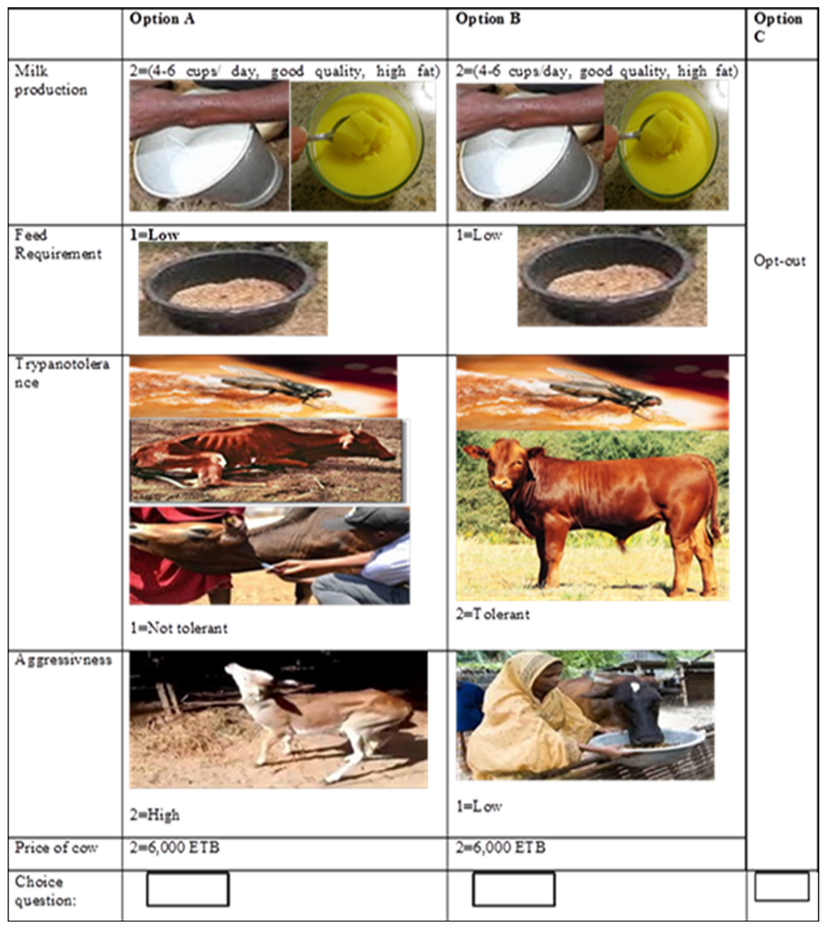

Figure 2: Example of a choice set

Materials

- Benchi Maji Zone, southwestern Ethiopia
- 12 kebeles in 3 districts (Sheko, Semein Benchi, Debub Benchi)
- Two agro-ecological zones (AEZ): Midlands and lowlands
- 400 cattle keepers
- Selection criteria: at least 2 cattle breeds, > 18 years old

Table 1: Cattle attributes and levels used in the choice experiments

Attributes	Zebu (Z)	Sheko (S)	S x Exotic	Expected sign
Milk production[1], fat content	Low, low fat	Medium, high fat	High, low fat	+
Feed requirement	Low	High	High	-
Aggressiveness	Low	High	Low	-
Trypanotolerance	Low	High	Low	+
Price of heifer (< 2 years) (ETB[2])	4,000	6,000-8,000	10,000	-

[1]Milk production: Low (2 L day^{-1}), medium (4-6 L day^{-1}), high (8-10 L day^{-1})
[2]ETB: Ethiopian Birr

Conclusions

- Conservation strategies for Sheko cattle shall imply compensation payments of the farmers due to the breed's unfavorable attributes.
- It is recommended to implement conservation strategies in the midland AEZ. In addition, strategies that reduce compensation costs such as improved veterinary services should be thought.

Methods

- Choice experiments (CE) with 6 choice sets (Fig. 2)
- 5 cattle attributes with 2 or 3 levels, including purchase price (Tab. 1)
- Conditional logit (CL) models: Willingness to pay (WTP) for attributes (overall, based on AEZ and socio-demographic characteristics)

Results

- Farmers strongly preferred cattle with high trypanotolerance, low feed requirement, low aggressiveness, and good milk production (Tab. 2)
- Adaptability, esp. trypanotolerance, and also behavioral traits are more highly valued than performance traits (Tab. 2)

Table 2: Farmers' preferences and willingness to pay (WTP) for cattle attributes (CL model results)

Attributes	Coeff.(β)	SE	WTP	SE
Milk production	0.1600***	0.0895	404***	220.7
Feed requirements	-1.2565***	0.2763	-3173***	0.000
Trypanotolerance	2.0631***	0.3046	5210***	0.000
Aggressiveness	-0.9285***	0.1729	-2345***	0.000
Price of heifer (ETB)	-0.0003**	0.0000		

Significance levels: * (P<0.1), ** (P<0.05) and *** (P<0.01).

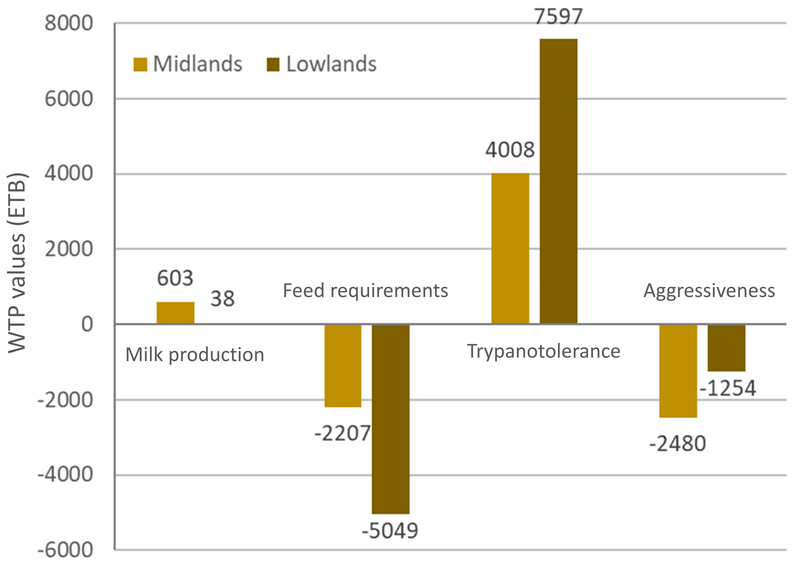

Figure 3: Heterogeneity of farmers' willingness to pay (WTP) for cattle attributes across AEZ (CL model results)

- Farmers in the midlands preferred cattle with high milk performance (Fig. 3)
- Higher WTP values for feed requirements and trypanotolerance for farmers in the lowlands (Fig. 3)

- Farmers born in Sheko community tended to prefer aggressive cattle
- Longer experience in keeping Sheko cattle was associated with higher preference of cows with good milk performance
- Positive interaction between satisfaction with the veterinary service and high milk production, and high feed requirements and high trypanotolerance was found

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