Beef cattle breeding programmes for sub-Saharan Africa

T.O. Rewe¹, P. Herold¹, A.K. Kahi² and A. Valle Zárate¹,

¹Institute of Animal Production, Hohenheim University, Stuttgart, Germany,

²Department of Animal Sciences, Egerton University, Njoro, Kenya.

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Organisation of Presentation

1. Introduction
2. The Breeding Process
3. Beef cattle farmers
4. Sampled cases
5. Community based organisation for genetic improvement of livestock
6. Concluding remarks and Acknowledgements
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Introduction

Figure 1. Projected meat demand by the year 2020 in different regions of the world:

Growing outputs were credited to growing cattle populations other than genetic improvement. 
Research Question

• Do we have beef cattle genetic resources in sub-Saharan Africa?

• Is breeding beef cattle necessary?

• Are all beef cattle farmers breeders?

• Are nucleus breeding programmes sustainable?

• What does the future look like for community based breeding programmes?
Schedule of the Breeding Process

• Development of breeding objectives

• Identification of selection criteria

• Recording and genetic evaluation

• Mating systems and dissemination of genetic gain

• Setting up breeding programmes
Beef cattle farmers
A classical classification example

- Livestock users - *purely exploitative relationship with the animal*

- Livestock keepers - *perform basic husbandry practices*

- Livestock producers - *supply additional inputs to improve animal production with market orientation*

- Livestock breeders - *have integrated herd management*

Source: Neidhardt, et al. (1996)
## Table 1. Cattle production systems with a beef component in sub-Saharan Africa

<table>
<thead>
<tr>
<th>Production system</th>
<th>Descriptors</th>
<th>Potential breeding objective</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nomadic/Pastoral</strong></td>
<td>-Indigenous cattle (mostly)</td>
<td><strong>Multipurpose objective</strong></td>
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<tr>
<td></td>
<td>-Traditional settings</td>
<td>Milk, meat, draft, social security, savings and animal by-products</td>
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<tr>
<td></td>
<td>-Irregular marketing</td>
<td></td>
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<tr>
<td></td>
<td>-Rangeland grazing</td>
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<tr>
<td></td>
<td>-Large (mixed) herds</td>
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<tr>
<td></td>
<td>-Low-input</td>
<td></td>
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<tr>
<td><strong>Farm Integrated</strong></td>
<td>-Indigenous and crossbreds</td>
<td><strong>-Dual-purpose objective</strong></td>
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<tr>
<td></td>
<td>-Animal husbandry practiced</td>
<td>-Meat and milk</td>
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<tr>
<td></td>
<td>-Strategic marketing</td>
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<tr>
<td></td>
<td>-Small herds</td>
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<tr>
<td></td>
<td>-Low-input</td>
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<tr>
<td><strong>Market oriented</strong></td>
<td>-Purebred indigenous/exotic and/or crossbreds</td>
<td><strong>-Single-purpose objective</strong></td>
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<tr>
<td></td>
<td>-Record keeping</td>
<td>-Meat production</td>
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<tr>
<td></td>
<td>-Regular marketing</td>
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<td></td>
<td>-Farmer organisations</td>
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<tr>
<td></td>
<td>-Large herds</td>
<td></td>
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<tr>
<td></td>
<td>-Medium-input</td>
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</tbody>
</table>

Modified from: Neidhardt, et al. (1996)
Pictorial View of farmer groups

Baulé cattle in Burkina Faso
Large breeding herd in a ranch

DFID-AHP Photos: livestock_market
Small holder farmers trading livestock
Sampled Cases
The Case of N’Dama cattle

- Three-tier breeding programme Initiated in 1995 – ITC (International Trypanosomiasis Centre)

- Multiple breeding objective (meat, milk and disease resistance - trypanotolerance)

- A simple young-sire system
Pictorial view of N’Dama cattle

provided by Campagne J. Van Lancker

http://www.ansi.okstate.edu/breeds/cattle/
The Case of N’Dama cattle...

- Important Factors for success and sustainability;
  - Building capacity of local staff
  - Income generating ability
  - Close working relationship

- Results: formation of Indigenous Livestock Breeders’ Associations to promote;
  - Public awareness (even through community radio)
  - Purchase of male offspring from multipliers
  - Encourage farmers’ to participate
  - Supply of veterinary inputs

Source: Bosso, et al. (2006)
The Case for Kenya Boran Cattle

- *Bos indicus* breed kept primarily for beef production

- Challenge is to manage the breeding activities of the various farmers

- In 1968, National Beef Research Centre (NBRC),

- **Setbacks**
  - Lack of well-defined breeding objectives,
  - Lack of genetic evaluation,
  - Lack of feed back from research centre to farmers.
Pictorial view of Boran cattle

Source: Boran Cattle Breeders Society
The Case for Boran Cattle...

- In the 1970s a recording scheme was initiated: the Livestock Recording Centre (LRC)

- Producers opted out of the scheme – lack of feedback!

- Boran Cattle Breeders Society (BCBS) led to intuitive breeding of the improved Boran

- Boran cattle keepers are still independent with respect to selection and genetic improvement.

Source: Kahi (2006)
The case for Nguni Cattle

- Previously crossbred with European breeds
- This dilution of indigenous cattle genetic resources
- In 1950, the Bonsma report on appreciable deterioration of performance in European breeds in the semi-tropical regions of South Africa
Pictorial view of Nguni cattle

Nguni Bull
http://www.ansi.okstate.edu/breeds/cattle/

Nguni Cows and calves
http://www2.flickr.com/photos/overberg/42767607/
The case for Nguni Cattle ...

- In 1985, the Nguni Cattle Breeders’ Society was incorporated

- Member of the South African Stud Book and Livestock Improvement Association

- The Nguni is being selected for functional efficiency

- South African studbook and livestock breeders association
  - Crucial for sustainability and advancement of livestock breeding programmes in South Africa.

http://studbook.co.za/society/nguni
General Comments

- Governments and international development agencies took central roles in establishing heavily funded breeding herds.

- Strong breed societies have taken up the initiative to oversee the breeding of their respective cattle types.
Community based organisation for genetic improvement of livestock
Community based Organisation for Genetic Improvement of Livestock (CBOGIL)

- Livestock owner groups with similar objectives
  - Breeder groups
  - Multiplier groups
  - Commercial groups

- Avoids infrastructural and logistical – regional operations

- Breeder “group” nucleus – set of satellite nuclei

- The multiplier and commercial groups receive improved stock from breeder groups

Source: Kahi et al. (2005)
Application of breeding technologies

• Breeder groups support - National Agricultural Research Systems
  - breeding technologies, e.g. estimation of economic values,
    Strategic simple recording, computerisation of data

• Centralisation of data
  - Genetic evaluation and selection

• Dissemination of genetic material - supported by breeders’ organisation and the government extension service
NH – Nucleus Herds

Breeder group trading on both beef and breeding stock

BEEF MARKET

Commercial Group
Strategic interaction with breeders for genetic material

Source: Rewe et al., 2007
Concluding remarks

Technological and institutional adjustment is necessary for breeding programmes to work within breeder group communities of sub-Saharan Africa

CBOGILs provide an avenue for farmers to access breeding technologies towards market orientation
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References


