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Indigenous selection criteria in Ankole cattle and different production systems in Uganda

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Abstract
Ankole cattle are kept in South-Western Uganda, which is part of the cattle corridor, an area that was traditionally communal grazing land and pastoral systems. Currently, the pastoral system is undergoing a dramatic change due to land shortage, market forces and political reasons. Four different regions were identified and 30 farmers each were interviewed. In the two areas with more traditional systems main selection criteria in cows and bulls are body characteristics (coat colour, horn size and colour). Here, herds are generally larger and cattle are the main source of income. During the dry season, some families still move with their cattle in search of water and pasture. In the two other areas farmers are sedentary and both livestock and crop production contribute to the income. Due to increasing population pressure the trend is to keep few but more productive animals. Selection focuses more on production traits like milk yield, growth and fertility. Crossbreeding with exotic cattle breeds is becoming more popular. Farmers mention that Ankole have advantages over exotic breeds in terms of disease resistance, heat tolerance, lower feed requirements and the beauty of the animals. The study reported here was carried out to describe the production system with a focus on indigenous knowledge and the documentation of changes. Implications of the on-going changes on future development and improvement interventions are also discussed.

1 Introduction

Ankole cattle play a central role in the lives of Bahima, an ethnic group within the Banyankore tribe. They are found in South-Western Uganda, which is part of the cattle corridor. This corridor traverses Uganda from North-East through to the South-West (Nakimbugwe and Muchunguzi, 2003). Originally pastoralists, like the Bahima and Karamajong moved with their herds seeking for pasture. However, the pastoral system is dying out because of different reasons. These include human population growth and the associated pressure that it has on land as well as political pressure. The Ankole cattle is known for its characteristically long horns. The study was set out

to describe different existing production systems and document the local knowledge with a focus on indigenous selection criteria.

2 Material and Methods

The study was carried out in Mbarara, Rukungiri and Luwero District, which are located in Southwestern Uganda. For the survey, Mbarara District was split in Mbarara North and Mbarara South as the production systems in these parts are distinctively different. The dominant vegetation in Mbarara and Luwero District is grassland savannah with scattered trees. These two districts form the most eastern part of the cattle corridor, where traditionally people moved with their animals in the search for water and pasture. Rukungiri District is dominated by hills and has both, the savannah and modified equatorial climatic zones. There is enough precipitation for crop production. The Bakiga tribe traditionally live sedentary and keep a special strain of the Ankole cattle known as Kigezi cattle. In each of the 4 study areas 30 farmers were interviewed. The questionnaire consisted of open and closed questions; all questions were translated into the local language. Before the survey was conducted enumerators were trained in a two-days workshop and a pre-test with farmers was carried out. The sampling procedure in each region was the following: A random sampling across parishes taking in consideration geographic distribution and economic situation of the households. In Mbarara South and Luwero, two more traditional areas, moving and sedentary people were included in the study.
The questionnaire covered a large range of topics, general information about the household, management of herds, data about cattle, breeding strategies, animal health, pasture management, products from cattle and life style of the family (nomadic, semi-nomadic or sedentary). All questionnaires were entered in a database and analysed with SAS (1999).

3 Results and discussion

Household, Lifestyle
Household size is defined as the number of persons preparing their daily meals together, but not necessarily eating together. There are on average 11 persons living in one household in Luwero, Mbarara South and North, whereas in Rukungiri households are smaller with on average of 8 persons. In the two more traditional areas Luwero and Mbarara South the main source of income is livestock, whereas in the two other regions also crop production or off-farm activities contribute to the income. In all 4 regions milk is consumed in the household and also sold. Except from Rukungiri different milk products like ghee, sour milk and yoghurt are prepared for home consumption and for selling. 17 farmers in Mbarara North mentioned the use of urine. Urine mixed with milk is used as a laxative. Morning urine from cattle is used as a detergent in cleaning of milk pots, in concortion with herbs as a mouth wash or for skin infections (Nakimbugwe and Muchunguzi, 2003). Some farmers in Mbarara North and South also mentioned use of blood. Both products are exclusively for home consumption.
In the districts Mbarara and Rukungiri today all farmers live sedentary. Only in Luwero 14 farmers said that they live semi-nomadic and 2 farmers nomadic. All of them mentioned land (pasture) shortage during the dry season as main reason for moving with their cattle. They mentioned a number of difficulties and disadvantages of moving: These include: (i) Problems with hostile communities, (ii) evictions by landlords and Forest Department, (iii) official movement documentations for moving

with their cattle to other areas, (iv) transmission of diseases of animals and (v) break up of family structures.

Herd management

Besides cattle, sheep, goats and too a lesser extend poultry, are kept in all 4 regions. Pure Ankole, but also different levels of Ankole crosses are kept in all regions. The predominant crossbreds are Ankole-Friesian, only in Luwero 8 farmers explained that they keep other crosses; mostly Ankole-Boran crosses for meat production.

Table 1 shows the average herd size and the range of herd size for each region. The largest herds can be found in Mbarara North with an average of 104 Ankole cattle. In Rukungiri the herds are very small and the proportion of pure Ankole cattle in the mixed herds was 48%, and lowest for the 4 regions.

In Mbarara North and South all the pastureland is owned by individual households. In Luwero, 21 out of 30 farmers graze their cattle on own land, 4 rented land from private persons and 5 leased land from the Forest Department. In Rukungiri some farmers have their own land, but some use in addition, communal land.

Regarding responsibilities of the herd management a clear labour division can be found. Breeding decisions, purchase or selling of cattle is always done by the household head. Only in few cases the spouse or the son is allowed to contribute to decision made by the household head. Workers carry out the daily work routine chores such as herding, watering and milking. Almost no farmers said that children have any cattle husbandry responsibilities.

Table 1. Herd size (number of animals), % of Ankole in mixed herds

	Luwero N=30	Mbarara South n=30	Mbarara North n=30	Rukungiri n=30
Pure Ankole herds	117 (29 – 586)	96 (19 – 201)	104 (8 – 336)	8 (2 – 24)
Mixed herds	130 (29 – 707)	110 (19 – 261)	174 (27 – 1284)	12 (3 – 52)
% of Ankole in mixed herds	88 (66 – 99)	79 (28 – 99)	67 (15 – 98)	48 (6 – 94)

The reasons for keeping Ankole cattle are summarized in Table 2. Farmers were asked in an open-ended question to list the most important reasons for keeping cattle. Except for Luwero milk production was cited as the main reason. Intangible reasons like tradition, wealth or insurance ranked high, and the social status among clan members were mentioned in three study areas. Traits which are considered as important for adaptation (hardiness, disease resistance or walkability) were almost never mentioned (did not seem to play a role) at all in their decisions.

Table 2. Reasons for keeping Ankole cattle in the four study areas in Uganda

	Luwero n=30	Mbarara South n=30	Mbarara North n=30	Rukungiri N=30
Milk	18	30	26	29
Meat	4	26	21	11
Tradition	17	4	19	13
Insurance	27	9	9	29
Wealth	14	18	16	8
Clan	8	11	6	0
Beauty	1	5	11	0
Hardiness	1	1	0	0
Disease resistance	1	0	1	0
Walkability	1	0	1	0
Ghee	0	16	3	0

Farmers were asked to give a list of advantages of Ankole cattle compared to other breeds/genotypes (Table 3). Farmers clearly stated that Ankole are better adapted to the production system, because they are more resistant to different endemic diseases, need less feed and can withstand very hot conditions. Except from Rukungiri, farmers mentioned that the beauty of Ankole cattle was also an important factor. In both study areas in Mbarara milk and meat quality were mentioned as positive attributes. Milk from Ankole cattle has a higher fat content, which is important for the ghee production.

Table 3. Advantages of Ankole cattle compared to other breeds/genotypes

	Luwero n=30	Mbarara South n=30	Mbarara North n=30	Rukungiri n=30
Disease resistance	26	28	30	19
Low feed requirement	15	9	26	17
Heat tolerance	14	20	27	0
Beauty	22	23	30	0
Milk quality	0	20	16	0
Meat quality	1	19	6	0

Breeding strategies, selection criteria

Tables 4 and Table 5 give estimates for cow and bull reproductive parameters, which were obtained from direct interviews and not by analysing data from herd recording.

Table 4. Figures for breeding – cows, average and range in brackets

	Luwero n=30	Mbarara South n=30	Mbarara North N=30	Rukungiri n=30
1st mating (months)	**24** (18 – 30)	**22** (12 – 36)	**22** (9 – 36)	**27** (18 – 42)
1st calving (months)	**33** (27 – 39)	**30** (9 – 45)	**32** (20 – 45)	**36** (27 – 51)
Lactation length (months)	**7** (5 – 12)	**7** (5 – 9)	**8** (6 – 18)	**7** (5 – 9)
Calving interval (months)	**13** (12 – 18)	**13** (12 – 18)	**16** (12– 24)	**17** (12 – 24)
Number of calves born	**7** (5 – 12)	**9** (5 – 12)	**11** (5 – 18)	**9** (5 – 16)
Age at disposal (year)	**9** (8 – 14)	**12** (8 – 15)	**14** (10 – 20)	**14** (10 – 20)

Table 5. Figures for breeding – bulls, average and range in brackets

	Luwero n=30	Mbarara South n=30	Mbarara North N=30	Rukungiri n=30
1st service (months)	**23** (12 – 24)	**31** (14 – 48)	**23** (12 – 36)	**31** (22 – 36)
Age at disposal (year)	**10** (3 – 15)	**8** (6 – 11)	**8** (3 – 16)	**7** (5 – 10)
Duration of service (year)	**8** (2 – 13)	**5** (3 – 8)	**6** (2 – 15)	**4** (3 – 8)

In a first step farmers were asked to list the most important selection criteria in cows and bulls and in a second step they ranked the criteria in order of their importance. The results are summarized in Table 6 for cows and in Table 7 for bulls. Milk yield was in all four regions the predominant criterion in cows. Rukungiri with a distinct production system (intensive crop-livestock), production and reproduction is more important. Milk yield was ranked first followed by growth and fertility. Traits like coat colour and horns, which reflect the beauty of the cattle are featured in both cows and bulls, but ranked very low in Rukungiri. Disease resistance was mentioned by farmers as an advantage of Ankole, but was apparently not taken in consideration in selection decisions, at least form these results (Tables 6 and 7). One explanation for this rather unexpected observation could be that, this is a trait which is considered as given in Ankole cattle (i.e. all Ankole cattle are expected to be disease resistant). Ancestral information is not important in cows, whereas information about the sire ranked high in bulls in three regions. It seems that the phenotypic features are more important in bulls than in cows. In some ways, this indicates that different selection criteria and emphasis are applied for cows and bulls, with cows being selected for their milk production, while for bulls, the beauty related traits were more emphasized (Tables 6 and 7).

Table 6. Ranking of selection criteria in cows

	Luwero n=30	Mbarara South n=30	Mbarara North n=30	Rukungiri n=30
Coat colour	2	3	1	5
Horns	4	4	4	7
Growth	3	1	3	2
Milk yield	1	2	2	1
Fertility	5	5	6	3
Disease resistance	6	7	7	6
Mother	7	6	5	4

1 = high, 7 = low

Table 7. Ranking of selection criteria in bulls

	Luwero n=30	Mbarara South n=30	Mbarara North n=30	Rukungiri n=30
Coat colour	2	2	1	4
Horns	3	3	5	8
Growth/Muscularity	4	1	4	1
Disease resistance	7	8	7	9
Fertility	8	7	6	3
Temperament	5	9	8	6
Milk	9	5	9	7
Mother	6	4	3	5
Father	1	6	2	2

1 = high, 7 = low

Farmers were also asked which breed they would like to keep in the near future. In Luwero all farmers would like to keep pure Ankole, in the other three regions at least half of the interviewees indicated that they would continue to do so. But there was also often the wish to keep Ankole-Friesian cattle for improved milk production. Other crosses to other breeds were mentioned rarely.

4 Conclusions

In the four study areas the production systems vary in many aspects. This is also reflected in different features demanded from Ankole cattle. Therefore, the selection criteria are strongly linked to the production system. The traditional lifestyle of moving herds is almost inexistent. Nevertheless, farmers still have a very strong relationship with the Ankole breed and would like to keep it in the future. But mostly because of improving the income of the household in the short term, crossbreeding is commonly being practised and may likely increase in future.

5 References

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