Group V

ANKOLE

Origin

The Ankole cattle are usually referred to as being of the Sanga type which is considered by Epstein and other workers to have been evolved from the intermixture of the lateral-horned zebu and the Hamitic Longhorn (Bonsma, 1951). Curson and Thornton (1936) describe the routes which these cattle may have taken when accompanying human migrations. They state that " the southern stream probably passed through Uganda and followed the great lakes until the Zambesi was reached ".

Ankole cattle have also been spoken of as Bahima (Uganda and the Belgian Congo), Watusi or Watusi Longhorn (Ruanda-Urundi and Tanganyika), Ruanda and Barundi (to the north of Lake Kivu) from the tribes and districts with which they are associated, while Curson and Thornton (1936) mention, in addition, the name Nsagala as being used in Uganda. In Ruanda-Urundi, the sacred cows, Inyambos, are of the Ankole type. The Bashi cattle of the Belgian Congo, which have developed from the intermixture of the local cattle of the district of that name and the Barundi, are a smaller variety of the Ankole in which the horns are finer and shorter.

Conditions in the native home of the breed

Location, topography and soils

The Ankole cattle type, together with its local strains and varieties, is located in an area between approximately 5° south and 3° north of the equator and between 27° and 32° east longitude, which comprises parts of the southwestern districts of Toro, Kigezi and Ankole in Uganda; the Bukoba district of Lake Province and the Kibondo, Kasulu and Ufipa districts of Western Province, Tanganyika; Ruanda-Urundi; and the district of Kibali-Huri in Eastern Province, the territory of

Buma and Irumi and the mountain lands to the west of Lake Albert, Kivu Province, Costermansville district, and the territories of Rutshuru, Masisi, Uvira, Fizi and Mwenga in the Belgian Congo.

The area in Uganda in which Ankole cattle occur is a highland plateau with an approximate average altitude of 4,500 feet above sea level. In Tanganyika they are found in the western section of Lake Province and the highlands of Western Province. Ankole cattle in Tanganyika occur, for the main part, on a strip of mountain grassland along the borders of Belgian territory. In the Eastern Province of the Belgian Congo, Ankole cattle are found in the mountainous areas where the altitude varies from 1,200 to 2,000 meters. The soil of this region is of granitic origin. They were formerly maintained in the alluvial plains of Semliki valley, but the area was evacuated owing to tsetse fly infection. In the zone north of Lake Kivu this cattle type is localized in a highland region of elevation between 1,600 and 2,000 meters. The soil in the whole of this area is of recent volcanic formation and, in the Rutshuru territory, is of more or less weathered lava. The western sector of Ruzizi valley is slightly undulating with an altitude varying from 750 to 900 meters. The soil is sandy clay with interspersed limestone. Along the banks of the river slightly saline lagoons occur. In the southern zone of Lake Kivu, where the smaller Bashi variety prevails, the region is mountainous with altitudes varying from 1,450 to 2,200 meters with a red clayey soil of basaltic origin which is intensely cultivated.

Climate

In the Western Province of Uganda, where Ankole cattle are bred, there are two peak rainy periods. The first peak occurs during March to April while the second peak is in September to October. The average rainfall of the area varies from 40 to 50 inches. The mean maximum temperature during the day is about 80° to 85° F. while the diurnal variation may be about 25° F.

The climate of the Ankole area in Tanganyika is hot and dry, except in the hill country of Ufipa, Kasulu and Kibondo districts. A fairly high annual mean temperature of 70° F., with daily and seasonal variations exceeding 30° F., is experienced. The annual rainfall occurs in two periods and is about 30 to 40 inches. The tract where Ankole cattle are raised has a comparatively poor rainfall, but in Bukoba the annual rainfall is as high as 80 inches.

Climatological data from Bunia in the Eastern Province of the Belgian Congo, where an Ankole herd is maintained, are given in Table 63.

TABLE 63. – CLIMATOLOGICAL DATA FOR BUNIA IN THE BELGIAN CONGO (ALTITUDE 1,250 M.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Maximum temperature, °C. .	37.0	36.0	37.0	33.0	33.0	31.0	29.9	31.0	32.0	31.0	30.6	31.5	32.8
Minimum temperature, °C. ...	13.0	12.0	12.0	14.0	13.4	13.1	12.4	11.8	12.8	12.7	12.5	12.4	12.7
Mean temperature, °C.	22.0	22.8	22.9	22.9	22.4	21.0	20.5	20.8	21.1	22.5	21.2	21.8	21.8
Humidity at 07.00 hrs., %	89	87	90	87	86	81	88	87	86	87	85	89	86.7
Rainfall, mm. .	74	60	121	187	210	165	143	197	217	126	105	73	1 678

SOURCE: Herin, *Personal Communication*.

The climatological data given in Tables 64 and 65 are for the zone north of Kivu, the data in the first of these tables referring to the elevated area, while those in the second are from Lubarika Station in the Ruzizi valley.

TABLE 64. – CLIMATOLOGICAL DATA FOR LULENGA MISSION IN THE BELGIAN CONGO (ALTITUDE 1,850 M. 29° 22′ E., 1° 24′ S.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Maximum temperature, °C. .	27.8	28.8	29.5	29.2	27.2	27.0	28.0	27.9	27.5	26.0	27.0	30.0	28.0
Minimum temperature, °C. ...	9.0	10.0	9.8	10.0	8.0	9.0	9.0	9.5	9.0	9.0	10.0	8.4	9.2
Mean temperature, °C.	18.0	18.2	17.5	18.0	18.0	17.8	18.0	18.0	18.0	17.5	17.4	17.6	17.8
Average humidity, %	81	80	83	86	85	82	81	81	83	86	84	83	82.9
Maximum rainfall, mm ...	188	224	246	380	262	166	119	221	325	258	310	204	2 903
Minimum rainfall mm.	9	61	163	111	66	23	—	56	103	115	109	76	892
Mean rainfall, mm.	106	125	198	223	161	106	62	121	204	192	191	136	1 825

SOURCE: Herin, *Personal Communication*

TABLE 65. – CLIMATOLOGICAL DATA FOR LUBARIKA STATION IN THE BELGIAN CONGO (ALTITUDE 850 M. 28° 55′ E., 2° 50′ S.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Maximum temperature, °C. .	36.0	34.0	33.0	33.0	32.5	32.5	32.6	34.1	36.0	35.5	35.4	34.0	34.0
Minimum temperature, °C. ...	16.0	14.2	15.0	16.0	16.0	15.0	15.0	16.0	16.0	16.0	16.0	15.0	15.5
Mean temperature, °C.	25.0	24.6	24.4	24.4	24.4	24.4	23.8	24.7	25.1	25.4	24.8	24.3	24.6
Humidity (1950) %	75.6	71.0	73.3	75.3	75.0	65.9	58.9	61.0	55.1	67.0	71.6	78.8	69.0
Rainfall, mm. (1939-1950) ...	121.8	118.9	140.0	190.0	145.1	21.5	85.0	15.7	32.1	65.1	122.7	150.3	1 208.2

SOURCE: Herin, *Personal Communication.*

Climatological data for the southern zone of Lake Kivu are given in Table 66.

TABLE 66. – CLIMATOLOGICAL DATA FOR KABARE IN THE BELGIAN CONGO (ALTITUDE 1,925 M. 28° 43′ E., 2° 29′ S.)

	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Temperature, ° C.	16.4	16.8	17.0	16.4	16.2	16.4	16.8	17.1	16.8	16.9	16.6	16.6	16.7
Rainfall, mm. .	150	163	167	155	58	48	29	39	111	166	189	174	1 449

SOURCE: Herin, *Personal Communication.*

Vegetation

In the Western Province of Uganda where the Ankole is the principal cattle type, the communal grazing areas have poor grass cover but in other grassland areas the growth is luxurious. The area west of Lake Victoria and stretching across the country to Lakes Albert and George is covered with elephant grass (*Pennisetum purpureum*) growing in rain-forest areas. North of Ankole is the *Themeda* and *Acacia* area, while in most of the highland area of Kigezi, kikuyu grass (*Pennisetum clandestinum*) is dominant.

In Tanganyika the Ankole area is largely mountain grassland, which lies along the borders of Ruanda-Urundi. Extensive studies of the vegetation types of Tanganyika territory have been reported by Gillman (1949).

In the Belgian Congo the vegetation is of the eastern savannah type. The pastures are burnt in July to August, just prior to the rains.

In Ruanda-Urundi, during the rainy season (May), the pastures show excellent growth. The following genera have been observed: *Cynodon*, *Brachiaria*, *Panicum*, *Paspalum*, *Chloris*, *Themeda*, *Hyparrhenia*, *Pennisetum*, *Setaria* and others.

Management practices

The breeders of Ankole cattle attach a social importance to their herds; to them cattle numbers are an indication of wealth. As the currency of the " bride wealth," cattle guarantee the stability of the native family, while, by different provisions in the deeds of transfer of animals between chiefs and subjects they contribute towards maintaining order in the tribes. Under modern economic pressure some cattle owners are beginning to understand the economic value, based on productivity, to be derived from the ownership of a herd. The cattle which are slaughtered on ceremonial occasions are also of importance in the religious and tribal customs. Milk and meat are utilized only to a limited extent, but the animals are regularly bled by some tribes, the blood forming part of the diet. Very limited use is made, and only in a few localities, of the draft power of the animals. In view of the above, disease is the only major factor, other than low reproductivity, that limits the growth of cattle numbers in the area.

Individual Ankole breeders in Uganda usually own a considerable number of animals. The owners are not normally the herdsmen, but the management of stock is left to other tribes. Cattle are kept many miles from the owners' homes, under semi-ranching conditions. Calves are usually well cared for and in recent times some supplementary feeding of maize, cassava, sweet potatoes, etc. has been practiced. The Bahima breeders of Ankole district in Uganda are showing increased interest in rearing male calves and the traditional Hima custom of slaughtering the majority of male calves shortly after birth is reported to be on the decrease.

In Tanganyika the area occupied by Ankole cattle is well-watered mountain grassland. The cattle are grazed during the day for a few hours only and corralled at night in an enclosure. Cows are regularly milked, but usually only once daily. The calves accompany their dams during the day but at night they are separated from their dams and are housed with good bedding.

The Bahima, Batusi and other herders in the Belgian Congo follow more or less the same management pattern. The practice of " farming out " cattle by wealthy landowners is also followed in Ruanda-Urundi.

As the herds are maintained on grazing, seasonal scarcity of herbage affects the growth of the animals. During dry seasons the cattle may be taken to marshy areas. Saline earth from certain of these marshes is fed to the cattle as a substitute for salt. Reid, N.R. (*Personal Communication*) has observed that impoverished pastures are the main limiting factor to reproduction and growth in Bukoba, and that the same factor, due to overstocking, operates in Ruanda-Urundi.

Breeders have often paid attention to breeding for abnormally large horns or fancy colors; beyond that, natural selection is allowed to determine the development of the cattle type. As all the animals, adult as well as young stock are run together, and as very little or late castration is practiced, almost all the young and old bulls have an opportunity to serve the cows.

Physical characteristics of the breed

In Uganda, Ankole cattle (Figure 51) have been described as being large animals, with straight backs, and with predominently cervical humps which, in the male, may show some development, but in the female are not prominent. The horns are long and sweeping, though polled animals, known locally as *Kigezi*, are occasionally seen. The predominant coat color is a dark reddish-brown, though deep red, red and white, light red, yellow, strawberry roan, and red with white spots are frequently seen. The average weight at maturity has been estimated to be 800 to 900 lb. in males and 700 lb. in females.

In Tanganyika, the cattle have been described as having large horns and small humps. Whole-colored reds and browns, with occasional white patches, are frequently observed. The horns are of enormous size and grow typically outwards, upwards and backwards. The animals are tall and the legs are long. McCall (Tanganyika Territory, 1926) gives the picture of an aged bull weighing 850 lb. with height to the top of shoulder of 58 inches. Girth measurement is about 68 inches. In an Annual Report (Tanganyika Territory, 1937) of the Department of Veterinary Science and Animal Husbandry, when a tuberculin test on a group of 14 Ankole cattle was carried out, it was recorded that the average skin thickness was 4.4 mm., with a range of 6.0 to 3.0 mm.

Belgian authorities described the cattle from the Eastern Province of the Belgian Congo (Figures 49 and 50) as fairly large in size, big-boned, long in the leg and with long and well-developed horns, the growth of which is frequently stimulated by irritation of the matrix, and as having a cervico-thoracic hump. The coat is usually red, or red and white in color. Some animals have dingy black hair. The

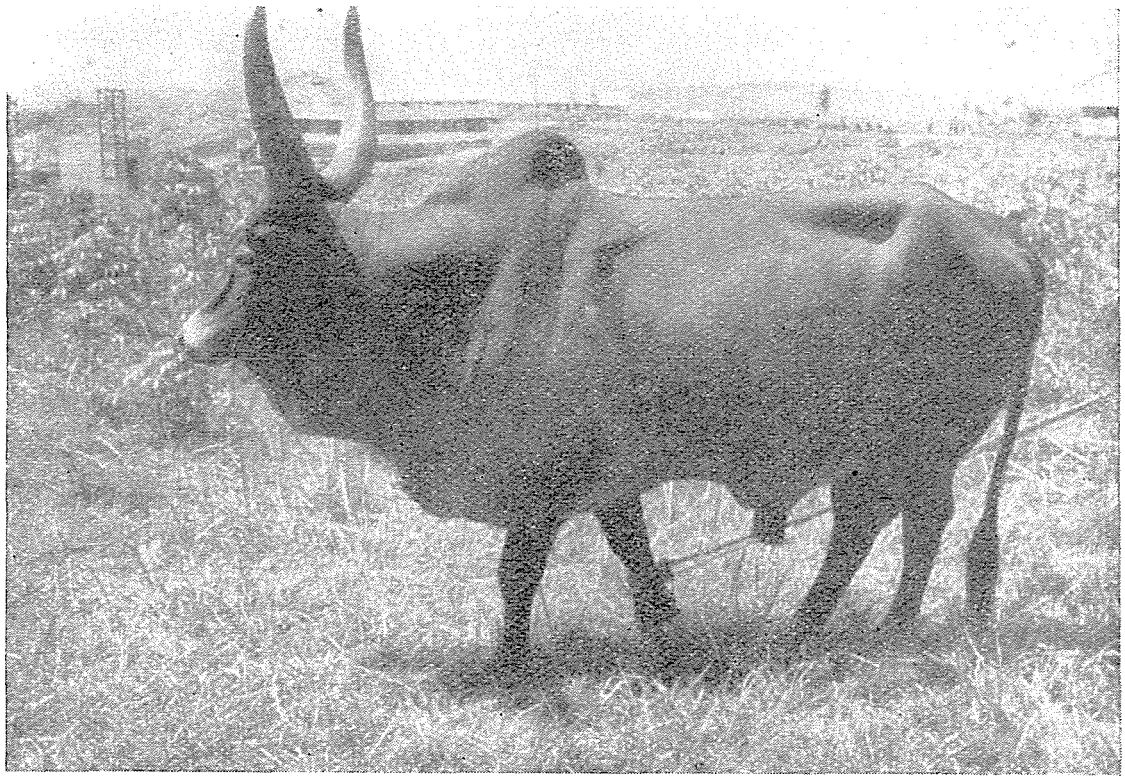
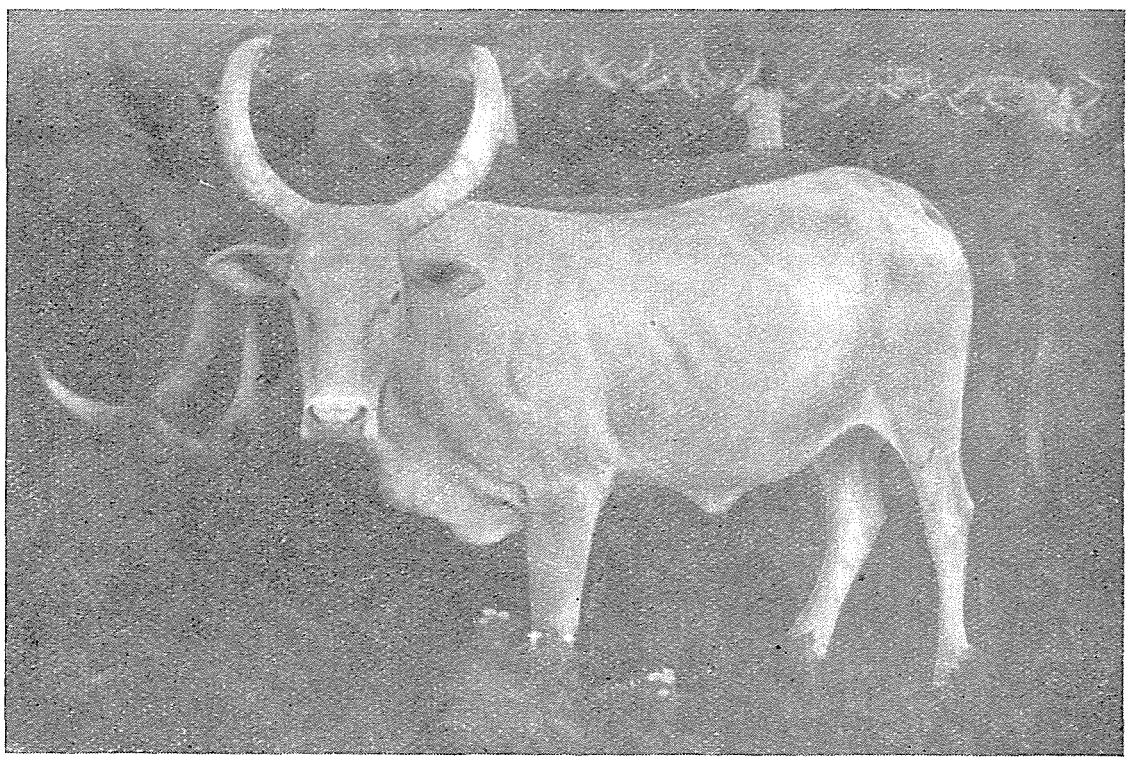


FIGURE 49. *Ankole cattle. Bahema bull.*

FIGURE 50. *Ankole cattle. Bahema cow.*

Courtesy of R. Druet



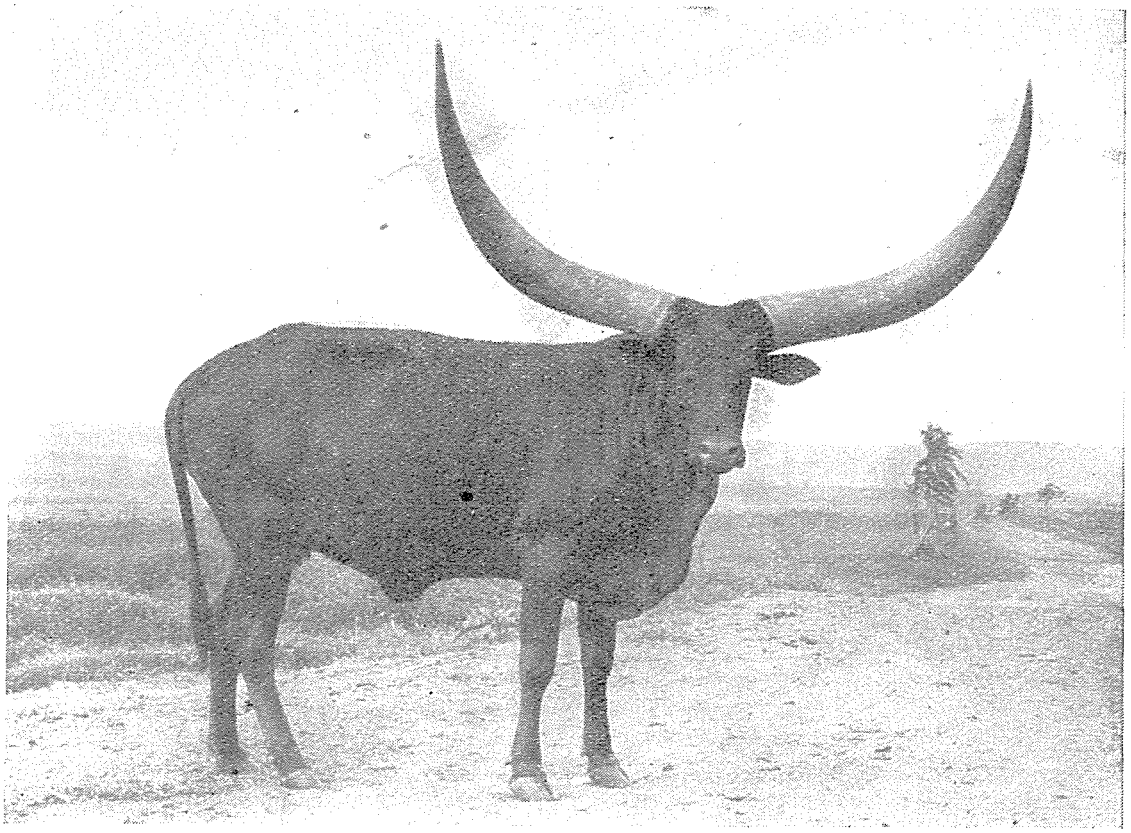


FIGURE 51. *An Ankole cow in Uganda. The horns measure 52 inches between the tips.*

Courtesy of Dept. of Information, Uganda Protectorate

hairs are short and neither coarse nor soft. The skin is slightly loose, of medium thickness and of dark pigmentation. The hoofs are hard.

The Ruanda or Barundi type (Figures 1, 52 and 53), bred in the Bahutu tribal districts located northeast of Lake Kivu and in the Ruzizi valley as well as in the mountainous region west of the Ruzizi river, is described as follows: the coat is brown; this color lightened to a bay shade is fairly common in the Ruzizi plain, while red, white and red, red and white, black and its compounds — white and black, black and white — also occur. The frame is good, lean in poor pasture regions, well muscled in areas which are not overstocked. The horns are as described above, but polled animals and cattle with mutilated horns occur throughout the area.

The Bashi type (Figure 54) is small with a fine skeleton and horns of reduced size.

The Ankole cattle in Ruanda-Urundi (Figure 55) are described as short-bodied, highset animals with short heads, narrow chests and elevated and pointed rumps. The withers may be topped by a more or less distinct hump, which is more obvious in the male than in the

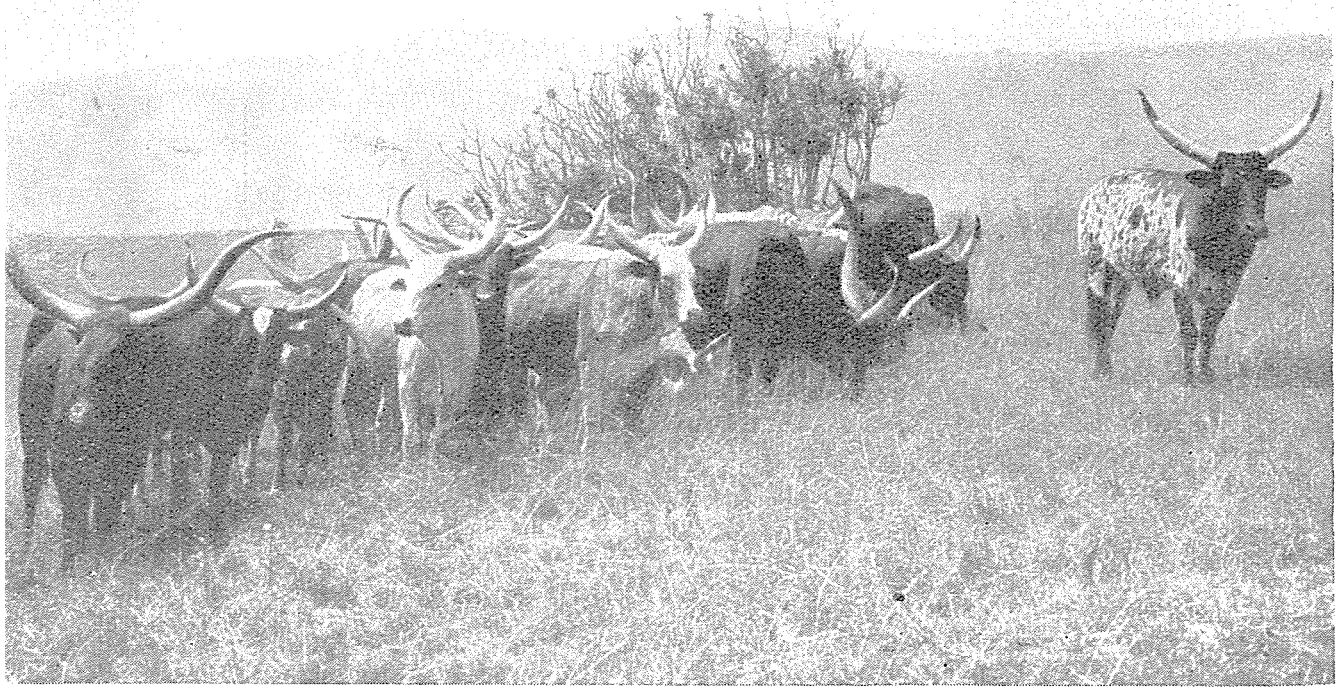


FIGURE 52. *A nkole cattle. Aherd of work and beef cattle on the Nyamyaga Livestock Farm in Ruanda.*

Courtesy of Congopress: J. Mulders

female. The dewlap is deep. Both polled and horned animals occur. The horns, which may attain to a large size both in length and thickness, show variation in the direction of growth, the most characteristic being in a slightly spiralled lyre shape as is the case in the sacred cows (*Inyambos*) of the King of Ruanda. It is reported, however, that the offspring of polled animals may have horns.

The usual coat color is an even dark red, though shading from corn color to brownish red occurs. Piebald coats are also frequently seen. The mucous membranes are light or pigmented.

Average data on certain body measurements as reported by the veterinary authorities of the Eastern Province in the Belgian Congo are summarized in Table 67.

TABLE 67. – AVERAGE MEASUREMENTS OF ANKOLE CATTLE (BAHIMA)

	Male			Female			Ox mature
	1 year	2 years	mature	1 year	2 years	mature	
Weight, kg.	135.0 (43)	190.0 (21)	502.0 (8)	125.0 (41)	185.0 (47)	345.0 (8)	341
Length from shoulder point to pinbone, cm.	96.1 (43)	107.0 (21)	144.7 (8)	96.0 (41)	104.8 (47)	132.6 (8)	—
Height at withers, cm.	97.9 (43)	107.0 (21)	144.7 (8)	97.3 (41)	104.8 (47)	118.0 (8)	—
Depth of chest, cm.	47.3 (43)	52.0 (21)	73 0 (8)	46.8 (41)	50.7 (47)	63.6 (8)	—
Width of hips, cm.	28.4 (43)	33.6 (21)	43.2 (8)	28.0 (41)	33.6 (47)	39.0 (8)	—
Heart girth, cm.	129.0 (43)	139.0 (21)	260.3 (8)	127.7 (41)	138.2 (47)	186.6 (8)	—

Numbers sampled in brackets.
SOURCE: Herin, *Personal Communication.*

Average data on certain body measurements for the Ruanda or Barundi cattle are summarized in Table 68.

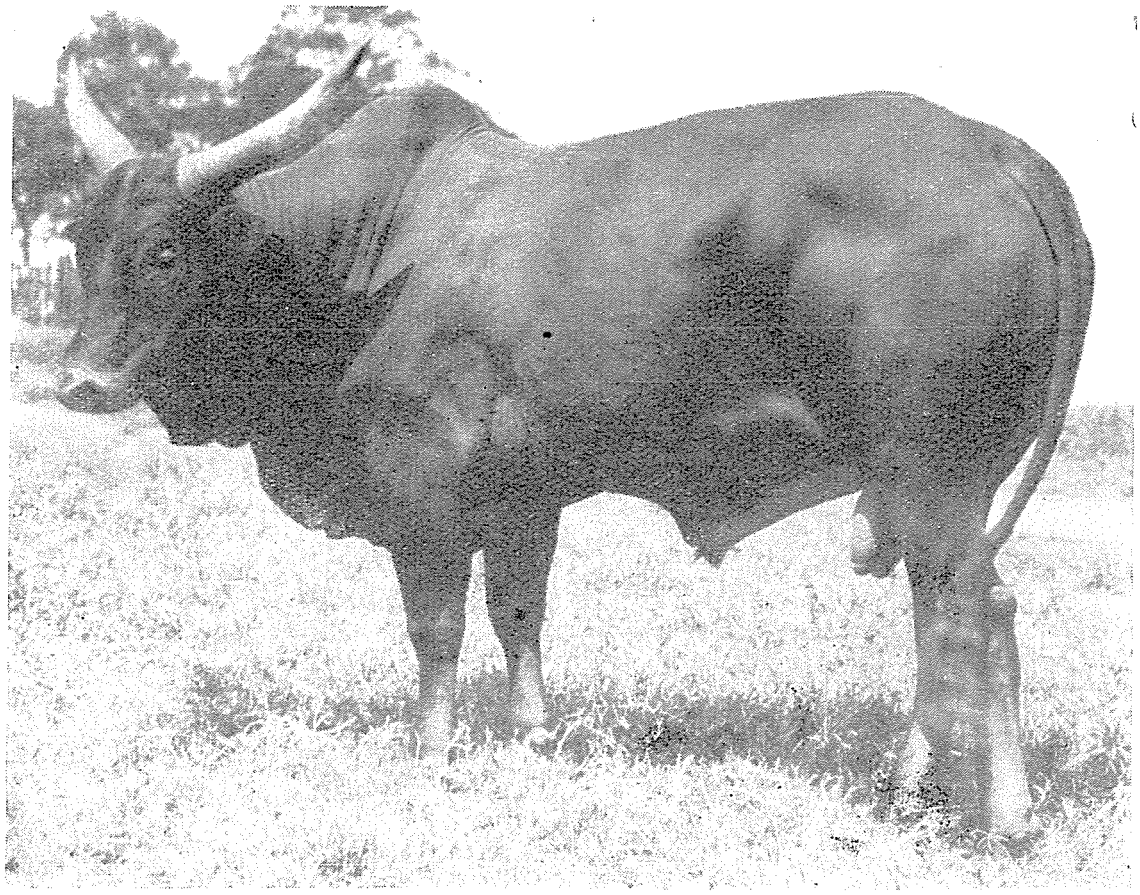
TABLE 68. – AVERAGE MEASUREMENTS OF ANKOLE CATTLE (RUANDA OR BARUNDI)

		Male			Female			Ox
		1 year	2 years	mature	1 year	2 years	mature	mature
Weight, kg.	*a)*	136	231	410	143	204	315	365
	b)	136	231	425	103	202	300	358
Length from shoulder point to pinbone, cm. ..	*a)*	117	125	141	114	119	130	140
	b)	87	121	151	88	122	131	143
Height at withers, cm. ..	*a)*	115	119	133	110	117	127	132
	b)	103	115	132	90	112	118	130
Depth of chest, cm.....	*a)*	—	—	—	—	—	—	—
	b)	45	55	70	42	52	61	66
Width of hips, cm.	*a)*	40	43	58	39	45	55	51
	b)	27	37	50	26	36	44	47
Heart girth, cm.	*a)*	134	145	181	127	143	165	174
	b)	134	146	188	118	143	166	177

a) Data from volcanic regions.
b) Data from plains.
SOURCE: Herin, *Personal Communication*.

FIGURE 53. *Ankole cattle. One of the breeding bulls at the INEAC Farm at Nyamyaga in Ruanda. This bull weighed 550 kg. at 7 years of age, a liveweight well above the average for the area.*

Courtesy of Congopress: J. Mulders



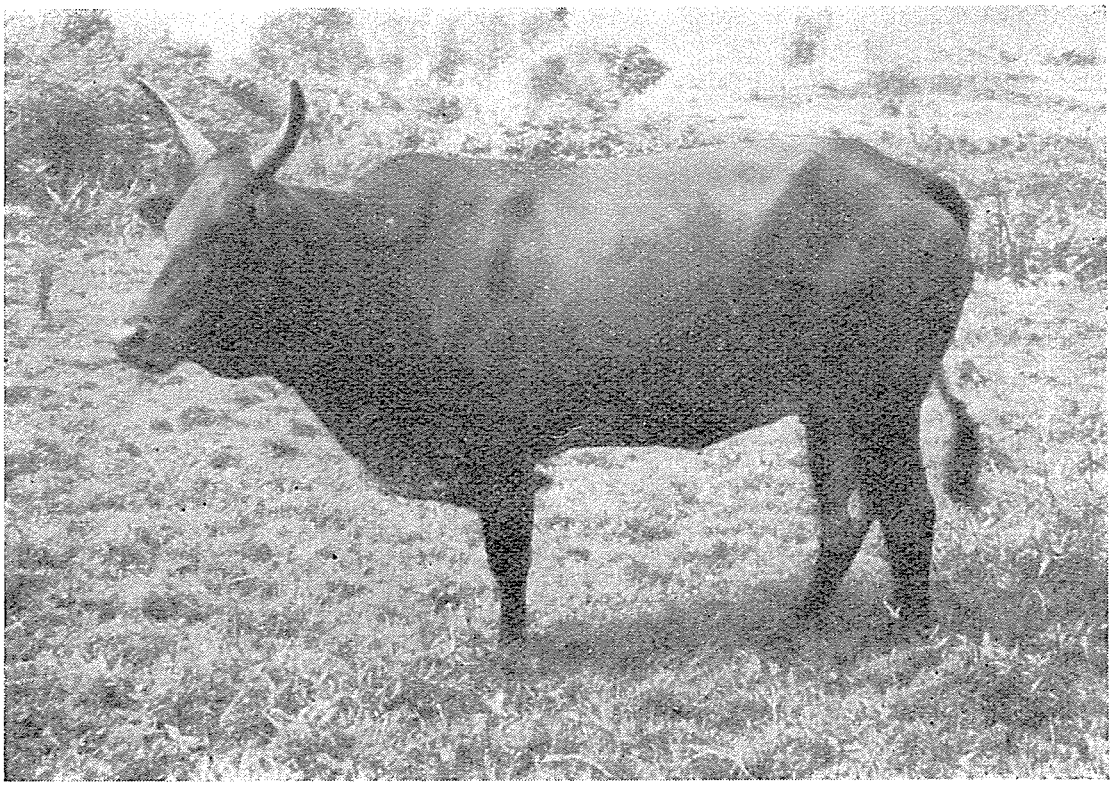
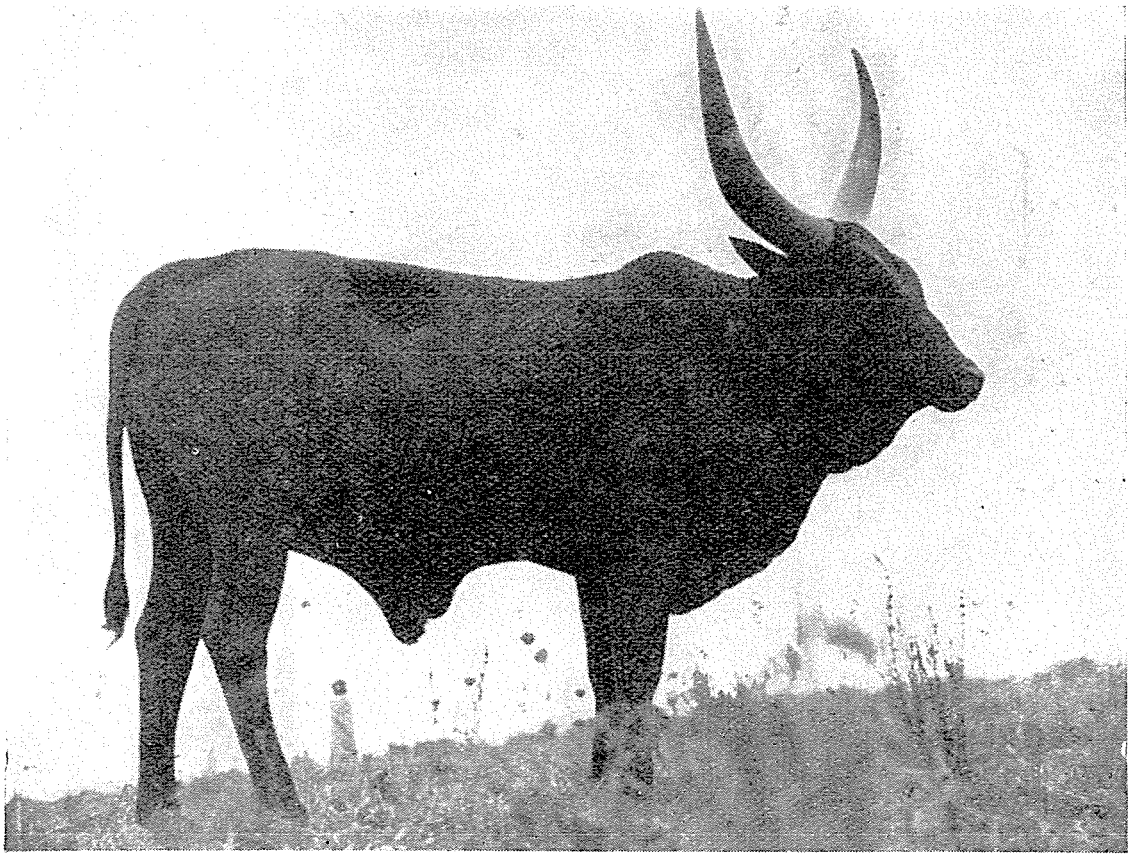


FIGURE 54. *Ankole cattle. Bashi cow.*
Courtesy of Ministère des colonies, Brussels

FIGURE 55. *Ankole cattle. A bull in Ruanda-Urundi.*
Courtesy of Congopress: J. Mulders



The average birthweight of males has been 17.25 kg., and that of females 15.20 kg.

Average data on certain body measurements for the Bashi cattle, which are localized in the Bashi tribal areas of the Province of Kivu in the Belgian Congo, are summarized in Table 69.

TABLE 69. – AVERAGE MEASUREMENTS OF ANKOLE CATTLE (BASHI)

	Male			Female		
	1 year	2/3 years	mature	1 year	2/3 years	mature
Weight, kg.	120.0	172.0	290.0	93.0	117.0	242.0
Length from shoulder point to pinbone, cm.	109.0	123.5	137.0	87.5	124.5	137.0
Height at withers, cm.	85.0	108.5	118.5	89.7	109.0	116.0
Depth of chest, cm.	43.0	52.0	57.2	38.5	51.7	57.7
Width of hips, cm.	31.2	41.0	46.0	27.0	38.7	43.0
Heart girth, cm.	120.5	135.0	160.7	109.5	136.2	152.0

SOURCE: Herin, *Personal Communication.*

The average birthweight of males has been 17 kg., and that of females 15 kg.

The principal measurements of Ankole cattle on the Songa Farm in Ruanda-Urundi are summarized in Table 70.

TABLE 70. – AVERAGE MEASUREMENTS OF ANKOLE CATTLE (RUANDA-URUNDI)

	Male			Female		
	1 year	2 years	mature	1 year	2 years	mature
Weight, kg.	140	225	458	100	190	350
Height at withers, cm.	—	112	135	—	110	124
Width of hips, cm.	—	35	47	—	33	45
Heart girth, cm.	—	150	190	—	135	160

SOURCE: Herin, *Personal Communication.*

Functional characteristics of the breed

In Uganda the Ankole cattle are larger but have the reputation of being less hardy than the other cattle of the area. They have been said to be more susceptible to diseases, particularly rinderpest and trypanosomiasis, and also to unfavorable climatic conditions and

poor grazing. However, no data are available on these points. The bulls attain their maximum size at 5 years of age and the females calve for the first time at 3 ½ to 4 years. It is estimated that the calving interval may vary from 18 months to 2 years, depending upon grazing conditions. Very little information has been recorded on the productivity of the breed.

In Tanganyika also, on account of its supposed susceptibility to tickborne diseases and other epizootics, the Ankole has not received much attention. Buckley (1953) reports a production of 9.21 lb. of milk per day per cow in 1952 from an Ankole herd maintained at the Government Stock Farm, Mpwapwa, since 1938.

In the Eastern Province of the Belgian Congo, where the Ankole are bred by the Bahima tribe, it has been observed that the heifers calve for the first time at between 4 and 5 years of age, when they usually have 6 permanent teeth. Breeding tends to take place in two seasons of the year, from September to October, and between March and April. The males start service at 3 years of age and have been reported to be slow in service except under improved management conditions.

The average milk production and lactation duration derived from the records of 72 cows was 302 liters in 212 days. Among these 72 recorded cows, the 34 which had a production higher than the average, were classified as follows:

12	cows	produced	300	to 350	liters
9	"	"	350	to 400	"
2	"	"	400	to 450	"
6	"	"	450	to 500	"
4	"	"	500	to 550	"
1	cow	"	550	to 600	"

The individual butterfat content of the milk varied from 3 to 7 percent, the average being 4.5 percent.

The average calving interval varied from 16 to 20 months. Cows produced about 8 calves during a lifetime.

The cattle are not utilized for draft purposes by the local people.

It has been observed that Ankole cattle do not fatten easily on the grassland of the region. The males and steers are sold for slaughter when they have 2 permanent teeth.

The veterinary authorities in the Eastern Province of the Belgian Congo reported that the average liveweights at markets were: bulls 301 kg.; bull calves 157 kg.; old cows 250 kg.; oxen 230 kg.; young bullocks 176 kg.

The dressing percentage is reported to be 45.

The following information was reported from a herd of Ankole cattle established by INEAC (Institut national pour l'étude agronomique du Congo belge) at Nioka Station:

The average age of heifers at first calving was 42.7 months. The bulls were put to service at the age of 4 years. The daily milk yield of cows was 1.5 to 2.5 liters containing 4.4 percent butterfat. The average lactation period was 240 days and the average calving interval was 12 months.

On good pastures Ankole cattle fatten well. At 4 years the bullocks weigh about 303 kg. and dress at about 50 percent when slaughtered.

The functional behavior of the Ruanda or Barundi cattle of Ankole type bred in the northern zone of Lake Kivu and in the Ruzizi valley has been reported as follows:

In the volcanic region the cows have their first calves when about 4 years old. The liveweights of the calves vary from 25 to 30 kg. The males are first used for service at about 2 to 2 ½ years of age and are observed to be very quick in serving. The active breeding life is about 10 years.

In the Ruzizi valley the cattle mature fairly early; about 31 percent of the heifers are bred when they have 4, and 67 percent when they have 6 permanent teeth. The males start service at the age of about 2 years.

In the volcanic region the daily milk yield averages 3 to 4 liters with a lactation period of about 6 months. The butterfat content is 5 to 6 percent. The average calving interval is about 18 months and it has been estimated that there are about 7 lactations in an average lifetime.

On the Ruzizi plain, on alluvial sandy soil with good feeding, the average lactation production reported for 135 recorded cows was 960 liters of milk in 240 days. The largest amount of milk yielded in one day was 8.3 liters. The butterfat content varied from 4 to 7 percent.

The bullocks are used as draft animals. They are put to work at the age of about 2 ½ years, when the average liveweight is about 300 kg. They are active and willing workers. A pair of oxen can haul a load of 800 kg. in a rubber-tired cart. They can travel about 3 ½ km. in an hour or approximately 16 km. in a working day of four hours. When plowing hard dry soil Ankole oxen can work for between four and five hours in a day.

The cattle show fairly good adaptability to fattening on grassland on alluvial soil. They weigh about 358 kg. at 3 ½ years and dress out at about 50 percent though 55 percent is not unusual. It has been reported that the meat is well marbled. In the volcanic region cattle are not ready for slaughter until they are 4 to 6 years old,

and yield about 175 to 225 kg. of dressed carcass. The dressing percentage in this region is about 45 to 50.

The cattle bred by the Bashi owners to the south of Lake Kivu produce about 420 liters of milk in 240 days with an average butterfat percentage of about 6.0 The calving interval is about 2 years. The animals in this region are slow maturing and about 69 percent of cows do not calve for the first time until they are over 4 years of age.

The bulls start service when they are 3 to 4 years old, and are usually kept in the herds until they are 10 years old.

Although not much utilized for that purpose, Ankole cattle have been found to be tractable but slow draft animals.

In Ruanda-Urundi the Ankole has been observed to be slow maturing. Heifers calve for the first time at the age of about 4 ½ years. The animals are not very prolific and the calving interval is about 2 years. The milk yield is approximately 3 liters per day from a good cow, in addition to the amount taken by the suckling calf.

Slaughtered animals show a dressing percentage of 40 to 45. However, the animals respond well to improved feeding.

A herd has been established at Songa Farm since 1936. Initially, two herds of Ankole were established, one of polled and the other of horned animals, but as it was observed at a later date that the animals without horns neither bred true for the polled character, nor showed marked superiority over those with horns, this part of the experiment was discontinued. Birthweights and production figures from the horned animals are given in Table 71.

TABLE 71. – DATA ON HORNED ANKOLE CATTLE AT SONGA FARM IN RUANDA-URUNDI

Year	Birthweight, kg.	Number of days lactation	Average milk yield, liters	Average butterfat content, %	Average monthly weight increase of calves, kg.
1938	—	335	766	5.45	9.70
1939	23.3	336	695	4.76	8.75
1940	24.0	—	684	—	—
1941	23.0	—	755	4.96	—
1942	24.0	377	725	4.96	9.40
1943	22.3	387	833	4.96	9.40
1944	23.0	381	829	5.00	9.10
1945	23.5	400	920	—	9.20
1946	—	—	—	—	—
1947	—	—	—	—	—
1948	—	—	—	—	6.40
1949	23.4	—	676	—	10.00

SOURCE: Herin, *Personal Communication*.

Herin (—), in the Annual Reports of the Songa Farm, records that calves born in the dry season showed a higher mortality rate than those born in the rainy season, and that calves born during the rainy season showed greater liveweight increases than those born in the dry season. The bullocks at the farm were good beef animals and when slaughtered dressed out at 55 to 60 percent of excellent meat.

Sources of breeding stock and information regarding the breed

Information regarding Ankole cattle in Uganda can be obtained from the Director of Veterinary Services, Kampala, Uganda. A herd of Ankole cattle was maintained at the Government Stock Farm, Mpwapwa from 1938 until it was transferred to the Western Province Pasture Research Station, Tumbi, Tanganyika, before being dispersed. Information on the Ankole in Tanganyika can be obtained from the Director of Veterinary Services, Mpwapwa, Tanganyika.

In the Belgian Congo a herd of Ankole (Bahima) is maintained by INEAC (Institut national pour l'étude agronomique du Congo belge) at Nioka. Information on the stock can be obtained from the Officer-in-Charge of the Provincial Veterinary Service, Eastern Province, Stanleyville, Belgian Congo. Information on the Ruanda-Urundi or Barundi type is available from the "Service vétérinaire provincial," Usumbura, Ruanda-Urundi. Information on the Bashi type of Ankole can be obtained from the "Service vétérinaire provincial," Costermansville, Province of Kivu, Belgian Congo.

BAROTSE

Origin

The Barotse cattle are of the Longhorn Sanga type. The animals possess cervico-thoracic muscular humps and large lyre-shaped horns. The Barotse and Baila are virtually identical and are allied to the Setswana cattle of Bechuanaland (Walker, C.A., *Personal Communication*).

Conditions in the native home of the breed

Location, topography and soils

Barotse Province of Northern Rhodesia, where the Barotse cattle are found, forms the most westerly section of Northern Rhodesia. It is bounded by the Kwando and Zambesi rivers on the west and south, and by Angola on the north and west. The area is located approxi-

mately between 22° and 27° east longitude and 14° and 18° south latitude. The altitude varies from 2,000 to 4,000 feet above sea level. The Barotse valley includes the plain in which Lealui, the seat of the paramount native Chief of Barotse is located. This area is flooded every year during the months of March and April due to the rise of rain waters in the Zambesi river. The predominant soils are sandy or sandy loam.

Climate

May to September is the dry season with easterly and southeasterly winds. The first part of this season, which may be called the post-rainy season, is good for plant growth with sufficient moisture in the soil; in the later part the temperatures begin to rise, although on an average they are dry, cool and comfortable months. The nights are always cool and ground frost can occur. Temperatures are at their highest between September and November, in the second half of which the rainy begin and continue until early April. With the exception of the rain months, the sun shines brightly throughout the year.

Climatological data for Mongu, the provincial headquarters for Barotse Province, are summarized in Table 72.

TABLE 72. – CLIMATOLOGICAL DATA FOR MONGU

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Mean temperature, °F.	74.2	74.4	74.1	73.3	68.7	64.3	64.7	70.0	76.8	79.2	76.2	74.2	72.50
Humidity, % ...	67	67	63	52	41	38	32	27	25	35	50	62	46.60
Rainfall, in.	8.66	7.73	6.23	1.25	0.2	—	—	0.01	0.75	1.40	3.9	7.95	34.39

SOURCE: Meteorological Department for Northern Rhodesia.
Average for 10 years.

Vegetation

The natural vegetation of the pastoral areas has been described as low grass savannah with open woodland. The grass cover varies in density. The locally important grasses are of the genera *Paspalum*, *Hyparrhenia*, *Brachiaria* and *Eragrostis*. Crop residues are also utilized as stock feed.

Management practices

As well as their general function of producing milk, beef, and work, the cattle play an important social role. They are used for the payment of the bride wealth and also for ceremonial purposes.

The cattle, which are very largely dependent on grazing, remain in the riverain areas in the dry season but are taken inland away from the flood plains of the rivers during the rains. They are also tethered on crop residues as a simple method of manuring garden lands. The calf is allowed to suckle the dam but some milking is done to provide milk for preparing *mafi*, a fermented milk product for human consumption.

Physical characteristics of the breed

The Barotse cattle (Figures 56 and 57) are large in size, heavily boned and have, in general, large lyre-shaped horns, although there are wide variations in the shape and size of the horns. The hump, which is small or vestiginal in the female, is of medium size in the male, muscular in texture and cervico-thoracic in position. The usual coat colors are brown, black, dark russet and fawn. Whole white coloration is rare. The skin is loose and of medium thickness with dark pigmentation. The hairs are short and of medium softness. The dewlap is of moderate size and the ears are medium in size. The hoofs are characteristically large, but are reported to be not very durable.

The birthweights of males and females, as reported from a herd of Barotse cattle established at the Government Experimental Farm at Masabuka, have been 60 lb. and 55 lb. respectively. Liveweights of males at the same station were 312 lb. at one year of age, 700 lb. at 2 years, and 1,350 lb. at maturity. Average data on liveweights and body measurements of Barotse cattle are summarized in Table 73.

TABLE 73. – AVERAGE LIVEWEIGHTS AND MEASUREMENTS OF BAROTSE CATTLE

	Male			Female			Ox
	1 year	2 years	2 years 9 mths.	1 year	2 years	2 years, 9 mths.	mature
Liveweight, lb.	238	525	777	231	434	756	1 090
Length from shoulder point to pinbone, cm.	—	137	144	—	127	138	—
Height at withers, cm.	93	114	121	100	117	126	132
Heart girth, cm.	—	151	169	—	140	154	190

SOURCE: (Male, Female): Black, J.G., *Personal Communication.*

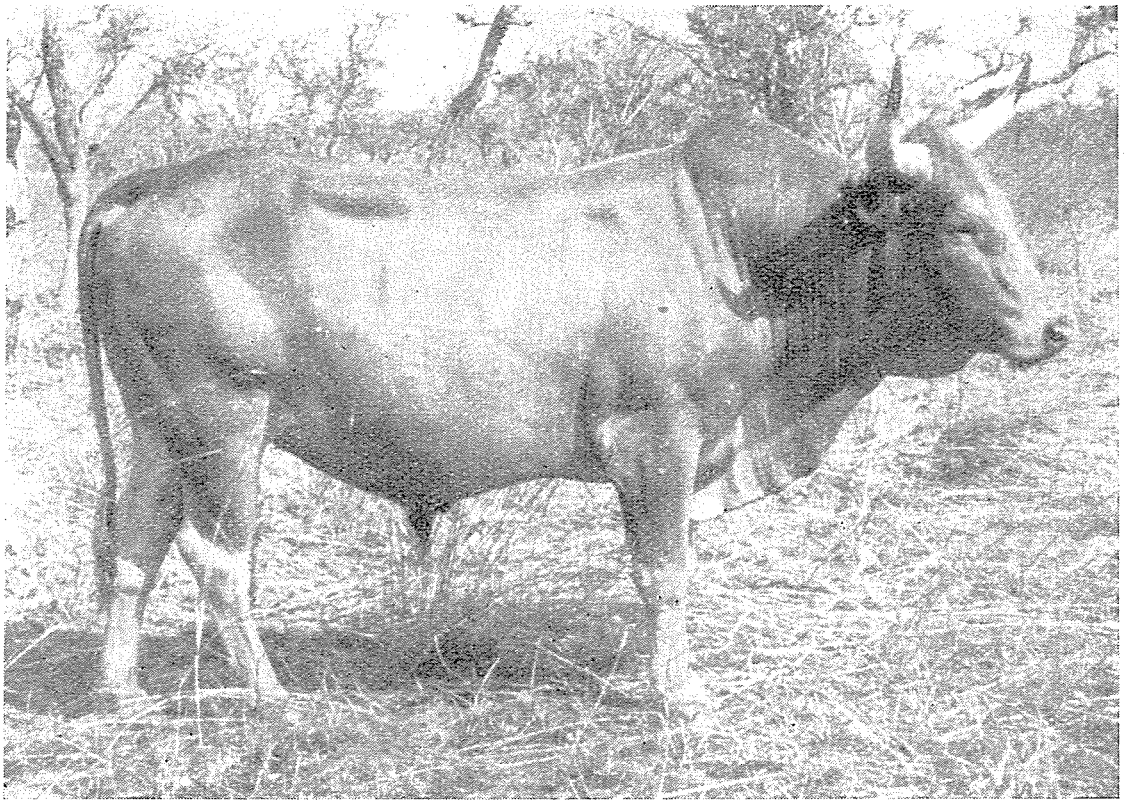
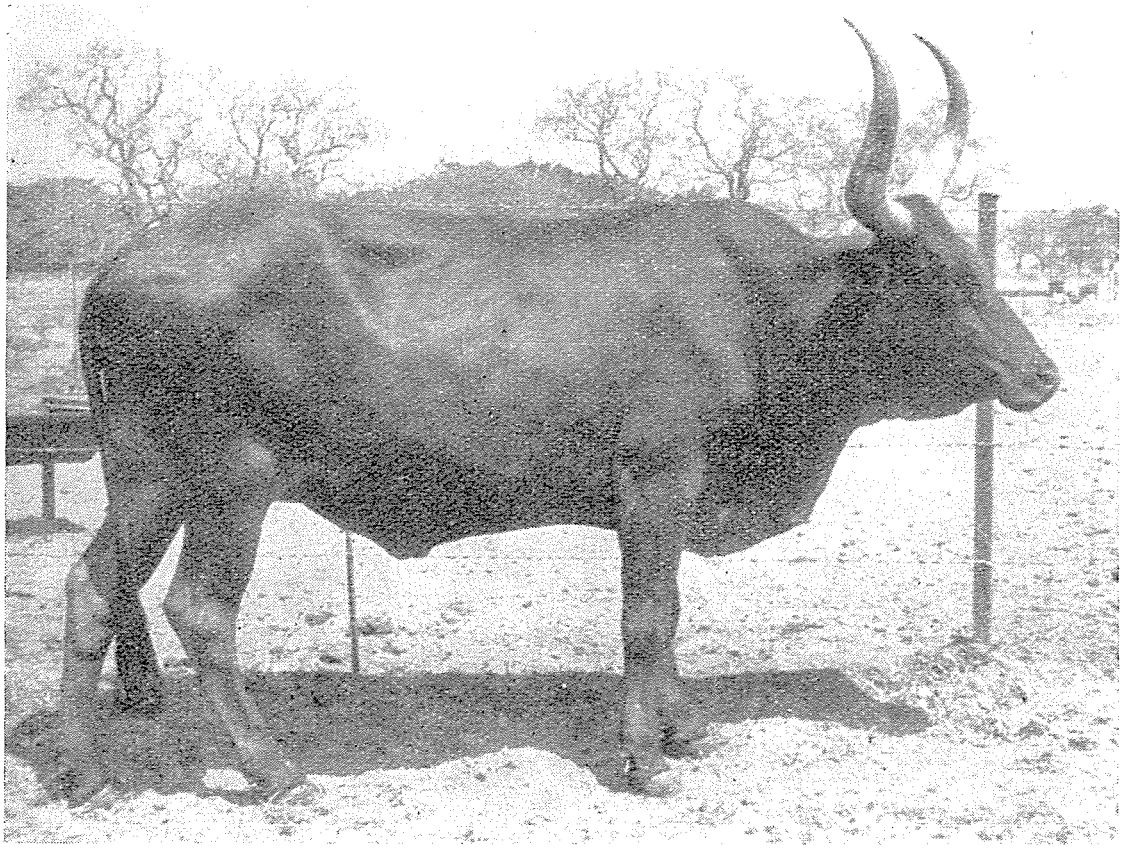


FIGURE 56. *Barotse bull.*

FIGURE 57. *Barotse cow.*

Courtesy of J. G. Black



Functional characteristics of the breed

The Barotse is reported to be hardy, slow maturing and sufficiently adaptable to the hot conditions of the region. On account of its size, it shows good possibilities for development for beef production.

The females calve for the first time at over 3 years of age and the males start service when they are about 2 years old. The average breeding life of males is estimated to be about 12 years. They are reported to be shy breeders. Animals used for draft are put to work when they are 2 to 3 years old. Although they are even-tempered, their working capacity is limited by the poor durability of their hoofs.

The beef qualities of these cattle have been under investigation at the Experimental Farm at Mazabuka. It is reported that animals slaughtered at 5 years of age weighed 1,200 lb. The dressing percentage was 52.9. It was also noted that the average percentage of bones in the carcass was 18.1. Faulkner and Brown (Colonial Office, 1953) report that the best of a few recorded Barotse cattle showed a capability of yielding half a gallon of milk per day at the peak of the lactation in addition to feeding the calf.

It has been observed that Barotse cattle are not heavily infested with ticks.

Records of performance of the Barotse herd maintained at Mazabuka Government Experimental Station (Northern Rhodesia, 1952, 1953) are summarized in Table 74.

TABLE 74. – PERFORMANCE RECORDS OF A BAROTSE HERD

No. of cows in herd at beginning of each breeding season						Total progeny produced, 1947-52	Total progeny mortality	Corrected liveweight of beef produced - 100 cow unit			Average weight of calves, males and females, lb.				
1947	1948	1949	1950	1951	1952			In 4 years, lb.	In 5 years lb.	In 6 years, lb.	1 year	2 years	3 years	4 years	5 years
—	37	20	64	76	60	180	28	32 120	60 669	93 451	211	450	705	971	1 150

Sources of breeding stock and information regarding the breed

It has been estimated that there are over 228,000 head of Barotse cattle in Barotse Province.

Further information may be obtained from the Director of Veterinary Services, Mazabuka, Northern Rhodesia.

BASUTO

Origin

There seems to be some justification for considering the Basuto cattle as a type distinct from other cattle varieties in southern Africa. Bisschop, J.H.R. (*Personal Communication*) is of the opinion that, notwithstanding the presence among them of exotic and Africander grades, the majority of these cattle conform in general body build and, more particularly, in the shape of the head and horns, to a definite type which is quite separate from any other known indigenous cattle type, and that these conformational characteristics are sufficiently specific to permit of the use of the term "Basuto cattle."

These cattle are thought to have accompanied the Basuto Bantu tribes on their migration southward through Africa to their present habitat and to have been remotely derived from the admixture of zebu and Hamitic cattle which is assumed to lie at the origin of the Sanga group of cattle types.

Conditions in the native home of the breed

Ecological conditions in Basutoland are broadly similar to those which are described in the section on the Africander (p. 268) and the management practices of the Basuto bear some resemblance to those of the Nguni (p. 169).

Physical characteristics of the breed

The Basuto cattle (Figure 58) are animals of only moderate size and weight, usually fairly well proportioned conformationally, but lean of musculature. The head is long, particularly in cows and steers, straight or slightly convex of profile and with a slightly dished forehead, the convexity of which is accentuated by the prominence of the supra-orbital processes. The horns, which may be either round or oval in cross section, seldom measure more than 18 to 24 inches along their greatest curvature. They come away from the head in an outward and slightly upward and backward direction and then turn forward, upwards and outwards. Up to about 5 percent of cattle in Basuto herds are naturally polled.

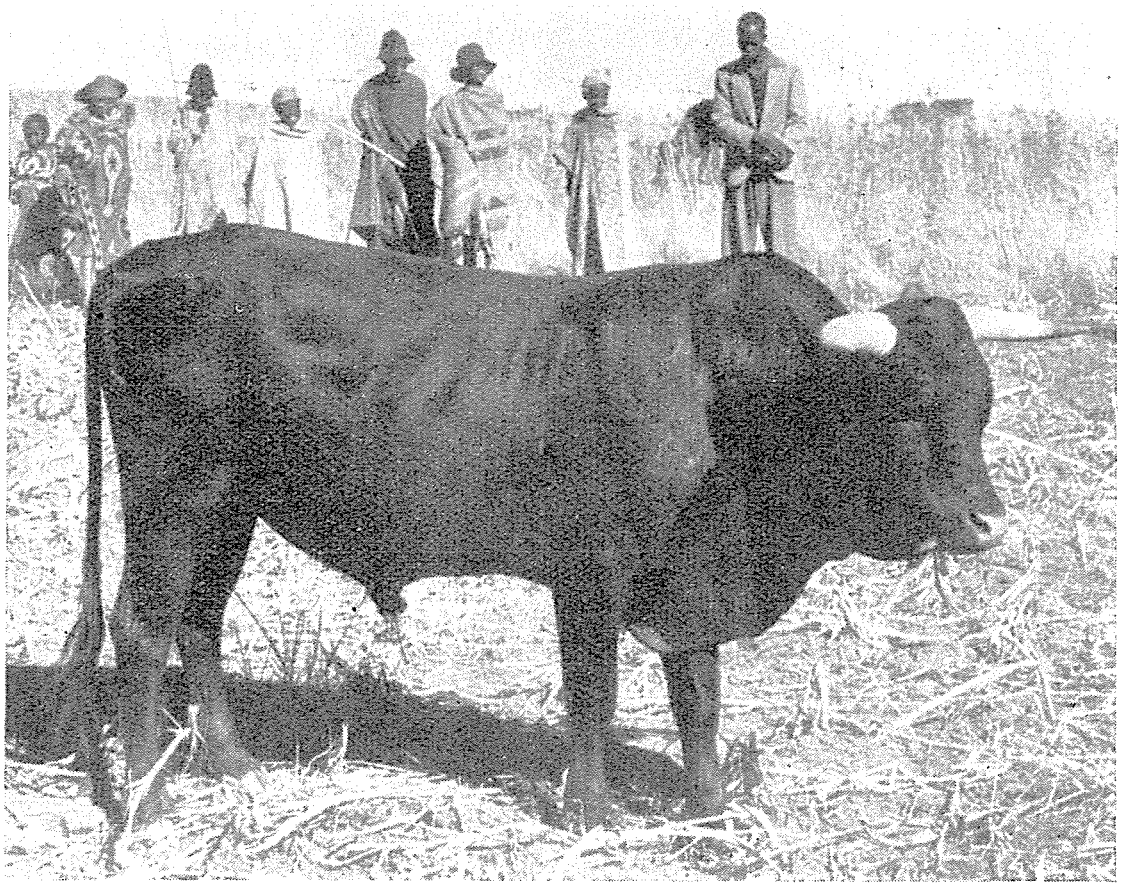


FIGURE 58. *Basuto bull.*

Courtesy of J. H. R. Bisschop

The muscular cervico-thoracic hump is well developed in the male but small in the female and castrate. The dewlap, particularly in the cow, is not strongly developed.

The body is of fair length and depth but often tends to lack width through the heart. The topline is straight but is often narrow and sharp, although the loins are usually of fair width and strength. The ribs, which tend to be straight and flat in front, show good curvature further back, giving good digestive capacity. The umbilical fold is small in both sexes.

The rump is of fair length but slopes considerably from hooks to pins. Owing to its narrowness between the pins, it tends to be triangular in plan. The sacrum lies approximately horizontally and shows a distinct notch in front of the tail root. The tail is set on high and is long and slender, with the vertebrae extending down to the hocks.

The udder is small and carried close up against the belly. The teats are small and generally pigmented.

The front legs are generally well placed but, as a result of the narrowness of the pinbones, the hind legs are often cow-hocked. The skeletal bones are light, small, dense and hard.

The hides of most of the cattle which have been inspected have been pigmented. The hairy coat is short and smooth. An inner coat is discernible. Black is the most common coat coloration; other colorations include duns, reds, red and blue roans, and black, red and black-and-tan color-sided " nkone " patterns (Bisschop, J.H.R., *Personal Communication*).

Crosses with other breeds of cattle

It appears probable (Bisschop, J.H.R., *Personal Communication*) that the cattle types which have been referred to as the Uys, Kemp and Tintern Black have been derived from indigenous South African cattle similar to those of the Basuto, which were crossed with cattle from the Netherlands introduced at the time when South Africa was a Dutch colony. Cattle derived from the cross were introduced into Natal at the time of the Great Trek in the second quarter of the nineteenth century. Herds of these cattle appear to have been maintained as approximately closed breeding units and a recognizable type has been developed to which the name " Drakensberger " is now applied.

The cattle have pigmented hides and short, sleek black coats. The female has no hump, while that of the male is small and cervico-thoracic in position. The head is of medium length with a broad forehead and muzzle, and the horns are short, growing from the poll in an outward and forward direction. Drakensberger cattle are reported to be well adapted to the local environment of the Orange Free State and Natal, with the ability to produce milk and meat at a reasonable level under extensive husbandry conditions (Weideman, 1948; Van Rensburg *et al.*, 1947).

Sources of breeding stock and information regarding the breed

Further information on the Basuto cattle can be obtained from:

The Director of Livestock and Agricultural Services, Basutoland.

The Director of Animal Husbandry and Dairying, Department of Agriculture, P. O. Vallis, Pretoria, Union of South Africa.

NGUNI

Origin

The nomenclature " Nguni " has been approved by a committee appointed by the Secretary of Agriculture of the Union of South Africa (Union of South Africa, 1950) to make an investigation into the indigenous breeds and types of livestock in South Africa. The type had previously been referred to as " Zulu " or " Swazi " according to the tribe of Nguni Bantu in whose possession it was found.

Various authors who have speculated on the remote origins of indigenous African cattle (Epstein, 1933, 0000; Curson and Epstein, 1934; Curson and Thornton, 1936; Bisschop, 1937) have suggested that the Nguni cattle may have had their origin in an intermixture of the now extinct Hamitic Longhorn and the Lateral-Horned zebu and, as such, have been included in the category of " Sanga " in classifications of African cattle. Cattle of Nguni type would appear to have had their origin in northeastern Africa, from whence they accompanied the Bantu migrations to southern Africa.

Conditions in the native home of the breed

Location, topography and soils

Nguni cattle are found in Zululand (northern Natal), Swaziland, and in southern Mozambique. The part of the area which lies in Natal and Swaziland has been described as being " the region from the Komati river, north of Swaziland to the Tugela river as its southern boundary. In Swaziland the Drakensberg mountains and the Lebombo ranges form the western and eastern boundaries respectively. In Zululand the western boundary of the area runs slightly to the east of Vrijheid and to the south approximately through Babanango as far as Mapumula, with the coast as the eastern boundary ". (Union of South Africa, 1950).

The coastal belt is gently undulating country with marshes and lakes near the sea and with a maximum altitude of 500 feet. In the southern part the soils vary from red sandy loams in the west to sandy soils in the east while in the north there are deep white sands.

Inland from the coastal strip the country becomes more undulating and hilly and increases in altitude towards the Hlabisa hills and the Ubombo range in the west and beyond to the Nongoma and Sapana

ranges. The soils change from sands in the east to fertile loams in the west.

To the west of the Ubombo range the area includes the Lebombo flats, a level valley of fertile soils and altitude in the neighborhood of 700 feet above sea level. The land rises westwards in a series of steps to the middleveld of Swaziland where the average elevation is about 2,000 feet. This is undulating country with soils of a fertility somewhat lower than those of the Lebombo flats and which has deteriorated as the result of continuous cultivation by the native peoples.

The highveld, a part of the Drakensberg range, lies to the west of the middleveld and rises to altitudes exceeding 5,000 feet. The land is broken and dissected by gorges and the slopes are generally too steep for cultivation (Swaziland, —).

Away from the group of east-flowing rivers (including the Komati, the White and Black Umbulusis, the Usutu, and the Pongola) which are fairly evenly distributed through the territory, watering facilities for livestock are very limited.

TABLE 75. – CLIMATOLOGICAL DATA FOR MBABANE, SWAZILAND (ALTITUDE 3,800 FT.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Mean temperature, °F.	68	67	66	62	59	54	53	57	61	64	66	67	62
Mean rainfall, in.	9.9	7.6	7.9	2.6	1.3	0.5	0.9	1.1	2.1	5.0	6.8	8.4	54.0

SOURCE: Kendrew, 1953.

Climate

In general, the climate of the Nguni area is warm with relatively high humidities, but there are very considerable climatological variations between the different parts of the region. Along the coastal belt 60 to 70 percent of the rainfall occurs in the summer months and annual precipitation is in the range of 30 to 40 inches. Further inland in Zululand temperatures are lower and the winter is drier. Annual precipitation ranges from 25 to 35 inches. The Lebombo flats and the contiguous area along the east side of the Lebombo range is markedly drier with annual precipitation between 15 and 25 inches. Day temperatures are frequently high. Mean maxima in excess of 95° F. occur in some areas for several months and absolute maximum temperatures of up to 115° F. have been recorded. The greater part of the area

is frost-free throughout the year (Kendrew, 1953; Union of South Africa, 1950). The mean annual rainfall at Sipofaneni in the lowveld has been 26.5 inches, while at Bremersdorp in the middleveld it was 36.8 inches and at Mbabano in the highveld, 54 to 55.6 inches. Annual mean maximum and minimum temperatures at the same stations have been: 84.4° and 59.5° F. at Sipofaneni, 77.7° and 54.1° F. at Bremersdorp, and 72.7° and 52.8° F. at Mbabane (Swaziland, —). Climatological data for Mbabane in Swaziland are given in Table 75 and monthly rainfall averages for Mpisi in Table 76.

TABLE 76. – 10-YEAR MONTHLY RAINFALL AVERAGES FOR MPISI CATTLE BREEDING STATION, SWAZILAND, 1941-1950

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Mean rainfall, in.	5.35	3.55	2.88	1.90	0.81	0.59	0.42	0.51	1.14	2.01	3.74	3.33	26.33

SOURCE: Barnard, 1951.

Vegetation

The vegetation of the sandy coastal belt is sparse and consists largely of inferior grassland dominated by *Aristida* spp. of low nutritional value.

Inland of the coastal strip, towards the Hlabisa hills and the Ubombo range there is grassland and scrub (thornveld) of good nutritional value in large areas of which *Themeda triandra* is the dominant species.

In the Lebombo flats there is good savannah grazing which merges into mixed thornveld in the middleveld (Union of South Africa, 1950).

Management practices

Cattle are kept extensively by the native population of the area. They are maintained largely for the provision of milk, but beasts are slaughtered on festive occasions and the meat from cattle that die from natural causes is eaten. The hides are utilized locally for household purposes. Oxen are used as draft animals.

Cattle play a predominant part in the social life of the people, particularly in relation to the bride wealth or "lobolo" system. The herds are not the property of individuals to be disposed of at will, but are regarded as being held in trust for the family, distributed in time, including the ancestors and descendants as well as the contemporary household. As there appears to be little or no consideration

of the quality of the cattle offered as the bride wealth, numbers are regarded as being of paramount importance and it has been difficult to obtain local co-operation in measures designed for the prevention of overstocking or the improvement of the conformation and productive capacity of the cattle, but which might entail a reduction in the size of the herds.

On farms under European management Nguni cows have been maintained for the production of beef calves by crossing with bulls of imported beef breeds. Nguni oxen are used extensively for draft purposes and are considered to be superior to the Africander in this function under the climatic conditions of Natal.

Beef exports from the Nguni area are predominantly to Durban and Johannesburg and a large proportion of the hides go to Durban and Lourenço Marques. Cream is collected at separating stations in the native areas and about 500,000 lb. of butter are exported each year to Johannesburg and Lourenço Marques.

Physical characteristics of the breed

Nguni cattle (Figures 59 and 60) show a very considerable variation in size which appears to be dependent on local nutritional conditions. In general they are cattle of medium size, with a fair depth of body, fairly short legs and a tendency towards the wedge-shaped " dairy type."

The head is of fair length with the width at the eyes only slightly greater than that at the poll, so that the broad forehead is nearly rectangular. The face constitutes about three fifths of the length of the head, is lean and fairly broad and tapers only slightly to the wide muzzle. The profile is straight or, in the bull, slightly convex. The orbital arches are slightly accentuated, so that the forehead may have a degree of lateral concavity. The ears are small and sharply pointed and are placed below and behind the horns. The horns are dense in structure and are lyre-shaped in the adult animal. They rise from a level poll often on well-defined pedestals in an outward and slightly backward direction, then grow upwards and forwards, turning inwards in the second half of their length and inclining backwards in the final 4 to 6 inches. The horns are round or slightly oval in cross section. They are usually of medium thickness and end in thin tapering points, but Faulkner (1947) refers to two horn types, one narrow and springing from the poll in a slightly upward direction, and the other thicker and with its initial growth horizontal. In the bull the horns are markedly shorter and thicker than in the female. The general line of growth of the horns, as viewed from the side, is in advance of the line

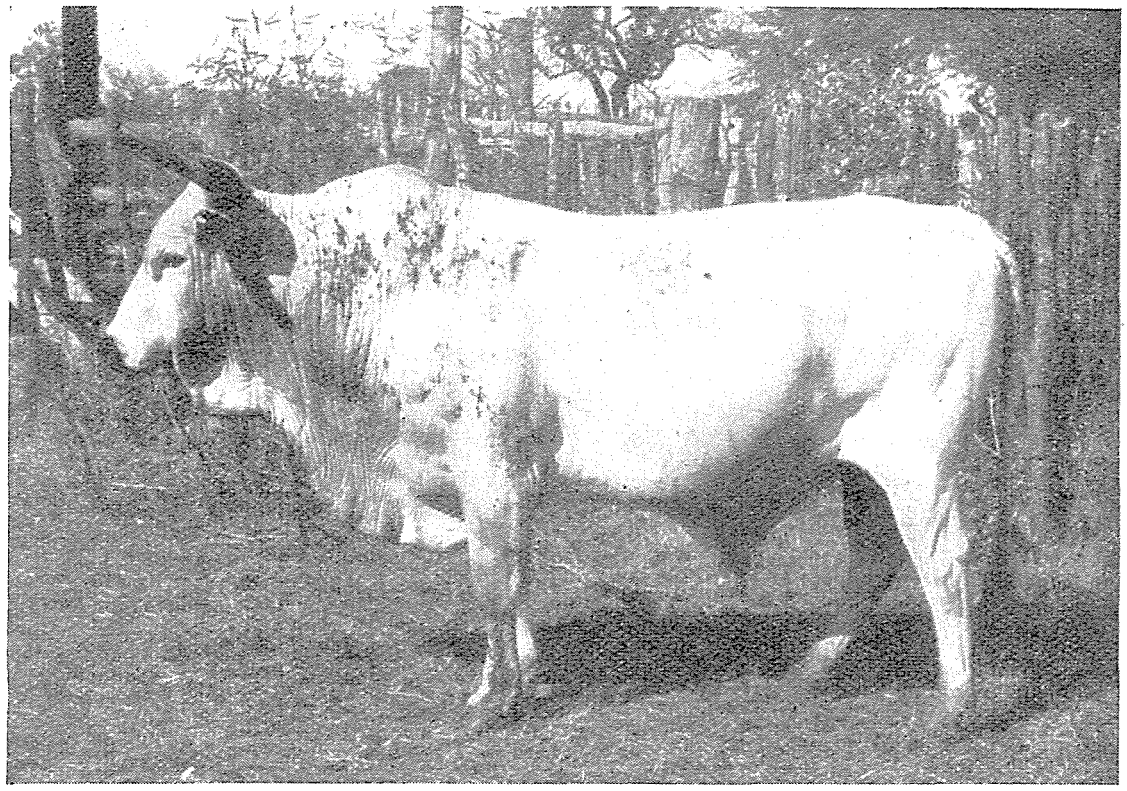
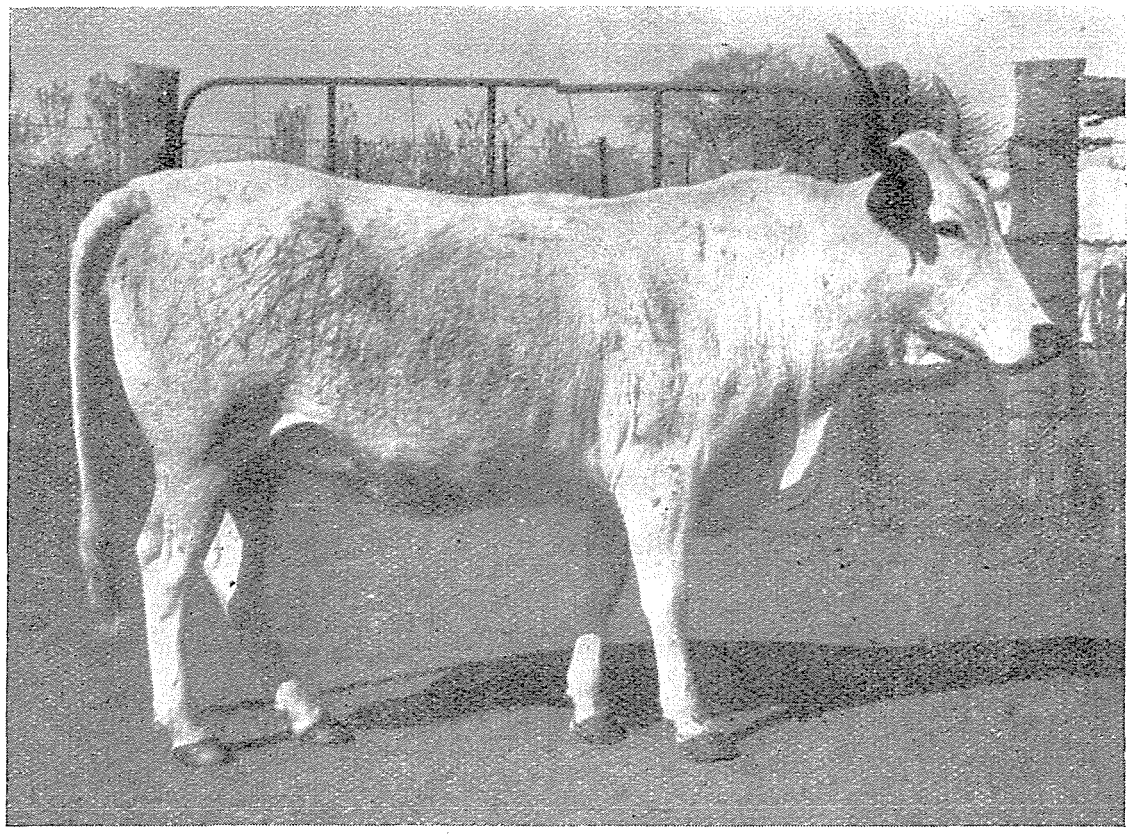


FIGURE 59. *Nguni bull at the Mpisi Cattle Breeding Station.*

FIGURE 60. *Nguni cow at the Mpisi Cattle Breeding Station.*

Courtesy of J. H. R. Bisschop



of the profile with which it makes an angle varying from 50° to 100° or more.

The neck is fairly long and lean. The hump is muscular and cervico-thoracic in position. It is well developed in the male but small in the female. The topline shows considerable variation. It tends to be narrow forward, widening to the rear, and fairly level or rising to some extent towards the rump. It is generally rather lean with a tendency to be "roofy." The rump is of moderate length and slope with a slightly prominent sacrum and tends to be narrow over the pinbones. The dewlap is of moderate or small size and the umbilical fold, while not generally apparent in the female is, together with the sheath, fairly prominent in the male. The limbs tend to be short. They are lean and light of bone and tend to be upright in position. The tail is long and thin with a full switch.

TABLE 77. – AVERAGE LIVEWEIGHTS AND BODY MEASUREMENTS OF NGUNI CATTLE IN SWAZILAND

Cattle	Age	Live-weight, lb.	Length of body, cm.	Height at withers, cm.	Height at hips, cm.	Chest girth, cm.	Depth of ches, cm.
Females	1 year	315	98	99	104	120	40
Females	2 years	457	118	113	118	138	53
Females	mature	723	135	122	122	157	60
Males	mature	1 385	152	133	132	177	67

SOURCE: Bonsma *et al.*, 1953.

In the majority of Nguni cattle the hide, which is of tough, fine texture, is darkly pigmented. There is a considerable variation in coat coloration which has been classified in considerable detail by the Union of South Africa Committee on Indigenous Livestock (Union of South Africa, 1950). Full whites, blacks, browns, reds, duns and yellows occur. The hides of white and yellow cattle are of lighter pigmentation than those with the coats of the other colors. Black and tan and brindle also occur and there are, in addition, a series of patterned and combination colorations. Bisschop (1943-1946) has suggested that a coloration (*nhlophekati*) in which the whole coat is white except for the areas around the muzzle and the eyes, and the inner surfaces of the ears, may be basal to this series which has been described in detail by the South Africa Committee on Indigenous Livestock (Union of South Africa, 1950).

The average liveweight of cows has been given as about 750 lb. with a range of 500 to 1,000 lb., and that of bulls about 1,100 lb. with a range of 950 to 1,300 lb. In areas in which the grazing is of poor nutritional quality cows are found measuring 3 ½ feet at the withers and with liveweights in the neighborhood of 500 lb. The Union of South Africa Committee on Indigenous Livestock Types (Union of South Africa, 1950) observed bulls of approximately 1,300 lb. liveweight and steers which they estimated to be 5 feet high at the withers and of more than 1,300 lb. liveweight. In a few cases steers estimated to be of 1,600 lb. liveweight were seen. Some liveweights and measurements of Nguni cattle at the Mpisi Research Station in Swaziland are given in Tables 77 and 78.

TABLE 78. – AVERAGE LIVEWEIGHTS OF NGUNI CATTLE AT MPISI CATTLE BREEDING STATION

Cattle	Age in months	Number sampled	Average liveweight, lb.
Females	9 – 12	55	331.3
	12 – 24	295	447.6
	24 – 36	256	588.8
	over 36	1 135	788.3
Males	9 – 12	40	325.8
	12 – 24	99	521.0
	24 – 36	34	634.3
	over 36	35	1 223.8
Oxen	9 – 12	21	347.7
	12 – 24	172	459.9
	24 – 36	251	638.7
	over 36	168	810.9

SOURCE: Barnard, 1951.

The average body temperature of Nguni cattle at Messina Research Station before sunrise was found to be 101.25° F $\pm$ 0.64. This value was significantly greater than those obtained for the body temperatures of Shorthorns and Africanders (Bonsma, 1955).

Functional characteristics of the breed

Apart from the role they play in the social organization of the native peoples of the area, Nguni cattle are maintained for the production of crossbred beef, milk for local consumption and draft animals.

The females appear to be slow in reaching sexual maturity. Although, under local conditions, heifers are normally allowed to run with a bull, they seldom calve at less than 3 years of age. After the first calf, cows appear to calve down at regular intervals and a high

proportion are reported to continue breeding until they are 15 or more years old.

The Union of South Africa Committee on Indigenous Livestock Types (Union of South Africa, 1950) suggested, on the basis of local opinion, that Nguni cattle had a considerable potential value as milk producers. Native owners were reported to have claimed peak daily yields of 2 to 3 gallons of milk off grazing. The results obtained at the Mpisi Research Station have, however, been less promising (Barnard, 1953). The average yield of cows which calved in May to July was 384 lb. in 161 days and that of cows calving in November to January was 529 lb. in 217 days. In both cases the yields were those of cows which were also suckling their calves. The mean values of butterfat tests made at Mpisi and reported in 1952 and 1953 were 4.23 percent and 3.59 percent respectively (Barnard, 1952, 1953).

Fifty-five Nguni steers, of average age 55 months, which were exported to Johannesburg in 1951 and which had on arrival an average liveweight of 907 lb. (as compared to 1,009 lb. before leaving Swaziland) had an average dressed weight of 521 lb., giving a dressing percentage of 57.7. The mean weight of the hides was 65 lb., and that of the offals 318 lb. (Barnard, 1952). A further sample sold in Johannesburg in 1952 had an average dressed weight and dressing percentage of 504 lb. and 55.4 (Barnard, 1953).

TABLE 79. – LIVEWEIGHTS AND CARCASS DATA FROM NGUNI STEERS AT ONDERSTEPOORT

Mean age, months	No. of steers	Mean liveweight, lb.	Mean carcass weight, lb.	Mean hindquarter weight, lb.	Mean forequarter weight, lb.	Dressing percentage
40	5	713	404	105	101	56.7
53	6	934	564	142	132	60.4
56	5	1 010	627	163	150	62.1

SOURCE: Bisschop, J. H. R., *Personal Communication*.

Slaughter tests have been carried out on Nguni steers bred in the experimental herd of the veterinary laboratories at Onderstepoort and reared on the farm of the Institute. The results of these tests are summarized in Table 79. The final group of 5 steers (of average age 56 months) were slaughtered after 107 days pen-feeding. They were, however, very wild when brought in from the veld and, never really settling down to stall-feeding conditions, gained on the average only just over 1 lb. per head per day. On deboning, the carcasses

of the pen-fed steers yielded 87.3 percent of beef and 12.7 percent of bone. A tasting and judging panel found that rib roasts from the pen-fed Nguni steers were superior in grain and tenderness to roasts from Africander steers of the same age which had been stall-fed since weaning, although there was no difference between the respective roasts in juiciness and flavor (Bisschop, J. H. R., *Personal Communication*).

The hides from 12 Nguni steers of average age and liveweight, 53 months and 938 lb., had a mean wet weight of 69 lb. and a mean surface area of 49.71 square feet (Bisschop, J. H. R., *Personal Communication*).

The Union of South Africa Committee on Indigenous Livestock Types (Union of South Africa, 1950) observed that Nguni cattle do well in the eastern coastal area, which is regarded as being one of the most unhealthy for cattle in South Africa. They suggested that there might be, in Nguni cattle, hereditary physical characters which give a degree of resistance to diseases including heartwater, redwater, trypanosomiasis, and opthalmia. Among these characters are the short coat and tough skin, which give some protection against tick-bite, and the pigmented surround to the eye, which appears to be a factor toward freedom from opthalmia. At Mpisi Research Station it was observed that the resistance of Nguni cattle to the locally prevalent diseases appeared to be superior to that of the Africander herd.

Bonsma *et al.* (1953) found, however, that in a semi-arid subtropical environment in the Northern Transvaal Nguni cattle were less successful than Africanders and required 5.2 lb. of total digestible nutrients above their maintenance requirement to achieve a 1 lb. liveweight gain, as opposed to a total digestible nutrients requirement of 3.0 lb. per 1 lb. liveweight gain for Africanders.

Crosses with other breeds of cattle

Nguni cattle are used extensively on farms managed by Europeans in southeastern Africa for crossing and grading up to European beef breeds and especially to the Aberdeen-Angus and Shorthorn. It has been observed that too large a proportion of exotic cattle in an animal's ancestry leads to a deterioration in its adaptation to the local environment. An attempt is commonly made to correct this effect by putting the crossbred cows to Africander bulls.

Sources of breeding stock and information regarding the breed

The cattle population of the Nguni area has been given as 1,173,032 head. It was estimated that in this total 420,000 head were breeding cows, of which approximately 84,000 were likely to be free of the presence of exotic cattle in their ancestry (Union of South Africa, 1950).

Herds of Nguni cattle are maintained at the Mpisi Cattle Breeding Station, Swaziland, and at the Bartlow Combine Breeding Station of the Department of Native Affairs in the Ubombo district of Zululand in the Union of South Africa.

Further information regarding the Nguni cattle can be obtained from:

The Veterinary Department, Bremersdorp, Swaziland.

The Director of Bantu Agriculture, Department of Native Affairs, Pretoria, Union of South Africa.

NILOTIC

Origin

Nilotic cattle include those of the Shilluk, Nuer and Dinka tribes of Nilote peoples who live in the flood plain of the Nile system of rivers in the southern provinces of the Republic of the Sudan.

The cattle type appears to be of great antiquity and is generally supposed to have resulted from an intermixture of the original wild longhorned cattle of Africa (*Bos africanus*) with later incursions of Asiatic zebus (*Bos indicus*). There is no tradition among the people of their having entered the area from elsewhere, or of their having obtained their cattle from unrelated tribes.

On the northern and southern borders of the Nilotic area there has been some admixture with neighboring cattle types; notably in the Shilluk and northern Dinka herds by the Nile north of Malakal where the influence of the Northern Sudan shorthorned zebu is clearly apparent, and in the south and southeast where Nilotes come in contact with tribes owning the small East African zebu and the pyramidal humped Toposa-Murle cattle.

Within the area, raiding in the past and marriage exchanges and, to a small extent, purchases in the present, have mitigated against the development of the closed breeding groups which could become distinct breeds or varieties and, in general, such local differences in conformation and size as exist appear to be very largely of environmental origin.

While there is sufficient resemblance within the cattle population of the area to justify its consideration as a single type, the degree of variation between individuals is sufficiently high to make it inadvisable to refer to it by the more specific term " breed."

Location, topography and soils

The distribution of the Nilotic cattle is confined to the seasonally inundated flood plain of the Nile system in the Provinces of Upper Nile and Bahr el Ghazal and part of Equatorial Province. The northernmost limit is set by the Bahr el Arab where the Baggara Arabs of Darfur are encountered and further to the east, where the Abialang Dinka to the north of Bentiu have their villages on the north bank of the Bahr el Ghazal, by the boundary of Upper Nile Province, which confines the area occupied by the Shilluk and northern Dinka who extend on both banks of the White Nile as far as approximately latitude 12° N. East of Malakal, the Eastern Nuer have their villages to the north of the River Sobat as far as the Ethiopian border. The spread of Nilotic cattle to the west and southwest is prevented by the presence of tsetse fly in the wooded ironstone country which, very approximately, follows the line Aweil-Wau-Tonj-Rumbek-Juba. The southern limit to the Nilotic area is indefinite, but the cattle become predominantly of the small East African zebu type between Terakeka and Juba on the Bahr el Jebel (White Nile). To the east of the Bahr el Jebel there are large areas of country which, although flooded during and after the rains, are waterless during the dry season and in which it is, therefore, impossible to maintain cattle.

The whole of the area is a flat clay plain sloping very gently from southeast and southwest towards the main river channels. During the rains a combination of river spill and accumulation of rain water results in the whole area being inundated, with the exception of low islands and ridges on which the inhabitants have established their homesteads and where they carry out their crop cultivation. This flood water clears by drainage to the rivers and by evapo-transpiration as the dry season advances, the last parts to be exposed being the low-lying areas near the rivers known as *toich*.

The soils of the plain are predominantly heavy alkaline clays and loams. The higher areas are generally of sandy material, while the *toichs*, which are waterlogged for the greater part of the year and may never dry out, are of mainly clayey material (McLaughlin, E. A., *Personal Communication*).

Climate

The climate is that of a tropical continental area. The dry season, which is of eight months' duration at Renk in the extreme northern extension of the Nilotic cattle down the Nile, shortens towards the south and, at Bor, towards the south of the area, is five months long. Average annual rainfall at Renk is 525 mm. while at Bor it is 858 mm.

Precipitation is at its highest in the southwest of the area. Temperatures seldom vary more than 5° C. from one place to another on the plain.

Climatological data for Malakal in Upper Nile Province and Wau in Bahr el Ghazal Province are given in Tables 80 and 81.

TABLE 80. – CLIMATOLOGICAL DATA FOR MALAKAL, UPPER NILE PROVINCE (ALTITUDE 390 M.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Mean maximum temperature, °C.	35.8	37.2	38.0	38.6	35.8	33.0	31.0	30.8	32.2	33.9	35.6	35.7	34.9
Mean minimum temperature, °C.	18.5	19.9	22.1	23.7	23.2	22.0	21.6	21.5	21.8	21.9	19.7	18.3	21.2
Mean relative humidity at 08.00 hrs., %	28	23	26	46	66	77	84	87	84	78	52	34	57
Mean relative humidity at 14.00 hrs., %	17	14	15	25	42	52	61	64	60	51	28	20	37
Mean rainfall, mm.	0	0	4	32	88	116	175	183	140	70	9	1	818

SOURCE: SDIT, 1955.

TABLE 81. – CLIMATOLOGICAL DATA FOR WAU (BAHR EL GHAZAL PROVINCE)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Mean Maximum temperature, °C.	35.8	36.8	37.9	37.1	35.0	33.2	31.7	31.4	32.7	34.1	35.5	35.8	34.8
Mean minimum temperature, °C.	17.6	19.1	21.1	22.4	21.8	21.1	20.7	20.5	20.5	20.6	19.5	17.9	20.2
Mean relative humidity at 08.00 hrs., %	46	42	48	65	73	78	83	85	82	79	70	56	67
Mean relative humidity at 14.00 hrs., %	21	20	22	34	44	50	56	56	52	46	30	23	38
Mean rainfall, mm.	1	6	24	65	135	166	191	209	167	124	14	1	1 103

SOURCE: Ireland, 1948

Vegetation

The greater part of the flood plain is covered by open grassland with dispersed areas of woodland. The dominant grass species are *Hyparrhenia rufa* in areas of greater flooding and *Setaria incrassata* where slightly drier conditions prevail. The woodland is mainly composed of *Acacia seyal* and *Balanites aegyptiaca*; pure stands of *Acacia*

FIGURE 61. *Nilotic cattle. "Dinka" cattle grazing on* toich *near Jonglei Post, Upper Nile Province, Republic of the Sudan.*

Courtesy of J. D. M. Jack

seyal are frequent, and there are large areas of parkland in which *Balanites aegyptiaca* is the tree species. On the higher land there is woodland of *Acacia* spp. and *Balanites aegyptiaca* and, on sandy soils, the palms *Hyphaene thebaica* and *Borassus flabellifer* Linn. var. *aethiopium* together with, in the north, the short annual grasses, *Eragrostis* spp. and *Aristida* spp., and further south, in dense woodland, tall annuals such as *Rottboellia exaltata*, *Leptochloa chinensis* and *Hyparrhenia* spp.

The *toichs* (Figure 61) are open grasslands dominated by different grass species according to the degree to which inundation is complete and the period over which it is extended. Where inundation is complete and prolonged *Echinochloa* spp. dominate the plant population; where inundation is sporadic *Phragmites communis* or *Hyparrhenia rufa* tend to be the dominant species (SDIT, 1955).

A form of shifting cultivation using hand implements is practiced in the area. The main crop is dura (*Sorghum vulgare*) for local consumption. Maize (*Zea mays*) is grown in some districts, as well as small crops of sesame, curcurbits and pulses. Tobacco is cultivated by most of the inhabitants on a very small scale for their own consumption. It is tended with great care and appears to be the only crop that they attempt to water in times of drought.

Management practices

Livestock play an important and integral part in the primitive subsistence economy of the area. The people rely on milk and meat to supplement their otherwise inadequate diet. Cattle play a predominant part in the social and ritual life of the people and, as the cur-

rency of the " bride wealth," are essential to the continuation of the present social system.

The permanent homesteads are situated on the relatively small areas of higher land which remain above the level of the seasonal inundation. During the middle and late rains the cattle graze those parts of the higher land which are not occupied by the grain crop, as well as the more shallowly flooded land nearby. During this period the necessity for remaining near the grain crop, together with the extensive flooding, restricts the movement of the people, and grazing within reach of the homesteads may become inadequate, so that losses among cattle which are weakened by undernutrition and exposure to flooding and storms may be severe. After the rains flooding continues for several weeks, during which the cattle continue to graze near the homesteads. When the harvest is over, the straw of the grain crop is grazed *in situ*. In early December the water has fallen sufficiently for the grass to be burnt so that a young green regrowth becomes available for grazing. When the harvest is completed the people move with their herds toward the rivers, where they burn the grass on the *toich* and graze their cattle on the regrowth. The cattle remain on the *toich* from January until the early rains in April or May when a return is made to the homesteads which are reached in June and preparations for the grain crop begun. The distances moved from the permanent homesteads to the *toich* seldom exceed 120 km. (SDIT, 1955) and are usually considerably less.

FIGURE 62. *Nilotic cattle. " Dinka song bull " steer, Bar el Ghazal Province, Republic of the Sudan. The structures in the background are* luaks *or cattle shelters.*

Courtesy of E. A. McLaughlin

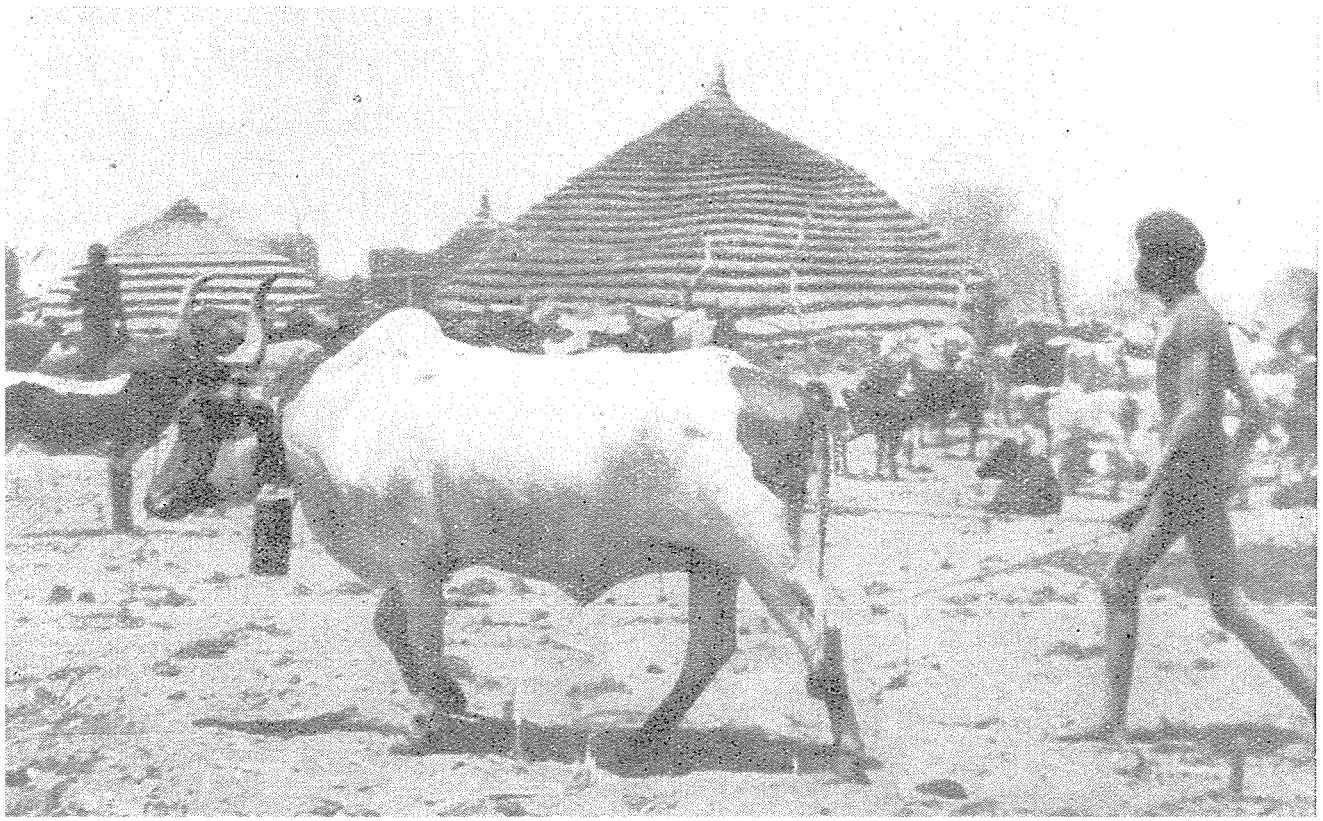


FIGURE 63. *A cattle camp in Bahr el Ghazal Province, Republic of the Sudan.*

Courtesy of E. A. McLaughlin

Biting flies (Tabanids and *Stomoxys* spp.) during the day and mosquitoes at night prey upon both cattle and man when the herds are grazing near the homesteads. The cattle are housed at night in *luaks*, large circular grass-thatched shelters (Figure 62). A dung fire is lit in the center of the *luak* at dusk and is kept burning throughout the night, so that its smoke will serve as a deterrent against mosquitoes. When the herds are away from the villages during the dry season, the cattle are tethered in large groups during the night and dung fires are placed among them as an insect deterrent (Figure 63).

During the rains cattle are taken out to graze at between 09.00 and 10.00 hrs. and remain out until 15.00-16.30 hrs. If biting flies are troublesome the cattle may be brought back to the camp for between one and two hours at midday. In the dry season grazing hours are rather longer: the cattle are taken out at between 08.00 and 09.00 hrs. and do not return until 17.00 or 18.00 hrs., shortly before sunset. During the rains the cattle, if they are not grazing in or near water, are taken to drink daily at midday. In the dry season watering is twice daily. Normally the cattle have access to green-growing grass throughout the year.

In general, the cattle graze for only five or six hours a day in the rains and eight or nine hours in the dry season, while between 15 and 19 hours are spent standing tethered in the *luak* or camp. During this time no cut or preserved feed is given to the cattle. In spite of this long fasting period it has been observed that cattle do not appear

to be excessively hungry or thirsty when they are released in the morning. Night grazing is never practiced.

Normally, grazing is sufficient at all times of the year, although there may be temporary local shortages if the fall of the river is delayed or if it should rise unexpectedly. In much of the area, however, there may be shortages during and immediately after the rains and, in the west in particular, the increase in cattle numbers consequent upon the success of disease control measures has resulted in overcrowding of the *toich* in the dry season.

Bulls are allowed to run with the cows. Although there may be sufficient bulls to effect the service of all the cows as they come in heat, it has been observed that one bull will establish itself as the " master " of the herd and will prevent younger or weaker bulls from serving cows even if their numbers are beyond its own capacity. When the cattle return to the camp, a bull may be allowed to walk among the cows for a short time after they have been tethered. Bulls are said to be selected on the basis of their dams' milk-producing reputation, but a degree of negative selection is effected by the practice of castrating exceptionally well-grown young bulls at between 1 and 3 years of age so that they may become the pet " song bulls " of the young warriors (Figure 62).

Calves suckle their dams and are allowed all the milk for the first 15 days, when milk is considered to be " unclean " for human consumption. After this, the calf is permitted to suckle in order to stimulate milk ejection and again at the completion of milking. The young calf remains in the camp tethered to a peg until it is 3 to 4 months old, when it enters a calf herd in which it remains until it is weaned on the completion of its dam's lactation. After weaning, the calves join the main herd as soon as they are considered to be sufficiently well grown.

Milking is carried out twice daily at about 08.00 hrs. and 18.30 hrs. It is customary for the gourds in which milk is collected to be rinsed in cow's urine before milking, and the cow's udder is frequently plastered with fresh cow's dung after milking is completed, probably with the intention of deterring the calf from suckling. It is believed that inflation of the cow's vagina stimulates milk ejection.

Liquid milk is consumed by the cattle-owning tribes either fresh or, preferably, slightly sour, and forms the basis of the diet at the dry season camps. When sufficient milk is available it may be churned in a gourd and used for making clarified butter which is consumed locally. It is very rare for milk or milk products to be disposed of outside the immediate family circle. In times of grain famine the cattle may be bled from the jugular vein and the blood mixed with milk which is boiled to form a " porridge " (McLaughlin, E. A., *Personal Communication*).

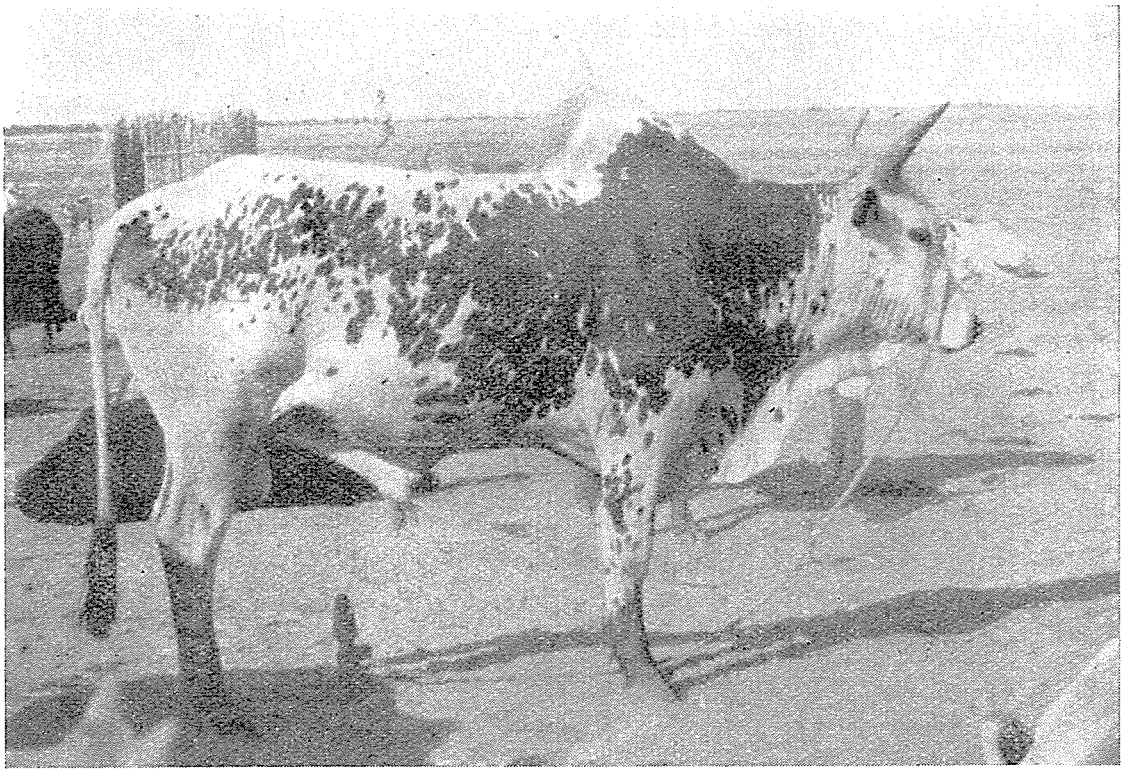
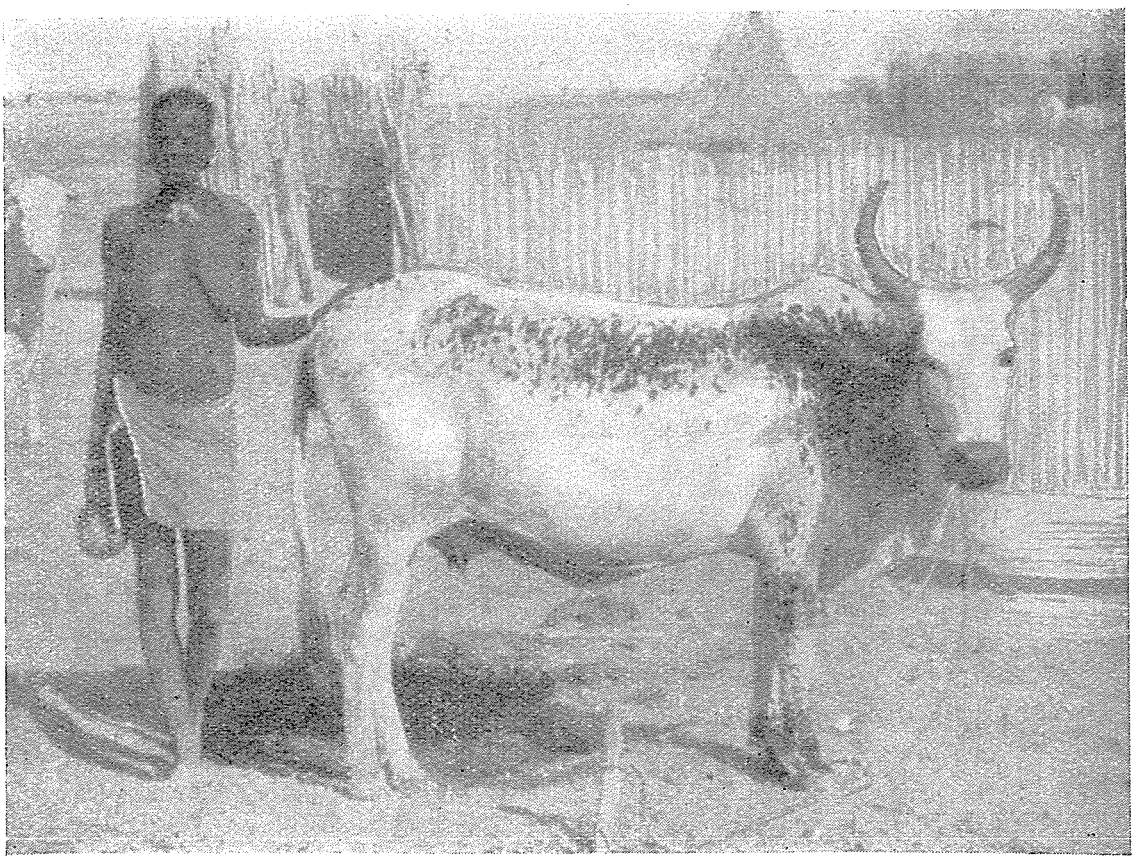


FIGURE 64. *Nilotic "Nuer" bull, Eastern Nuer district, Upper Nile Province, Republic of the Sudan.*

FIGURE 65. *Nilotic "Nuer" cow, Eastern Nuer District, Upper Nile Province, Republic of the Sudan.*

Courtesy of E. A. McLaughlin



Physical characteristics of the breed

Nilotic cattle (Figures 64 and 65) are of an undifferentiated type which has developed as a result of a form of natural selection under the difficult conditions imposed by an environment dominated by seasonal and prolonged flooding and the prevalence of insect pests. They are of medium size, long in the leg and generally tend to be lacking in spring of rib and depth of chest.

There is a tendency for cattle in the east of the area to be of greater size and superior conformation than those in the west. This differential has been associated with superior fertility of the pastures in the eastern districts and a more level supply of grazing throughout the year.

The head is of moderate length. The face is lean and the profile is normally straight with a variation between slightly convex and slightly concave. The horns spring from a concave poll on well-developed pedestals, and are lyre-shaped, growing in an outward and backward, then upward, inward, and forward direction, with the tips inclined backwards. The size of the horns varies greatly. In the southern parts of the area — in Bor district and the Aliab valley — horns tend to be immense, with the diameter of the horn at its base 20 cm. and its length up to 152 cm.; elsewhere horns tend to be of medium length and do not normally exceed 30 to 40 cm. in length. The largest horns appear to occur in the castrated male, although cows with very large horns can be seen in the south. Bulls generally have horns of medium length which often terminate in very sharp points. Polled animals occur throughout the Nilotic area. In the northern part of the area loose unattached horns are seen. It is noteworthy that this anomaly is common among Northern Sudan short-horned zebus and its occurrence among Nilotic cattle in places contiguous with districts in which the Northern Sudan shorthorned zebu is the cattle type may be due to an exchange of genetic material across the type boundary. The ears are of moderate size and are held horizontally.

The hump is muscular and cervical to cervico-thoracic in position. It is of small to moderate size in the female and castrated male, but in the bull it is sometimes of considerable size and may lean over slightly to one side.

The topline rises from the withers to the rump and tends to be more or less sharply ridged. The rump is of moderate length and slope and the sacrum is less accentuated than in Northern Sudan zebus. The dewlap is fairly well developed and may be about 25 cm. deep, while the umbilical fold in the female is about 25 to 30 cm. long and up to 23 cm. deep (SDIT, 1955).

Coat coloration shows great variation and includes almost every possible combination of colors, including white, gray, dun, brindle roans, whole reds, browns and blacks and patterns of these colors, singly or in combination, on a white ground. Lighter areas around the eyes and muzzle are common. Whites and grays are most common in the extreme south of the area in the Bor and Aliab districts, while in the northeast, in the Eastern Nuer district, red spotting on the flanks of an otherwise white animal occurs. The skin is moderately loose. Its pigmentation is generally fairly dark but tends to be intensified in animals of light coat coloration.

The average liveweight of 52 mature cows at Malakal Government Dairy in 1954 was 254 kg. and the average liveweight of 10 steers, approximately 3 years old, was 240 kg. The average birthweight of calves is reported to be about 30 kg.

The average height at withers and heart girth measurement of Nilotic cows at Malakal Dairy in 1954 were 115 cm. and 162 cm. respectively (SDIT, 1955; McLaughlin, E.A., *Personal Communication*). Liveweights and measurements of Nilotic cattle are given in Tables 82, 83 and 84.

Functional characteristics of the breed

Nilotic heifers calve for the first time at between 3 and 4 ½ years of age. The calving interval between subsequent calves under tribal conditions is estimated to be between 1 and 3 years, and the productive life of a cow is variously estimated to be between 4 and 12 lactations. A bull is first used for breeding at about 3 years of age and the period during which it remains in the herd is reported to be about 4 to 6 years. While some calves are born in every month of the year, the majority of calvings are reported to take place between October and early January from services when the cows are grazing on the *toich* between January and April.

Nilotic cows are capable of only small milk yields. It has been estimated that under tribal conditions average daily yields are in the neighborhood of 4 to 5 lb. of milk from a cow that is suckling her calf twice daily at milking time. Very exceptional cows are said to give 11 to 14 lb. during the first 20 days after calving as well as feeding a calf. At Malakal Government Dairy, in 1953-54, the average yield of 47 cows, which were also suckling their calves was 896 liters in 263 days (SDIT, 1955). In 1950-51 the average yield of all cows at the dairy was 1,230 lb. of milk in 37 weeks with calf suckling (Sudan Veterinary Service, 1951).

TABLE 82. – AVERAGE MEASUREMENTS OF NILOTIC CATTLE IN UPPER NILE PROVINCE

	Male			Female			Ox
	1 year	2 years	mature	1 year	2 years	mature	
Weight, kg.	55	130	350	55	130	225	380
Length from shoulder point to pinbone, cm.	53	76	94	53	76	96	99
Height at withers, cm.....	81	102	122	81	102	108	131
Depth of chest, cm.	—	—	—	—	—	—	—
Width of hips, cm.	15	25	36	15	25	36	38
Heart girth, cm.	89	132	165	89	132	155	179

SOURCE: Jack, J. D. M., *Personal Communication.*

TABLE 83. – AVERAGE MEASUREMENTS OF NILOTIC CATTLE IN EASTERN BAHR EL GHAZAL PROVINCE

	Male			Female	Ox
	1 year	2 years	mature	mature	
Weight, kg.	70	130	300	220	300
Length from shoulder point to pinbone, cm.	66	74	102	99	114
Height at withers, cm.	88	102	127	125	151
Depth of chest, cm.	48	60	75	73	83
Width of hips, cm.	21	22	44	38	55
Heart girth, cm.	104	120	152	145	185

SOURCE: Jack, J. D. M., *Personal Communication.*

TABLE 84. – AVERAGE MEASUREMENTS OF NILOTIC CATTLE IN WESTERN BAHR EL GHAZAL PROVINCE

	Male			Female	Ox
	1 year	2 years	mature	mature	
Estimated weight, kg.	60	120	280	180	280
Length from shoulder point to pinbone, cm.	63	70	100	84	104
Height at withers, cm.	95	108	138	110	136
Depth of chest, cm.	41	50	70	59	63
Width of hips, cm.	22	29	42	36	48
Heart girth, cm.	110	123	165	142	160

SOURCE: Jack, J. D. M., *Personal Communication.*

The meat from Nilotic cattle is generally considered to be superior to that of Northern Sudan cattle. Considerable quantities of meat are consumed by the Nilotes, and it is probable that almost every beast is eventually eaten. The dressing percentage of Nilotic steers is reported to be about 50 percent.

Nilotic bulls and steers can be trained for draft work in which they are docile but slow. On a government station where they are used they are first put to work at 6 years of age, have a useful working life of about eight years and are not normally required to work for more than four hours a day.

Nilotic cattle are susceptible to the main epizootic diseases of the area — rinderpest and contagious bovine pleuro-pneumonia — which in the past have been an effective means of preventing any substantial increase in the cattle population. Rinderpest has been effectively controlled by prophylactic vaccination, but contagious bovine pleuro-pneumonia still causes quite large losses. The cattle are tolerant of the locally prevalent strains of foot-and-mouth disease, although a chronic form exists which causes the affected animal to develop a rough, thick coat and a characteristic form of respiration, and is responsible for the name of " panters " which is applied to animals with this condition. Anthrax occurs sporadically. Trypanosomiasis is widespread, particularly in Bahr el Ghazal Province where the cattle graze in the wooded ironstone country during the rains, but has been successfully controlled in much of the area by the veterinary authorities (Jack, J. D. M., *Personal Communication*; McLaughlin, E. A., *Personal Communication*).

Performance in other areas

Nilotic cattle have been taken into the wooded tsetse country in the southwestern Sudan where a herd of slaughter cattle has been maintained at Nzara in Equatoria Province. When protected by a trypanocidal drug they remained in good health for the short period that elapsed before their slaughter.

Sources of breeding stock and information regarding the breed

It has been estimated (SDIT, 1955) that there were about 2,000,000 cattle of this type in the three provinces of the southern Sudan in 1954.

Government dairy herds, largely composed of Nilotic cattle have been maintained at Malakal in Upper Nile Province, and at Wau and Yirrol in Bahr el Ghazal Province.

Further information regarding Nilotic cattle can be obtained from the Director, Department of Animal Production, Ministry of Animal Resources, Khartoum, Republic of the Sudan.

NIOKA

Origin

The Nioka cattle have developed from the interbreeding of the Ankole (Bahima, Sanga type) and the Lugware zebu. They are reported to be an established type.

Conditions in the native home of the breed

Location, topography and soils

The type is localized in the broken plateau area of the Haut-Ituri, Nioka, Mahagi, and Djugu regions in the Eastern Province of the Belgian Congo. The altitude of the area varies from 5,000 to 6,000 feet.

Nioka Station, where the Belgian Congo authorities maintain a breeding herd of Nioka cattle, has an elevation of 5,500 feet and is situated at 30° 22′ east longitude and 2° 2′ north latitude.

The soils in the area are of granitic origin. They are generally clayey sand and rocky in texture and are of poor fertility.

Climate

The climate is characterized by two rainy seasons. In spite of the relatively high altitude maximum temperatures throughout the year are above 30° C. The nights are cool and at times chilly and foggy. The variation between day and night temperatures is great. November to January are comparatively dry months. Humidity is high throughout the year. Some meteorological data for Nioka Station are summarized in Table 85.

TABLE 85. – CLIMATOLOGICAL DATA FROM THE INEAC STATION AT NIOKA

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Mean maximum temperature, °C.	34	34	32	34	32	31	30	29	32	33	30	30	31.8
Mean minimum temperature, °C.	7	7	9	11	9	9	8	8	8	9	10	8	8.6
Mean temperature, °C.	19.8	19.6	20.0	20.2	19.6	18.6	17.9	18.3	18.9	19.1	19.2	19.4	19.2
Mean rainfall, mm.	17	91	92	126	117	98	113	148	151	116	72	52	1 193

SOURCE: Veterinary Service of the Belgian Congo, *Personal Communication*.

Vegetation

Hyparrhenia cymbaria, *Loudetia arundinacea* and *Digitaria abyssinea* are among the more important grazing grasses, as well as species of *Cymbopogon* and *Afronardus*. The grasses grow rapidly during the rainy seasons but become woody during the drier months.

Management practices

The cattle are maintained on pastures throughout the year. During the rainy seasons when grass is abundant the cattle thrive well, but during the drier months when there is scarcity of feed they lose weight. There are no extensive movements of cattle in search of better pastures. The cattle are grazed during the day, but are kept in an enclosure during the night for protection against wild animals.

Physical characteristics of the breed

Variation in the general conformation of the Nioka cattle (Figures 66 and 67) is due to the mixture of two distinct parental types; the Sanga type Ankole and the Zebu type Lugware. The formation of the hump, for instance, varies from the rudimentary to a prominence similar to that of the zebu. They are, on an average, compact medium-sized animals. The bones are dense and the hoofs are strong. The formation of the horns varies considerably. The usual coat colors are brown, brown and white, and black. The skin is soft and pliable. The pigmentation of the skin is dark. The dewlap is fairly well developed. The hairy coat is short and of medium softness.

Data on certain body measurements are summarized in Table 86.

TABLE 86. – DATA ON CERTAIN BODY MEASUREMENTS OF NIOKA CATTLE MAINTAINED AT THE INEAC STATION, NIOKA, BELGIAN CONGO

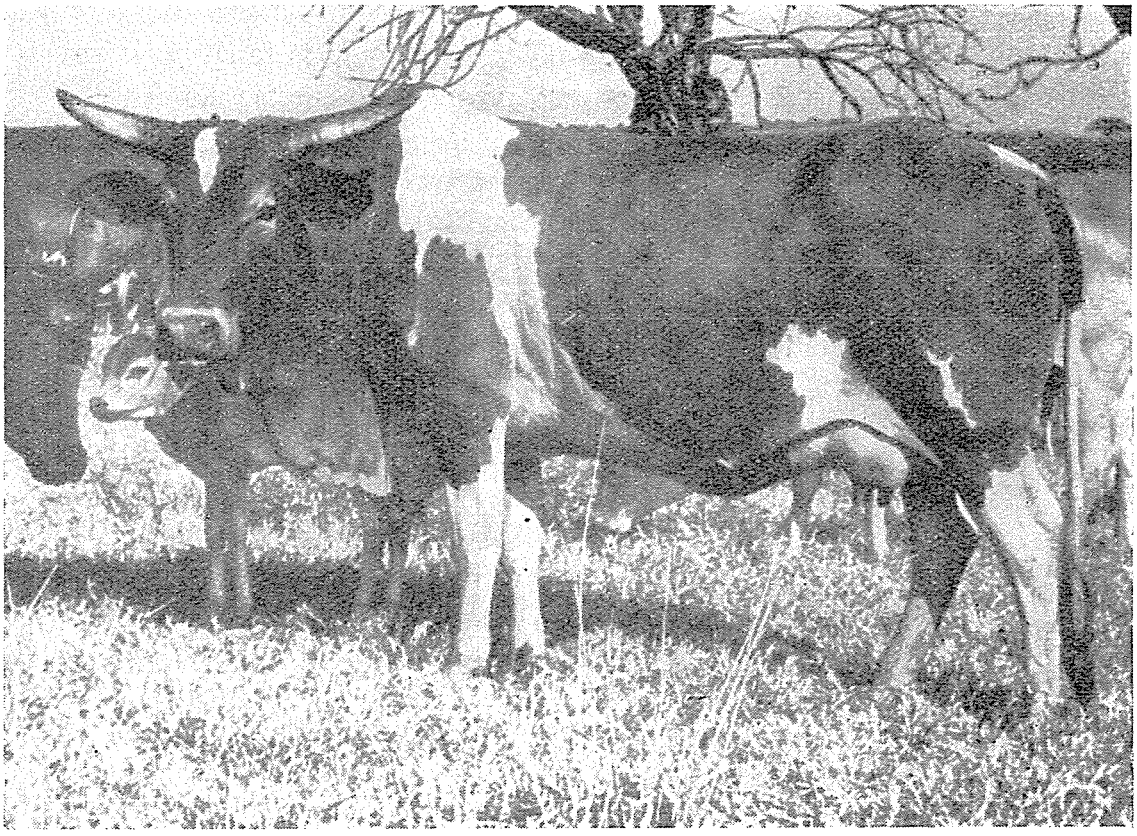
	1 year	2 years	Mature
Weight, males, kg.	152	231	540.00
Weight, females, kg.	152	212	343.00
FEMALES			
Height at withers, cm.	—	—	116.12
Depth of chest, cm.	—	—	61.80
Width at hips, cm.	—	—	40.40
Heart girth, cm.	—	—	159.20

SOURCE: Veterinary Service of the Belgian Congo, *Personal Communication*.

FIGURE 66. *Nioka bull.*

FIGURE 67. *Nioka cow.*

Courtesy of R. Druet



Functional characteristics of the breed

Nioka cattle are utilized for the production of milk and meat. They thrive well on the pastures available in the area and produce excellent beef. The females calve for the first time at from 41 to 48 months of age. The average calving interval is about one year. The average number of lactations during a normal lifetime is 9. The average daily milk production in a lactation period of 240 days has been 2.98 liters.

The males are put to service when they are 32 to 36 months old. They are fairly quick at service.

The Nioka cattle show good adaptability to fattening on grasslands. They are generally slaughtered at about 3 years of age when they weigh about 330 kg. The dressing percentage is about 50.

Sources of breeding stock and information regarding the breed

It is estimated that there are over 45,000 Nioka cattle in the region.

Further information regarding the type may be obtained from:

The Provincial Director of Veterinary Services, Eastern Province, Stanleyville, Belgian Congo.

The Director of INEAC (Institut national pour l'étude agronomique du Congo belge), Nioka Station, Nioka, Belgian Congo.

NGANDA

Origin

The Nganda cattle had their origin in the crossing of the Sanga type Ankole and the Bukedi zebu of Uganda. Crossbred strains occur alongside the pure parent types in those areas where the parent types exist. The cattle type is not stabilized on account of constant intermixtures with either of the parent types, and it may, therefore, not yet be sufficiently well established to justify classification as a breed. Strains are observed in which either the Ankole or the Bukedi zebu characteristics are predominant. The crosses in which the Ankole strain predominates have a very rudimentary hump. It is reported by the Director of Veterinary Services, Uganda, that the majority of these cattle breed reasonably true to type, although exact data are not available. On account of its producing qualities, which are higher than those of other local types, it is liked by the farmers. Nganda cattle are numerous in Buganda Province and in central Uganda.

Location, topography and soils

The area occupied by the Nganda cattle lies on the northern side of Lake Victoria in Uganda. It is part of the lake basin and is characterized by flat-topped hills of uniform height. The average elevation varies from 3,000 to 6,000 feet above sea level. The valley bottoms are occupied by swampy streams.

The soils on the top of the hills are gray in color and well supplied with nutrients. The soils on the slopes are red earths. These red soils grade into sandy soils around the edges of the swamps. The swamps usually have black soils of poor drainage.

Climate

The area occupied by the Nganda cattle is situated on the equator. The climate is, on the whole, equable and pleasant. There are two rainfall periods, one from March to May and the other from October to December. The high plateau land and hill ranges as well as the valleys and swamps locally modify the climatic conditions.

Average climatological data for Entebbe are summarized in Table 87. Figures illustrating the degree of cloud at Entebbe in the different months of the year are given in Table 88.

TABLE 87. – CLIMATOLOGICAL DATA FOR ENTEBBE (ALTITUDE 3,878 FT.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Mean maximum temperature, °F.	80.9	80.3	78.7	78.6	77.4	77.3	76.3	77.2	78.4	79.4	80.1	78.9	70.3
Mean minimum temperature, °F.	63.8	64.0	63.7	64.7	64.8	63.5	61.9	62.1	62.5	63.0	63.3	62.9	63.4
Humidity at 08.30 hrs., %	83	81	84	85	86	84	86	86	85	81	81	83	83.8
Humidity at 14.30 hrs., %	63	64	69	71	71	70	71	71	69	67	65	67	68.2
Average monthly rainfall, in.	2.74	3.58	6.35	9.93	9.67	4.76	3.38	2.80	2.92	3.92	4.56	4.52	59.13

SOURCE: Waller, 1940.

TABLE 88. – FURTHER CLIMATOLOGICAL DATA FOR ENTEBBE

Time of day	Mean cloud (tenths of the sky covered)											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
08.30	7	8	8	9	9	8	7	7	7	8	8	7
14.30	6	7	7	7	7	7	7	7	7	7	7	7

SOURCE: Kendrew, 1953.

Vegetation

Under the prevailing climatic and soil conditions grasses grow rapidly and luxuriantly. Elephant grass (*Pennisetum purpureum*) is the dominant species in the grazing areas. Spear grass (*Imperata cylindrica*) and *Digitaria scalarum* occur when there is overgrazing. *Hyparrhenia* spp. and *Cymbopogon afronardus* are common on dry rocky hillsides in this zone. On very swampy ground, where elephant grass does not flourish, it is replaced by *Eragrostis* spp. It has been reported that farmers in Buganda Province readily adopt improved pasture management practices. Supplementary feeding of cattle includes raw cassava, banana peelings and leaves, sweet potatoes, maize, millet, cottonseed and beans.

Management practices

The normal farmer's herd in Buganda Province includes from 20 to 50 cattle. Nowadays cattle seldom travel long distances to pasture but utilize whatever grazing is available in the vicinity of the homestead. Biting flies (*Stomoxys* spp.) are the cause of great distress to the cattle in the grazing areas. As a protective measure, the cattle are generally kraaled during most of the day, only being allowed out to pasture for short periods in the morning and evening, so that the daily grazing time tends to be restricted below that which would be necessary for an adequate intake of nutrients by the animals. The calves, which are housed separately, receive besides grazing, chopped elephant grass and any other feeds which may be available on the farm.

The calves are not weaned from their dams, but on account of the cash value of milk, are often almost starved. This greatly retards their growth and the mortality among the calves is very high.

Physical characteristics of the breed

The Nganda cattle (Figure 68) are medium-sized and compact, with deep bodies. The hump is rudimentary except in those animals which may have a greater proportion of zebu breeding. The coat colors usually found are reds of varying shades, red and white, black and white, and gray. Both horned and polled cattle occur in the herds. The hoofs are strong. The dewlap is fairly well developed but the umbilical fold and sheath are not strongly marked. The skin is of medium thickness and the coat is smooth.

Average weights of cattle born during the years 1948-1952 at the Livestock Experimental Station, Entebbe, where a herd of polled Nganda cattle is maintained, are given in Table 89.

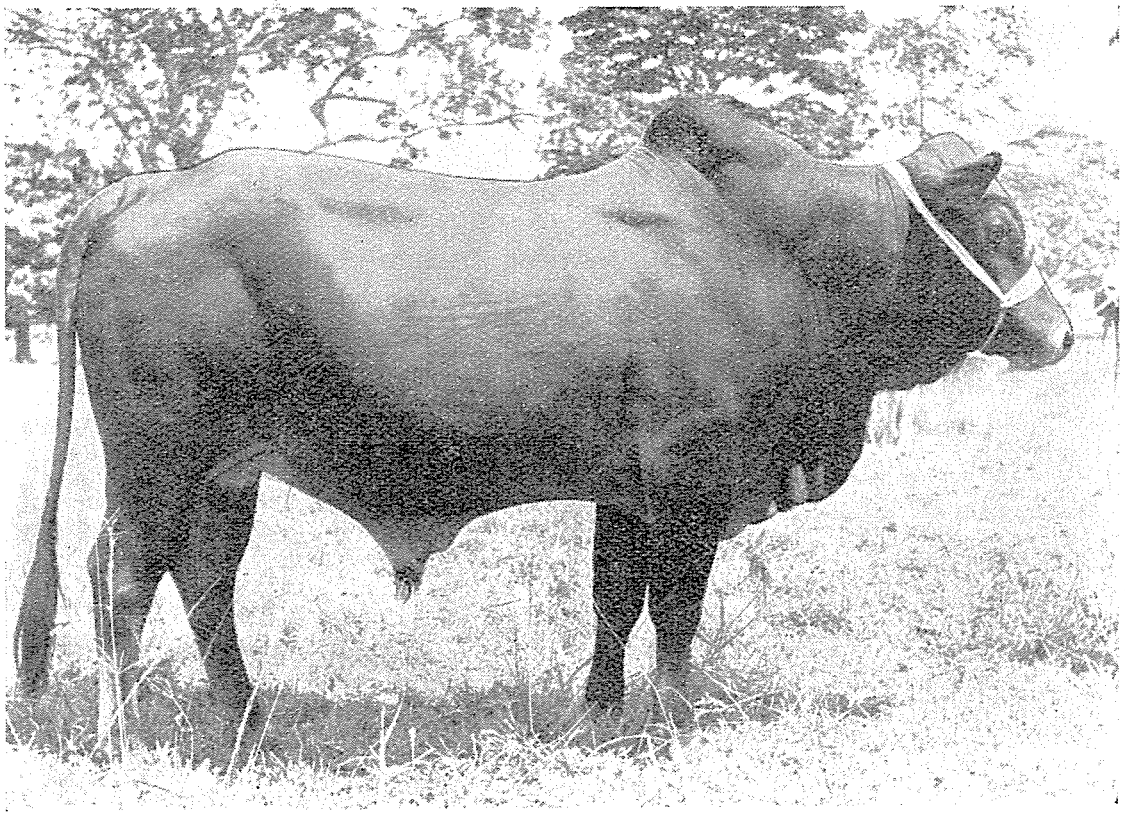


FIGURE 68. *Nganda cattle.* [above] *Bull. Birthweight, 44 lb., liveweight at 72 months, 1,000 lb;* [below] *Cow. Average milk yield of 6 lactations, 383 gallons milk, containing 225.5 lb. butterfat.*

Courtesy of R. N. Sanders

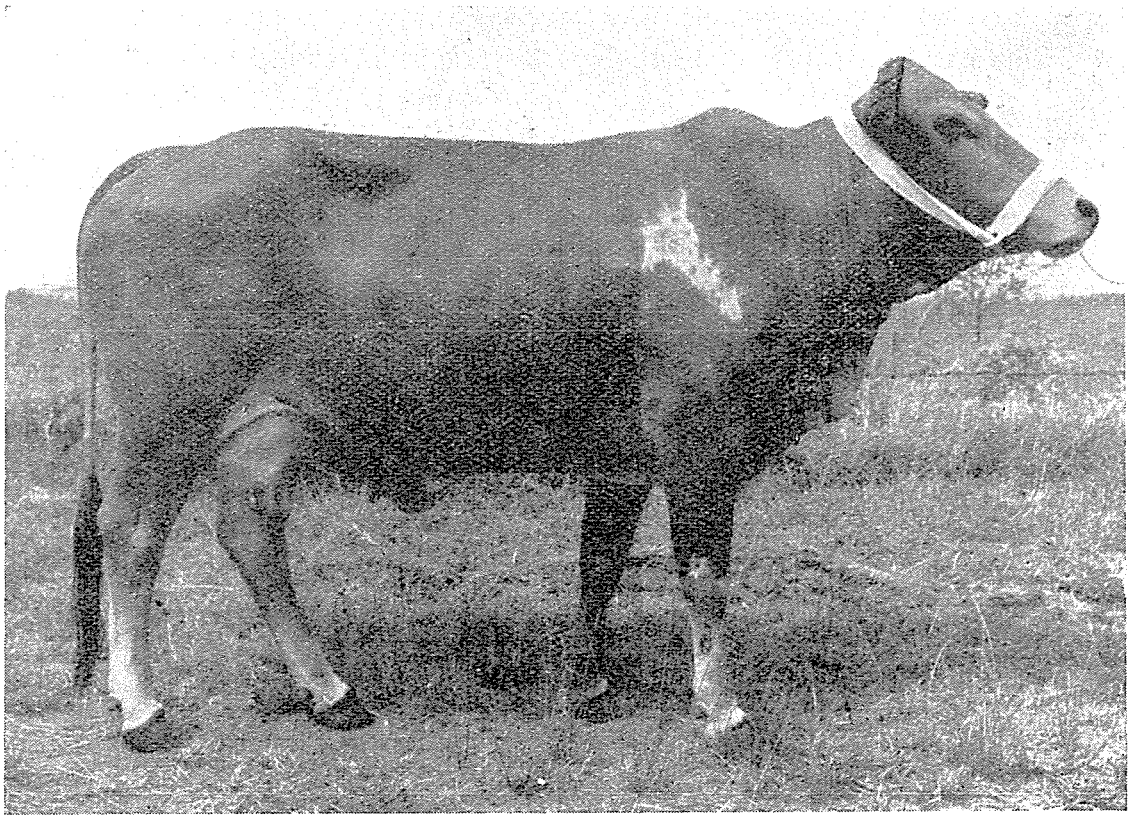


TABLE 89. – WEIGHTS OF NGANDA CATTLE IN DIFFERENT AGE GROUPS

	Average birth-weight,	6 months	12 months	18 months	24 months	30 months	36 months	42 months
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
Male	42.5	172.4	278.5	319.8	385.9	492.9	558.0	623.0
Female	40.9	165.9	257.1	308.0	390.0	466.0	523.2	601.9

SOURCE: Uganda Protectorate, 1953.

Functional characteristics of the breed

Nganda cattle are used for the production of both milk and beef. Castrated males are used for draft purposes. The Nganda is reported to show superior productivity to either the Ankole or the Bukedi zebu.

Nganda heifers calve for the first time at an average age of 45 months.

Average milk production records of Nganda cows maintained at the Livestock Experimental Station, Entebbe, are summarized in Table 90.

TABLE 90. – RECORDS OF MILK YIELDS OF NGANDA COWS AT ENTEBBE

Year	No. of cows in the herd	No. of completed lactations	Milk yield, lb.	No. of days in milk	Calving interval, days	Range in milk yield	
						min., lb.	max., lb.
1949	28 [1]	15	2 100	247	385	1 148	2 930
1950	31 [1]	24	2 345	298	377	1 457	3 727
1951	27 [2]	17	2 091	281	375	1 420	3 779
1951	21 [3]	19	2 842	272	401	1 409	3 809
1952	30 [2]	26	1 927	262	374	561	4 108
1953	18 [3]	16	2 705	272	395	1 869	3 993

[1] Cows milked with calves suckling and cows completely milked; 800 lb. added as the milk estimated to be taken by the calf.
[2] Cows entirely milked without calves.
[3] Cows suckling calves at milking; 900 lb. added to the yield.
SOURCE: Uganda Protectorate, 1953.

Sources of breeding stock and information regarding the breed

Information regarding the Nganda cattle type can be obtained from the Director of Veterinary Services, Uganda Protectorate, Entebbe, Uganda.

TONGA

Origin

The Tonga cattle are of the Sanga type and appear to be similar to the smaller Mashona cattle of Southern Rhodesia and the Nguni of Swaziland and Zululand (Walker, C.A., *Personal Communication*). They are also known as Baila or Mashu Kulumbwe. They are smaller in size and have shorter horns than some other Sanga cattle types.

Conditions in the native home of the breed

Location, topography and soils

Tonga cattle are found in a roughly rectangular area following the railway from Livingstone to Broken Hill, extending on the south and southwest to the Southern Rhodesian border from Nyarukanza to Kazungula, and on the northwest to a line running from Broken Hill through Namwala to Kazungula. The area is situated approximately between 25° and 30° east longitude and between 15° and 18° south latitude.

The altitude varies from 2,000 to 4,000 feet above sea level. The main soil types prevailing in the area are derived from granitic parent material with a preponderance of Kalahari sand.

TABLE 91. – CLIMATOLOGICAL DATA FOR MAZABUKA

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Mean maximum temperature, °F.	81.8	79.4	80.7	82.4	79.1	73.0	78.5	82.0	85.5	92.8	87.1	85.6	82.3
Mean minimum temperature, °F.	76.4	66.6	62.6	64.4	57.7	55.1	51.6	57.2	62.3	77.0	70.4	68.3	63.4
Humidity, % ..	95	94	86	86	87	83	81	83	87	87	89	93	87.6
Rainfall, in. ...	3.02	12.25	2.61	0.24	0.01	—	—	—	0.01	0.17	5.25	9.54	33.1

SOURCE: Meteorological Department of Northern Rhodesia.
Average for 10 years.

Climate

Temperature rises rapidly during the months of September and October and even the nights are sometimes warm and oppressive. The heat is occasionally relieved during the month of November by thunderstorms, which become more frequent as the rainy season

approaches. November to April are rainy months. During winter months night temperatures are apt to be low. Frosts occur quite frequently in the valley areas of the Zambesi and Kafue. The climates of Rhodesia and Nyasaland, according to the Thornthwaite classification, have been reported by Howe (1953), who may be referred to for further details.

Climatological data for Mazabuka are summarized in Table 91.

Vegetation

More than half of the total land surface is covered with open woodland and savannah, important to the native inhabitants as the basis of various systems of shifting cultivation. The main agricultural crops in these areas are maize, millets, groundnuts, cowpeas, beans and cassava. By-products from these are utilized for stock feeding. In the riverine grazing areas species of *Paspalum* and *Eragrostis* are common. Other important grasses are species of *Hyparrhenia*, *Setaria* and *Urochloa* (Trapnell *et al.*, 1947).

Management practices

Cattle husbandry in this area is seldom closely related to the growing of crops. The herds are semi-nomadic. During the wet season (from December to July) when the cattle are near the villages, the Batonga tribesmen keep them closely herded to prevent their trespassing on food crops. On the conclusion of the rains the cattle move away from the villages and cultivated land, following the receding flood of the Kafue river. When on the exposed flood plain they are not closely herded but are allowed to graze freely on the open range. The cattle remain on the dry season grazing from August to December.

As is usual in much of Africa, the number of cattle possessed by a man is regarded as the outward sign of his wealth and standing in society.

Calves are allowed to suckle their dams throughout the lactation, and only a few cows are milked to provide the family with its requirements of fresh milk and its products, such as fermented milk.

Physical characteristics of the breed

Tonga cattle (Figures 69 and 70) are medium-sized, relatively straight-backed animals of " Sanga " conformation. The head is long and the profile straight. The slight prominence of the orbital arches lends a degree of concavity to the forehead. The neck is short and the dewlap is of only moderate development. The cervico-thoracic, muscular hump

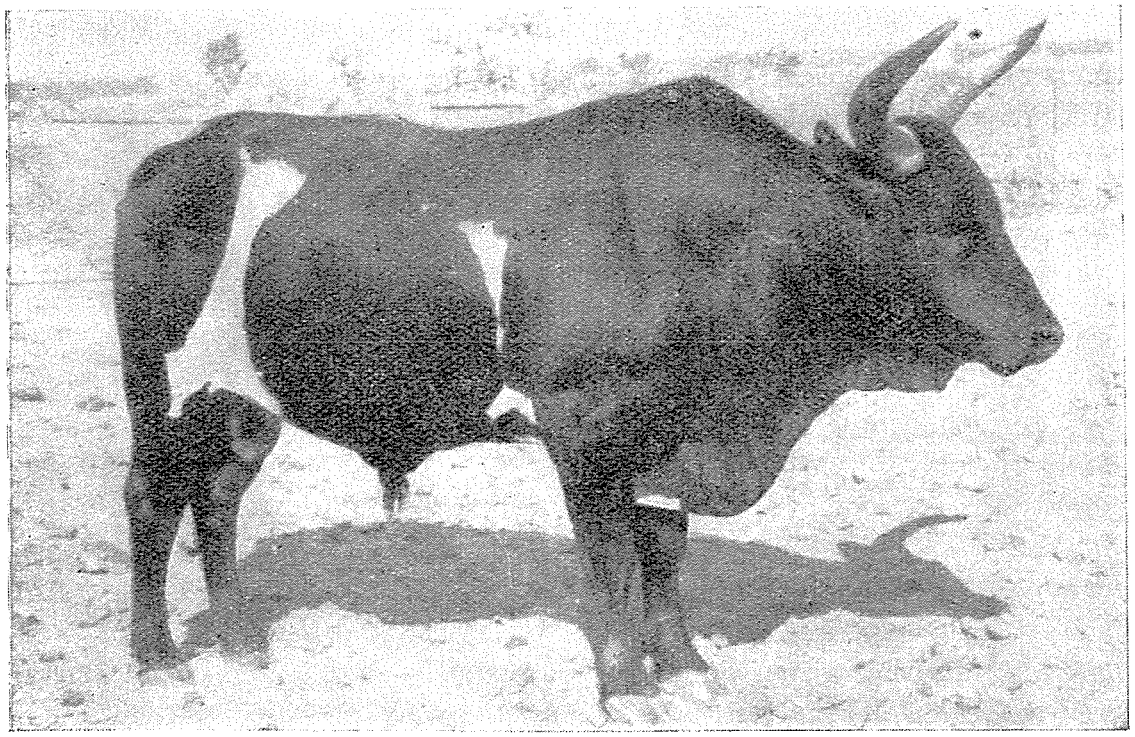
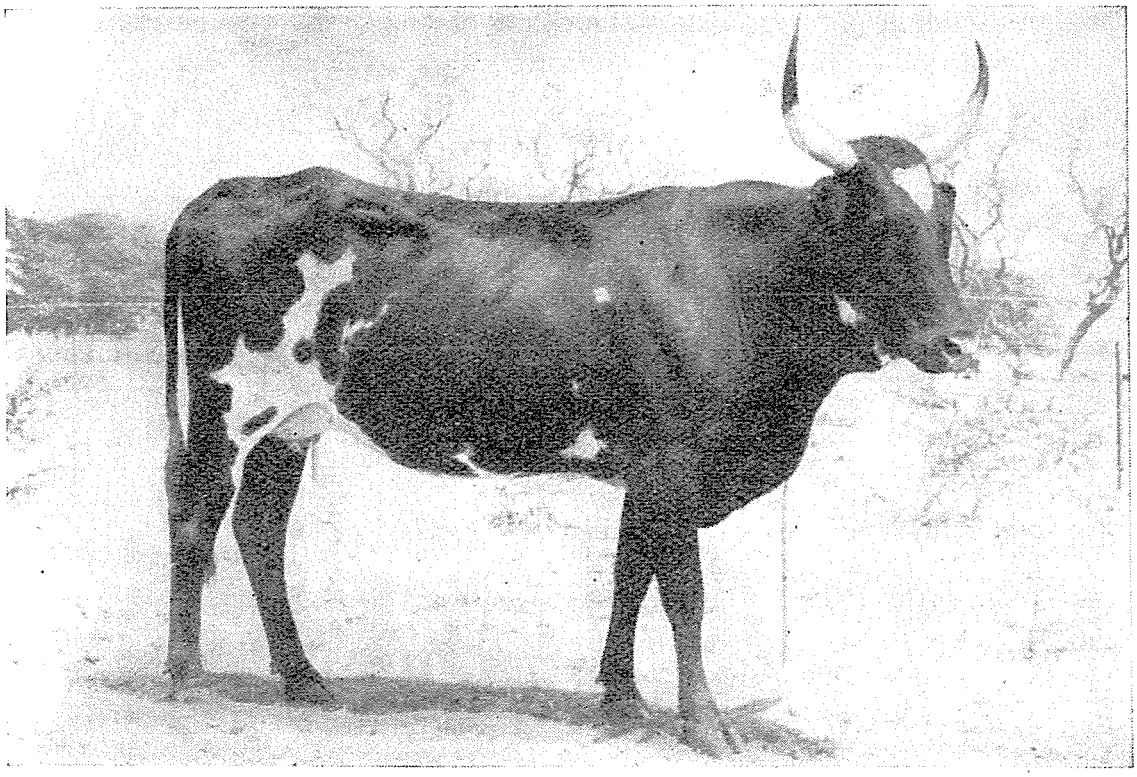


FIGURE 69. *Tonga bull.*

FIGURE 70. *Tonga cow.*

Courtesy of J. G. Black



is vestiginal in the female but of medium size in the male. The topline is relatively straight from the withers to the hindquarters, which are of only moderate slope. The sacrum is slightly prominent. The body is of moderate depth and the underline tends to rise from front to rear. The lack of depth of the body together with the relatively long limbs gives the animal an appearance of legginess. The hoofs have been reported to be very durable. The most usual coat colors are red, black, and pied with red or black. Whole white is rare. The skin is darkly pigmented, loose and of medium thickness. The hair is short and close.

Average liveweights of Tonga cattle in the Mazabuka herd, the foundation animals of which had been drawn from the Namwala district, were: male and female calves at birth, 48 and 40 lb. respectively; 1-year-old males, 245 lb.; 2-year-old males, 560 lb.; mature bulls, 1,100 lb.; and mature oxen, 1,050 lb. (Walker, C. A., *Personal Communication*). Some liveweights and measurements of Tonga cattle are given in Table 92.

TABLE 92. – AVERAGE LIVEWEIGHTS AND MEASUREMENTS OF TONGA CATTLE

	Male			Female		
	1 year	2 years	2 years, 9 months	1 year	2 years	2 years, 9 months
Liveweight, lb.	343	588	798	259	476	672
Length from shoulder point to pinbone, cm.	—	135	135	—	127	138
Heart girth, cm.	—	160	189	—	141	158

SOURCE: Black, J. G., *Personal Communication*.

Functional characteristics of the breed

The Tonga is used as a general-purpose animal and is reported to be hardy and to have high heat tolerance. The cows are occasionally milked by the native tribesmen, although usually the calves are allowed all the milk. They are not used extensively for beef production, only the old and decrepit animals being slaughtered.

The females calve for the first time when they are a little over 3 years old. There is no fixed breeding season and calvings occur throughout the year, although the largest drop of calves is from August to March. The average calving percentage in the breeding herd at Mazabuka has been about 59. The males are allowed to serve from about 2 years of age; only males which are used for work are castrated. Tonga

cattle are slow but steady draft animals and are used for all kinds of haulage, using sleds or carts, as well as for field work. From limited data reported from the experimental herd at Mazabuka it has been observed that at 5 years of age they weigh about 1,100 lb. and are ready for slaughter. The dressing percentage has been reported to be 53.6, the proportion of bone in the carcass being 15.2 percent. The type is reported to be moderately susceptible to ticks and lice infestation and to foot-and-mouth disease (Walker, C. A., *Personal Communication*).

Records of performance of the Tonga herd at Mazabuka Government Experimental Station are summarized in Table 93.

TABLE 93. – PERFORMANCE RECORDS OF THE TONGA HERD AT MAZABUKA GOVERNMENT EXPERIMENTAL STATION

No. of cows in herd at beginning of each breeding season						Total progeny produced, 1947-52	Total progeny mortality	Corrected liveweight of beef produced - 100 cow unit			Average weight of calves, males and females, lb.				
1947	1948	1949	1950	1951	1952			in 4 years, lb.	in 5 years, lb.	in 6 years, lb.	1 year	2 years	3 years	4 years	5 years
30	29	33	23	63	65	141	26	32 602	59 160	88 611	198	490	610	975	1 165

SOURCE: Northern Rhodesia, 1952, 1953.

Sources of breeding stock and information regarding the breed

It is estimated that there are about 400,000 Tonga cattle in Northern Rhodesia.

Further information may be obtained from the Director, Veterinary Services, Mazabuka, Northern Rhodesia.