MUBENDE

Origins. Part of the Small East African group but said to be specifically selected for its skins.
Distribution. Mainly in the former Kingdom of Buganda in the Mubende district of west-central Uganda and in Masaka district to the south but also elsewhere in higher rainfall areas of Uganda north and west of Lake Victoria.
Ecological zones. Sub-humid highland areas of Uganda, usually with bimodal or a prolonged unimodal rainfall pattern.
Management systems. Agro-pastoral. Animals are tethered or allowed to roam freely, particularly in the non-cropping season. In addition to being reputed producers of skins and meat, goats have important cultural and social functions in the Baganda area and are used in divine healing.
Physical characteristics. Small size. Weight: male 35 kg (up to 51 kg); female 31 kg.
Horns in both sexes although polled animals not uncommon: generally short and carried close to nape of neck. Ears short to medium length, pricked forward and upward. Males and some females bearded. Males have a mane along the length of the back (Figure 44).
Colour, selected, generally black: other colours also occur. Coat short and fine.
Products. Meat; skins.
Productivity.
REPRODUCTION. *First kidding:* 13.5 months on station at Makerere; 567 ± 11.6 (s.e.) days (n=80) on station at Mbarara. *Kidding interval:* 9.6 months at Makerere, 10.6 months at first and 8.5 months at second and third intervals; 297 ± 8.5 (s.e.) days at Mbarara. *Multiple births:* common; 69.0 per cent single, 31.0 per cent twin at Makerere, 86.4 per cent single at first, 50.0 per cent single at second and third parturitions; 68.3 per cent single, 30.0 per cent twin, 1.7 per cent triplet at Mbarara. *Litter size:* 1.4 (n=42) at Makerere. *Lifetime production:* 6 parturitions at Mbarara.

Figure 44 Male Mubende goat at Lweza station, Uganda (photograph by K.L. Okello)

GROWTH. *Birth weight:* 1.22 kg on station at Makerere, single 1.39, twin 1.04, male 1.26, female 1.19; male singles 2.14 ± 0.045 (s.e.) kg (n=538) at Mbarara. *Weight for age:* 4 months-10.3, 12-21.3 kg at Makerere; 2 months-7.4, 5(weaning)-11.9, 12-20.3 kg for male singles at Mbarara. *Average daily gain:* birth-120 days - 75.7, post-weaning-12 months - 44.9 g at Makerere; birth-2 months - singles 86 twins 68, 2-5 - singles 45 twins 40, 5-12 - singles and twins 36 g at Mbarara.
MEAT. *Dressing percentage:* 56.4 for males at live weight of 35.7 kg, 50.7 at 36.0 kg and 44.1 at 28.4 kg for castrates, 54.4 for females at 31.5 kg.
Research. Department of Veterinary Physiological Sciences, Makerere University, P.O.Box 7062, Kampala, Uganda.
References. Trail & Sacker, 1966; Okello, 1985; K.L. Okello, pers.comm.

KIGEZI

Origins. Part of the Small East African group.
Sub-types and races. Sebei and Karamoja types are also recognized in Uganda.
Distribution. South-west Uganda and neighbouring Zaire and Rwanda.
Ecological zones. Warm or hot semi-arid lowlands to sub-humid uplands and cool mountains.
Management systems. Agro-pastoral and agricultural of the Bakiga tribe.
Physical characteristics. Small size 50-60 cm. Weight: 30 kg.
Horns in both sexes. Ears shortto medium length, pricked.
Colour black or grey in Kigezi. Hair long, especially on hindquarters, in Kigezi.
Products. Hair; meat.
Productivity.
MEAT. *Dressing percentage:* males 49.4 at live weight of 30 kg, castrates 52.0 at 28.8 kg, females 51.6 at 30.3 kg.
HAIR. Used for clothing by Bakiga tribe.
References. Okello, 1985.

BORAN

Synonyms. Galla; Somali.
Origins. Part of the Small East African group.
Sub-types and races. In the Somali systems the 'yeygirr' is smaller than the 'deguen' and has short prick ears in contrast to the forward-inclined pendent ears of the latter which is bred by the Muruli clan. Several Somali clan types have names, including Mudugh, Abgal, Benadir and Ogaden.
Distribution. Northern Kenya, southern Somalia and parts of southern and south-eastern Ethiopia.
Ecological zones. Semi-arid bimodal rainfall areas, bordering on arid.
Management systems. Pastoral, agro-pastoral and agricultural.
KENYA COAST. Three agro-ecological zones are recognised, these being the coconut-cassava (1000-1230 mm annual rainfall), the cashewnut-cassava (800-1100 mm) and the livestock-millet (700-880 mm) areas. About 20 per cent of farms keep cattle but about 60 per cent have small ruminants, mostly goats. Of farms with small ruminants, 59 per cent have goats only, 37 per cent goats and sheep and 3 per cent sheep only. Flock sizes are medium averaging 22.8 on farms owning small ruminants, 80 per cent being goats: the ratio of goats to sheep is 8.6:1.0 in the coconut zone and 3.0:1.0 in the millet zone. Goat and sheep numbers (on farms owning) increase from the coconut zone to the millet zone (Table 30). Flock structures are related mainly to meat production: females 73 per cent (51 per cent "mature"); males 27 per cent (11 per cent mature, 1 per cent castrates) (n=18 330); the proportion of males decreases from wetter to drier zones. About 5 per cent of goats are not owned by farmers in whose flocks they are found.
CENTRAL SOMALIA. Rainfall averages 100-250 mm per year and the vegetation is predominently low open thornbush. Animals are herded during the day and penned in thorn enclosures at night, kids separate from adults. Kids are allowed to suckle twice a day after milk for human consumption has been taken off. Bucks run continuously with does to ensure kidding (and a human milk supply) all year round.

Table 30 Small ruminant flock sizes in various agro-ecological zones on the Kenya coast

Agro-ecological zone	Flock size					
	Goat flocks		Sheep flocks		Mixed flocks	
	n	± s.d	n	± s.d	n	± s.d
Coconut-cassava	11.2	8.4	5.3	4.5	18.2	9.6
Cashewnut-cassava	16.6	13.6	8.6	7.9	28.3	18.2
Livestock-millet	32.5	33.5	17.5	18.8	54.4	49.9
Overall	18.8	21.1	11.2	13.6	22.7	27.1

Flock sizes usually *very* large, 9000 flocks averaging 154 head in 11 'degaan' in Bulo Burti district in 1983, in range 52-241 head. About 8 per cent of goats are in multiple-owner flocks. Flock structures, with some very early offtake of males, are related to milk production: females 78.7 per cent

(57.8 per cent breeding); males 21.3 per cent (6.6 per cent breeding bucks, 7.4 per cent mature castrates).

Physical characteristics. Small size 60 cm. Weight: male 30-40 kg; female 25-30 kg. Benadir is slightly larger.

Head fine, muzzle narrow, facial profile convex.

Horns small, usually slender with no marked twist, in about 97 per cent of animals. Ears short to medium, pricked sideways and slightly forwards and upwards (Figure 45). Toggles in about 5 per cent of both *sexes.*

Neck medium length. Chest narrow, girth exceeding withers height by about 10 per cent. Withers (58.1 ± 5.52 (s.d.) cm (n=293) in central Somalia) about same height as sacrum. Back fairly long and slightly dipped. Croup sloping. Legs rather long.

Colour usually brilliant white (> 70 per cent in central Somalia). Some Ethiopian goats from the Ogaden have black spotting or solid black on the head and fore part of the neck: some varieties have a black dorsal stripe. Hair short,shiny, smooth. Skin thin.

Figure 45 Boran or Galla goats at Kiboko National Range Research Station, Kenya

Products. Meat; milk; (skins).

Productivity.

REPRODUCTION. *First kidding:* very late, about 30 months in central Somalia. *Kidding interval:* about 14 months in central Somalia. *Multiple births:* fairly common. *Litter size:* 1.29 (n=108) at Kiboko in Kenya. *Annual reproductive rate:* 1.03 with 8 month mating at Kiboko; in Somalia national statistics indicate range of 0.65 to 0.90 kids per doe per year from 1970 to 1984. *Fertility* (=does kidded/does mated): about 75 per cent at Kiboko. *Fecundity* (=kids born/does present per year): 65 per cent in central Somalia.

GROWTH. *Birth weight:* 3.38 kg (n=139) at Kiboko. *Height for age:* 6 months-13.7, 18-19.2, 30-23.5, 42-25.6, 54-27.7 kg in central Somalia *Average daily gain:* birth-120 days - 82 g at Naivasha.

MILK. *Yield:* almost 1 million tonnes of which 360 000 tonnes used for human consumption from Somali national flock in 1984; in central Somalia does kidding during the rains yield 85 litres in 6 months, those during the

rains 49 litres, of which about 40 and 20 per cent is used for human consumption.
MEAT. Exports of live goats from Somalia varied from 273 000 to 828 000 from 1970 to 1984; internal slaughter in the same period was 1.8 to 3.6 million head.
SKINS. Total production in Somalia of goats and sheep combined varied from 1.54 to 3.84 million pieces in 1970-1984.
Research. National Range Research Station, Kiboko, Kenya.
References. Rakoczi, 1974a; Dahir Mumin, 1986; Bourzat et al, 1988; W. Thorpe, pers.comm.

MASAI

Origins. Part of the Small East African group
Sub-types and races. Goats of very similar type occur throughout much of East Africa and are given tribal or regional names. Gogo in central Tanzania, Arusha and Chagga in northern Tanzania.
Distribution. Kenya and northern Tanzania.
Ecological zones. Semi-arid bimodal rainfall areas, bordering on sub-humid to the west of their range in both Kenya and Tanzania.
Management systems. Pastoral, agro-pastoral and agricultural where they are owned by mainly cultivating tribes, for example on the slopes of Mounts Kilimanjaro and Meru. Often kept in mixed flocks about equally composed of goats and sheep. Both goats and sheep are herded by children by day and penned in thorn enclosures at night with unweaned kids being separated from adults. Flock sizes fairly large to large and average about 190 head on Elangata Wuas group ranch in south-central Kenya. Flock structure is related to meat, fat and milk production: females 66.2 per cent (48.3 per cent breeding); males 33.8 per cent (4.1 per cent entire > 14 months, 6.1 per cent castrates > 14 months).
Physical characteristics. Small size 64 cm. Weight: male 40 kg; female 31 kg.
Head fine, muzzle narrow, facial profile dished or straight (Figure 46). Horns usually present in both sexes: short (10 cm) and fine and sweeping directly backwards, often curved upwards at the tip. In some flocks only about 65 per cent of animals are horned, possibly indicating some out-crossing to exotic breeds. Ears medium length (12-16 cm), slightly pendent, rarely pricked. Males and about 10 per cent of older females have a small beard of rather fine hair: 40 per cent of males under 14 months have beards. Toggles in both sexes in less than 5 per cent of animals. Males have a light or heavier mane extending to the withers or just beyond.

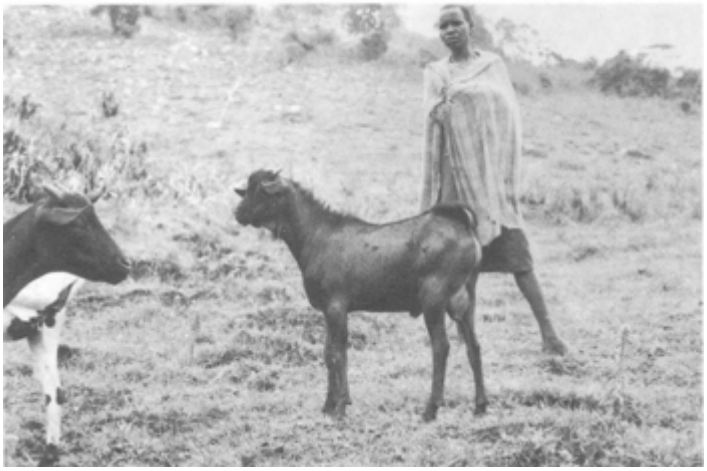

Figure 46 Masai goat of Small East African type in west Mara region, Kenya

Neck fine and medium long. Chest fairly well rounded, girth measuring 10-15 per cent more than withers height (64 ± 3.2 (s.d.) cm (n=239) in females, 73 ± 4.4 cm (n=22) in mature castrates). Withers not prominent and lower than sacrum. Back short and dipped. Croup short and sharply sloping. Legs well proportioned and fleshed.

Colour extremely variable. Coat short and fine in both males and females but with occasional longer hair on the hindquarters.

Products. Meat; milk; fat.

Productivity.

REPRODUCTION. *First kidding:* 556 ± 119.0 (s.d.) days (n=28) on group ranch in south-central Kenya which is very late for a traditional system and due to use of an apron to control breeding (Figure 8); of 211 first kidding dams 12.3, 37.9, 34.1, 13.7 and 1.9 per cent had milk teeth and 1 to 4 pairs respectively of permanent incisors. *Kidding interval:* 306 days at Elangata Wuas group ranch, decreasing with increasing parity, differing in different flocks and also varying with season, intervals being longer following parturitions in long and short rains seasons. *Multiple births:* fairly common. *Litter size:* 1.23, varying with parity and season, litters larger for parturitions in short and long dry seasons. *Annual reproductive rate:* 1.46.

GROWTH. *Birth weight:* about 2.9 kg at Elangata Wuas. *Weight for age:* 10 days-3.3, 550 days-21.8 kg, a growth equation $y=ax^b$ having values of 0.95 and 0.48 for variables a and b respectively. *Average daily gain:* birth-150 days - 49.3, birth-365 - 38.3 g. *Post-partum weights:* 28.0 kg; 23.4 kg at first and 27.5 at fourth and subsequent parities. *Mature weights:* females 30.9 ± 3.99 (s.d.) kg (n=239), range 18-44 kg; castrates 42.2 ± 6.12 (s.d.) kg (n=22) in range 33-53 kg.

Research. Field studies in 1978-1983 by ILCA now discontinued.

References. Wilson, 1978; Wilson, Peacock & Sayers, 1983; 1984; 1985; Wilson & Ole Maki, 1989.

Synonyms. Chèvre commune rwandaise; chèvre commune burundaise.
Origins. Part of the Small East African group.
Sub-types and races. The "types" from Rwanda, Burundi and eastern Zaire are, for all practical purposes, indistinguishable.
Distribution. Rwanda, Burundi and Kivu province of Zaire and extending into southern Uganda and the extreme west of Tanzania.
Ecological zones. Sub-humid east-central African highlands from 1200 m to 2500 m altitude in 800 mm to 1500 mm rainfall zone. Rain falls in two more or less distinct seasons.
Management systems. Agro-pastoral and agricultural. Verging on pastoral in Ankole/ /Bahima areas of eastern and lower areas of Rwanda. Often attached individually to pickets (Figure 47). Some data on the importance of goats in 3 different areas of highland central Africa have been provided in Table 5. Approximately 76 per cent of families own goats, average flock size being 2.95 goats for those owning (2.88 in Burundi, 3.42 in Rwanda and 2.67 in eastern Zaire). Generalized flock structure is related mainly to meat production: females 82.6 per cent (65.7 per cent weaned); males 17.4 per cent (3.7 per cent weaned); 51.3 per cent of all goats in the traditional system have milk teeth only. The estimated total number of goats and sheep (of which probably 75 per cent were goats) in Burundi was 1 313 000 in 1984; total goats in Rwanda were 940 000 in 1983, according to an administrative census (for tax purposes), but a sample agricultural survey at the same time estimated 2.2 million goats. Goats are important sacrificial animals in Rwanda ('guterekera'), killed and eaten following the death of a family member: they are also used as dowry among the Twa of north-west Rwanda, 1 male and 1 female goat being offered by the man to his prospective in-laws.

Figure 47 A Rwanda goat at a picket in the agricultural system near Kigali

Physical characteristics. Small size 64 cm (60-67). Weight: male 35 kg; female 27 kg.

Horns in both sexes: curving outwards and backwards in males, up to 20 cm in length; female horns lighter and scimitar shaped; polled animals very rare. Ears short to medium length, pricked forward and upward. Toggles present in both sexes (- 14 per cent). Most males and some females are bearded. Some males have a top-knot and a mane along the whole length of the spine is almost universal in this sex.
Neck fine and medium length. Chest reasonably well rounded, girth measurement 20-25 per cent greater than withers height. Withers level with sacrum. Back short and straight. Legs normally proportioned in relation to body, front cannon bone circumference about 7-8 cm. Udder rounded and small with short teats.
Colour very variable, whole blacks common but many parti- and multi-coloured animals. Coat is fine and short but a very few males have long hair on the hind legs.
Products. Meat.
Productivity.
REPRODUCTION. *First kidding:* 640 ± 27.8 (s.e.) days (n=205) on station in Rwanda where does born as twins kidded more than 3 months later than those born as singles and females out of older dams kidded younger than those out of junior dams. *Kidding interval:* 343 ± 13.8 (s.e.) days (n=498) on station but this largely due to an imposed breeding season. *Multiple births:* very common; 61.1 per cent single, 37.1 per cent twin, 1.8 per cent triplet (n=221) in traditional system in north of Burundi; 54.6, 42.5, 2.8 and 0.2 per cent single, twin, triplet and quadruplet (n=1340) in large scale traditional study in 3 countries combined; 41.4 per cent single, 58.6 per cent multiple (n=256) under station management in south-east Rwanda. *Litter size:* 1.44 (n=1378 parturitions) in traditional system; 1.75 (n=726) on station, not differing significantly with season but larger litters at older parities were noted. *Annual reproductive rate:* 1.86 on station. *Lifetime production:* most females do not exceed 5 parturitions but up to 12 recorded (Figure 48); average of 2.39 parturitions for 1340 does in large scale traditional system survey.
GROWTH. *Birth weight:* 2.0 kg in north Burundi traditional system; 2.3 kg (n=156) on station in Rwanda. *Height for age:* 3 months-8.5, 6-12.1, 12-19.1 kg in traditional system; 30 days-3.9, 90-8.7, 150-11.1, 240-14.4, 365-19.9 kg on station in Rwanda. *Average daily gain*: birth-3 months - 68, 3-6 - 40, 6-12 - 39 g. *Mature weights:* 2 years-27.7, 3-31.2, 4-33.5, 5-36.4 kg on station in Rwanda.

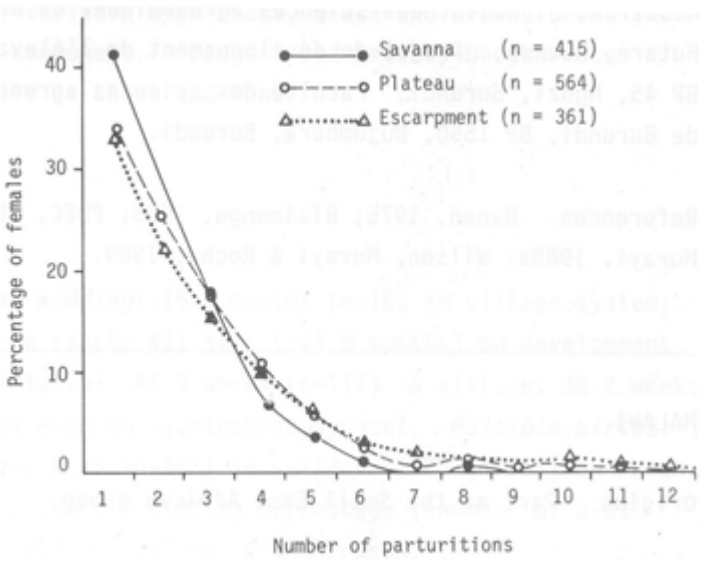

Figure 48 Frequency distribution of reproductive careers of Rwanda/Burundi goats in traditional systems in highland east-central Africa.

MILK. *Yield:* 33-86 kg in 108 days; average production of 380 ml/d for 12 goats on station, best female yielding 780 ml when fed concentrate.
MEAT. Dressing percentage: 52.2 at 18.2 kg live weight. Carcass *composition:* fifth quarter 16.6 and wet hide 7.9 per cent of live weight.
In 1983 a total of 37 800 goats was slaughtered at official abattoirs in Rwanda.
SKINS. Skin exports from Rwanda varied from 203 000 to 435 000 pieces from 1971 to 1975 inclusive, average dry weight being 470 g.
Research. Institut des sciences agronomiques du Rwanda, BP 138, Butaré, Rwanda. Projet de développement de l'élevage caprin de Ngozi, BP 45, Ngozi, Burundi. Faculte des sciences agronomiques, Universite de Burundi, BP 1550, Bujumbura, Burundi.
References. Hanon, 1976; Bizimungu, 1986; PDEC, 1986; Wilson & Murayi, 1988a; Wilson, Murayi & Rocha, 1989.

MALAWI

Origins. Part of the Small East African group.
Distribution. Malawi, but more common in the south than in the north. Estimated population 950 000 in 1988.
Ecological zones. Semi-arid to sub-humid uplands.
Management systems. Agricultural. About 43 per cent of households keep goats around Lilongwe with an average flock size of 9; 60 per cent of flocks are less than 10 animals. Tethering during the day to prevent crop damage is common (93 per cent). Night housing practices vary, some being in the owner's house, some in purpose built sheds, but whatever system is adopted goats are tied individually. Flock structure is related to meat production: females 72.4 per cent (57.1 per cent > 12 months); males 27.6 per cent (7.0 per cent > 12 months).
Physical characteristics. Small size 62 cm. Weight: female 29.1 kg. Head fine. Profile straight or dished.

Horns in both sexes: light and short. Ears pricked.
Neck fine and fairly long. Chest fairly well developed, girth measurement greater than withers height by about 20 per cent. Rump higher than withers. Colour is very variable with black, black and brown, brown and red, and white the commonest. "Badger" and reverse badger face markings occur. Hair is short and fine.

Products. Meat.

Productivity.

REPRODUCTION. *First kidding:* 15.6 months (n=16) in village system; 17.5 months (n=21) on ranch; 451 days (=14.8 months) on development project. *Kidding interval:* 44.9 weeks (n=l17) in village; 35.2 weeks (n=80) on ranch; 254 days on development project. *Multiple births:* common. *Litter size:* 1.35 (n=422) in village; 1.38 (n=152) on ranch; 1.46 on develoment project. *Kidding percentage* (=number of kids born/does exposed): 107 in village; 175 on ranch.

GROWTH. *Birth weight:* 1.76 kg (Table 31). *Height for age:* 280 days-12.2 ± 2.4 (s.d.) kg (n=49) on development project. *Average daily gain:* birth-280 days - 36 ± 8 g on development project. *Post-partum weights:* 29.5 kg (n=421) in traditional system; 28.5 kg (n=151) on ranch.

Table 31 Birth weights (kg) of Malawi kids under various management systems

Type of birth and Sex		System							
		Traditional village			Ranch			Development project	
		n	x	s.d.	n	x	s.d.	n	x
Single									
	male	139	2.0	0.5	45	2.0	0.6	143	2.1
	female	133	1.8	0.5	49	1.9	0.5	137	1.9
Twin									
	male	92	1.7	0.5	57	1.6	0.6	51	1.6
	female	146	1.6	0.5	55	1.6	0.6	47	1.6
Triplet									
	male	2	1.2	0.2	3	1.5	0.0	-	-
	female	4	1.0	0.0	-	-	-	-	-

MILK. *Yield:* 290 g/d over 16 weeks (n=8) fed solely on natural pasture. *Composition:* fat 6.7 per cent; solids-not-fat 9.6 per cent; protein 2.2 per cent; lactose 6.3 per cent.

MEAT. *Dressing percentage:* 52.3 at 25.7 kg live weight for females, 52.7 at 19.6 kg for males, 53.6 at 21.7 kg for castrates. *Carcass proportions:* hindquarter percentage increases with age to 48.4 at 2 years. *Carcass composition:* head 7.2 per cent, liver 2.9 per cent, skin 6.9 per cent, lungs 2.0 per cent, heart 1.5 per cent, testes 2.1 per cent; 66.3/15.9/11.3 per cent lean/bone/fat in 15-24 months males weighing 29.1 kg.

Research. Department of Animal Science, Bunda College of Agriculture, P.O.Box 219, Lilongwe, Malawi.

References. Owen, 1975; Phoya, 1982; Kamwanja, Ayoade & Makhambera, 1985; Kasowanjete, Stotz & Zerfas, 1987; Karua, 1989.