

SMALL GOATS

RED SOKOTO

Synonyms. Chèvre rousse de Maradi.

Origins. One of the Savanna goat group but its relatively small size in relation to these indicates possible crossing with forest or dwarf goats before selection in its present area of distribution. The relatively high prolificity of the Sokoto goat would tend to support a hypothesis that such a fusion has occurred.

Sub-types and races. Outside the main centres of its distribution, the colour varies somewhat and various types are recognised such as Kano Brown, Bornu White, etc. The Buduma goat of Chad appears to be the same variety as the Bornu White.

Haemoglobin variants (3 variants and 5 phenotypes) have been reported to differ from the expected proportions and it has been postulated that these differences are due to differential susceptibilities to helminth infestation.

Distribution. Southern Niger and northern Nigeria between latitudes 12°N and 14°N and longitudes 4°E and 10°E. In Nigeria its main strongholds are in Sokoto and Kano States and in Niger it is commonest in Maradi and Tessoua Departments but its sub-types extend to the west and east. The purebred population is probably about 1 million with a further 2.5 million of similar type.

Ecological zones. Semi-arid areas with a single rainfall season of 4-6 months duration. These areas are cultivated to millet, sorghum and groundnuts. Several species of economic trees (Baobab, *Adansonia digitata*; Shea-butter Nut, *Butyrospermum parkii*; Locust Bean, *Parkia biglobosa*) form an integral part of the agro-sylvo-pastoral system. In Maradi Department most goats are found in the cultivated valleys of seasonal rivers (rainfall 600 mm) which provide a favourable micro-zone with out-of-season crop residues and browse shrubs.

Management systems. Agro-pastoral. Owned mainly by sedentary cultivators of the Hausa tribe or of related Hausa-speaking groups. Often confined within house compounds, either loose or tied to stakes, especially during the crop growing season when they may be zero-grazed. Flock sizes are usually small (< 10 head) but as skins are the main product, the imbalance in the sex ratio between females and males is less marked than in many other systems. In a traditional system in the Zaria area in northern Nigeria 64.6 per cent of families own goats, average flock size being 19.2 in the range of 2 to 70. In the Zaria area flock structures are 79.3 per cent females (45.8 per cent with 1 or more pairs permanent incisors) and 20.6 per cent males (2.2 per cent with 1 or more pairs permanent incisors) with a ratio of breeding males to females of 1.0:19.7,

Physical characteristics. Relatively small size 60 cm (male 60-65 cm; female 54-65 cm). Weight: male 27 kg; female 25 kg. Bornu White is larger, up to 80 cm.

Head fine, forehead prominent, profile rather short and straight or slightly dished, mucous membranes black.



Figure 38 Red Sokoto buck or Chèvre rousse de Maradi at Zugu Sokoto State, Nigeria

Horns in both sexes: short to medium in length, slightly heavier in males but set close together on the skull; rather flattened dorso-ventrally and growing backwards close to the head and neck (Figure 38). Ears short, medium width and usually carried horizontally; rather longer and semi-pendulous in Niger; longer also in Bornu White. Toggles rare. Beard of profuse hair in males but usually often covered with hair which is ^{absent} in females. Forehead longer, bushier and darker in males than in females. Males carry a light mane extending to the shoulders.

Neck short, thin and very mobile. Chest rounded and well proportioned. Withers not prominent. Back of medium length and Croup short. Legs rather short and strong but well muscled both fore and hind. Udder of good conformation, well rounded and with well spaced teats (Figure 39).



Figure 39 Female Chèvre rousse de Maradi straight. at Maradi station, Niger

Colour usually deep red in the Sokoto but lighter and occasionally almost chestnut in the Maradi. A government order promulgated in Niger in 1945 made the culling of spotted females obligatory in parts of Maradi and by

1950 this order had been extended to other Departments including Zinder, Tahoua and Goure: undesirable males were to be castrated before 6 months but animals of the correct type of both sexes could not be slaughtered at less than 18 months. Males are invariably darker than females and may have a black back stripe. Tail hairs usually black. Coat of fine and short hair but males may have longer and wavier hair. Bornu White is white, occasionally with black or brown spots on ears, nose and around eyes.

Products. Skins; milk (especially in Niger); meat.

Productivity.

REPRODUCTION. *Age at first oestrus:* 157 ± 5.92 (s.d.) days (n=8), youngest at 120 days in Kano Brown. *Weight at first oestrus:* 10.5-18.0 kg. *First kidding:* 435 ± 135.0 (s.d.) days (range 243-882) (n=51) at Shika experimental farm in Nigeria; apparently rather late in Nigeria traditional system near Zaria where only 2.4 per cent of does with milk teeth and 75.6 per cent with 1 pair of permanent incisors had kidded; 7.1 per cent at 10 months on station in Niger, 21.4 at 12, 14.2 at 13, 35.7 at 14, 14.3 at 16, 7.1 at 17; 426.7 ± 204.40 (s.d.) days (n=227) in a traditional Hausa village in Niger in a study of 3 years duration; 416 ± 86 (s.d.) days for Kano Brown and also 9-16 months; in traditional systems in Niger it has been recorded that 31 per cent of first births take place when the dam is 7-10 months old, 25 at 10-11, 27 at 11-12 and 7 at > 12 months. *Kidding interval:* 240 ± 57.8 (s.d.) days at Shika; 332 ± 109.3 (s.d.) days (n=665) in Niger traditional system with 11.3 per cent of intervals < 240 days, 43.5 at 240-340 and 45.2 at > 340; under research station management in Niger 20.0 per cent of intervals were < 180 days, 25.0 at 180-210, 17.5 at 210-240, 17 at 240-275, 12.5 at 275-305, 2.5 at 305-335 and 5.0 at > 335; intervals following an abortion (220 ± 16 (n=59)) and those following kid deaths in the first 15 days of life (269 ± 22 (n=32)) were significantly shorter than all intervals (332 ± 109 (n=665)) in the Niger traditional system; intervals were also influenced by season of previous birth and when this took place in the rainy season of Jul-Aug, interval was 266 ± 97.3 (n=56) days, in the dry season of Sep-Apr was 343 ± 164.5 (n=552) days and in the pre-rains season of May-Jun was 302 ± 105.7 (n=57) days; breeding occurs all year round but there are markedly more births in early hot dry season in Niger than at other times of year. *Multiple births:* extremely common; 32.6 per cent single, 58.8 twin, 7.2 triplet, 1.8 quadruplet (n=123) at Shika; 32 per cent multiple births in Zaria traditional system; 56.1 per cent single, 40.9 twin, 2.8 triplet, 0.1 quadruplet (n=1668) in Niger traditional system; 48.6 per cent single, 47.5 twin, 3.9 triplet on station in Niger. *Litter size:* about 1.8; 1.45 at first parity (n=51) at Shika increasing from 1.17 for dams of 8-9 months to 1.70 for dams > 24 months, 1.86 at second parity (n=37) and 2.00 at third (n=8); 1.35 (n=1938) in northern Nigeria traditional system near Zaria (Table 28); 1.47 ± 0.83 (n=761) in Niger traditional system rising from first to third and older parities being 1.08 ± 0.60 (n=227), 1.20 ± 0.79 (n=51) and 1.72 ± 1.10 (n=483) respectively; considerable variation in litter size in relation to month of birth and maximum litter size not occurring at period of maximum number of births (Figure 40) as seen also in West African Long-legged goats in Mali and Burkina Faso. *Annual reproductive rate:* 1.50-2.00; 1.67 in Niger. *Oestrus cycle:* 15-30 days but up to 66 days on station in Niger; heat lasts

24-120 hours in Kano Brown. *Gestation period*: 153 days (range 142-165) in Niger.

Table 28 Reproductive data established from owner recall in 116 flocks of sedentary Red Sokoto goats in Kaduna state, northern Nigeria

Parameter	Physiological age of goat					Overall
	Pairs permanent incisors				Temporary incisors	
	4	3	2	1		
Number in sample	280	205	173	254	665	1577
Type of birth						
single	605	334	204	174	14	1331
twin	402	103	52	18	2	577
triplet	43	4	1	0	0	2
quadruplet	2	0	0	0	0	2
Total births	1052	441	257	192	16	1958
Total young born	1546	552	311	210	18	2637
Litter size	1.47	1.25	1.21	1.09	1.13	1.35
Births per doe	3.76	2.15	1.49	0.76	0.02	1.24

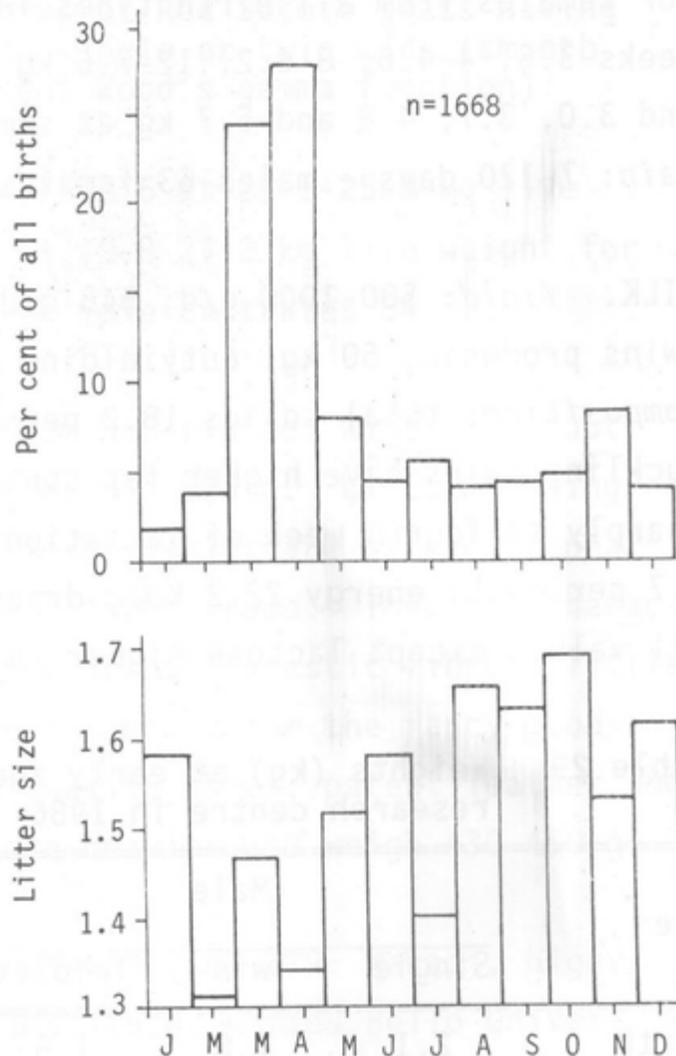


Figure 40 Distribution of parturition and variations in litter size in Maradi goats in Niger

Repeatability of litter size 0.28 ± 0.07 for 37 first to second kiddings and heritability at first kidding 0.08 ± 0.02 for 50 dam-daughter pairs, both estimates from Shika.

GROWTH. *Birth weight:* 1.7-2.0 kg; $1.8 + 0.021$ (s.e.) kg (n=1301) and 1.9 ± 0.022 kg (n=624) in Niger. *Height for age:* 3 weeks-2.7, 1 month-3.9, 2-8.1, 4-9.9, 5-12.1 kg for twins, both sexes combined, on station in Niger (Table 29); 2 months-8.0, 4-8.9, 6-10.5, 12-18.5, 18-26.3 kg for females from all birth types in traditional system in Niger; 2 weeks-3.6, 4-4.6, 8-6.2, 12-7.6 kg for singles on station in Nigeria and 3.0, 3.7, 4.8 and 5.7 kg at same ages for twins. *Average daily gain:* 7-120 days - males 63 females 55 g, 4-18 months - females 41 g.

MILK. *Yield:* 500-1000 g/d; 545 g/d in 12 week lactation, does with twins producing 50 kg, outyielding singles by 20 per cent (Figure 41).

Composition: total solids 18.2 per cent; fat 4.7-7.8 per cent, does suckling twins have higher fat content and fat content diminishes sharply to fourth week of lactation; protein 3.8-4.7 per cent; lactose 4.7 per cent; energy 22.2

KJ/g dried milk, 381 KJ/100 g whole milk; all values except lactose higher in colostrum than in milk.

Table 29 Weights (kg) at early ages of Sokoto goats at Maradi research centre in 1986

Age	Male			Female		
	Single	Twin	Triplet	Single	Twin	Triplet
Birth	2.1	1.8	1.5	2.1	2.1	1.4
1 month	3.0	3.9	3.0	3.7	4.4	3.0
2 months	6.1	5.8	5.4	5.0	5.0	4.2
3 months	7.7	7.0	6.8	7.5	7.5	4.4
6 months	10.3	10.1	10.9	10.4	11.1	6.5

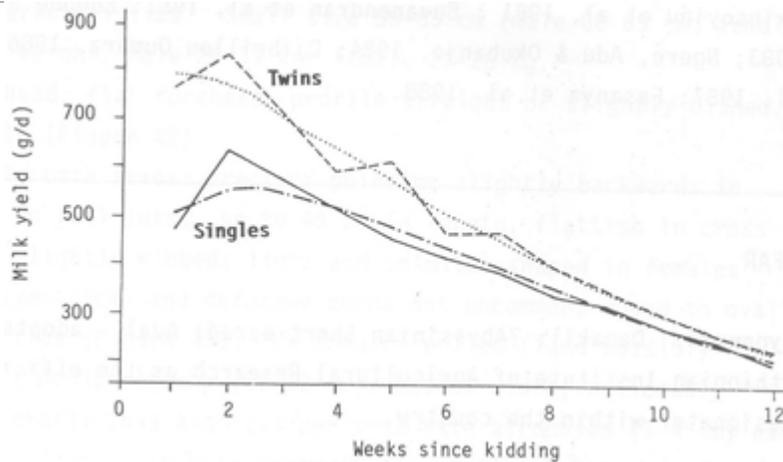


Figure 41 Lactation curves of Red Sokoto goats having given birth to single or twin kids (smooth curves represent Wood's gamma function) MEAT. Dressing percentage: 45-50; 44.7-48.6 at 20.5-25.0 kg live weight for Bornu White and 43.7-48.1 at 19.8-24.2 kg live weight for Red Sokoto at Maiduguri abattoir; young male castrates 54-55.

SKINS. Average dry weight of skins from Nigeria and Niger is about 420 g, "extra light" being 250 g and "heavy" 625 g. Useful tanning area is 3-7 ft² (0.28-0.65 m²). Red Sokoto skins are of exceptional quality and known as "Morocco" in the tannery trade. They are characterized by deep pronounced grain, dense compact elastic fibres, little grease, and ease of tanning; they are in demand for the fancy goods trade, particularly for gloves, high quality shoes, patent leather and suede clothes. Skins of Kano goats are heavier and weigh 430-460 g.

Research. Centre d'élevage caprin du Maradi, BP 379, Maradi, Niger. National Animal Production Research Institute, Ahmadu Bello University, Shika, P.M.B. 1096, Zaria, Nigeria.

References. Beaton, 1939; Robinet, 1967; Haumesser, 1975; Mba, Boyo & Oyenuga, 1975; Molokwu & Igono, 1978; Adu, Buvanendran & Lakpini, 1979; Akinsoyinu et al, 1981 ; Buvanendran et al, 1981; Ehoche & Buvanendran, 1983; Ngere, Adu & Okubanjo, 1984; Djibri1lou Oumara, 1986; Otchere et al, 1987; Fasanya et al, 1988.

AFAR

Synonyms. Danakil; ?Abyssinian Short-eared; Adal - adopted by the Ethiopian Institute of Agricultural Research as the official designator within the country.

Origins. Probably from south-west Asia (North Yemen and Saudi Arabia) where similar goats are common.

Sub-types and races. There are possibly some morphological and performance differences throughout this type's range from Eritrea in the north to Djibouti in the south.

Distribution. Coastal strip and Rift Valley in Ethiopia from 12°N to 6°N in the area where the Afar (Danakil) tribe is found. Northern two-thirds of Republic of Djibouti.

Ecological zones. Desert and coastal desert.

Management systems. Pastoral. Free-ranging transhumant and/or nomadic Afar. Kids are separated from adults and housed in small stone houses. Male kids, except those required for breeding, are usually killed (especially in drier than usual periods) a few days after birth. Flock sizes generally large (> 100 head). Flock structures, related to requirement for milk, overwhelmingly female: females 98.0 per cent (breeding 84.5); males 2.0 per cent (no castrates).

Physical characteristics. Small size 55-65 cm (male 60-65 cm; female 55-60 cm). Weight: male 26-39 kg; female 22-28 kg.

Small head, flat forehead, profile straight or slightly dished, narrow muzzle (Figure 42).

Horns in both sexes: erect or pointing slightly backwards in males, half to full twist, up to 45 cm in length, flattish in cross-section and slightly ribbed; light and scimitar shaped in females although asymmetrical and deformed horns not uncommon, round to oval in cross-section (Figure 43); few females polled (?and possibly males). Ears medium length (10-12 cm), medium width, noticeably pricked and erect; less than 1.5 per cent have atrophied (3-4 cm) ears (Figure 43). Toggles in both sexes (6 per cent). Males usually bearded and lightly maned; females unbearded except for a few with very wispy beard.

Neck medium long. Chest very narrow and shallow. Croup sharply sloping. Legs tend to be short in relation to height, a character more noticeable in some flocks than others. Scrotum usually split for at least half its length. Colour very variable, whole whites common, reds and blacks less so, multicoloured and spotted and blotched animals commonest. Coat of very fine, short hair.

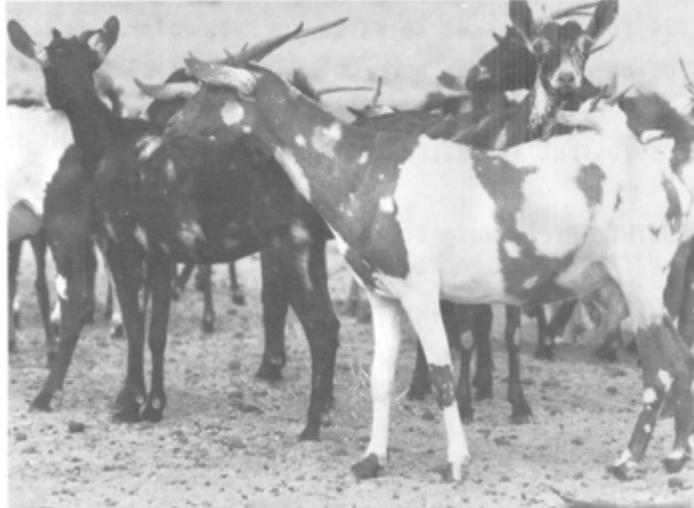


Figure 42 Afar goats at a desert well in Djibouti
Products. Milk; (meat); skins for water carriers.



Figure 43 Afar goats showing (left) horns of female, immature and male; and (right) vestigial ears on a female

Productivity.

REPRODUCTION. *First kidding:* 24 months. *Kidding interval:* once a year although some only every 2 years; related to short rainy period, not otherwise controlled. *Multiple births:* very uncommon (or uncommonly admitted) in traditional systems; 65 per cent single, 35 per cent twin at Melka Werer. *Litter size:* ?1.02 in traditional systems; 1.24 for 21 does at Melka Werer. *Annual reproductive rate:* ?0.9. *Kidding rate* (=kids born/does mated): 1.07 (n=352 does mated).

Very low conception rates of 45 per cent obtained at Melka Werer in 1970s but increased to 79 per cent in 1980s.

GROWTH. *Birth weight:* 2.0 kg in traditional system; 2.1 kg on station.

Weight for age: 6 months-11, 9-13, 12-16, 18-21, 24-23, 36-27 kg in traditional system in Tigray; 90 days-7.6, 180-15.3, 365-22.1 kg on station.

Average daily gain: birth-26 weeks - 45 g in Tigray; 90-180 days - 48 g at Melka Werer. *Mature weights:* males 34.1 kg (n=4) in Tigray traditional system, 33.0 kg on station at Melka Werer; females 26.8 ± 3.71 (s.d.) kg (n=431) in Tigray, 24.0 kg at Melka Werer.

MILK. *Lactation length:* 90-120 days; 84 days on irrigated pasture and with 200-300 g concentrate at Melka Werer. *Yield:* 20-25 kg; 491 g/d (range 230-1080) at Melka Werer.

MEAT. *Carcass yield:* males 12 kg; females 10 kg.

Research. Melka Werer Research Station, Institute of Agricultural Research, P.O.Box 2003, Addis Ababa, Ethiopia. Some minor and incomplete field studies.

References. Wilson, 1975; Galal & Getachew, 1977; Galal, Sebhatu & Getachew, 1977; Galal & Kassahun, 1981; Kassahun, Yibrah & Fletcher, 1989.