DWARF GOATS

WEST AFRICAN DWARF

Synonyms. Chèvre de Fouta Djallon; chèvre guinéenne; chèvre naine.
Origins. An achondroplastic dwarf (Figure 50) with lack of ossification at the cartilage joints. Probably evolved specifically in response to the conditions of the humid forest zone by selection of recessive genes for dwarfism. More or less trypanotolerant.
Sub-types and races. Many are recognised, usually by the name of the country of their location and the type of habitat: Cameroon grassland (Figure 51); Ghana forest (Figure 51); Cote d'Ivoire dwarf (Figure 51); Congo Dwarf. Slightly larger goats than the typical West African Dwarf such as the Mossi of Burkina Faso, goats of southern Mali and the Kirdi of southern Chad and northern Cameroon are also sometimes included in this main type.

Figure 50 West African Dwarf goat scavenging in Abomey market in Benin

Distribution. The true West African Dwarf is considered to be confined to 15 countries in West and Central Africa (Table 32), all of these except the Central African Republic having an Atlantic coastline. An experimental flock is maintained at Wageningen University in the Netherlands. There are many kept as pets and in zoos in the USA where it is known as the African Pygmy and for which there is a breed society. The total population in West Africa is probably about 16 million.
Ecological zones. Essentially confined to humid forest zones with more than 270 growing days per year and rainfall in excess of 1500 mm per year. Most of this zone is infested with the tsetse fly and trypanosome infections are prevalent.
Management systems. Agricultural, urban and (to a lesser extent) agro-pastoral. Owned by many ethnic groups. These goats are often not herded but left to wander in the vicinity of the household or village. Household waste is an important but unquantified source of food in many areas. Flock sizes are usually very small.
NIGERIA. Flock structure, related primarily to meat production, results from very early offtake of males: females 77.0 per cent (55.5 per cent breeding);

males 23.0 per cent (3.0 per cent > 12 months). In south-west Nigeria (Ogun and Oyo states) 80 per cent of house-holds own 1.7 to 3.7 goats and far fewer households own lesser numbers of sheep. In south-east Nigeria (Bendel, Anambra, Imo and Rivers states) 92 per cent of households own goats, flock sizes being 7.5 head in those households owning, 6.9 head in all households. The range in flock size for house-holds owning is 1-183, the modal number owned being 3. There is a strong correlation between goat and sheep ownership. Three types of management are evident in south-east Nigeria: free roaming (59 per cent); confined for part of the year (5 per cent); confined the whole year (36 per cent); free range flocks are larger than confined ones. Percentages of households with different flock sizes are: 0=8; 1-4=54; 5-9=11; 10-19=2; >20=5.

Figure 51 West African Dwarf goats of (top) the Cameroon Grassland sub-type at Mankon station, Bamenda, of (centre) the Ghana Forest sub-type in a house compound at Kumasi, and of (bottom) the Cote d'Ivoire type near Abidjan

Table 32 Distribution and importance of the West African Dwarf goat

Country	Sheep and Goats ('000)	Goats ('000)	WAD goats (per cent of all goats)
Guinea Bissau	200	140	80
Guinea	870	425	80
Liberia	440	220	100
Sierra Leone	433	158	100
Cote d'Ivoire	2640	1320	75
Ghana	3900	2150	33

Togo	1585	750	47
Benin	1910	940	47
Nigeria	40000	26600	29
Cameroon	4715	2535	50
Congo	211	139	100
Equatorial Guinea	41	7	100
Gabon	116	59	100
Zaire	3664	2900	50
Central African Republic	1075	988	80
Total	59820	38331	38

SENEGAL. West African Dwarf goats are mostly found in Casamance, in the southern part of the country. Almost all families own small ruminants, with more owning goats than sheep. Within families, 60 per cent of adult women and 40 per cent of adult men own either or both species, women owning 60 per cent of both species combined but owning 75 per cent of goats. Individual owners with more than 5 animals are rare, the average holding for each human adult being 2.5 goats and sheep combined. About 68 per cent of households own less than 10 head, these families owning only 32 per cent of the total small ruminants. In Fulani villages, increasing flock sizes are usually a prelude to barter of goats and sheep for cattle. Integration of goats with agriculture is evident from the seasonal feeding patterns. Crop residues are the main source of feed in the dry season from Oct-Mar/Apr, when animals may not be herded but provided with some supplement in the compound to entice them home at night: during the crop growing season animals are individually attached to pickets or herded. Flock structure is related to meat production: females 71.9 per cent (35.2 per cent breeding > 1 year, this low percentage indicating a very high reproductive rate), about 30 per cent not being born in the flock but bought in; males 28.1 per cent (1.4 per cent > 1 year showing very early offtake).
TOGO. Total population about 750 000 head. Approximately 45 per cent of households (- 118 000) own goats. Unlike sheep, goats are evenly distributed throughout the country except for Central Province where there are few. Average flock size is 7: more than 90 per cent of flocks are smaller than 10 head. Most animals are confined or tied individually to stakes and fed on household waste and crop by-products. Flock structure also related to meat production but from males at older ages: females 67 per cent (50 per cent breeding > 1 year); males 33 per cent (15 per cent > 1 year).
Physical characteristics. Markedly dwarfed 30-50 cm. Weight: male 20-25 kg; female 18-22 kg.
Strong head, bulging forehead, profile straight or slightly dished, narrow muzzle, lower jaw slightly longer than upper.
Horns in both sexes: curl outwards and backwards in males and fairly strong; light, sharp and pointing upwards and backwards in females. Ears short to medium length, narrow, carried horizontally. Toggles present occasionally in both sexes. Males normally bearded and with a weak mane; females occasionally have beards; degree of bearding varies greatly according to sub-type.

Neck strong and fairly long. Chest broad and deep, girth much greater than height (60-70 cm). Back straight and long. Croup well developed. Legs extremely short. Udder small but usually well shaped.
Colour very variable according to region, dark brown with black points possibly commonest but blacks, whites, reds, pied and mixed colours also occur. Coat usually of stiff short hair, longer hair with a varying degree of waviness in some sub-types.
Products. Meat (skin is eaten with meat).
Productivity.

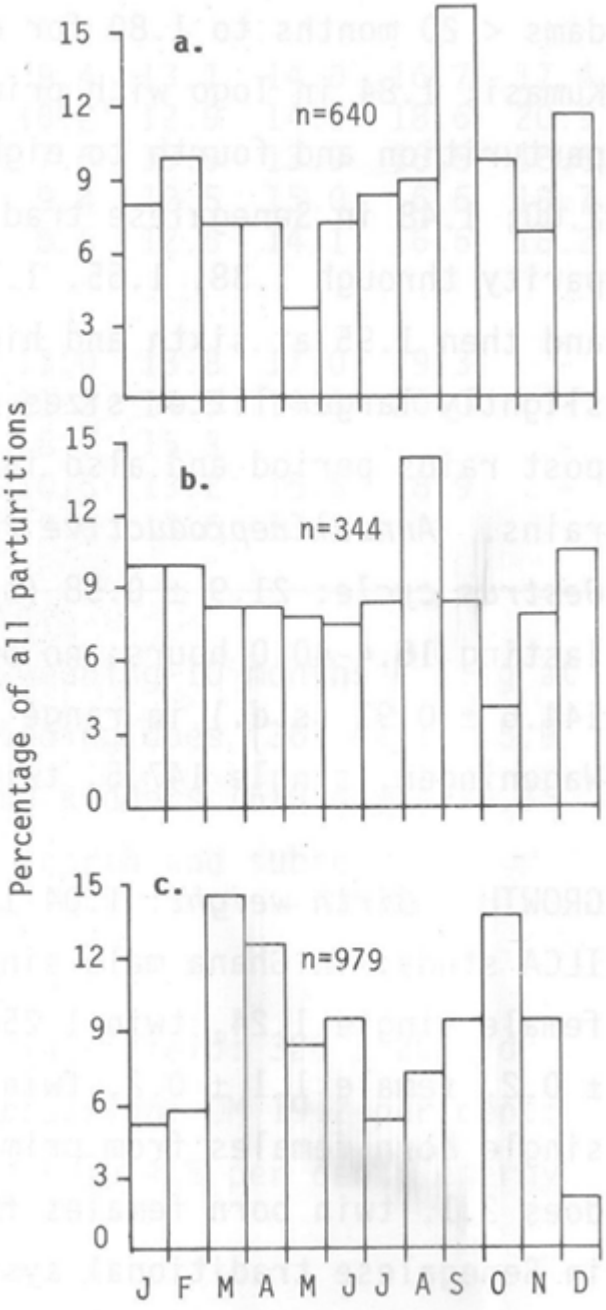

Figure 52 Distribution of parturitions in 3 traditionally man-aged populations of West African Dwarf goats in: a. Nigeria, b. Togo and c. Senegal

REPRODUCTION. *First kidding:* 12-18 months; 19.8 months at Ibadan University research farm; 17.0 + 4.56 (s.d.) months (n=206) in ILCA study of traditional system in south-western Nigeria; 361 ± 93 days (n=166) in Senegal; 450 ± 83 days (n=47) in Togo. *Kidding interval:* means of several studies vary between 228 and *283 days in overall range of 210-290;* first interval 267 ± 49 (s.d.) days and subsequent intervals 219 + 27 at Ibadan; 283 ± 88.4 (n=350) in ILCA study; 206 ± 43.6 (s.d.) days (n=9) at Kumasi in traditional system; first interval 258 days (n=127) and subsequent intervals 231 days (n=293.) in Senegal; 208 + 38 (s.d.) days (n=201) in Togo where births occur, as they do almost throughout the type's range, all the year (Figure 52). *Multiple births:* very numerous; twins extremely common, triplets common, occasional quadruplets; 19.1 per cent single, 53.6 twin, 27.4 triplet at Ibadan; 32.7 per cent single, 54.0 twin, 12.8 triplet, 0.6 quadruplet in Togo; 55.1 per cent single, 40.0 per cent twin, 4.9 per cent triplet overall in Senegal traditional system changing from 80.7 per cent single and 0.3 per cent triplet at first parturition to 26.2 per cent single and 21.3 per cent triplet at sixth and subsequent parturitions. *Litter size:* 1.40-1.85; 1.56 ± 0.60 (s.d.) (n=890) in ILCA study where increased from 1.2 for dams < 20 months to 1.80 for dams > 40 months; 1.50 ± 0.575 (n=54) at Kumasi; 1.84 in Togo with primiparous does producing 1.18 kids per parturition and fourth to eighth parities all producing more than 2.00; 1.48 in Senegalese traditional system rising from 1.17 at first parity through 1.38, 1.55, 1.74 and 1.86 at second to fifth parities and then 1.95 at sixth and higher parities and with some evidence of slightly larger litter sizes in Mar-May related to conception in the post rains period and also in Oct related to conception in the early rains. *Annual reproductive rate:* 1.86-2.96; 2.01 in ILCA study. *Oestrus cycle:* 21.9 ± 0.58 (s.d.) in range 16-25 days with heat lasting 16.4-40.0 hours; no observed seasonality. *Gestation period:* 144.6 ± 0.93 (s.d.) in range 142-149 days; 146 ± 3.3 days (n=124) at Wageningen, single 147.5, twin 146.4, triplet 149.1 (s.d.) days.

GROWTH. *Birth weight:* 1.04-1.62 kg; 1.57 ± 0.513 (s.d.) kg (n=657) in ILCA study; in Ghana male single 1.45, twin 1.22, triplet 1.04 and female single 1.24, twin 1.25, triplet 1.06; in Togo 1.1 kg, male 1.2 ± 0.2, female 1.1 ± 0.2, twin (not distinguished by sex) 1.0 ± 0.2; single born females from primiparous does 1.5 kg, from multiparous does 2.1, twin born females from primiparous and multiparous does 1.1 in Senegalese traditional system. *Weight for age:* 3 months-4.6 ± 1.28 (s.d.) (n=657), 9-6.0 ± 1.58 (n=127), 12-9.5 ± 3.16 kg (n=127) in ILCA study; females with 1 pair permanent incisors in Togo-8.5, 2 pairs-11.7, 3 pairs-13.8, full mouth-17.4 kg; heavier weights at comparable ages recorded in traditional system in southern Senegal (Table 33). *Average daily gain:* birth-90 days - 35, 90-150 - 20, 150-365 - 16 g in ILCA study; birth-weaning - males 88.1 females 83.4, singles 95.0 twins 87.0 triplets 74.0 g at Wageningen under intensive feeding of 60 g concentrate per day per $kg^{0.75}$; post-weaning-10 months - 52 g at Wageningen. *Post-partum weights:* first kidding does (361 days) 15.9 kg (=58 per cent of maximum weight), second kidders (619 days) 19.3 kg, third kidders (856 days) 21.8 kg, and fourth and subsequent kidders 25.2 kg.

Table 33 Weights (kg) at specific ages of West African Dwarf goats in a southern Senegal traditional system as affected by different variables (n=933 animals at 1 month)

Sex and Birth type		Age (months)							
		1	2	3	5	8	12	18	24
Overall average		3.6	5.5	7.2	9.9	12.9	14.8	17.1	18.8
Female									
	single primiparous	3.5	5.1	6.5	9.4	13.1	14.0	16.7	17.4
	single multiparous	4.0	5.9	7.8	10.2	12.9	14.6	18.6	20.9
	twin primiparous	2.8	3.9	5.2	7.6	10.9	13.9	16.5	18.6
	twin multiparous	3.4	5.2	6.8	9.4	12.5	15.0	16.6	18.7
	triplet multiparous	2.9	4.5	6.1	8.6	12.6	14.1	16.6	18.2
Male									
	single primiparous	3.8	5.7	7.7	11.0	13.8	17.0	19.3	-
	single multiparous	4.7	6.8	8.5	11.2	14.5	14.3	20.0	-
	twin primiparous	2.9	4.4	5.6	8.7	15.3	-	-	-
	twin multiparous	3.8	5.8	7.7	10.5	13.2	15.5	18.9	-
	triplet multiparous	3.2	5.2	7.0	9.6	13.6	13.2	-	-

MILK. *Lactation length:* 126 days in Nigeria. *Yield:* 320 ± 20 g/d with peak of 710 g at about 40 days. *Composition:* DM 19.2 per cent; fat 8.3 per cent; protein 5.1 per cent; lactose 4.5 per cent; energy 123 Kcal/100 g.
MEAT. *Dressing percentage:* 63 at live weight of 23.5 kg. *Carcass composition:* meat/bone ratio 0.41.
Carcass has more fat than dwarf sheep in the same environment.
Research. Department of Animal Production, University of Ife, IleIfe, Nigeria. Humid Zones Programme, International Livestock Centre for Africa, P.M.B. 5320, Ibadan, Nigeria. Laboratoire national de l'élevage et de recherches vétérinaires, Institut sénégalais des recherches agricoles, BP 2057, Dakar-Hann, Senegal. Institut de recherches zootechniques, BP 1457, Yaoundé, Cameroun. Societé pour le Développement de la Production Animale, BP 1249, Abidjan 01, Côte d'Ivoire. Department of Tropical Animal Production, Agricultural University of Wageningen, The Netherlands.
References. Epstein, 1953; Akinsoyinu, Mba & Olubajo, 1975; Mba, Boyo & Oyenuga, 1975; Akinsoyinu, Mba & Olubajo, 1977; Matthewman, 1980; Ademosun & Adebowale, 1981; Oppong & Yebuah, 1981; Mack, 1983; Togo, 1983; Akusu & Egbunike, 1984; Ngere, Adu & Okubanjo, 1984; Bourzat, 1985 (includes extensive bibliography); Ademosun, Bosman & Roessen, 1985; Asare & Wilson, 1986; Amégee, 1988; Francis, 1988; Hadzi, 1988a; ISRA, 1988.

EXOTIC GOATS

ANGORA

Origins. Probably from the Himalaya region. Modern development dates from the middle of the 16th century in the Angora region of Turkey. Mohair production was a Turkish monopoly until the early 19th century.
Distribution. Southern Africa including the Republic of South Africa (which is now the world's main mohair producing area) and Lesotho. Also in Kenya. World distribution includes Turkey and southern Texas.
The first importation into South Africa was of 12 bucks (rendered sterile by the Turks) and one female in 1838. The female gave birth to a male kid and this became the foundation of the South African national flock. Other Turkish importations were made until 1896. By 1900 the breed was widespread over much of what is now the Republic of South Africa. Angoras were already present in 1900 in Lesotho. It is probable that Lesotho Angoras arrived by two main routes -- thefts from Republic farms by returning labourers and purchases from these farms by the same labourers. Labourers probably also received goats in lieu of cash wages and imported them to Lesotho. In 1908 the Lesotho administration imported 35 bucks and a further 140 were imported in 1910. No stud is established in Lesotho and 275 bucks were imported from South Africa in 1986. The Angora goat population was estimated at 1.0 million in Lesotho in 1986 and it is so important to the economy that it is depicted on a coin (Figure 53).
Commercial keeping of Angoras started on the Laikipia plateau in Kenya in 1920 when a Mrs Carnegie bought two South African bucks from the Naivasha Experimental Station. These were bred to local white or other light-coloured goats and the current flock, following continued importation of South African bucks, is considered among the best in the world outside the major stud flocks in South Africa. Two other Kenya breeders started flocks in the Laikipia area later in the 1920s but these flocks were later amalgamated, the joint flock now numbering about 3000 animals. Total pure and high-grade Angoras in Kenya is less than 4000.
Ecological zones. Semi-arid in South Africa. Highland sub-humid and mountainous areas in Lesotho. Upland semi-arid in Kenya.
Management systems. Ranching, pastoral and agro-pastoral. Producer cooperatives in Lesotho had 1877 members in 1982 and 4234 in 1986. Two large scale commercial flocks in Kenya.

Figure 53 A Lesotho coin attesting to the importance of the Angora goat to the country

About 23 per cent of Lesotho households own goats, those owning goats only having a flock of 25.2 animals, those combining goats with sheep owning a flock of 55.0 animals. Older household heads are more likely to own, and own larger, flocks than younger ones. Only 12 per cent of flocks are owned or managed by women whose flocks are small.

Physical characteristics. Small size.

The South African Angora Goat Stud Breeders' Society has standards of which the following is an abridged version. The flock-book was closed to non-registered does in 1969, since when new members must buy animals from registered breeders.

Head bold in males, forehead wide, muzzle strong, mouth small. Hair should grow on forehead and down sides of face.

Horns present in both *sexes:* thick in males, set at least 2.5 cm apart at the base and spreading upwards, backwards and outwards; less heavy in females but also set apart and sloping backwards and out-wards; colour should not be wholly black. Ears long and lopped. "Beard" of mohair in males and females.

Neck long, well covered with hair. Chest deep with well sprung ribs. Back and underline straight. Croup full, not falling away. Legs straight and well set, well covered with hair. Tail straight and also covered with hair. Colour should be white as colour-ed hair reduces commercial value. Traces of colour persist in grade goats for many generations. Hair not excessively curly or straight, fine, dense and long (Figure 54).

Figure 54 An Angora buck, imported from South Africa, at a Lesotho government stud

Products. Mohair ("Angora" wool).

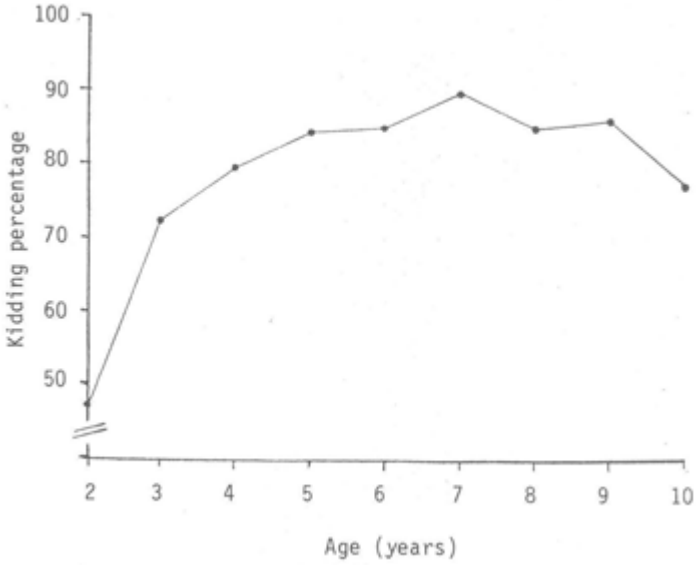

Figure 55 Angora goat fertility in different age groups in South Africa

Productivity.

REPRODUCTION. *First kidding:* first bred after eruption of first pair of permanent incisors in Kenya, first birth therefore at about 20 months; earlier in Lesotho traditional system. *Kidding interval:* once a year in Kenya (5 months gestation + 5 months suckling + l?-2 months rest). *Multiple births:* uncommon; twinning rate about 5 per cent. *Kidding percentage:* about 70 in Kenya, less in primiparous does as they are shy and poor mothers; up to 90 in mature does in South Africa (Figure 55).

Male Angoras show a "rut" in part of the year only when beard and caudal glands exude a dark, smelly, fluid.

GROWTH. *Birth weight:* 2.0-3.5 kg.

HAIR. *Yield:* 0.82 kg per head in Lesotho (507 t) in 1976, 0.80 kg (788 t) in 1986 (Figure 56); first-clip kids yield about 1.0 kg at 6 months in Kenya and mature females about 3.0 kg per year in 2 clips; in South Africa total production of Mohair in 1984 was 8.1 million kg from 1.9 million goats

equivalent to an average yield of 4.26 kg. *Fibre length:* 15 cm at 6 months. *Fibre diameter:* 27-32 um.
Kemp should only be present at base of horns: kemp constitutes about 44 per cent of fibres at birth but this is reduced to 7 per cent at 3 months. Breaking strength of single fibres about 0.42 g/um (wool 0.31) and tensile strength about 2154 kg/cm^2 (wool 1510 kg/cm^2). The fleece can be washed on the goat but this should be at least 14 days before shearing to allow grease to redevelop. In Kenya kid mohair is baled separately from adult hair and carried a premium of about US$ 4 per kg in 1984 (US$ 18 compared to US$ 14). Urine-stained mohair is also baled separately but no other sorting is done in Kenya. Kenya hair (about 4 tonnes) is exported to Switzerland and used mainly for fine suitings and knitting yarns but also in space suits as it is radiation resistant.

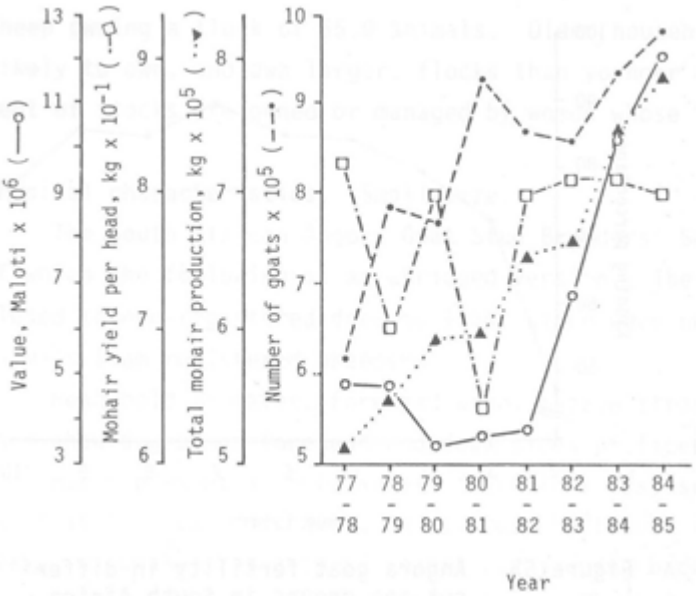

Figure 56 Technical and financial productivity of Angora goats in Lesotho

Research. South African Mohair Growers' Association.
References. van der Westhuysen, Wentzel & Grobler, 1985; Makhooane, 1987; Hunter, 1989; L. Carnegie, pers.comm.