The Gir cattle breed of India - characteristics and present status

G.K. Gaur, S.N. Kaushik & R.C. Garg

*PH-7, Pallavpuram Phase II, Modipuram, **Meerut**-250 110, Uttar Pradesh, India*

Summary

The Gir is a famous milk cattle breed of India. The native tract of the breed is Gir hills and forests of Kathiawar including Junagadh, Bhavnagar, Rajkot and Amreli districts of Gujarat. The breeding tract lies between 20°5' and 22°6' north latitude and 70° and 72° east longitude. The total cattle population of Saurashtra region i.e., breeding tract of Gir cattle is 2.5 million and Gir breed accounts for 37 percent of total cattle population in the region. The body of Gir animals is well proportioned. Udder in cows is well developed and round. The body weight at one year of age was 138 kg in males and 136 kg in females. Adult body weight, height at withers, body length and heart girth in cows averaged 313 kg, 120 cm, 125 cm and 160 cm, respectively.

Age at first heat and calving averaged 1 149 and 1 534 day, respectively. Average dry period and inter-calving period were 123 and 423 days, respectively. Heifers received an average 1.07 inseminations for successful conception whereas cows received 1.64 inseminations per conception. Total lactation milk yield averaged 2 063 litres in an average lactation period of 326 days. Average milk yield in 300 days was 1 930 litres. Milk yield per day of calving interval was 4.98 litres. Average fat percentage in the milk ranged between 4.69±0.04 and 4.97±0.02. Gir animals are considered as hardy with low overall mortality (3.63 percent).

Résumé

La race Gir est un bovin à lait très connu originaire des Indes. Le milieu naturel de cette race sont les collines et les forêts de Kathiawar, y compris les zones de Janagadh, Bhavnagar, Rajkot et Amreli dans la région de Gujarat. La race se trouve principalement entre les latitudes 20°5' et 22°6' Nord et longitude 70° et 72° Est. La population totale dans la région de Saurashtra de race Gir est de 2,5 millions et représente 37 pour cent du total de la population bovine de la région. Le corps des Gir est bien proportionné, et les mamelles sont bien développées et rondes. Le poids corporel à l'âge de un an est de 138 kg chez les mâles et 136 kg chez les femelles. Le poids corporel adulte, la hauteur au garrot, la longueur corporelle et la circonférence chez les vaches est en moyenne de 313 kg, 120 cm, 125 cm, et 160 cm, respectivement. L'âge moyen de la première chaleur et première mise bas est de 1 149 à 1 534 jours, respectivement. La période moyenne de tarissement et entre mises bas est de 123 et 423 jours, respectivement. Les femelles reçoivent en moyenne 1,07 d'insémination pour un résultat positif, tandis que les vaches ont besoin de 1,64 inséminations par conception. La moyenne par lactation est de 2 063 litres sur une période de 326 jours. La moyenne de lait sur 300 jours est de 1 930 litres. La moyenne lait par jour entre mises bas est de 4,98 litres. Le contenu en matière grasse dans le lait est de 4,69±0,04 et 4,97±0,02. Les animaux de la race Gir sont considérés robustes avec une faible mortalité (3,63 pour cent).

Keywords: *India, Gir cattle, characteristics, present status*

Introduction

The Gir is a famous milk cattle breed of India. The native tract of the breed is Gir hills and forests of Kathiawar including Junagadh, Bhavnagar, Rajkot and Amreli districts of Gujarat. This breed is also known as Bhodali, Desan, Gujarati, Kathiawari, Sorthi and Surti in different parts of the breeding tract. The Gir animals are famous for their tolerance to stress conditions and resistance to various tropical diseases. Bullocks of this breed are used to drag heavy loads on all kinds of soil. Brazil, Mexico, USA and Venezuela have imported these animals where they are being bred successfully. These animals contribute significantly to the total milk production of Gujarat State. This paper presents information on breed characteristics, demographic distribution, morphological characteristics, management practices and reproduction and production parameters of Gir cattle.

Topography and Climate

The breed derives its name from the Gir forest, which is the natural habitat of the breed. The breeding tract lies between 20°5' and 22°6' north latitude and 70° and 72° east latitude (Figure 1). The tract is at an altitude of about 400 m above mean sea level ranging from 125 to 600 m. Soil is generally black with scattered tracts of light colours. The climate of the region is tropical. The temperature reaches 40°C (highest) in May and 11°C (lowest) in January. Rainfall ranges from 50 to 100 cm annually. The climate is dry in winter. The relative humidity ranges from 60 to 80 percent during the rainy season (July to September).

Management Practices

The Rabaris, Bharwads, Maldharis, Ahirs and Charans tribes are mainly involved in rearing of Gir cattle. They move with their

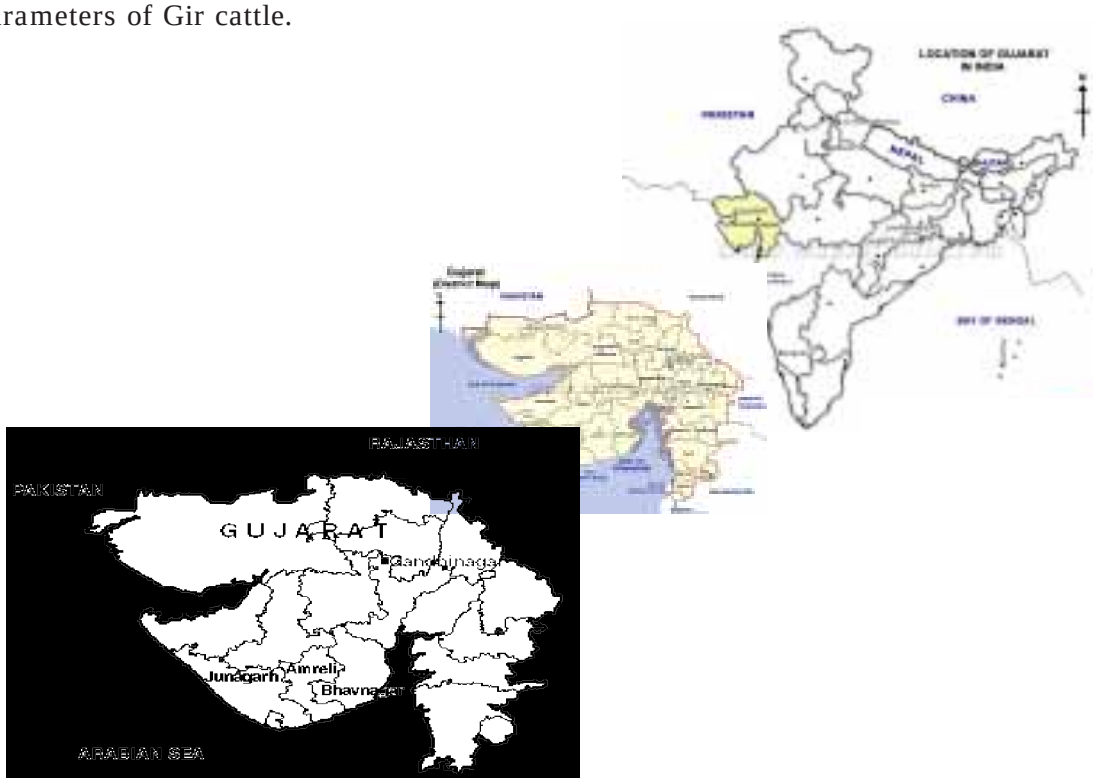

Figure 1. Breeding tract of Gir cattle.

Figure 2. A Gir calf.

Figure 3. A group of Gir calves.

cattle from one place to another in search for grazing. Sufficient fodder is available in pastures of the breeding tract from July to December, thereafter animals migrate to the adjoining districts. Weaning of the calves (Figures 2 and 3) has not been practised and milking cows, new born calves and bullocks are not sent for grazing in villages. Milking cows and bullocks (Figure 4) are given some amount of concentrate (1 to 3 kg/day), which is prepared from wheat bran, crushed pulses, grain husk, oil cakes, cotton seed, etc.

Figure 4. A prestigious Gir bull.

Proper shelter is provided to the animals especially in winter nights. The animals in migration stay in fallow land during the night. Nominal payment (by farmers) is made to the animal owners for their animals to stay in the fields as dung and urine are very precious for the soil fertility. The Gir animals are also kept at different *gaushalas* (cow barns) in Gujarat State. These animals are maintained on green fodder, concentrates and pasture. Natural mating is practised in the entire breeding tract except on a few farms where artificial insemination takes place. The calving season in Gir cows lasts from July to September.

Population

The total cattle population of the Gujarat State is 6.24 million, which is about 3.13 percent of India's cattle repository (Dairy India, 1997). The herd size (Figure 5) varies from a few animals (two to five) to relatively larger herds (10 to 20). The size of the migratory herds ranges from 100 to 200. The population of breedable females in the state is 1.78 million including 0.084 million in Amreli, 0.117 million in Bhavnagar, 0.142 million in Rajkot and 0.140 million in Junagadh districts. The total cattle population of Saurashtra region i.e. breeding tract of Gir cattle is 2.5 million and Gir breed accounts for 36.61 percent of total cattle population in the region (Anonymous, 2001).

Physical Characteristics

The coat colour of Gir animals varies from shades of red and white to almost black and white or entire red. Skin colour is dominantly black but in a few animals it is brown. Forehead is prominent, convex and broad like a bony shield. This overhangs eyes in such a way that they appear to be partially closed and the animal shows sloppy appearance. Ears are long and pendulous and folded like a leaf with a notch at the tip. Horns are curved turning back at the tip. They orient downwards and backwards from the base and incline a little upwards and forwards, thereafter. Gir animals have moderately developed dewlap: males have a large and pendulous sheath. The tail is long and whip like; hooves are black and

Table 1. Body weight (kg) at different ages in Gir cattle.

Sl. No.	Age	Male N	Male Mean ± S.E.	Female N	Female Mean ± S.E.	Overall N	Overall Mean ± S.E.
1.	At birth	54	22.0 ± 0.4	65	20.2 ± 0.2	119	21.0 ± 0.3
2.	3 months	42	56.1 ± 1.2	56	52.4 ± 1.8	98	54.0 ± 1.1
3.	6 months	23	87.7 ± 3.1	21	83.9 ± 2.4	44	85.9 ± 2.2
4.	12 months	10	138.5 ± 5.2	12	135.7 ± 5.7	22	137.0 ± 4.9
5.	At puberty	--	--	11	241.3 ± 8.1	11	241.3 ± 8.1
6.	At first calving	--	--	14	284.9 ± 5.3	14	284.8 ± 5.3

N: Number of records, S.E. Standard error of the mean.
(Source: PDC Annual Report, 1997-98).

medium-sized; hair is short and glossy; skin is loose and pliable; hipbones are prominent; the body is well proportioned; the udder in cows is well developed and round and teat tips are round.

Morphometric Characteristics

Body weights of Gir cattle at different ages are shown in Table 1. Males were heavier than the females at all ages from birth to 12 months of age. Body weight at one year of age was 138 kg in males and 136 kg in females. Kaushik *et al.* (1980), however, reported lower body weight at birth in Gir cattle. Tripathi *et al.* (1978), based on 326 Gir cows (Figures 6 and 7), reported average adult body weight as 313.05 kg, average height at withers as 120.4 cm, average body length as 125.14 cm and average heart girth as 160.53 cm. In a study on 72 Gir cows, Qureshi *et al.* (1980) observed mean udder length, udder width and udder depth as 53.80±0.40, 50.11±0.40 and 13.61±0.39 cm, respectively. In a herd of 240 cows, Tripathi *et al.* (1982) reported frequency of bowl shaped, rounded and goat like udders as 59.6, 39.5 and 0.90 percent, respectively. The frequency of cylindrical, funnel shaped and bottle shaped teats was 31.5, 15.4 and 3.1 percent for fore teats and 27.5, 21.2 and 1.4 percent for rear teats, respectively. Teat length, diameter and placement averaged 7.28, 2.88 and 3.11 cm, respectively. The distances between front teats and between rear teats averaged 5.57±0.22 and 2.09±0.12 cm, respectively.

Reproductive Performance

Reproductive performance of Gir heifers and cows is presented in Table 2. Heifers received a lesser number of artificial inseminations for successful conception than cows. Service period and calving interval presented in the table are lower than those reported by Ulmek and Patel (1995). Their values were 174.5 days for service period and 461.5 days for calving interval. Singh *et al.* (1981) observed age at first calving in Gir cows as 52.49 months. Age at first oestrus, gestation length, age at calving, service period, dry period and calving interval in 57 Gir heifers averaged 1 096, 287, 1 367, 317, 271 and 603 days, respectively (Malik and Ghei, 1977).

Production Performance

Production performance in Gir cows is presented in Table 3. Two cows (Lalita and Laxmi) produced more than 2 800 litre of

Figure 5. A Gir herd.

Table 2. Reproductive performance of Gir cows.

Sl. No.	Traits	Heifers		Cows	
		N	Mean ± S.E.	N	Mean ± S.E.
1.	Age at first heat (days)	29	1 149 ± 58	-	--
2.	Age at first calving (days)	29	1 533 ± 56	-	--
3.	Dry days	-	--	56	123 ± 14
4.	Inter calving period (days)	-	--	56	423 ± 12
5.	Post partum oestrus interval (days)	-	--	39	88 ± 10
6.	Service period (days)	-	--	56	141 ± 18.8
7.	No. of artificial inseminations per conception	29	1.07 ± 0.2	56	1.64 ± 0.1

N: Number of records, S.E. Standard error of the mean
(Source: PDC Annual Report, 1997-98)

milk in a lactation of 300 days. Nanavati and Qureshi (1996) observed 10±0.10 kg average peak yield and 47±0.83 days to attain the peak in 211 Gir cows. Ulmek and Patel (1993a) reported average lactation and 300 days milk yield in 378 Gir cows as 1 775 and 1 449 kg, respectively. They also observed that milk yield was significantly affected by parity and season of calving. Ulmek and Patel (1993b) reported milk yield per day of age at first calving, per day of first calving interval and per day of first lactation length as 1.10±0.04, 4.20±0.14 and 5.54±0.12 kg, respectively. Malik and Ghei

Table 3. Production performance of Gir cows.

Sl. No.	Characteristics	N	Mean ± S.E.
1.	Lactation period (days)	62	326 ± 11
2.	Total lactation milk yield (litre)	62	2 063 ± 114
3.	300 days milk yield (litre)	62	1 930 ± 95
4.	Milk yield / day of calving interval (litre)	44	5.0 ± 0.3
5.	Record 300 days yield (litre)	1st cow (Name: Lalita)	2 867
		2nd cow (Name: Laxmi)	2 832

N: Number of records, S.E. Standard error of the mean.
(Source: PDC Annual Report, 1997-98).

Figure 6. A prized Gir cow with calf.

(1977) in a study on 57 Gir Hiefers observed 351 days lactation length and 1 191 kg lactation milk yield. Average fat percentage in the milk of Gir cows ranged between 4.69±0.04 and 4.97±0.02.

Disease Pattern/Survivability

Gir animals are considered as hardy with low overall mortality. Mortality pattern is presented in Table 4. Highest mortality was observed from birth to one month of age. Female calves had higher mortality than males during this stage. Mortality was very marginal after one year of age. Odedra (1979) has also reported similar calf mortality in Gir animals. Broncho-Pneumonia and Pneumo-Enteritis were the major causes of mortality in calves. A few cases of reproductive disorders i.e. dystokia, abortion, retention of placenta, prolaps have also been noticed in females.

Table 4. Mortality pattern in Gir herd.

Sl. No.	Age group	Sex	Total death	Population at risk	Mortality (%)
1.	Birth to 1 month	Male	4	54	7.41
		Female	11	65	16.92
		Overall	15	119	12.61
2.	1 – 3 months	Male	1	50	2.00
		Female	0	54	0
		Overall	1	104	0.96
3.	3 – 6 months	Male	0	49	0
		Female	0	54	0
		Overall	0	103	0
4.	6 – 12 months	Male	4	49	8.16
		Female	1	54	1.85
		Overall	5	103	48.5
5.	1 – 2 years	Male	0	45	0
		Female	0	43	0
		Overall	0	88	0
6.	Above 2 years	Male	1	61	1.64
		Female	6	184	3.26
		Overall	7	245	2.86
7.	Pooled	Male	10	308	3.24
		Female	18	464	3.38
		Overall	28	772	3.63

(Source: PDC Annual Report, 1997-98).

Figure 7. A prestigious Gir cow with well developed udder.

Conservation and Genetic Improvement Programmes

This breed has been crossed with exotic breeds in All India Coordinated Research Project (Cattle) for the genetic improvement. The major objective of this mega project was to develop a crossbred strain suitable for the existing environmental conditions. The Animal Husbandry Department initiated a genetic improvement programme for Gir animals. Young Gir bulls are being progeny tested under this programme.

The Indian Council of Agricultural Research (ICAR) started two projects on Gir cattle, one is executed by the National Bureau of Animal Genetic Resources (NBAGR) for the conservation of breed and another by the Project Directorate on Cattle (PDC) for genetic improvement. The objectives of the former project are to characterise the breed in terms of qualitative and quantitative traits, to study the molecular genetic characteristics of the breed, develop breed descriptors and conserve the germplasm of elite/unique animals. The latter project aims to undertake testing and selection of bulls for the genetic improvement and to provide superior germplasm for utilisation in other development programmes.

References

Anonymous. 2001. Project Coordinator's Report for Network Project on Animal Genetic Resources. Presented on 28-29 May 2001 at NBAGR, Karnal, Haryana (India).

Dairy India. 1997. 5th Edition. A25 Priyadarshini Vihar, New Delhi.

Kaushik, S.N., Singhal, R.A., Koul, G.L. & Katpatal, B.G. 1980. Studies on birth weight in Gir cattle. Indian Veterinary Medical Journal 4: 166-169.

Malik, B.S. & Ghei, G.C. 1977. A note on some production characteristics of Gir cattle. Indian Journal of Animal Sciences, 47: 587-88.

Nanavati, S. & Qureshi, M.I. 1996. Study of peak yield and peak day in Gir cattle. Indian Veterinary Journal 73: 762-765.

Odedra, B.A. 1979. Calf mortality in Gir cattle. Indian Journal of Dairy Science 32: 105-10.

Qureshi, M.I., Taylor, C.M. & Singh, B.N. 1980. Note on inheritance of udder measurements and their correlation with test milk yield in Gir cows. Indian Journal of Animal Sciences 50: 198-99.

Singh, A., Taylor, C.M. & Gurang, B.S. 1981. Studies on age at first calving in Gir cattle. Livestock Adviser 6: 29-31.

Tripathi, G.S., Koul, G.L. & Katpatal, B.G. 1978. Predicting weight from body measurements in Gir cattle. Indian Journal of Dairy Science 31: 204-7.

Tripathi, G.S., Koul, G.L. & Katpatal, B.G. 1982. Biometrical studies on shape and size of udder and teats and their relation with milk yield in Gir cattle. Indian Journal of Dairy Science 35: 539-43.

Ulmek, B.R. & Patel, M.M. 1993a. Genetic study of milk yield in Gir cattle. Journal of Maharashtra Agricultural Universities 18: 435-37.

Ulmek, B.R. & Patel, M.M. 1993b. Milk production efficiency in Gir cattle. Journal of Dairying, Foods and Home Sciences 12: 53-56.

Ulmek, B.R. & Patel, M.M. 1995. Effect of season on reproduction parameters of Gir cattle. Livestock Adviser 20: 13-15.