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AMRITMAHAL

The Amritmahal breed is found in Hassan, Chikmagalur and Chitradurga districts of Karnataka state in southern India. It is a famous draught breed known for its power and endurance. Animals are fiery and active. Bullocks are especially suited for trotting and quick transportation. Cows are poor milkers. Between 1572 and 1636 AD the rulers of Mysore reared these cattle to supply milk and milk products to the palace, and to produce bullocks for movement of army equipments. These cattle consisted of three distinct strains: Hallikar, Hagalvadi and Chitaldoorg.

Amritmahals are grey cattle but their shade varies from almost white to nearly black. In some animals white grey markings are present on face and dewlap. Muzzle, face and tail switch are usually black but in older animals the colour looks lighter. Cows are white, bullocks slightly white and bulls' dark, rusty white and even interlace to some extent. Typical characteristics of this breed are head shape and horns. Head Amritmahal calf is long and tapering towards muzzle. Forehead is narrow, bulging out with a furrow in the middle. Horns are long and emerge from the top of the poll fairly close together in backward and upward direction, turn in and end in sharp black points. Sometimes the long, sharp points touch each other and appear like torch light. Eyes are bright. Ears are small, horizontal and taper to a point. Hump is well developed and is carried slightly forward. Dewlap is tine and does not extend very far. Sheath and navel flap are very small and close to the body. Legs are medium in length and well proportioned. Hooves are hard, close together and small. Skin is thin, smooth, tight and jet black with short glossy hair. Udder is small, and compact with hard and small teats. An adult male weighs around 500 kg and female around 318 kg. Age at first calving is 1,337.6±115.52 days and milk yield is 572±24 kg. Calving interval is 577.6±24.32 days and lactation length 299±10 days.

BACHAUR

This breed was found in Sitamari and some parts of Madhubani, Darbhanga, Samastipur and Muzaffarpur districts of Bihar but a recent survey has revealed that the original breeding tract has shrunken and the Bachaur cattle are now concentrated in the areas adjoining Nepal border comprising Bachaur and Koilpur subdivisions of Sitamarhi district. It is known for its draught qualities and ability to thrive on poor fodder resources. This breed has very close similarity to the Hariana breed. The cattle are of grey colour, compact with straight back, well rounded barrel and short neck. Face is short, forehead broad and flat or slightly convex. Poll is almost absent, prominent eyes and medium sized horns. Legs are short and thin, medium sized dewlap, short and thick tail and small udder. Tail switch is either black or white. Cows are poor milker and produce around 540 kg of milk (range 495 to 605 kg) in a lactation of around 254 days. Bullocks can work about 8 hours without any break.
BARGUR

Bargur is a draught breed found around Bargur hills in Bhavani taluk of Erode district of Tamil Nadu, and are bred extensively by Lingaiys and Lambadis of that area. This area was earlier a part of Cairn bat are district. Animals are of Mysore-type, but smaller and more compact. They are very restive and fiery in disposition, and are difficult to train. They are light in built and are developed mainly for carrying out agricultural operations in the uneven and hilly terrain. Cattle of this breed are unsurpassed in speed and endurance in trotting.

Bargur cattle are of brown colour with white markings. Some white or dark brown animals are also seen. Calves are generally brown in colour. Colour does not change with age as in Kangayam and Umblachery breeds. Animals are well built, compact and medium in size. Head is brownish, well shaped, long and tapering towards the muzzle. Forehead is slightly prominent and has a deep furrow between the roots of horns. Muzzle is moderate and black in colour. Eyes are prominent and bright. Ears are moderately long and erect. Horns are of light brown colour, moderate length, closer at the roots, inclining backward, outward and upward with a forward curve and sharp at the tip. Neck is fairly long and thin. Hump is moderately developed in females and well developed in males. Dewlap is thin and short extending up to sternum only. Navel flap is present in many animals. Sheath is tucked up. These cattle have thin and bony limbs. Thighs are well developed. Hindquarters are well developed and slightly dropping. Cows have small udders applied close to the body. Teats are small and well set apart. Cows are poor milker, and produce 250 to 1, 300 kg of milk in a lactation period of 270 to 310 days.

DANGI

Dangi is a draught breed found in a small area of Nasik and Ahmednagar districts in Maharashtra state including an area in the Western Ghats known as Dangs from which the breed takes its name. They are well known for their excellent working qualities in heavy rainfall areas, rice fields and hilly tracts.

Dangi breeders are semi-nomadic. They belong to Kandadi, Mahadeo Koli, Thakar and Maratha communities, who practice seasonal migration and remain away from their villages for about 9 months in a year (January to September). During the hot and dry season, the breeders migrate towards coastal areas where grass, tree fodder and water are available to some extent. During the period of heavy rainfall, they settle down at the foothills for protection from the cold draught.

Dangi cattle have distinct white coat colour with red or black spots distributed unevenly over the body. Animals are medium in size with deep bodies. Head is usually small with a slightly protruding forehead. Muzzle is large. Horns are short and thick. Ears are small. Dewlap is slightly pendulous. Hump is firm and medium in size. Hoovers are black, flint-like and exceptionally hardy. Skin exudes an oily secretion which protects the animals from heavy rain. Milk yield averages 530 kg (range 32 to 1,228 kg) in an average lactation period of 269 days (range 100 to 396 days). Average fat in milk is 4.3%.
DEONI

Deoni is an important dual-purpose breed of cattle in Maharashtra. These animals are mainly found in the Latur district and the adjoining area of Prabhani, Nanded and Osmanabad districts of the Marathwada region of Maharashtra. The name of the breed is derived from Deoni Taluk of the Latur district. Deoni is a medium heavy animal. It is found in three colour variations viz. Wannera (clear white with black colour at the sides of the face), Balankya (clear white with black spots on the lower side of the body) and Shevera (white body with irregular black spots). The body is moderately developed and symmetrical with distinct muscles. The colour of the head is black and white in Wannera and Shevera and completely white in the Balankya strain. The forehead is prominent, broad, slightly bulged and white in all the strains; ears are long and drooping with slightly curved tips; horns are medium, thick, apart and emerge from the sides of the poles; tips of the horns are blunt; and eyes are prominent, bright and alert with black eyebrows. The neck is short, strong and well developed. Dewlap is thick, pendulous, and muscular with folds. It is more pendulous in males than in females. The tail is long reaching below the hock with black and white switch. The udder is well attached and medium in size with squarely placed black teats. The animals are docile and calm. Deshpande and Singh (1977A) observed lactation milk yield in Deoni herds ranging from 800 to 1000 kg. Sontakke et al. (1978) reported average fat percent of 4.29 in 100 samples of Deoni cow milk.

GAOLAO

The Gaolao is a dual-purpose breed reared for draught (mainly fast transportation) and milk production. This breed is found in Wardha district of Maharashtra; and Balaghat, Chhindwara, Durg, Rajnandgaon and Seoni districts of Madhya Pradesh. There is a close similarity between the Ongole and the Gaolao except that the latter is much lighter with greater agility. Herd size is normally 6 to 8 but some farmers have large herds. Animals are grazed in the grasslands preserved by the forest department. Grazing is usually available from middle of July to the end of October. Sorghum is the principal crop of the area. Grains are used for human consumption while the stover is fed to cattle. Cows and young stock are usually undernourished but bullocks and young male calves ready for sale are well fed. Cotton seed, linseed or groundnut is given as concentrates. Bullocks are particularly trained to run fast. Gaolao animals are white or light grey. Males are generally grey over the neck, hump and quarters, medium sized, light built, narrow and long. Head is markedly long and narrow usually tapering towards the muzzle. Forehead is usually flat, though it appears to recede at the top, giving a slightly convex appearance. Eyes are almond shaped and placed slightly at angles. Ears are of medium size and carried high. Horns are short and stumpy, blunt at the points and curve slightly backward. Hump is well developed, loose and hangs on one side. Dewlap is voluminous but the sheath is moderately developed. Tail is short, reaching just below hocks. Average body weight is around 430 kg in males and 340 kg in females. Average age at first calving is around 1,300 days. Milk production is about 600 kg (range 470 to 725 kg) in a lactation of about 240 days. Fat is about 5.5%. Average service period is around 93 days and calving interval around 387 days.
The Gir is a famous milk cattle breed of India. The native tract of the breed is Gir hills and forests of Kathiawar including Junagharh, Bhavnagar, Rajkot and Amreli districts of Gujarat. 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. The Rabaris, Bharwads, Maldharis, Ahirs and Charans tribes are mainly involved in Rearing of Gir cattle. They move with their cattle from one place to another in search for grazing. The Gir animals are also kept at different Gaushalas (cow barns) in Gujarat State.

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. The tail is long and whip like, hooves are black and 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 teat tips are round. Heifers received a lesser number of artificial inseminations for successful conception than cows. Singh et al. (1981) observed age at first calving in Gir cows as 52.49 months. Ulmek and Patel (1993a) reported average lactation and 300 days milk yield in 378 Gir cows as 1775 and 1449 kg, respectively.
Hallikar cattle is typical Mysore type of cattle found mainly in Mysore, Mandya, Bangalore, Kolar, Tumkur, Hassan and Chitradurga district of Karnataka. It is one of the best draught breed of southern India. In the entire tract bullocks are given special attention. Price of each bullock ranges from Rs. 5,500 to Rs 10,000. This is probably the only consideration for personal attention in the feeding and management of the males. Females are being used for all kinds of farm operations. They can also work in water logged fields and contribute to the farming system.

Color is grey to dark grey with deep shading on the fore and hind quarters. Frequently, there are light grey marking on the face, dewlap and under the body. Hallikar cattle are medium sized, compact and muscular in appearance. The forehead is prominent giving a slight bulgy appearance and is furrowed in the middle. The face is long and tapers towards the muzzle, which is usually grey to black. Horns emerge near each other from the top of poll and are carried backward, each in a straight line for nearly half their length and then with a gentle and graceful sweep bend forward and slightly inward toward the tips which are black and sharp. Horns almost touch the neck in front of hump when the animal is feeding with its head downward. Eyes are small and clear. Ears are small tapering to a point. Dewlap is thin and moderately developed. Sheath is very small and is tucked up with the body. Tail is fine with a black switch which reaches little below hocks. Age at first calving ranges from 915 to 1,800 days with an average of about 1,370 days. Lactation milk yield is around 540 kg ranging from 227 to 1,134 kg. Lactation length ranges from 210 to 310 days averaging of about 285 days. Fat is about 5.7%. Average calving interval is 598.9±27.36 days.
HARYANA

Haryana, a prominent dual-purpose breed of northern India, was primarily reared for bullock production. Its breeding tract encompasses large parts of Rohtak, Hisar, Jind and Gurgaon districts of Haryana. These animals are also reared in Jodhpur, Alwar, Loharu and Bharatpur districts of Rajasthan. Meerut, Bulandshahar and Aligarh districts of western Uttar Pradesh also have sizable population of this breed. This is one of the most widely spread breed in the Indo-Gangetic plains. According to some reports the purebred Hariana cattle were abundant in Jhajjar, Beri and Jahajgarh pockets of Rohtak district. Hariana animals are white or light-grey in colour. In bulls, colour in between fore and hind-quarters is relatively dark or dark grey. Skin is black. Hariana cattle have compact and proportionately built body. They are characterized by a long and narrow face, flat forehead and a well marked bony prominence at the centre of the poll. The: have small horns. Muzzle is usually black. Eyes are large and prominent. Typical animals have black eyelashes. Head is carried high and gives them a graceful appearance. Hump is of medium size in cows and large in males. Legs are moderately long and lean with small, hard and well shaped feet. Sheath is small. Udder is capacious and extends well forward with a well-developed milk-vein. Teats are well developed proportionate and medium sized. Tail is rather short, thin and tapering. There is black switch reaching just below hocks. A coat colour other than white or grey as well as white switch of tail is considered a marked deviation from the typical attributes and a disqualification from the stand point of breed registration. Adult body weight is around 499 and 325 kg in males and females respectively. Age at first calving ranges from 1,067 to 1,809 days with an average of 1,567 days. Average milk yield is around 997 kg with a range of 692 to 1,754 kg. Lactation length is about 272 days ranging from 238 to 330 days. Average service period is 232 days (range 126 to 305 days), dry period 255 days (range 133 to 571 days) and calving interval 483 days (range 415 to 561 days).

KANGAYAM

Kangayam is a draught breed of cattle and distributed in Kangayam, Dharapuram, Perundurai, Erode, Bhavani and part of Gobichettipalayam taluks of Erode district, Dindigul, Karur and Coimbatore district. On the other hand, replacement of Kangayam cattle by exotic crosses is high in Udumalpet, Pollachi, Palladam and Tirupur taluks of Coimbatore, and Erode district. This breed is most closely related to the Umblachery breed of cattle. Kangayam animals are well built and heavier than Umblachery cattle and are found in drier climate, whereas Umblachery are found in the hot humid tract. Kangayam cattle are maintained under semi-intensive system of management. They are traditionally reared on grazing in dry lands kept as pasture land by farmers for cattle and sheep in the breeding tract. Coat is red at birth, but changes to grey at about 6 months of age. Bulls are grey with dark colour in hump, fore- and hind-quarters, face and legs. Bullocks are grey. Cows are grey or white and grey. However, animals with red, black, fawn and broken colour are also observed. Such animals comprise approximately 1 to 2 % of the total population. Horns, muzzle, eyelids, tail switch and hooves are black. Skin is also black. Animals are strong and active with compact body. Legs are short and stout with strong hooves. Bullocks are capable for carting with load on a sunny cloudless summer day with ambient temperature of 30 to 35 degree Celsius. Milk yield ranges from 600 to 800 Kg with an average of about 540 Kg in a lactation of about 270 days. Average fat and SNF is 3.88 + 0.07 and 6.96 + 0.05 % respectively.
KANKREJ

Kankrej cattle have had the important impact on U.S. cattle breeding. Kankrej cattle are gray cattle of northern India and have long, lyre shaped horns. They are among the largest cattle of India and are prized as powerful draft animals and are moderate milk producers. Having short broad faces with long ears drooping and open to the front. Color varies from light gray to black at maturity. The barrel is generally lighter in color than the rest of the body, especially in bulls. Bulls tend to get darker than cows or steers. Kankrej cattle are maintained as a pure breed in India and Brazil in large numbers, with a few in the U. S. The Kankrej was the most important breed in the formation of the American Brahman. A literature review of these and other Indian breeds in India, Brazil, Mexico and the U. S., would indicate production characteristics similar to the American Brahman and other Bos indicus breeds with lower birth weights in purebreds than Bos taurus breeds. Like all Bos indicus breeds the Kankrej adds environmental adaptability to tropical and subtropical conditions, insect tolerance and some disease resistance, longevity, and maternal ability, especially in crosses with Bos taurus breeds. The cattle are gentle without a disposition problem and are fertile under adverse conditions.

The gait of Kankrej is peculiar to the breed, the action is smooth, and there is hardly any movement of the body. The gait is called one fourth paces (sawai chal) by the breeder. Average milk yield is around 1,746 kg (range 1,097 to 3,194 kg). Lactation length averages 294 days (range 257 to 350 days), calving interval is around 490 days, and fat is around 4.8% (range 4.66 to 4.99%).

KENKATHA

The Kenkatha cattle take their name from the River Ken, for they are bred along the banks of this small river in the area of Bundelkhand comprising Lalitpur, Hamirpur and Banda districts of Uttar Pradesh, and Tikamgarh district of Madhya Pradesh. This breed is similar to the Malvi breed.

The Kenkatha cattle are small, sturdy and fairly powerful, varying in colour from grey on the barrel to dark grey on the rest of the body. Head is short and broad. Forehead is dished. Horns emerge from the outer angles of poll in a markedly forward direction and terminate in sharp points. Ears are sharply pointed and do not droop. Body is short, deep and compact. Hump is well-developed. Sheath is somewhat pendulous and ends with a black tip. Dewlap is moderately heavy. Tail grows beyond hocks.
KHERIGARH

Kherigarh breed is closely allied to the Malvi breed. This breed is mostly found in the Lakhimpur-Kheri district of Uttar Pradesh, but some animals are also found in the adjoining Piliphit district. This breed has been named after the area. The local people, however, do not know anything about its name and just call it as desi. Population of Kherigarh breed has decreased considerably over the last few years because of large scale deforestation for crop production. The grazing areas are now restricted to roadsides and canal banks only.

Kherigarh cattle have white coat colour. Some animals have grey colour distributed all over body especially on face. They grey colour might have appeared due to interbreeding among different breeds. These are small-sized, very active animals, reared mainly for draught purpose. Face is small. Forehead is flat and broad. Eyes are large, bulging and bright. Horns are medium (about 15 cm) and upstanding, curving outward and upward. These are thick at the base. Horn formation is typical of the lyre-horned Malvi type. Animals of this breed are much lighter in general appearance than the Malvis. Ears are small and horizontal. Muzzle is black. Neck is short. Hump is small in females and medium sized in males. Dewlap is thin and pendulous, starts from right under the chin and continues up to brisket. Legs are light and straight. Hooves are small and black. Tail is long almost touching the ground and ending in a black switch. Udder is small and tightly attached with the body. Teats are small and cylindrical. Skin is slightly loose and black. Bullocks are very good for draught purposes. They produce about 1 to 1.5 liters of milk in a day for about one year. A weekly animal fair is held at Dhubagha, Lakhimpur - Kheri for trade of only male animals.

KHILLARI

Khillari breed of cattle is known for quick draught capabilities of its bullocks. This breed is found in Kolhapur, Solapur, Sangli and Satara districts of Maharashtra and Belgaum, Bijapur and Dharwad districts of Karnataka. This breed is seemed to have originated from Hallikar or Amrithmahal breed of cattle.

A typical Khillar animal is compact and tight skinned, with clean cut features. Appearance is like a compact cylinder with stout, strongly set limbs. There is a slight rise in the level of back toward the hook bones. A groove runs in the center of the forehead from the nasal bridge to of the poll. Face is lean and long with smooth, tightly drawn skin. Ear is small, pointed and always held sideways. Horns are long and pointed. Dewlap is light with very few folds. Hump in male is firm and moderate size. Khillar bullocks are highly valued as fast powerful draught cattle, for they can travel miles without showing any sign of fatigue. Cattle of this breed are exported to north – western Shri Lanka to improve draught qualities of Sinhala breed. Cow producing average milk of 384 kg (range 240 to 515 kg).
KRISHNA VALLEY

Krishna Valley is the draught breed of cattle, braving extreme hot, humid climatic conditions and is able to work well in the black cotton soil in the valleys of Krishna river in Karnataka state in India. It was reported that the kings of Southern Mahratta country, which lied in the watershed areas of the rivers (Krishna, Ghataprabha and Malaprabha), tried to evolve a powerful bullock for agricultural purposes in the sticky black cotton soil during the last two decades of the nineteenth century (Joshi and Phillips 1953). It was claimed that Gir and possibly Kankrej cattle from Gujarat state, Ongole cattle from Andhra Pradesh state and local cattle having Mysore-type blood were used to evolve the Krishna Valley breed. The king of Sangli, a well-known breeder of Krishna Valley, contributed substantially in making judicious use of all these strains to produce the desired type of animal. At present, only a few hundred animals of true to type are available in and around few villages of Jamkhandi, Mudhol and Athani taluks of northern parts of Karnataka. The reasons for the decline in number are selling of animals of Krishna Valley due to continuous drought in the tract and preference of the farmers for Khillari breed which is more attractive and massive in appearance resulted in lack of Krishna Valley Breeding bulls. The first step towards conservation of livestock genetic resources is the genetic characterization with respect to phenotypic parameters, unique qualities and utility. Subsequently finding out the genetic architecture through molecular means and evolutionary relationship with other related breeds would provide valuable information about the breed for taking up conservation measures. The physical characterization had already been done by Ramesha et al. (2001) in the native tract. Considering these facts, the present study has been carried out to characterize the Krishna Valley breed of cattle using the molecular marker, such as microsatellites.

MALVI

Malvi is primarily a draught breed found in a large area comprising Indore, Dewas, Ujjain, Shajapur, Mandsaur, Ratlam, and Rajgarh districts of Madhya Pradesh, and Jhalawar district of Rajasthan. There are 3 strains of Malvi breed: light, medium and heavy. The Umatware strain bred in Rajgarh and Narsingarh is a heavy type animal; the Saugar strain in the Malwa tract of Madhya Pradesh is a lighter type. In the west adjoining Rajasthan the breed is larger, while in Madhya Pradesh it is smaller. Malvi bullocks are well known for quick transportation, endurance and ability to carry heavy loads on rough roads.

Malvi cattle are grey in males, with neck, shoulders, hump and quarters almost black. Cows are bullocks become nearly pure white with age. Malvi cattle have short, deep and compact body. Legs are short but powerful, and hooves are strong and black. Dewlap is well developed and the sheath is pendulous. Head is short and broad with dished forehead. Muzzle is dark and slightly upturned. Horns are strong and pointed, and emerge from the outer angles of poll in an outward and upward direction. Average milk yield is 1,074 kg (range 627 to 1,227 kg). Average lactation length is 306 days (range 411 and 530 days).
Mewati

Mewati breed of cattle is found in the tract known as Mewat, comprising Alwar and Bharatpur districts of Rajasthan. These cattle are also found around Mathura and Kosi in western Uttar Pradesh, and Faridabad and Gurgaon districts of Haryana. The breed is sometimes spoken of as Kosi, on account of the sale of large number of cattle of this breed at the Kosi market. Presently this market has become buffalo dominated and few cows are being brought for sale. Mewati cattle are similar in type to the Haryana but there are traces of influence of the Gir, Kankrej and Malvi breeds. Mewati cattle are usually white with neck, shoulders and quarters of a darker shade. Face is long and narrow with forehead slightly bulging. Horns emerge from the outer angles of poll and are inclined to turn backward at the points. Eyes are prominent and surrounded by a very dark rim. Muzzle is wide and square. Upper lip is thick and overhanging, giving the upper part of the nose a contracted appearance. Ears are pendulous but not so long. Dewlap, though hanging, is not very loose. Sheath also is loose but not pendulous. Tail is long, the tuft nearly reaching the heels. Cows usually have well-developed udders. Mewati cattle are powerful and docile, and are useful for heavy ploughing and carting.

Nagori

Nagori is a reputed breed. It is primarily reared for draught quality of its bullocks. Its home tract lies in the Nagaur district of Rajasthan in Western India. A sizable population of the breed is also found in the adjoining Jodhpur district and Nokha tehsil of Bikaner district. The traditional breeding tract covers an area of 17,718 km.

Nagori animals are fine, upstanding, very alert and agile, and generally white or light grey. In some cases head, face and shoulder are slightly grayish. Eyelids are white or light grey. Muzzle, hooves and horns are black. Skin is tight and black. Forehead is flat and not so prominent. Face is long and narrow like that of horse. Eyelids are heavy and overhanging, whereas eyes are small, clear and bright. Ears are medium in size with pinkish inside. Poll is very small and is almost absent in animals true to the breed. Horns are of medium size emerging from the outer angles of poll. They extend in an outward direction and are carried upwards with a gentle curve to turn in at points. Shoulder blade is prominent. Hump is well developed; back straight; legs long and straight with small, strong and compact hooves. Dewlap is small, fine and buttoned up with the body. Navel sheath is very small, tucked up with the abdomen like a button. Tail is high set and is of moderate length (below hock) ending in a black switch. Cows have small and shallow udder. Bullocks are big and powerful. They are capable of heavy draught work in deep sands. There is a tendency to legginess and lightness of bone, though feet are strong. This characteristic has given the breed its agility and ease of movement. It runs like a horse. Cows are poor milkers. Average milk yield is 603 kg (range 479 to 905 kg). Average lactation period is 267 days (range 237 to 299 days). The Nagori is mainly a draught breed. Its bullocks are used for transportation and in agricultural operations such as ploughing, cultivation and drawing water from well. They are usually broken for light work at about 3 years of age when they weigh around 275 kg. A pair of bullocks cost approximately Rs. 15,000.
NIMARI

Nimari breed is found in Nimar tract of Narmada valley in Madhya Pradesh comprising Khandwa, Khargon and Barwani districts. Some animals are also found in Jalgaon district of Maharashtra. Animals are active. Bullocks are known for their draught work but cows are poor milkers. The Nimari breed seems to have originated from crossing of the Gir and the Khillari. Gir blood has contributed to its coat colour, massive body structure and convexity of forehead, and Khillari blood to its hardiness, agility and temper. Khamla found in Satpura ranges of Madhya Pradesh and Khamgoan in Berar are very similar to Nimari and may be its strains.

Nimari cattle are red with large splashes of white on various parts of the body. Head is moderately long with a somewhat bulging forehead. It is carried alertly and gives the animal a graceful appearance. Horns usually emerge in a backward direction from the outer angles of the poll, somewhat in the same manner as in Gir cattle, turning upward and outward and finally backward at the points. Occasionally, horns are also like those of Khillaris in size and shape, copper coloured and pointed. Ears are moderately long and wide, but are not pendulous. Muzzle in many animals is either copper or amber-coloured. Dewlap and sheath are moderately developed, though the sheath has the tendency to be pendulous. Hump in bulls is well developed and sometimes hangs over. Tail is long and thin with the black switch reaching to the ground. Hooves are strong and can stand rough wear on stony ground. Skin is fine and slightly loose. Cows usually have well-developed udder. Average milk yield is about 360 kg (range 310 to 495 kg). Average lactation length is 237 days (range 220 and 260 days). Milk fat is around 4.9%.

ONGOLE

Ongole is the dual-purpose breeds from southern part of India. Ongole breed contributed to the development of some of the exotic breeds like ‘American Brahman’, ‘Santa Getrudis’ etc. and is used extensively for beef purpose in Latin American countries. It is also called the Nellore breed since the Ongole taluka was earlier included in Nellore district but now it is included in Guntur district. Ongole have a glossy white coat called padakateeru by the breeders. Ongole are large and heavy with loosely knit frame, great muscularity and long limbs. They have majestic gait. Forehead is broad between eyes and slightly prominent. Face moderately long and coffin shaped. Hump in males are well developed and erect filled up on both side and not concave or leaning to either side. Dewlap is large fan shaped, fleshy and slightly pendulous. Farmers identify the Ongole breed with 3 lengths (legs, shoulder and back), 7 shorts (muzzle, ear, neck, dewlap, flank, sheath and tail) and 9 blacks (muzzle, eyes, tip of ear, knees, fetlocks, sheath, switch of tail, anal region and tip of testes). Average milk yield is 688 kg (range 475 to 1,000 kg) in a lactation period of about 230 days (range 160 to 270 days). Average fat is 4.2% (range 4.1 to 4.8%).
The Pilibhit district of Uttar Pradesh is the breeding tract of Ponwar cattle. The main area is the Puranpur Block in the Pilibhit district comprising Mainakot, Mazara, Bhirkhera, Faizulaganj and Rajpur Semra villages. A few animals of this breed are also found in Lakhimpur-Kheri district of Uttar Pradesh. This breed is also known as Kabri (mixture of colours) in the breeding tract. The Ponwar seems to be small hill type breed. Critical examination of the animals reveals that this breed may be a mixture of hill and plain cattle. The landless labourers and marginal farmers mainly keep these animals. The progressive farmer keeps no animal of this breed. Purebred animals are available in the interior area of the breeding tract. The Tharu tribe is mainly involved in rearing pure Ponwar animals. Some animals have also been maintained by Pasi and Yadav communities.

Coat color of these animals is brown or black with white patches in varying proportions. The colour of the muzzle, eyelids and hoofs is generally black. The tail switch is white in black animals and black in those having a greater proportion of white patches. The horns are small to medium and curve inward with pointed tips. The ears are small and erect with a sideways orientation and have pointed tips. The face is small and narrow with a slightly concave forehead, which is narrow and has a white marking. The body is small, compact and non-fleshy. The skin is tight, the dewlap is medium and the hump is small in females and developed in males. The tail is long and reaches to below the hock. Cows have small udders and teats and milk veins are small. The animals of this breed are aggressive. Cows produced little milk about 0.5 to 2.5 kg per day for 8 to 10 (average 8.9±0.1) months. Lactation milk yield averaged 462.5±12.1 kg. Age at first calving ranged from 40 to 60 months (average 52.2±0.5) and the inter-calving period averaged 12.6±0.1 months. The service period in Ponwar cattle varied from 60 to 100 (average 76.0±1.1) days. The approximate Ponwar population in the entire breeding tract was estimated as 10667 based on the figure available for total cattle population in Puranpur block (49800).
PUNGANUR

Punganur breed is short-statured cattle found in Chittoor district of Andhra Pradesh. Its home tract is Punganur town of Chittoor district. This breed was developed by Rajahs of Punganur. Hence this breed is known as ‘Punganur’. These are reared for milk. There are a very few animals left in the breeding tract. This breed is almost on the verge of extinction. These animals were used for agricultural operations on light soils. Punganur cattle are white, grey or light brown to dark brown. White mixed with red or black colour animals are also available. Combination of white with brown or black patches is not uncommon. Skin, muzzle, eyelids and hooves are black. Animals of this breed are compact with comparatively tighter skin, extensive hanging dewlap, short legs, and long body with well sprung ribs. Forehead is concave and broad. Horns are black, small and crescent shaped, and often loose curving backward and forward in males and lateral and forward in females. Horns are stumpy in males and slightly longer in females. Horn length ranges from 10 to 15 cm. Forehead is broad and prominent. Hump is of small size in females and medium but inclined to be drooping in males. Bulls are more docile than females.

Lactation milk yield is 546.0±30.6 litres (range 194 to 1,099 litres), lactation length 263.4±16.5 days (range 98 to 445 days), and calving interval 452.4±18.7 (range 317 to 832 days). On an average milk of Punganur cows contains 5% fat (range 3.11 to 10.0%) and 9.5% SNF (range 7.69 to 10.56%).

RATHI

The Rathi is an important milch breed of cattle found in the western part of Rajasthan. It takes its name from a pastoral tribe called Raths who are Muslims of Rajput extraction and lead a nomadic life. The home tract lies in the heart of Thar desert and includes Bikaner, Ganganagar and Jaisalmer districts of Rajasthan. These animals are particularly concentrated in the Loonkaransar tehsil of Bikaner district which is also known as ‘Rathi Tract’.

Rathi is a medium sized breed with symmetrical body. The animal is usually brown with white patches all over the body, but animals having completely brown or black coats with white patches are often encountered. The lower body parts are generally lighter in colour as compared to the rest of the body. Face is broad between eyes and slightly dished. Muzzle and hooves are black. Eyelids are brown or black in colour. Horns are short to medium in size, curving outward, upward and inward. Ears are of medium length, while dewlap is voluminous. Navel flap is large. Hump is of large size in male and sheath pendulous. Tail is long, fine, tapering to a good black switch well below hock. Udder is well developed with prominent milk-vein. Females are docile and average milkers.

Milk yield is 1,560 kg (range 1,062 to 2,810 kg). Average lactation length is 336 days (range 306 to 431 days).
RED KANDHARI

Red Kandhari breed of cattle in purest form is found in Kandhar, Mukhed, Nanded and Biloli tehsils of Nanded district; some pockets of other districts like Ahmadpur; Parli and Hingoli tehsils of Latur district; and Bid and Parbhani districts of Marathwada region.

In Kandhar tehsil the Red Kandhari breed of cattle is more common. It is said that this breed was taken up by the royal dynasty of King Somadevraya as far back as 4th Century A.D. Raja Somdeorai was the son of Raja Kanhar and ruled over Kandhar. The name Red Kandhari appears to be the corrupt name from Raja Kanhar. This cattle breed having red colour also naturally acquires the name Red Kandhari. The breed could have been named by Raja Somdeorai in memory of his father as Red Kanhari, now misnomered as Red Kandhari. Red Kandhari breed supplies bullock power to northern part of Marathwada. In markets like Parbhani and Puna in Parbhani district, and Loha Kundalwadi and Naigaon in Nanded district facilities are available for sale and purchase of these animals. In the last two named markets, bulls and cows of pure breed are available for breeding purpose.

Red Kandhari is a medium-sized, strong and robust animal. The body is compact, squarely built, but not massive, with well-proportionate limbs. The colour is uniform deep dark-red, but variations from a dull red to almost dark brown are found. Bulls are darker than cows. Fore-head is broad between eyes and is slightly bulging. Bullocks are used for heavy work. Average lactation yield is 597.6±18.32 kg in a lactation period of 259.8±4.26 days. Average fat content in milk is 4.57±0.03% and SNF content 8.62±0.01%.

RED SINDHI

Red Sindhi breed is mostly found in Karachi and Hyderabad districts of Pakistan. Some organized herds of this breed are also found in India in the states of Orissa, Tamil Nadu, Bihar, Kerala and Assam. Red Sindhi is considered to have originated from Las Bela cattle found in the state of Las Bela, Baluchistan. The original herd was established at Malir outside Karachi.

Red Sindhi cattle are somewhat similar to Sahiwal and may also be related to Afghan and Gir cattle. Red Sindhi is one of the important dairy cattle breeds in Indian sub-continent. Realizing its potential, the Government of India established Central Cattle Breeding Farm at Chiplima, Orissa on 15.01.1968. Red Sindhi cattle have been exported to Afghanistan, Nepal, Myanmar, Thailand, Cambodia, Vietnam, Malaysia, Brunei, Sarawak, Sri Lanka, Indonesia, the Philippines, Taiwan, Korea, Iran, Iraq and Saudi Arabia in Asia; Tunis, Kenya, Tanzania, Seychelles and Mauritius in Africa; the United States of America, Brazil and Cuba in the Americas and Australia.

This breed has distinctly red colour. Red shades vary from dark red to dim yellow. Though patches of white are seen on dewlap and sometimes on forehead, no large white patches are present on the body. In bulls, colour is dark on the shoulders and thighs. Hair is soft and short, and skin is loose. Milk production is around 1,840 kg (range 1,100 to 2,600 kg) and lactation length 296 days (range 260 to 330 days). Fat is around 4.5% (range 4.0 to 5.2%).
SAHIWAL

The Sahiwal is one of the best dairy breeds of zebu cattle. Though its original breeding tract lies in Montgomery (now Sahiwal) district of Pakistan, yet some herds are also found in India along the Indo-Pak border in Ferozepur and Amritsar districts of Punjab, and Sri Ganganagar district of Rajasthan. Sahiwal breed, because of its desirable traits, is being utilized widely for improvement of local stock or for initial crossbreeding of the indigenous stock before undertaking upgrading with European breeds in many warm humid countries of the world. It is known to have been introduced into 17 other countries, besides Pakistan and India. These are: Mauritius, Kenya, Tanzania, Sierra Leone, Malaysia, the Philippines, Vietnam, Thailand, Myanmar, Bangladesh, Sri Lanka, Nepal, Brazil, Jamaica, Trinidad, Australia and New Zealand.

Coat colour is usually reddish dun but pale red or brown occasionally mixed with white spots is also not uncommon. The Sahiwal is a heavy breed with symmetrical body and loose skin. Animals are long, deep, fleshy and comparatively lethargic. Horns are short and stumpy. Udder is generally large, bowl shaped, pliable, and firmly suspended from the body. Average milk yield is 2,326 kg (range 1,600 to 2,750 kg). Average lactation length is 318 days (range 285 to 375 days). Fat is 4.8 to 5.1% (average 4.93%).

SIRI

The Siri is small sized zebu cattle of hilly region and is found in upper reaches of Darjeeling district in West Bengal and Sikkim Districts in India. There are some related types of Siri cattle. Kachha Siri: This is a Nepal x Siri cross, and is very similar to the Siri, but is distinguished from it by the colour pattern and position of hump and horn. Tarai: This type is found in Nepal and is sometimes referred to as Siri. Animals are either black with white patches or brown with white patches. In some cases they’re totally black or brown. Skin is grey, and muzzle and eyelids are black. Black and white pattern is similar to that of Holstein-Friesian. Tail switch is black or white and hooves are black. Forehead is convex, wedge shaped with white patches. Horns are of medium size and curved outward, forward, slightly upward and inward with prominent hairy poll. Ears are of medium size and horizontal. Abdomen and inner part of legs are generally light in colour. Udder is small size with firm attachment. Milk yield is around 2-6 kg/day with lactation length of about 210 to 274 days. The fat content is 2.8 to 5.5 %, SNF 7.56 to 9.37%. A large variation is observed in the performance of Siri animals. The performance can be improved further by proper selection and distribution of Siri in breeding tract.
The name Tharparkar has been derived from the place of its origin - the Thar desert. Home tract of this breed is in the Tharparkar district of southeast Sindh in Pakistan. These animals are found along the Indo-Pak border covering western Rajasthan and up to Rann of Kutch in Gujarat. Tharparkar is not a homogeneous breed but it has the influence of the Kankrej, Red Sindhi, Gir and Nagori breeds. On the western side of the habitat the influence of the Red Sindhi is prominent, and on the north and northeast of the Nagori. In other parts influence of the Kankrej is predominant. A sprinkling of the Gir is also evident. In spite of all the heterogeneity, a medium type breed adapted to the desert conditions has been developed.

Animals are white or light grey. Face and extremities are of a darker shade than the body. Hairs are fine, short and straight, but in males they are slightly curly on the forehead. Forehead is broad and flat or slightly convex above eyes. The front of horns and face are practically in one plane. In bulls the convexity may be slightly more pronounced. Face is lean, fine and slightly dished to muzzle. Lips are muscular and jaws strong. Eyes are full and placid. Ears are somewhat long, broad and slightly pendulous.

Tharparkar cows calve for the first time at an average age of about 1,247 days (range 1,116 to 1,596 days), milk yield is 1,749 kg (range 913 to 2,147 kg) and calving interval 431 days (range 398 to 572 days) fat is about 4.88% (range 4.72 to 4.90%) and SNF 9.2% (range 8.9 to 9.7%).
Umblachery breed of cattle, one of the best draught breeds of Tamil Nadu, is found in Thanjavur, Thiruvarur and Nagappattinam districts. It derives its name from its home tract, Umblachery, a small village 10 km away from Thiruthuraipoondi town in Nagapattinam district. This breed is considered to be developed by crossing Kangayam with local animals’ of Thanjavur, and is very similar to Kangayam except in the appearance of head and smaller size. These are light built draught animals developed for work in the marshy paddy fields. About 60-70% of cattle in this area belong to Umblachery breed. Umblachery calves are generally red or brown at birth with all the characteristic white markings on the face, on limbs and tail. This colour changes to grey at about 6 months of age. In adult females, the predominant coat colour is grey with white markings on face and legs. Bullocks are grey in colour. All the legs below hocks have white marks either ‘socks’ or ‘stockings’ even a portion of hooves is white. Forehead is fairly broad, sometimes with a slight groove in the middle. It is well pronounced with white star. Face is short and straight. Muzzle is broad and black. Eyes are prominent and bright with black eyelashes. Ears are short, erect and laterally placed. Horns are very small, curving outward and inward and sometimes spreading laterally. These are thick in bulls and thin in cows. Hump is medium in size, not fleshy, generally erect. Dewlap is thin and short extending to the sternum. In cows, udder is moderately developed with small and squarely placed teats. Milk-vein is not prominent. Bullocks are small, swift and suited for agricultural operations. Umblachery bullocks are used for ploughing, carting, thrashing and paddling. The bullocks are capable of doing work for 6 to 7 hours under hot sun. A pair of bullocks can pull a total load (including cart weight) of 2 to 2.2 tones over a distance of 20 km in about 7 hours. Daily milk yield is around 2 kg. The female produces 300 to 500 litres of milk in lactation. On an average, milk contains 4.94±0.06% fat and 7.80±0.03% SNF.
The Vechur cow has now attracted international recognition and attention. The credit of saving the Vechur cattle from the brink of extinction goes to a conservation programme undertaken by the Kerala Agriculture University (KAU). The Vechur cattle are now recognized as the smallest cattle in the world. The maximum height of a Vechur cow is 91 cms. This diminutive cow, weighing on an average 107 kgs. can give an average yield of 3 litres of milk per day. Proportionate to its body weight, the Vechur cow yields maximum milk in the world. The local people preserved the purity of the breed by selective breeding. The extremely small size, low feed requirements, high disease resistant and lovable nature of the cute animals made the Vechur cattle the attractive. The dwarf cattle were well adapted for the hot, humid tropical climate of Kerala. Vechur bulls, though small in size (maximum height at hump level 105 cms), were very strong and these lightweight animals were used for ploughing marshy paddy fields typical of Kerala.

Infant mortality has been found to be almost nil in Vechur cattle under farm conditions, quite resistant to foot and mouth disease and mastitis. Compared to crossbred cows, significantly lower incidences of respiratory infections have been reported from Vechur cattle. The percentage of fat and total solids in the milk of Vechur cows is higher compared to crossbred cows. But a more significant aspect is the size of the fat globules. The small size of fat globules means high phospholipid content because of greater surface area. Phospholipids are important in the development of brain and nerve tissues and also play a vital role in the absorption and digestion of fat. Thus the Vechur cow milk and its products are suitable for infants and the sick.