

*Cattle Genetic Resources of Orissa*

# **BINJHARPURI**

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*S. K. Dash and B. P. Sethi*



Orissa Livestock Resources Development Society  
(OLRDS)

Department of Animal Breeding and Genetics  
Orissa University of Agriculture & Technology, Bhubaneswar

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## PREFACE

Various indigenous breeds of cattle in our country are the result of thousands of years of selection, evolution and development of the wild species in the process of domestication suiting to the local agro-climatic conditions. The Indian cattle breeds were developed both for agricultural operations and dairy performance, the former being more important.

Binjharपुरi cattle, one of the lesser-known cattle breed is indigenous to the state of Orissa, which has been contributing to the welfare of farming community in general and landless, small and marginal farmers in particular in its native tract. Information on distribution, enumeration, physical parameters, production as well as reproduction performance of general and elite animals is essentially required to know the status of this breed and for initiating to conserve it if required.

Orissa Livestock Resources Development Society (OLRDS) by sanctioning a Project on survey, evaluation and characterization of Binjharपुरi cattle has provided adequate technological, financial and human resource support to carryout the research activities which provided the raw material to bring this manuscript to its present form.

All the infrastructure, administrative and logistic support of **Mr. C. J. Venugopal, I.A.S.**, Commissioner cum Secretary, F & ARD Department, Govt. of Orissa and **Prof. D. P. Ray**, Vice-Chancellor, OUAT have ultimately helped the better understanding of this most valuable cattle genetic resource of the state of Orissa. Constructive criticism and encouragement extended by Dr. B. K. Sahu, Dean, Orissa Veterinary College and Dr. G. Pattanayak, Prof. & Head, Dept. of ABG were crucial and worth mentioning in achieving the objective. The efforts made by resource persons of Dept. of VS & AH in Jajpur district for collection of information in field level is duly acknowledged.

Last but not the least, the cooperation and assistance rendered by the real stake holders of Binjharपुरi cattle, during the survey visits and collection of data which made the real base of this bulletin, is highly appreciable. At the end the authors thank all of them who directly or indirectly supported this mission.

OLRDS, Cuttack.

15<sup>th</sup> August, 2007.

Authors



## Introduction

Livestock production is the endeavor of millions of rural based farm families with small land holdings and is a major source of supplementary income in the agriculture-based livelihoods. It offers enough opportunities to the less privileged section like marginal and landless farmers. Crop production in Orissa is almost entirely dependant on work animals for farm power. Mechanization in agriculture has not yet influenced the crop production system significantly and will not change the scenario so much in foreseeable future. So locally adapted breeds resulted from long years of selection and evolution based on their utility (milk or draft or both) in the production system suiting to the local agro-climatic conditions have to be conserved and improved.

Binjarpuri, one of the lesser-known cattle breed is indigenous to the state of Orissa serving the farming community as a dual purpose cattle, which still exists in its purest form after so long use of A.I. through process of crossbreeding. This explains the preference of stakeholders towards maintenance of unique qualities of this cattle population in its native tract. This breed proves its worth in agricultural operations and milk production potentiality. Information on distribution, enumeration, body conformation traits, production as well as reproduction performance of general as well as elite animals is essentially required to know the status of this breed, which would be the first step towards conservation and improvement of this native Germplasm.





## Characterization of the breed

During the present study, information on 3230 animals of all age groups belonging to 458 farm families were collected through massive survey covering 48 villages. The information on body confirmation were collected by actual measurements and on production, reproduction and socio economic profile were collected through interactions and structure scheduled questionnaires developed by NBAGR with little modifications.

### A - Breed name and Synonyms

Binjharपुरi cattle are known as 'Deshi' cattle in its native tract along with the adjoining districts. This breed of cattle are mainly reared by marginal farmers and poorer section of the people. Very few animals of this type are reared by large farmers. These animals mostly live on grazing. They cover a distance of 3 to 4 km in nearby areas to fill their rumen and come back to the farmers house. This cattle type is unique in its characters viz compact medium sized body, swiftness and long tail with well developed switch. Binjharपुरi cattle are predominantly whitish in colour (about 85%). Brown, black and gray coat colours are also seen (Fig 1) . However the white colour animals are preferred by the farmers.



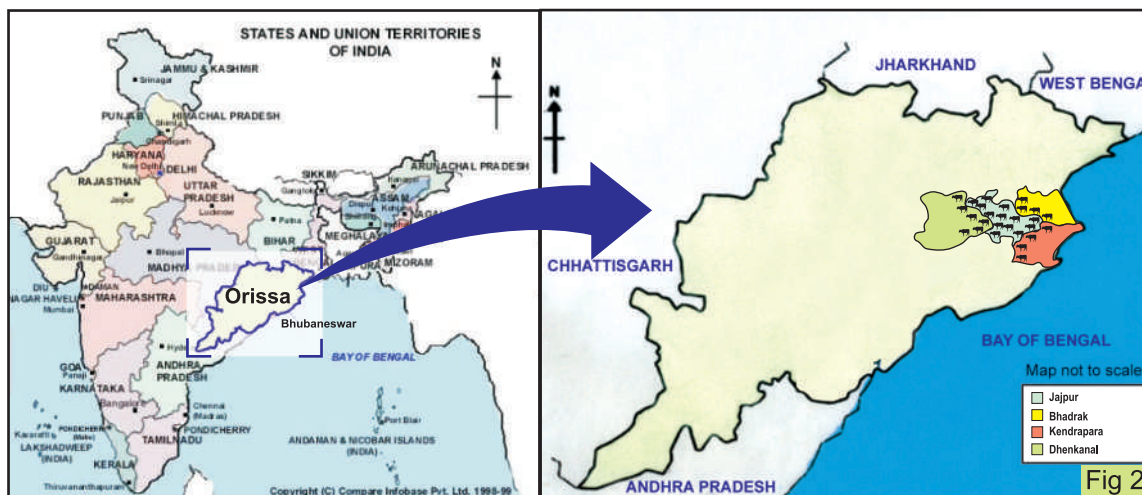
Fig 1

### B - Native tract

Binjharपुरi cattle are seen in its classical form in Jajpur district and some areas in adjoining districts of Kendrapara and Bhadrak district . The area comprises of mainly coastal plain and some saline zone. Heavy concentrations of Binjharपुरi cattle are seen in Binjharपुर, Bari, Sujanपुर and Dasarathपुर area of Jajpur district.



The name of breed backs to the place of its natural habitat. The native tract of the breed is distributed over 85° 40' to 86° 44' East longitude and 20° 43' to 21° 10' North latitude spread over an area of 3690 sq. km.(Fig 2) with an average altitude of



42 meters. Forest area covers 420 sq. km. The climatic conditions of the area in terms of minimum and maximum temperature and average rainfall in the region are presented in Table 1.

### C - Origin of the breed

Jajpur, the ancient capital of Orissa possesses a unique dual type of cattle known as 'Binjarpuri'. This breed might have been developed from the indigenous animals through several generations of natural selection and selective breeding from the time of kings' rule. Though no specific literature is available on development of this breed, it is assumed that the topography of the area and human's mediation for producing a better animal resulted in the development of this cattle type or breed.

### D - Utility of the breed

Binjarpuri is a dual type animal. The cows produce good quantity of milk. The bullocks are very good draft animals and are preferred in central and northern parts of Orissa for agricultural operations. These cows assure economic protection and good nutrition to owner as well as other family members. These animals serve as major assets for many marginal and landless farmers. A five-member family with 2 to 3 milch cows manages the entire socio-economic requirement along with expenses for children education from these cows.



The products like milk, ghee chhena and curd are sold in optimum price and are preferred by the people in comparison to milk and milk products from other breeds of cattle in the area.

The dung is very useful both in gobar gas plants and making manure for agriculture purpose. The farmers prepare 'Ghasi', a dried



dung cake (Fig 3) which serve as very good source of fuel in rainy season. The castrated calf at the age of 1 to 2 years (Fig 4) is sold at a high price of Rs. 3000 to Rs. 4000/-. At the same time the adult bullock pairs, ready for ploughing and carting (Fig 5) are sold at an average price of Rs. 13000 to Rs. 20,000/-. So these animals serve as a bank for the owners to meet the emergencies, if any, by virtue of their demand in agricultural operations not only in the native tract but also in central and northern parts of Orissa.



## E - Physical Characteristics

It is a medium sized, horned, strong, dual type docile cattle with good posture. Bulls look very strong, vigorous with well-developed hump, penis, naval flap and dewlap. The hump, neck and some region of face and back are black in colour irrespective of the coat colour of the males. The bulls have majestic gait. The cows are proportionate and compact with graceful appearance. The pin bones are distinct and quite wide apart compared with the body confirmation. The milk vein is prominent but medium in appearance. Calves with light brown or greyish colour develop to whitish colour at adult age. Vulva is comparatively larger and





drooping (Fig 6). Long tail is an important feature of this cattle type, which almost touches the ground. It is tapering towards tip with voluminous switch. The ears are short and dewlap is thin, small and soft. The body confirmation traits along with body weight at different stages of growth are presented in Table 2.

### Head profile

Medium sized straight fore head is characteristic of this animal type. Head of these animals is in upright position (Fig 7). Ears are small to medium in size and horizontal in position. Males have longer and bigger head than that of female ones.

### Coat colour

The coat colour of the animal is predominantly whitish (about 85%). However, black, brown and gray animals and also seen. The distribution of coat colour pattern is presented in Table 3. The colour of the muzzle and switch is usually black. Hooves are usually black. However, grey coloured switch is seen in 12 % cases.

### Horns

Two types of horns and its orientation are seen in this breed .

- (a) Broad base with tapering and pointed in ward (Fig 8).
- (b) Broad base short and straight horns

Colour of the horn is black. Both males and females are horned. It is seen that the horns grow with the age of the animal even at later age. The old animals have irregular shape of horns most of which are broken. Average size of horn in adult males and females are  $21.17 \pm 2.86$  and  $12.7 \pm 1.31$  cm., respectively.





## Ear

The ears are small and horizontal in position. The size of ear like other body measurements does not increase proportionately with the advance in age. The average ear length in adult males and females are  $20.53 \pm 0.23$  and  $19.14 \pm 0.26$  cm, respectively.

## Udder

The udder is bowel shaped, which is distinctly seen from both sides and rear part of the animal. The udder shrinks to nothing after milking. Milk vein is prominent. Teats are small or medium with rounded tips (Fig 9).



## Tail

Tail of Binjharpuri cattle is a very important feature and can be judged as a marker of this breed. Its tail almost touches the ground (Fig 10). The animal owners usually cut down the switch to prevent soiling (Fig 11). The tail is tapering towards the tip and while swinging it touches the scapula. The tail length and height at withers of the same animal become conspicuous at later age.



## Switch

Switch of this animal is thick and the predominant colour of the switch is black. However, white and grey colour switches are seen (Fig 12). The switch length varies from 18 to 28 cm. in adult animals. Usually the farmers prefer the animals with black switch. It is yet to be studied whether any correlation exists between colour of switch and desirable economic traits.





## F - Housing

No special planned shed is provided for these animals. About 70% the sheds are made up of thatched roof with kutcha floor. The four sides of the house are covered with bamboo sticks, palm leaves or coconut leaves, so that it is well ventilated (Fig 13).

Around 20% of the sheds have walls with clay and mud, the upper portion of the walls being open. In 5% of the cases a part of varandah of dwelling house of the owner serves as shed for these animals (Fig 14)

As a whole 3 % of animals are provided with sheds made up of bricks and concrete structure. No specific shed is provided for young calves. Inside the shed an enclosure with bamboo sticks is made and the calves are allowed to remain inside when they are one to three months old. Otherwise the calves remain with their mother till 21 to 30 days old. Usually one female member of the family takes care of the milch cows as well as new born calves.

The cows, bullocks and calves are tied with plastic or jute ropes individually during night in the shed. During morning all the animals are tied in the out skirts of owners house. They milk their cows at this place. They give feed and water either at the time of or after milking in the same place and let their animals loose for grazing. In summer season all the animals are tied outside the shed even in the night.

## G - Feeding and Drinking

These animals are exclusively reared almost on range system. During the morning the owners provide rice bran, water and some paddy straw. After milking the cows all the animals are let loose for grazing.



Fig 13



Fig 14



The working bullocks are provided with 'Kurchi' a mixture of rice bran, wheat bran, kitchen waste and some amount of rice warmed with water. Then these are taken for ploughing or carting. The milch animals fill their stomach with available grass and fodders in different seasons. After they return from pasture land these are supplied with clean drinking water. During a day an animal usually takes 50 to 60 liters of water. During evening these are provided with 'kurchi' and straw (Fig 15).



Fig 15



Fig 16

However, during rainy season most of the animals return inside the shed without grazing. They are supplied with available fodder plants, paddy straw and preserved post harvested dried legume plants - hay (Fig 16) in some places. No concentrate feed is given to the animals. It is a common practice that the farmers give louki, black gram, dimiri leaves etc. at least for 15 days after parturition to enhance the milk production and to get optimum milk in the lactation.

In few cases all the animals of a village are taken to grazing by hired labour when agriculture field are filled with crop. Some owners tie their animals with a long rope to allow for grazing in the homestead land. Details of feeding management of this cattle type along with calves are presented in Table 4.

## H - Breeding

Usually the owners of Binjharपुरi cattle do not prefer artificial insemination. They breed their animals with the available bulls of the same breed or indigenous one. Very few owners though opt for artificial insemination, in majority of cases the local bull manages to render effective service to produce its offspring. The animals of 4 to 5 villages gather at pastureland for grazing. The cow in oestrus at grazing is crossed by the most strong and stout bull in the herd. Two to three bulls are normally



seen in a herd of 50 to 100 cows. The owners speculate about the sire only when the calves are born looking to the phenotypic characters of the calves. The owners become happy when they get a male calf rather than female as it fetches good market price when it is 2 to 3 years of age. Even after one year of age the male castrated calf can be sold at Rs. 2000/-.

The major drawback in the breeding system (natural) is that people leave some defective (congenital defects) and dyeing male calves which in long run become bulls. They sacrifice the calves in the name of God as a part of religious belief. These male calves when grow older and start breeding contribute negatively both to the phenotype and genotype of animals. But in the herd the strongest bull (Fig 17) renders effective service to the cow in heat to contribute its genetic potency to the next generation. The reproductive performance of this cattle type is presented in Table 5 and the incidence of reproductive health problems is presented in Table 6. Though Binijharpuri cattle are not seasonal breeders still the onset of oestrus is more common in rainy and winter seasons. The distribution of oestrus is presented in Table 7.



Fig 17

Here it is recommended that the best male calves in each 4-5 villages be selected and maintained either by Government or non-government agencies to grow as bulls. These bulls will serve the propose of breeding when they are 3 ½ to 4 years old. The supply or raising of bulls be maintained scientifically to avoid inbreeding.



## I - Health Status

The general health condition of Binjharpuri cattle is good. The animals are resistant to many of the diseases and adverse climatic conditions. In the remote areas, farmers adopt indigenous knowledge to cure some minor diseases. The animals are periodically vaccinated against HS, BQ and FMD by veterinary aid centers. The age specific incidence of diseases is presents in Table 8. In major cases farmers take the help of veterinary professionals. It is observed that diarrhoea pneumonia, and ear / eye infection is higher in younger animals. Skin infection and viral diseases are prominent in older animals. It is observed that change of season play a great role in the manifestation of diseases. In rainy season the incidence of diarrhoea, fever, pneumonia and viral diseases are more compared to other seasons. The seasonality of incidence of diseases are presented in Table 9.

## J - Work Performance

Though Binjharpuri bullocks are hardy in nature, the hot humid climate do affect the draft power of the animals, as a result working ability decreases in summer as compared to rainy and winter seasons. The draft ability of Binjharpuri bullocks are demarcatingly superior to that of other bullock types viz. Haryana crosses and other non descript ones. It was observed that a pair of Binjharpuri bullock with average weight of 460 kg. can plough 0.8 acre of land in 6 hours (Fig 18) and can pull 1300kg. loaded cart to a distance of 4.0 km in one hour (Fig 19). However detail study on soil type and land scaping may give better picture on draftability of this animal.





## K - Migration

The migration of the animals occurs due to marketing viz. sale/purchase. Many weekly markets (Fig 20) are available in Jajpur and border district for sale of animals. Farming community opt for



purchasing a pair of Binjharpuri bullock (Fig 21) by giving more price than others. Then in daughter's marriage, the parents give a milch cow with a calf at foot as a symbol of love and affection.

This tradition is seen entirely in the district. So this cattle type is available in the border areas of adjacent districts also.

## L Production Performance

Udder bowl shape, teats - cylindrical, milk vein - prominent is the characteristic in Binjharpuri cow. Average milk yield is around 4 lts. per day in two milkings without any concentrate supplementation. If concentrate feed is given, the milk yield rises even up to 7 lts/ day. Average fat and SNF% of the milk is 4.4 and 8.5%, respectively. Cows are docile and woman member of the family usually milk the lactating cows. The lactational yield is around 1200 lts. with an average lactation length of 300 days. The lactation wise dairy performance of Binjharpuri cattle is presented in Table 10.





## M - Socio economic Profile

The socio-economic condition of farmers possessing Binjharpuri cattle is good. The houses in the villages are mostly kutcha with thatched roof but are clean and beautiful (Fig 22). As such the land is mostly irrigated and fertile. The average land holding of the farm families is 1.83 acres. The land holding of Binjharpuri cattle farmers are presented in Table 11. Many marginal farmers and landless owners take care of their cattle more than that of small and large farmers. Binjharpuri breed is in its purest form in the hand of landless and marginal farmers because they never go for A.I. of their animals with a belief that sophisticated management practices are needed for maintenance of crossbred cattle.



Fig 22

The woman member of the family usually takes care of the calves and lactating cows. In most of the cases the females clean the shed, milk the cows and feed them both in the morning and evening (Fig 23). All the milk products viz. ghee, curd and chhena preparation is performed by the female members. Drying of cow dung for use as fuel in emergency, particularly in rainy season is the most important task offered by female member of the family. In most of the cases the male member takes care of the bullocks. The average physiological parameters of Binjharpuri cattle are presented in Table 12.



Fig 23

## RECOMMENDATIONS

Binjharpuri cattle have many good qualities like adaptability to low input rearing, heat resistance, low incidence of diseases, less breeding problems and good draft capacity. The milk yield obtained from these animals will be of low cost, as these animals can be maintained on household wastes, agricultural byproducts and grazing. Further, relative variability amongst animals for the traits of interest is often very much higher in the present study. This between animal variability can be exploited for higher genetic gains through well planned and executed breeding programmes.





Keeping in view the economic importance, productivity and adaptability of Binjharपुरi cattle in its native tract along with the socio-economic status of the farmers, efforts should be made for conservation and improvement of these valuable cattle germplasm through selective breeding.

The existing herds of Binjharपुरi cattle need to be strengthened. In order to increase the herd size and check genetic deterioration in this breed, it is suggested that the progressive farmers/breeders maintaining relatively large herds should be associated to form a sizable test herd population for evaluating a large number of breeding bulls. Further, the closed herds could also be opened through two-way flow of superior germplasm from the breeding tract to nucleus herd and vice-versa. Thus with the adoption of open nucleus breeding system (ONBS), genetic gain can be augmented not only in organized herds but also in farmers' herds. Besides this, modern management practices can be integrated with traditional farming practices to improve the performance of Binjharपुरi cattle.

Improving the overall performance of locally adapted breeds with better package of management and breeding practices will often produce more sustained benefits than strategies involving replacement or crossing with exotic breeds.

To achieve the target for conservation and improvement of the breed, the following action plan is suggested.

1. Establishment of breeding services cell for overall monitoring and implementation of breeding programmes.
2. Establishment of breed nucleus herds / bull mother farms, young bull rearing centers and strengthening semen collection and cryo-storage banks.
3. Identification of operational areas / regions for the breed to be improved upon with availability of Binjharपुरi semen and trained manpower.
4. Formation of the Breed societies / NGOs for participation of farmers / breeders in breed conservation and improvement programmes.



Three generations of Binjharपुरi cattle



Twinning- an exception in Binjharपुरi cattle



## BREED DESCRIPTOR

### I. GENERAL DESCRIPTION

1. Name of the breed : **Binjharpuri**
2. Background for such a name : **Heavy concentration is in Binjharpur area of Jajpur district**
3. Species name
4. Most closely related breeds (in appearance) : **Nil**
5. Since when the breed is known
6. Estimated population (Approx) : **67,000**

	<b>Male</b>	<b>Female</b>
Claves (up to 1 year)	8,000	8,000
Stock (1 to 3 years)	8,000	10,000
Adult (3 years and above)	13,000	20,000
Milking females	-	10,000
Stud bulls	300	-
7. a. Native tract of distribution in terms of : **Longitude 85° 40' to 86° 44' E  
Latitude 20° 43' to 21° 10' N**
- b. Approximate area of distribution (in sq. kms.) : **3690 sq.km.**  
Place(s) : **Whole Jajpur district and adjoining areas of Kendrapara and Bhadrak. Heavy concentration is in Bari, Binjharpur and Dasrathpur area of Jajpur district.**
8. a. Communities responsible for developing the breed : **Non specific**
- b. Description of community (Farmers/nomads/isolated/tribals) : **Farmers is general and small & marginal farmers in particular.**
9. Native environment
  - a. Soil description : **Alluvial**
  - b. Minimum temperature **21.3°C** month of min. **January**
  - c. Maximum temperature **37.5°C** month of max. **May**
  - d. Maximum humidity **93.3** month of max. **October**
  - e. Minimum humidity **31.6** month of min. **February**
  - f. Annual rain fall **1580.9 mm**
  - g. Peak rain **527.3** month of peak. **September**
  - h. Annual duration of rain. **125.3 days**
  - i. Annual duration of drought
  - j. Annual duration of flood **18 days**
  - k. Elevation of land mean **42 meters** range **12 to 80 meters**
  - l. Sub-soil water depth during summer (in mtrs) **6.5**
  - m. Sub-soil water depth during rainy season (in mtrs) **2.2**
  - n. Forest area (in sq. kms.) : **420 sq. km.**
  - o. Wet cultivated area : **150,000 ha**
  - p. Dry cultivated area : **30,000 ha**
  - q. Uncultivated area : **5000 ha**
  - r. Main cultivated cereals : **Rice, Jowar, Maize**
  - s. Main cultivated pulses : **Bengal gram, Black gram, Kulthi**
  - t. Other crops : **Groundnut, Jute, Sugarcane**



**10. Feed**

**a. Major fodder trees**

- (a) Dimiri - *Ficus sp.*
- (b) Chakunda - *Abizia lebeck*
- (c) Tentuli - *Camarindus indicus*
- (d) Bara koli - *Zizyphus jujuba*
- (e) Sahada - *Stveblus asper*
- (f) Mandar - *Hibiscus rosa sinensis*
- (g) Bamboo - *Bambusa tulda*
- (h) Dhanwantari - *Cyndophogon flexupsus*
- (i) Bara - *Ficus bengalensis*
- (j) Aswastha - *Ficus religiosh*
- (k) Mango - *Magnifera indica*
- (l) Jackfruit - *Artocapus heterophylla*
- (m) Banana - *Musa paradisica*

**b. Major fodder shrubs**

- (a) Lajakuli - *Mimosa pudica*
- (b) Kantei koli - *Ziziphus oenoplia*

**c. Major native fodder grass**

- (a) Duba - *Cynodon dactylon*
- (b) Mutha - *Cyperus rotundus*
- (c) Bhuin kamuda - *Merenia emarginata*
- (d) Bena - *Vetiber zizanoids*
- (e) Gugurchia - *Chrysopogon aciculatus*

**d. Cultivated legume fodder and monocot grass. : Very negligible**

- (a) Green gram - *Vigna radiata*
- (b) Black gram - *Vigna Mango*
- (c) Bengal Gram - *Phaseolus radiatus*
- (d) Cow pea - *Lablab purpurus*
- (e) Maize - *Zea mays*
- (f) Sugarcane - *Saccharum officinarum*
- (g) Wheat - *Triticum Sps.*
- (h) Rice - *Coryza sativa*

**e. Cultivated tubers : Sweet potato**

**f. Source of dry fodder : Paddy straw**

**g. Seed and grain feed : Rice husk, Chuni**

**h. Cakes and other concentrates : Nil**

**i. Any reported deficiency of minerals in water. : Not studied**

**j. Any reported minerals in harmful quantity and source : Not studied**

**11. Housing : Only at night**

- a. Type of housing : Kutcha flooring with thatched roof. Mostly walls are made up of Bamboo, palm and coconut leaves. Very few walls are made up of clay or bricks.



<b>12. Herd size</b>	(Avr. farm family N = 8)	In grazing
a. Number of breeding females	: 02	45%
b. Number of replacement females	: 02	15%
c. Number of bullocks	: 02	14%
d. Number of calves (less than 12 months)	: 02	22%
e. Bull	: Nil	4%

### 13. Mating method

a. Natural service (%)	: 80%
b. Artificial insemination (%)	: 20%

## II. PHYSICAL CHARACTERS

### 1. COLOUR

		% Surface area in	
		Male	Female
a. Coat colour	<b>White</b>	<b>85</b>	<b>88</b>
	<b>Brown</b>	<b>05</b>	<b>04</b>
	<b>Black</b>	<b>02</b>	<b>05</b>
	<b>Grey</b>	<b>08</b>	<b>03</b>
b. Muzzle	<b>Black</b>	<b>100</b>	<b>100</b>
c. Eyelids	<b>Black</b>	<b>100</b>	<b>100</b>
d. Tail (switch)	<b>Black</b>	<b>90</b>	<b>87</b>
	<b>Grey/Whitish</b>	<b>10</b>	<b>13</b>
e. Hoofs	<b>Black</b>	<b>100</b>	<b>100</b>

### 2. HORNS

		Male	Female
a. Colour		<b>Black</b>	<b>Black</b>
b. Size		<b>21.17 ± 2.86</b>	<b>12.70 ± 1.31</b>
c. Shape (Straight/curved)		<b>Curved</b>	<b>Curved</b>

### 3. EARS

a. Length	: <b>20 cm</b>
b. Orientation (Horizontal/drooping)	: <b>Horizontal</b>

### 4. HEAD

a. Forehead (Convex/concave/straight):	<b>Straight</b>
b. General description	: <b>Head is in upright position and medium in size</b>

### 5. BODY

		Male	Female
a. Hump (Large/medium/small)		<b>Large</b>	<b>Medium</b>
b. Dewlap (Large/medium/small)		<b>Large</b>	<b>Small</b>
c. Naval flap (Large/medium/small)		<b>Large</b>	<b>-</b>
d. Basic temperament		<b>Vicious</b>	<b>Docile</b>

### 6. UDDER

a. Shape (bowl/round/trough/pendulous)	: <b>Bowl</b>
b. Fore-udder size (Large/medium/small)	: <b>Medium</b>
c. Rear-udder size (Large/medium/small)	: <b>Medium</b>
d. Teat shape (cylindrical/funnel/pear)	: <b>Cylindrical</b>
e. Teat tip (pointed/ round/flap)	: <b>Round</b>
f. Milk vein (Large/medium/small)	: <b>Medium</b>



### III. PERFORMANCE

#### 1. Body weight (kg)

	Male	Female
a. Birth weight	19.42 ± 0.67	17.83 ± 0.82
b. Pre-weaning weight	41.76 ± 1.12	39.21 ± 1.23
c. 12 month weight	98.72 ± 4.23	93.25 ± 3.26
d. Adult weight	254.71 ± 7.32	207.05 ± 5.32

#### 2. Body measurements(cm.)

	Male	Female
a. Chest-girth	144.2 ± 2.32	136.2 ± 2.84
b. Body length	126.32 ± 2.32	15.1 ± 1.14
c. Height at withers	121.4 ± 1.76	107.3 ± 2.16

#### 3. Dairy performance

	Lactation			
	I	II	III	IV
a. Daily milk yield (lts)	3.23 ± 0.14	3.35 ± 0.13	4.23 ± 0.16	4.34 ± 0.11
b. Peak milk yield (lts)	4.14	4.32	5.12	5.05
c. Days to reach peak yield	62.3	64.3	58.3	52.4
d. Lactation length (days)	273.73 ± 3.26	296.62 ± 3.75	302.23 ± 4.23	308.36 ± 4.23
e. Lactation milk yield (lts)	916.45	993.68	1278.43	1338.28
f. Fat %	4.41	4.40	4.36	4.41
g. SNF %	8.58	8.54	8.56	8.53
h. Dry period (days)	126.23	113.13	107.51	101.25
i. Productive life span (month)	180-192 months			
j. Milking rate (litres/min.)	1lt in 4 to 5 min			

#### 4. Reproduction

a. Males	
(i) Age at first mating (days)	: 1090.45
b. Females	
(i) Age at first oestrus (days)	: 912.32 ± 4.23
(ii) Oestrous cycle duration (days)	: 21
(iii) Oestrus duration (hrs)	: 24
(iv) Age at first mating (days)	: 938.42 ± 4.56
(v) Age at first calving (days)	: 1230.73 ± 6.42
(vi) Service period (days)	: 126.25 ± 3.41
(vii) Calving interval (days)	: 409.62 ± 6.72
(viii) Gestation length and range	: 282.32 ± 2.61
(vii) Twinning percentage	: Only one during survey
(viii) Dystocia percentage	: 4.7
(ix) Placental retention (%)	: 10.4
(x) Abortions (%)	: 4.7
(xi) Still births (%)	: 2.5
(xii) Post-gestational mortality (%)	: Not studied

#### 5. Type of work

a. Purpose (Ploughing, threshing, Power etc.)	: All types of agricultural operations
b. Capacity for work (Hard/medium/light)	: Hard
c. Average duration of work per day (hrs)	: 6 hours
6. Drought tolerance (Allocate grades 1-5, 1=high)	: 1
7. Heat tolerance (Allocate grades 1-5, 1=high)	: 1
8. Diseases and parasites	: Mostly resistant to most of diseases and parasites when compared with other cattle types in the area.
9. Measures against diseases	: Vaccination schedules are followed.



**TABLE 1: MONTHLY CLIMATIC PARAMETER OF BINJHARPURI CATTLE BREEDING TRACT**

Month	Jan	Feb	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Air Temp (°C)	Max.	25.5± 0.24	32.7± 0.28	34.1± 0.17	36.9± 0.18	37.5± 0.28	35.8± 0.16	34.1± 0.14	33.0± 0.24	29.1± 0.14	32.3± 0.23	35.6± 0.13	34.3± 0.16
	Min	21.3± 0.14	22.1± 0.41	25.3± 0.32	30.4± 0.09	31.3± 0.18	29.4± 0.24	27.8± 0.33	27.3± 0.23	29.1± 0.12	28.3± 0.15	25.0± 0.24	22.5± 0.15
Relative Humidity (%)	Max	91.2± 0.32	93.4± 0.33	92.8± 0.31	89.2± 0.52	86.0± 0.42	89.8± 0.23	92.6± 0.32	89.3± 0.24	91.3± 0.33	93.2± 0.24	88.5± 0.22	81.1± 0.41
	Min.	46.6± 0.21	31.6± 0.42	52.1± 0.32	51.2± 0.15	50.8± 0.43	51.2± 0.34	72.3± 0.42	72.7± 0.14	81.1± 0.21	82.2± 0.31	43.2± 0.22	45.4± 0.21
Rainfall (mm)	16.3	26.3	56.9	45.2	59.4	101.4	255.7	161.6	527.3	240.7	56.4	33.7	
Total rain days	2.2	2.8	3.6	2.3	4.7	11.3	20.6	15.3	18.6	20.0	3.6	2.7	



**TABLE 2. BODY WEIGHT AND BODY MEASUREMENTS OF BINJHARPURI CATTLE**

	SEX	BW (Kg)	HW(Cm)	BL(Cm)	HG(Cm)	PG (Cm)	TL (Cm)	HeL (Cm)	HoL (Cm)	EL (Cm)	SL (Cm)
Birth	M	19.42 ±0.67	58.32 ±1.23	46.41 ±1.12	57.62 ±2.10	58.62 ±2.36	32.22 ±0.42	18.23 ±0.28	-	12.86 ±0.18	5.32 ±0.26
	F	17.83 ±0.82	56.62 ±1.15	45.37 ±1.14	55.83 ±1.81	58.43 ±1.18	32.28 ±0.32	17.83 ±0.31	-	12.84 ±0.21	5.13 ±0.21
3 month	M	41.76 ±1.12	75.67 ±2.13	69.67 ±1.76	78.62 ±2.03	79.57 ±1.86	46.36 ±0.78	25.44 ±0.62	-	13.42 ±0.24	7.16 ±0.42
	F	39.21 ±1.23	73.82 ±1.18	69.67 ±1.76	78.62 ±2.03	79.57 ±1.86	46.36 ±0.78	25.44 ±0.62	-	13.31 ±0.28	6.64 ±0.46
6 month	M	56.65 ±3.78	84.32 ±2.42	78.23 ±2.23	86.42 ±1.62	87.12 ±2.13	56.78 ±1.02	29.82 ±0.62	-	15.56 ±0.41	10.23 ±0.35
	F	51.20 ±3.16	82.16 ±1.98	75.23 ±1.86	83.56 ±2.11	84.33 ±2.16	55.63 ±1.12	27.37 ±0.43	-	15.21 ±0.38	10.12 ±0.32
12 month	M	98.72 ±4.23	90.38 ±3.22	91.26 ±3.34	105.62 ±4.21	105.73 ±4.23	72.37 ±2.34	33.35 ±0.42	2.43 ±0.21	17.26 ±0.52	17.43 ±0.63
	F	93.25 ±3.26	88.56 ±1.20	89.67 ±1.65	103.56 ±1.86	103.32 ±1.72	73.62 ±0.86	30.72 ±0.42	1.43 ±0.21	16.86 ±0.37	18.76 ±0.82
Adult (>2 yr)	M	254.71 ±7.32	121.40 ±1.76	126.32 ±2.32	144.2 ±2.32	143.2 ±2.31	95.70 ±3.23	44.71 ±1.20	21.17 ±2.86	20.53 ±0.23	25.62 ±1.3
	F	207.05 ±5.32	107.30 ±2.16	115.10 ±1.14	136.21 ±2.84	146.30 ±3.51	97.90 ±3.71	40.10 ±0.21	12.70 ±1.31	19.14 ±0.26	28.20 ±1.21

- BW - Body Weight
- HW - Height at Withers
- BL - Body Length
- HG - Heart Girth
- PG - Punch Girth
- TL - Tail length
- HeL - Head length
- HoL- Horn length
- EL - Ear length
- SL - Switch length



**TABLE 3. COAT COLOUR PATTERN OF BINJHARPURI CATTLE IN DIFFERENT ZONES (%)**

Coat Colour	Zone			Overall
	Binjharpur	Dasrathpur	Bari	
White	86.4	83.8	85.3	85.52
Grey	4.1	5.3	4.0	4.37
Brown	4.4	3.1	3.5	3.83
Black	5.1	7.9	7.2	6.28

**TABLE 4. FEEDING MANAGEMENT OF BINJHARPURI CATTLE IN DIFFERENT ZONES**

Parameters	Binjharpur	Dasrathpur	Bari	Overall
Maximum distance travel from home (km)	4.2	4.0	3.5	4.15
Area covered daily (sq.km)	0.45	0.52	0.48	0.47
Duration of grazing (hr)	6.1±0.12	6.0±0.15	5.5±0.16	6.0±0.15
Duration of suckling Without milking (days)	22.34±1.24	20.46±1.33	21.23±1.22	22.10±1.05
Proportions calves grazed with mother (%)	44.23	42.32	45.23	44.68







**TABLE 5. REPRODUCTION TRAITS OF BINJHARPURI CATTLE**

Sl. No	Traits	Observation
<b>Male</b>		
1	Age at first mating (days)	1090.45
<b>Female</b>		
1	Age at puberty (days)	912.32 ±11.23
2	Oestrus cycle duration (days)	21
3	Oestrus duration (hrs)	24
4	Age at 1 <sup>st</sup> mating (days)	948.42 ±14.56
5	Age at 1 <sup>st</sup> calving (days)	1230.73 ±12.42
6	Age at 2 <sup>nd</sup> calving (days)	1648.65±18.43
7	Interval for calving to conception (days)	126.25±3.41
8	Calving interval (days)	409.62± 6.72
9	Gestation length (days)	282.32±2.61days
10	Life time no. of success for matings	9.26
11	No. of calvings	9.26

**TABLE 6. INCIDENCE (%) OF REPRODUCTIVE HEALTH PROBLEMS OF BINJHARPURI CATTLE**

Types of problems	Zone			Overall
	Binjharपुर	Bari	Dasrathपुर	
Abortion	4.2	5.3	4.6	4.7
Still birth	2.3	2.7	3.2	2.5
Retention of placenta	10.3	11.2	11.3	10.4
Repeat breeding	8.2	7.3	8.6	8.2
Pyometra	2.3	3.2	3.7	2.6
Anoestrus	8.7	10.8	11.3	9.3
Dystocia	3.7	5.3	6.2	4.7
Prolapese	10.7	11.2	10.8	10.4

**TABLE 7. EFFECT OF SEASON ON DISTRIBUTION OF OESTRUS OF BINJHARPURI CATTLE**

Sl. No	Animals	Summer	Rainy	Winter
1	Heifer	13.5 %	39.3%	47.2 %
2	Adult cow	21.6 %	37.5 %	40.9 %



**TABLE 8. AGE SPECIFIC INCIDENCE OF DIFFERENT DISEASES IN BINJHARPURI CATTLE (%)**

Diseases / Symptoms	Age group		
	Up to 1 month	> 1 to 12 month	> 12 months
Diarrhoea	20.23	66.71	13.06
Fever	26.24	33.35	40.41
Pneumonia	44.32	37.25	18.43
Parasite	16.24	43.36	40.39
Skin diseases	4.12	41.37	54.51
Anorexia	10.24	38.14	51.62
Ear/Eye inf	12.13	44.25	43.62
Viral diseases	4.51	35.14	60.35
Blood protozoan diseases	-	41.36	58.64
Miscellaneous	38.22	31.52	30.26

**TABLE 9. SEASONALITY OF DISEASE INCIDENCE IN BINJHARPURI CATTLE (%)**

Disease / Symptoms	Season			Overall
	Summer	Rainy	Winter	
Diarrhoea	17.2	22.5	5.3	45%
Fever	2.3	33.6	4.1	40%
Pneumonia	-	4.8	0.2	5%
Parasite	20.5	25.2	24.3	70%
Skin disease	4.1	3.2	2.8	10%
Anorexia	13.5	6.3	10.2	30%
Ear/Eye. Inf	0.1	2.7	0.2	3%
Viral diseases	1.8	17.2	1.0	20%
Blood protozoan diseases	3.2	4.6	2.2	10%
Miscellaneous	4.2	4.0	6.8	15%



**TABLE 10. DAIRY PERFORMANCE IN DIFFERENT LACTATIONS OF BINJHARPURI CATTLE**

Dairy performance	Lactation			
	I	II	III	IV
Daily milk yield(lts)	3.23±0.14	3.35 ±0.13	4.23 ± 0.16	4.34 ± 0.11
Peak milk yield(lts)	4.14	4.32	5.12	5.05
Days to reach peak yield	62.3	64.3	58.3	52.4
Lactation length(days)	273.73 ± 3.26	296.62 ± 3.75	302.23 ± 4.23	308.36 ± 4.23
Lactation milk yield(lts)	916.45	993.68	1278.43	1338.28
Fat %	4.41	4.40	4.36	4.41
SNF %	8.58	8.54	8.56	8.53
Dry period(days)	126.23	113.13	107.51	101.25

**TABLE 11. LAND HOLDING OF BINJHARPURI CATTLE FARMERS (%)**

Zone	Land holding			
	Landless	up to 1 acre	1.1 to 2 acres	> 2 acres
Binjharpur	10.58	17.36	35.54	36.52
Dasarathapur	12.12	18.21	38.23	32.44
Bari	11.20	20.12	36.41	32.27
Overall	10.23	17.94	36.67	35.16

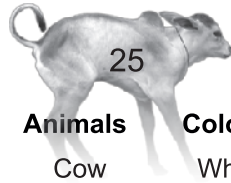
**TABLE 12. PHYSIOLOGICAL PARAMETERS OF BINJHARPURI CATTLE**

Sex	Age group	Rectal Temperature (°F)	Pulse rate (per min.)	Respiration rate (per min.)
Male	Up to 3 month	102.4 ± 0.3	78.6 ±0.8	22.4 ±0.4
	More than 3 month	101.2± 0.2	68.3 ±0.6	19.2 ± 0.3
Female	Up to 3 month	102.4 ± 0.3	78.4 ± 0.2	22.6 ± 0.6
	More than 3 month	101.3 ±0.1	68.6 ± 0.1	19.6 ± 0.5
Overall		101.6 ± 0.1	72.2 ± 0.8	20.1 ± 0.6



## List of elite breeding females

Name of the Farmers	Village	Animals	Colour	Switch	Horn (cm)	Age (yr)
Balaram Pani	Binjharpur	Cow	White	Black	18	4
Anil Ku. Rout	Binjharpur	Cow	White	Black	17	5
Samasundar Biswal	Debil	Cow	White	Black	20	8
Trilochan Jena	Debil	Cow	White	Black	11	6
Banamali Jena	Debil	Cow	Brown	Black	16	7
Sanatan jena	Debil	Cow	White	Black	14	4
Bijay Ku, Biswal	Debil	Cow	White	White	18	6
Gopabandhu Biswal	Debil	Cow	White	Black	24	7
Rajanee kanta Biswal	Debil	Cow	White	Black	23	8
Sudersan Jena	Debil	Cow	Brown	Black	24	7
Bhabagrahi Mallik	Kalamatia	Cow	White	Black	14	5
Banamali Barik	Kakudikuda	Cow	White	Black	12	6
Padmanabha Nayak	Kakudikuda	Cow	White	Black	10	6
Bipin Rout	Nuapada	Cow	White	Black	23	6
Maniram Dhal	Malkpur	Cow	White	Black	21	9
Purna Chaini	Bijapada	Cow	White	Black	16	8
Srihari Sahu	Singhpur	Cow	White	Black	16	4
Guru Ch. Sahoo	Kaipada	Cow	White	Black	15	7
Parsuram Biswal	Chatradulai	Cow	White	Black	18	5
Abhaya Ku. Biswal	Chatradulai	Cow	White	White	22	6
Ajaya Ku. Biswal	Chatisdulai	Cow	White	Black	11	6
Binakar Mallik	Kalamatia	Cow	Black	Black	12	8
Paramananda Biswal	Binjharpuri	Cow	White	Black	14	5
Radhakanta	Chatisa Debil	Cow	White	Black	23	8
Madhabandnda Biswal	Chatisa Debil	Cow	White	Black	13	6
Bipin Bihari Biswal	Chatisa Debil	Cow	White	Black	24	7
Krushna Ch, Das	Binjharpur	Cow	White	Black	10	7
Krupasindhu Panda	Binjharpur	Cow	White	Black	11	8
Rabinargan Das	Chandramu	Cow	Brown	Black	22	7
Ranjan Sutar	Keruna	Cow	Black	black	19	6
Ananda Ch. Nayak	Patapur	Cow	White	Black	13	5
Barini Behera	Dasarathpur	Cow	White	Black	15	7
Rabindra Das	Binjharpur	Cow	Black	Black	15	5
Gobardhan Rout	Chitalo	Cow	White	Black	17	4
Brundaban Kabi	Chitalo	Cow	White	Black	15	5
Bishnu Ch Routray	Chitalo	Cow	White	Black	18	5
Jiten Dhal	Bidrupa	Cow	White	Black	19	9
Sunakar Das	Bajapada	Cow	White	Black	20	4



Name of the Farmers	Village	Animals	Colour	Switch	Horn (cm)	Age (yr)
Dhruba Ch. Jena	Nuapada	Cow	White	Black	18	4
Prahalada Jena	Nuapada	Cow	White	Black	21	4
Abhaya Ku, Jena	Nuapada	Cow	White	Black	19	4
Balaram Rout	Binjharpur	Cow	White	Black	21	5
Chandana Dhal	Kalamatia	Cow	White	Black	20	4
Balaram Dhal	Bidrupa	Cow	White	Black	22	6
Bipin Patra	Bajapada	Cow	White	Black	23	7
Narahari Ray	Kaipada	Cow	White	Black	22	4
Bishnu Patra	Kaipada	Cow	white	Black	21	4
Rabibdra Patra	Bajapada	Cow	White	Black	22	4
Guru Ch. Dhala	Kalamatia	Cow	White	Black	21	5
Bairagi Ch. Dhala	Kalamatia	Cow	White	Black	22	6
Prahalada Jena	Nuapada	Cow	White	Black	21	5
Jiten Dhal	Bidrupa	Cow	White	Black	22	5
Sunakar Das	Bijapada	Cow	White	Black	21	4
Dhruba Ch. Jena	Nuapada	Cow	White	Black	19	4
Hari Sutar	Keruna	Cow	White	Black	17	5
Murari Kishane Panda	Patapur	Cow	White	Black	20	6
Gourahari Ray	Chitalo	Cow	White	Black	20	10
Girish Ch. Das	Chitalo	Cow	White	Black	15	4
Basanta Ku. Routray	Chitalo	Cow	White	Black	22	5
Akrura Ch. Ray	Chitalo	Cow	White	Black	12	4
Gopal Ch. Beuria	Chitalo	Cow	White	Black	12	4
Subash Mohapatro	Dasarathpur	Cow	White	Black	18	5
Nilamani Routray	Chitalo	Cow	White	Black	22	8
Gouranga Ch. Mallick	Hasanpur	Cow	White	Black	15	4



