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Popular Article

Murrah & Nili-Ravi Buffalo: Know the Breed, Judge the Best

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Introduction:

Buffaloes are an important component of dairy production, and breed characteristics play a major role in determining their productive and reproductive potential. Among the recognized dairy breeds, Murrah and Nili-Ravi are notable for their desirable dairy characteristics and high milk-producing ability. Murrah, originating from northwestern India, is widely distributed and extensively used for breeding and grading-up, while Nili-Ravi originated in the Sutlej-Ravi River belt of undivided Punjab. Beyond breed identification, systematic judging is essential for selecting superior animals. This article highlights their origin, physical, productive and reproductive traits, along with key principles for scientific buffalo judging and selection.

Salient Features

1. Murrah:

a) Origin and Breeding Tract:

Murrah buffaloes originated in northwestern India and were selected for high milk production and curled horns. The name *Murrah* means 'curled', while they are also called 'Delhi', referring to their centre of origin. Due to their superior milk production and global demand, they are known as the "Black Gold" or "Holstein-Friesian" of the buffalo world.

The home tract covers southern Haryana, including Rohtak, Jind, Hisar, Jhajjar, Fatehabad, Gurugram and Delhi. The breed is now widely distributed throughout India and is used for pure breeding as well as grading-up local buffaloes. It is also important in several countries, including Bulgaria, Philippines, Malaysia, Thailand, China, Indonesia, Bangladesh, Nepal, Myanmar, Vietnam, Brazil and Sri Lanka.

The native tract lies approximately between 28°15'-30°00' N latitude and 75°45'-70°80' E longitude. Soils are mainly light, sandy and loamy. The climate is hot and dry, with summer temperatures reaching about 45°C, while winter temperatures may approach freezing with occasional frost.

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b) Physical Characteristics:

- **Body colour:** Jet black; small white markings on the face or legs are occasionally present but not preferred.
- **Horns:** Short, tight, flattened, directed backward and upward, then spirally curved inward; curvature increases with age.
- **Eyes:** Black, prominent and active; cornea should be clear without whiteness.
- **Tail:** Long, reaching the fetlock; switch black or with white up to about 6 inches.
- **Body:** Heavy, well-built and wedge-shaped.
- **Head:** Medium-sized.
- **Neck:** Long and thin in females; thick and massive in males.
- **Ears:** Short, thin and alert.
- **Limbs:** Short and strong.
- **Skin:** Soft and smooth with scanty hair.
- **Udder:** Well-developed and drooping, with evenly distributed teats.
- **Teats:** Long and uniformly spaced; hind teats are longer than fore teats.

c) Biometry:

Character	Male	Female
Body length (cm)	150	148
Height (cm)	142	133
Heart girth (cm)	220	202
Birth weight (kg)	31.7	30
Adult body weight (kg)	450-800 (avg. 567)	350-700 (avg. 516)

d) Production Traits:

Milk production varies with management and environmental conditions. Large herds have recorded an average milk yield of about 1,800 kg, with peak yields generally exceeding 7 kg/day.

e) Reproductive Traits:

- **Age at first calving:** Average 1,319 days.
- **Dry period:** 187.6 days in first lactation and 154.8 days overall.
- **Service period:** 177.1 days in first parity and 136.3 days overall.
- **Calving interval:** 455-632 days in first calving (average 488.1 days) and 430-604 days overall (average 452.9 days).
- **Services per conception:** 1.75-2.15 (average 1.93).
- **Service period:** Despite a recommended postpartum rest of about 60 days, Murrah generally has a relatively long service period of 5-6 months.
- **Dry period:** Generally, around 6 months.

2. Nili-Ravi:

a) Origin and Breeding Tract:

Nili-Ravi buffaloes originated in the Sutlej-Ravi River belt of undivided Punjab. Originally, Nili and Ravi were two separate breeds, but extensive crossbreeding gradually resulted in the single Nili-Ravi breed.

In India, they are mainly concentrated in Amritsar, Gurdaspur and Ferozepur districts of Punjab. In Pakistan, they are widely distributed, with major concentrations in Lahore, Sheikhupura, Sahiwal, Multan, Bahawalpur and Bahawalnagar. Due to their excellent dairy characteristics, Nili-Ravi buffaloes are now found throughout Pakistan, including large numbers in the Karachi buffalo colony, where they are maintained for city milk supply.

b) Physical Characteristics:

- **Body colour:** Usually black; brown colour is also seen.
- **Horns:** Small, tightly curled and circular in cross-section; slightly less curled than Murrah.
- **Markings:** Characteristic white markings on the forehead, muzzle and legs.
- **Eyes:** Usually walled eyes (white cornea).
- **Tail:** Thick at the base, tapering towards the end, extending below the hocks with a white switch.
- **Body:** Large-sized with a deep, low-set frame.
- **Head:** Elongated, bulging at the top and depressed between the eyes.
- **Neck:** Long and thin in females; thick and powerful in males.
- **Udder:** Well-shaped, capacious and extending forward up to the navel flap.
- **Teats:** Long and evenly spaced.

c) Biometry:

Body weight is recorded at different ages from birth to first calving. Average daily weight gain is highest during the first 6 months and gradually decreases thereafter. On average, Nili-Ravi animals gain approximately 406.1 g/day from birth to first calving.

d) Production Traits:

Traits	Weighted Average	Range in Different Reports
Average lactation length (days)	306	262-319
Average lactation milk yield (kg)	1945	1688- 2317
Peak milk yield (kg)	9.4	7.2-11.8
Average Fat%	6.9	6.6-7.2

e) Reproductive Traits:

- First service period: 138.37–280.96 days.
- First dry period: 98.20–202.26 days.
- First calving interval: 443.03–579.99 days.

Judging of Buffaloes:

Judging is the systematic evaluation of buffaloes based on their conformation, functionality, productivity, longevity, and reproductive efficiency. The objective is to identify animals with superior genetic and economic potential rather than merely attractive appearance.

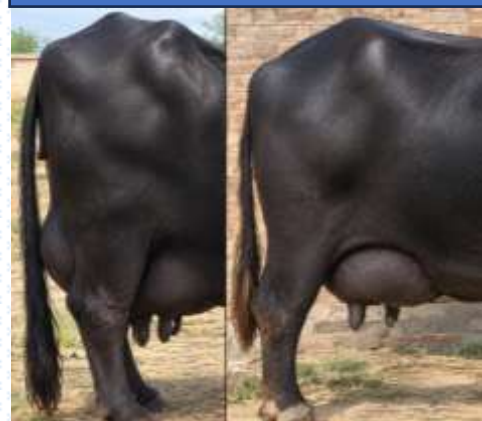
Standard Judging Score Card:

Trait	Weight (%)	Significance
Udder	40	Milk production and longevity
Dairy Strength	25	Production efficiency and feed utilization
Feet & Legs	20	Mobility, fertility and productive life
Frame	15	Structural support and calving ease

Udder (40%) – The Most Economically Important Trait: A well-developed udder directly determines the buffalo's milk-producing ability and herd life.

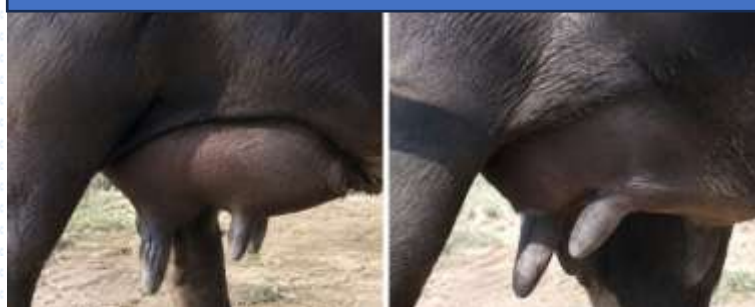
Ideal Characteristics:

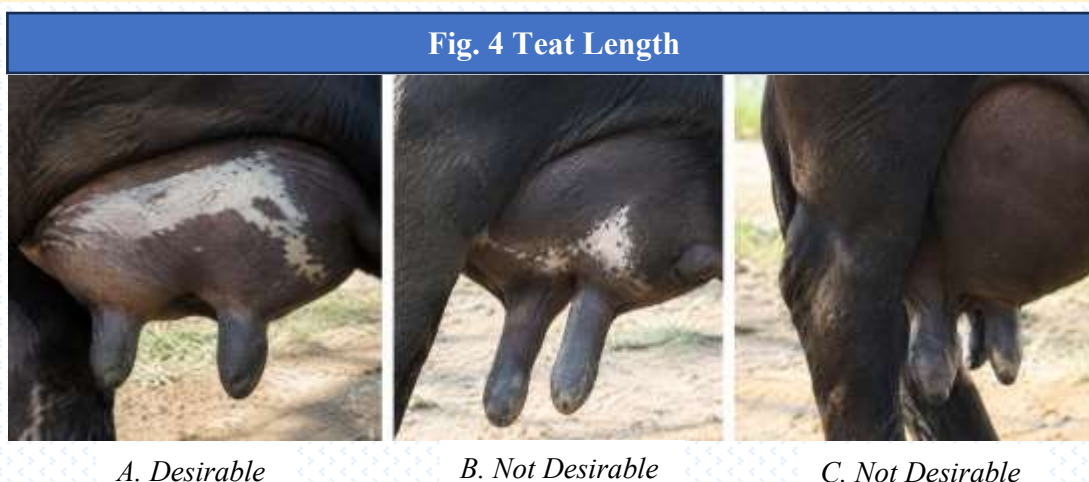
- Moderate udder depth (above the hocks)
- Strong fore and rear udder attachment
- High, wide rear udder
- Strong median suspensory ligament
- Square teat placement
- Cylindrical, medium-sized teats
- Soft, pliable udder texture

Fig. 1 Udder Depth

A. Not Desirable
(Below Hock)

B. Desirable
(Above Hock)

Fig. 2 Normal Teat Placement**Fig. 3 Abnormal Teat Placement**



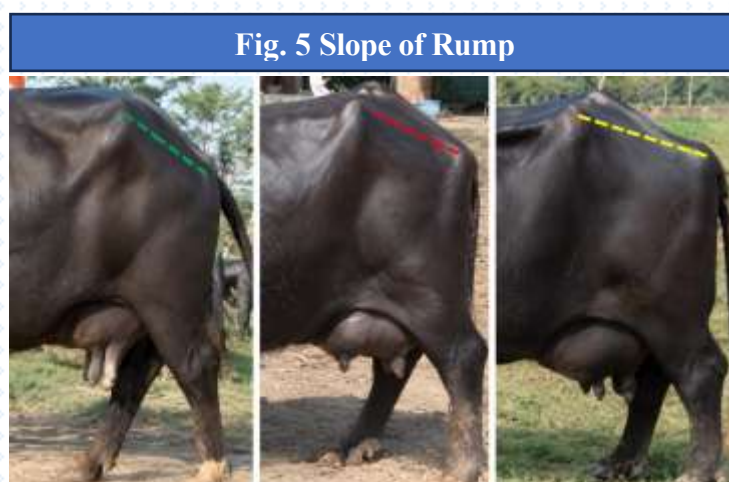
Economic Importance:

- a) **Milk Yield:** A capacious, well-attached udder accommodates larger secretory tissue, resulting in higher milk production.
- b) **Longer Productive Life:** Strong attachments prevent pendulous udders, reducing injuries and allowing animals to remain productive for more lactations.
- c) **Milking Efficiency:** Proper teat placement and teat size facilitate faster, complete hand or machine milking.
- d) **Lower Mastitis Risk:** Correct teat orientation and a strong suspensory ligament minimize contamination and udder infections.
- e) **Reduced Veterinary Costs:** Well-supported udders are less susceptible to trauma and teat injuries.

Dairy Strength (25%) - Dairy strength represents the balance between angularity (dairyness) and body strength required for sustained milk production.

Ideal Characteristics:

- Long lean neck
- Sharp withers
- Open ribs
- Deep chest
- Wide heart girth
- Thin, loose skin
- Lean thighs
- Prominent hip and pin bones



Very steep slope is not preferred: Considered to be related to uterine prolapse

Economic Importance:

- a) **Higher Feed Intake:** Deep chest and capacious barrel increase rumen capacity, enabling greater feed consumption.
- b) **Better Feed Conversion:** Animals efficiently convert nutrients into milk rather than body fat.
- c) **Persistent Lactation:** Strong constitution supports prolonged and consistent milk production.
- d) **Better Health:** Well-developed thoracic capacity supports heart and lung function, improving disease resistance
- e) **Improved Reproductive Performance:** Animals maintaining an optimal body condition return to estrus earlier and exhibit better fertility.

Fig. 6 Variation in Brisket Size (Right one Preferred)**Feet and Legs (20%) -**

Sound feet and legs are essential for locomotion, feeding, mating, and longevity.

Ideal Characteristics:

- Strong pasterns
- Deep heel
- Compact claws preferred
- Moderate hock angle
- Straight rear legs
- Foot angle (Free, comfortable movement)

Fig. 7 Body Size & Hock Position

- Body size (left and right: reasonable body size; middle: large body size)
- Hock position (left: straight hocks; middle: hock-in; right: extremely hock in)

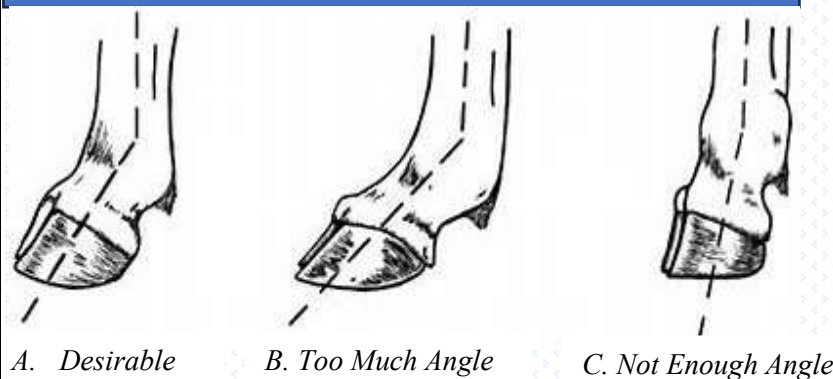
Fig. 8 Pastern Angle in Buffalo

Fig. 9 Rear leg side view (Left: too curved, centre: normal, right: too straight)



Economic Importance:

Increased Herd Life: Strong legs reduce premature culling.

Better Fertility: Healthy animals walk more comfortably, express estrus more clearly, and exhibit improved conception rates.

Higher Milk Yield: Reduced lameness allows greater feed intake and minimizes production losses.

Lower Maintenance Cost: Less expenditure on hoof trimming and treatment of locomotor disorders.

Improved Grazing Ability: Animals can efficiently utilize pasture resources.

Frame (15%) -

The frame provides the structural foundation supporting the udder and reproductive organs.

Ideal Characteristics:

- Long body
- Wide rump
- Moderate rump slope
- Strong topline
- Wide thurls
- Good stature
- Smooth shoulder attachment

Fig. 10 Sacral crest in buffaloes (left: undesirable; right: desirable)



Functional Relationship Between Type Traits and Economics:

Trait	Functional Benefit	Economic Benefit
Udder depth	Prevents injuries	Higher lifetime milk yield
Strong udder attachment	Prevents udder breakdown	Increased longevity
Square teat placement	Easy milking	Reduced labour cost
Deep chest	Greater lung and heart capacity	Better health and production
Open ribs	Greater feed intake	Higher milk yield
Strong feet	Better locomotion	Reduced lameness losses
Wide rump	Easier calving	Improved fertility
Good stature	Larger body capacity	Greater salvage value

Body Condition Score (BCS):

- Body Condition Score (BCS) is considered an important trait in buffaloes.
- However, BCS is largely influenced by the animal's nutrition and physiological status, rather than genetics alone.
- Therefore, it should not be used as a beauty or selection criterion in buffalo judging at the present stage of breed development.
- Buffaloes exhibited in beauty competitions are often over-conditioned, but excessively fleshy or beefy animals are not desirable in dairy buffaloes, as they do not reflect ideal dairy conformation.

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