



Cattle Behavior

Environmental Perception

فكر للحظة: لقد حبا الخالق

- الإنسان بحواس وملكات تجعله أفضل المخلوقات
- ومكنته من التفكير (التصوري والتخيلي) والتدبير والتحليل والنقد
- رغماً عن ذلك:
- فإن الحيوانات مكنها الخالق بفرط في بعض الحواس التي رفعت من قدراتها الإدراكية:
- فسر هذه العبارة بإستخدام الماشية كنموذج
- **Question:** Despite the higher thinking abilities of human, some animals have higher perception in some terms, explain this sentence using cattle as a model.

Environmental Perception

- **The external environment is perceived through,**
- **The 5 classical senses of: (SHOTT).**
 - 1. Sight (vision),**
 - 2. Hearing,**
 - 3. Olfaction,**
 - 4. Taste**
 - 5. Touch**

a) Vision:

- Cattle have both rod and cone receptors (2-3 rods/cone in the fovea & 5-6 rods /cone the papilla),
- Length of wave:
 - Cattle has better color vision for long wave lengths (yellow, orange and red).
 - Compared to short wave lengths blue, grey & green.

a) Vision:

- **Length of the light cycle (photoperiod):**
- Its effects on reproduction and production,
- least productivity is obtained from cows in declining short day lengths.

(NB: melatonin?)

b) Hearing:

- It's of importance in interspecies and interspecies communication.
- The audible range of sound frequencies is **greater in cattle than human,**

b) Hearing:

- **Cattle (about 20 Hz to 35KHz) than human (about 30Hz to 20KHz)**
- **this enables cattle to hear small predators, such as Vampire bats.**
- **It is a main transmitter to Rabies.**

C) Olfaction:

- It is necessary for
 - interspecies communication in cattle
 - in synchronization of reproduction.
- Unlike human, the olfaction in **cattle is higher than human,**
- hence there are 2 major sites in cattle, the **nasal organ** and the **vomero-nasal organ.**

C) Olfaction:

- **The vomero nasal organ** is present in the roof of the mouth and consisted of blind tubular diverticulae lined with olfactory epithelium.
- This organ is responsible for **smell of pheromones**

d) Touch (Epidermal)

Receptors:

- The skin contains a number of sensory receptors particularly;
 - Mechano-receptors to detect pressure (movement & force).,
 - Thermo receptors to detect temperature (heat and cold).
 - Noci-receptors to detect damaging effect as inflammation (pain).
- These -more numerous in the sensitive area of the body.
- In cattle. e.g. : the lips, tongue, the nose, udder and vulval labia.

Taste receptor

- Cattle has the ability to identify **4 primary tastes** - related to the physiological requirements:
 - (i) sweet taste for nutrient supply,
 - (ii) salt taste to control electrolyte balance,
 - (iii) bitter taste to avoid toxins and
 - (iv) sour taste to regulate the pH.

Epidermal Receptors:

- The skin of cattle contains
- a number of sensory receptors particularly;
 - Mechano-receptors to detect movement and force,
 - Thermo receptors to detect temperature.
 - Noci-receptors to detect damaging effect as inflammation.
- **These receptors - numerous in** -sensitive parts of body e.g. the lips, tongue, the nose, udder and vulva.

3- Play in cattle

Definition:

- actions performed for amusement of the performer and other animals involved in the activity.

Examples of play in cattle are:

- Mock fleeing, running, trotting, cantering, and galloping often with tail elevated
- Mock aggression.
- Mock copulation and mounting other playmates.
- Vocalization (normally of low amplitude and frequency)
- Environment Exploration. To explore a novel object.

Play in cattle

Animals encountered in play are:

- **Young** animals with adults (especially with their mothers)
- - Between **calves** of similar age.

Functions of play:

- 1- Well fed animals play more -poor fed animals. e.g. as way of dispersing excess energy.
- 2- In mock mounting; play helps to exercise muscles, e.g. in vital activities like reproduction.
- 3- In exploration: to increase and stimulate learning.
- 4- helps to keep young together through social facilitation and to learn their position in the dominance hierarchy.

2- Learning in cattle

- **Learning** In addition to innate behavior cattle can acquires behaviors through experience and learning.
- It's most rapid in young cattle.
- Complex behaviours (particularly used in early life are partly inherited.
- However, some behaviors are acquired solely acquired through learning and under the control of man. e.g. **moving out of parlour**

Social Behaviour in cattle

- 1. Investigatory Behaviour:**
- 2. Recognition:**
- 3. Communication:**
- 4. Aggressive encounters**
- 5. Allo-grooming:**
- 6. Sexual Behaviour:**
- 7. Animal bonding**
- 8. Social Organization**

Recognition:

Little is known about recognition memory

- Cattle can recognize about 50-70 herdmates.

Recognition occurs through;

a- Visual and vocal ways (provides the primary recognition response).

b- Olfaction; has confirmatory role

Communication:

- 1. Visual communication.**
- 2. Olfactory communication.**
- 3. Tactile communication.**
- 4. Vocal communication.**

Communication:

1. Visual communication:

The threat display,

- in bull includes lowering the head, inclining the horn to the opponent with charging actions such as pawing the ground.

Reproductive display,

- in bull is similar to the threat display.
- in cow, by homosexual mounting and standing to be mounted.

2. Olfactory communication:

- The chemical messengers, called **pheromones**, used for both interspecial and intraspecial social communication).
- **Pheromones** are secreted by interdigital, infraorbital, inguinal, sebaceous, and salivary glands.
- also **excreted** in milk, urine, and other body secretions.

3. Tactile communication:

- It is mainly used in aggressive encounters, allo-grooming and sexual behaviour.

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4. Vocal communication:

Animals living in groups make more use of vocalization than solitary one.

Vocalization is used for recognition, fear and threat display.

These are the main syllables that are produced: تحليل الصوت

1. The “m” sound -produced with mouth shut and the sound produced from the nostril. It indicate- mild degree of excitement.
2. “En” sound is produced with the mouth open.
3. The “h” sound is produced with the mouth opened or closed.
4. The “uh” sound is produced by rapid inspiration.

5- Allo-grooming

- - Grooming is a body care activity, besides body care, it has a **nutritional, psychological and communication** function.
- - prolactin hormone secretion is associated with allo-grooming which cause opiate induction and self-narcotization effect.

Animal Bonding

- **A. Intra- special Bonding:**
 - *i. Mother – filial bonding:*
 - *ii. Peer bonding:*
- **B. Inter-special Bonding:**

A. Intra- special Bonding

- *i. Mother– filial (Neonate) bonding (Imprinting):*
- soon develops after birth -“imprinting”. It has the following characteristics:
 - during the sensitive period i.e. (immediately after birth).
 - A cow with twins: a weaker bond than a cow with single calf.
 - Multiparous cows: a stronger band than primiparous cow.
 - Intensively selected breeds: such as Frisian shows a weak mother filial bonding than less developed breeds.

A. Intra- special Bonding

Mother– filial (Neonate) bonding (Imprinting):

- In all breeds: artificial rearing of calves reduces their social adaptivity and result in them occupying a lower order in dominance.**
- Beneficial for the calf, early licking of the perineal region stimulates the GIT and excretion.**

ii. Peer bonding:

- - **Juvenile bonds** : between calves, because calves initiated by contact with each other through their mothers, maintained through play.
- **In adult cattle**, peer bonds are maintained by allo-grooming and grazing and less by play.

b. Inter-special bonding:

- This bond preserves **inter-species- social cohesion** and **minimize** inter-species **conflicts**.
- In **competitive** situations horse dominates cattle which intern dominates sheep.
- So in **grazing** situations, **protection of** both juvenile and adult **sheep** from predator (**puma**) is achieved by bonding them to **cattle**.

b. Inter-special bonding

- **NB: The bond between cattle and man:** The man assume the role of most dominant animal or leader brings stability to the herd.
- **NB:** and there's evidence that cattle responds to a person who is confident and consistent in handling them.

8- Social organization

- 1. Social hierarchies:***
- 2. Dominance order: social rank”***
- 3. Milking order:***
- 4. Sexual partner priority:***
- 5. Spatial distribution:***

a. Social hierarchies:

Benefit:- Hierarchy reduces the aggression by eliminating the repeated agonistic encounter.

- In domesticated cattle the natural groups (mothers, off springs and bulls) are replaced by groups of cows and growing cattle.
- **After 6 months of age**, they are divided into groups of similar age and sex.
- In all intensively managed stock a strict hierarchy develops to determine priority of access to resources e.g. space, feeding.....etc.

b. Dominance order:

- **Social rank**: It indicates priority
- priority is measured by observing agonistic interactions between cattle when space availability is reduced.
- **Factors determining social rank**:
 1. - **Experience** and physical abilities determine hierarchy
 2. - **Heritability**: emotionally or the fear determines hierarchy and varies in different individuals.

b. Dominance order:

- **Heritability**
- **Dairy cattle: Airshire dominates Jersey, Aberdeen dominates beef cattle: Shorthorn, which in turn dominates Herford.**
- 3 Chest **Girth**
- 4- **Height** at the wither
- 5- **Seniority**: age is closed herd. So introduction of new animal leads to social encounter

e. Spatial Distribution:

- The personal space is an envelope
- around the animal and is called the "bubble".
- The distance from the animals head to the edge of the bubble is called the flight distance.

e. Spatial Distribution:

- The flight distance is determined by the environment, the type of cattle and their position in dominance order.
 - In intensive environment, the flight distance is a reduced, and
 - Animal higher in dominance order have a greater flight distance than others.

Dominance order

- In free movement cattle herds graze in pear shaped formation.

- - Forced movement creates an order unrelated to the dominance order
- (i.e. the dominant animal is said to lead the herd by pushing rather than pulling).