Animal Ethology

Presented by

Dr: Enas Nassef

(Animal, Poultry Behaviour & Management)

.Vet. Public Health Dep

Animal Behaviour (Ethology)

Animal behaviour: it is the end results of interaction between animal with outside .environment

.**Ethology:** is science of behaviour

:Aims of studying animal Ethology

.Establish optimum environmental conditions for animal -1

Achieve animal welfare for high performance of animal -2

Understand what is going in animal mind 4-Daignosis the abnormalities of animal -3

Knowledge the etiological factors of abnormalities -5

good exam and treat animal diseases -6

To breed and raise livestock -7

Neurobehaviour

Def: it is the relationship between nervous system & behaviour, where each animal has behavioural code in neuron (**nerve cell**) in the form of massage carried on peptide, .produced under control of DNA of neuron (**Nissel body**)

e.g. animal exposed to stimuli from environment → massage carried on peptide to brain → stimulate certain region of .body to give the response of stimuli (**Behaviour**)

NB. Nissel body is **DNA** of neuron , as food substances of nerve cell (**neuron**)

Behavioural Homeostasis

Homeostasis means **equilibrium** **or** tendency of internal environment of body to maintain constant (static .homeostasis)

For the maintenance static homeostatic homeostasis, there is compensatory bodies to meet changes in external .environment (Dynamic Homeostasis)

e.g. for maintain equilibrium must be present some activities (Dynamic homeostasis) unaer control of brain in the form of behaviour

Major factors affecting animal behaviour

:Stimuli -1

Def: it is the main factor due to any behaviour must be begin with stimuli.

eg: animal walk to green grass after visual information about grass (Visual stimuli)

Mode of action: through two ways, as following,

- change the probability of behaviour
- orient execution of behaviour

Types: positive and negative

Forms: visual, tactile, auditory, gustatory, olfaction, thermal, magnetic &electrical

.Factors alter relationship between stimuli & response

Fatigue: it decrease the response to stimuli **-1**

Maturation: some behaviour linked by maturation (sexual) **3- Learning**: **-2**

it change the response to stimuli

Motivation: seeing feed lead to ingestive behaviour**-4**

:Biological rhythms -2

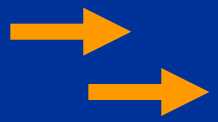
Def: it is periodical variation in the levels of biological activities & behaviour observable in animals

.**Causes:** due to seasonal & hormonal variations

eg: changes in behaviour over a period of many months & within a period of 24 hours

.**Types:** Diurnal animal that active during day light

.Nocturnal " " " " night



:Past experience -3

Def: it is one factor affecting on behaviour through physiological changes

Causes: due to training and learning

Its action: muscular fatigue → is inability of muscle to respond to stimuli due to recent past activity

sensory adaptation → is the decrease in responsiveness of sense organ due to repeated stimuli

Habituation: it is simplest form of learning which depend on neuronal activity in C.N.S. & animal exhibit a particular behaviour pattern on repeated stimuli

:Physiological condition -4

Def: it is stat of animal under a particular drive relate to changes in neural & .hormonal activities

eg: 1- reproductive drive in male & female animals

hunger animal make locomotion or searching behaviour for eating & drinking -2 (ingestive behaviour)

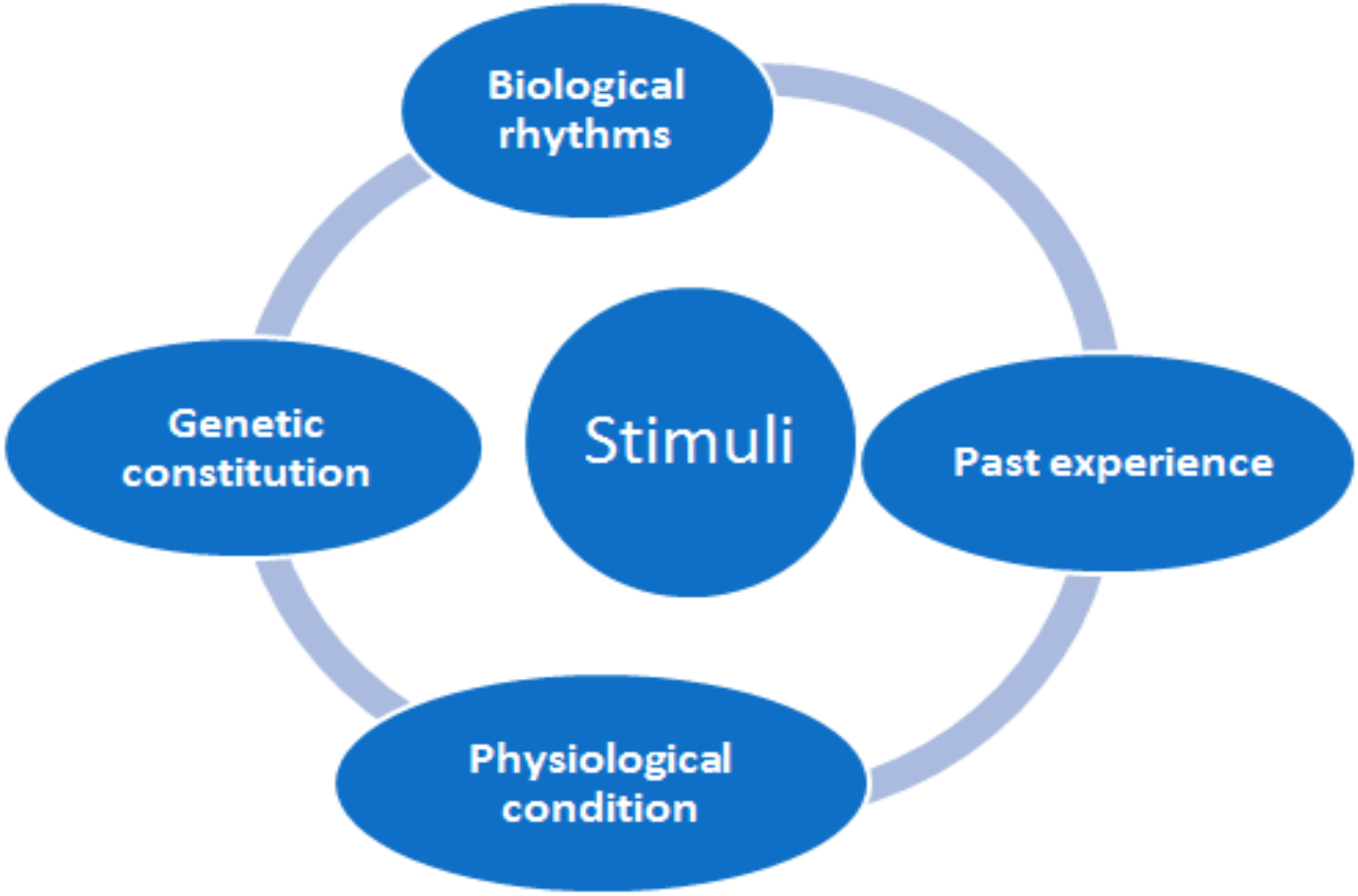
:Genetic condition -5

.Genes make change of behaviour due to anatomical changes

.**Polygenic behaviour:** it is controlled by more than one gene

Monogenic behaviour: it is controlled by one gene

FACTORS AFFECTING ANIMAL BEHAVIOUR



Classification of behaviour

inherited behaviour (innate) -1

acquired behaviour (learned) -2

Inherited behaviour

:It include 2 types

A- Maintenance behaviour: it is activities needs to maintain .animal life. E.g. ingestion, elimination, rest and sleep

B- Reproductive behaviour: It is activities needs for reproduction in to 2 behaviour (maternal, sexual). E.g. estrus, .courtship

Inherited behaviour related to Motivation (trigged by C.NS.) .which responsible for Goal-oriented behaviour

Phases of Goal-oriented behaviour

.Phase of searching of goal. E.g. appetite in ingestive beh -1

Phase of orientation the goal, once it found -2

Phase of quite or quiescence -3

Acquired behaviour

Where animal acquired behaviour through learning, which :classified into

:Habituation -1

It is simplest form of learning. It oriented as rapid stimuli are given close together. It is important for saving energy wasted in .repeated responses

:Exploratory learning (latent learning) -2

It is activity which important to acquire new information about environment. It enable animal to find the way of environment through learning characters of way by .exploration and remember its landmarks

:Imprinting -3

.It is early social learning during short period of animal life

e.g. baby duckling , lamb and colt are the most likely ones to .imprint

Imprinting can accomplish only within 36 hrs after hatching .of baby duckling

:Insight learning -4

It is the highest form of learning. The animal response to new .situation without trial & error

:Imitation -5

.Animal learns through imitation by observation other

e.g. cats watching other a cat press a bar to obtain food, thus .cats imitate other cat in obtaining the food

:Taste aversion -6

.It is avoiding a food that is associated with illness (G.I. malaise)

e.g. Poison usually kills rats in first time, but after first .application very few rats are killed, after no mortality

:Characters of taste aversion

specific for taste and olfaction, other stimuli will not be -1 .avoided

.The illness must be of internal origin (G.I. Malaise) -2

.The taste and illness can widely separated in time -3

:Associative learning -7

Animal learns to associate response with reward or punishment, where the animal remembers its past experiences and .modified its behaviour

NB: It has 2 types: CR type I & CR type II.

A- Conditional reflex (CR Type I), Classical or respondent conditioning (Pavlov condition): with new stimuli, in which .learning associated by rewards and punishment is avoided

e.g. 1- release let down milk hormone (Oxytocin hormone) with association with certain stimuli (squeezing teats, sound of milk equipment during specific time) as .conditional stimuli

sight of meats leads to salivation in dogs. Furthermore, -2 .the sound of bell stimulates salivation in dogs

lifting paws of dogs due to electric shock associated with sound, -3 .thus during this sound, the dogs lifts its paws

NB. Condition response (CR) is due to new stimuli with rewards, while A condition response (ACR) is due to new stimuli with .punishment

B- Trial & error (CR Type II), Instrumental or operant condition: .with no new stimuli, where stimuli repeated through trial & error

e.g. cats escape from box through different trial until press on lever of box, after that it learn to open the box from lever .directly

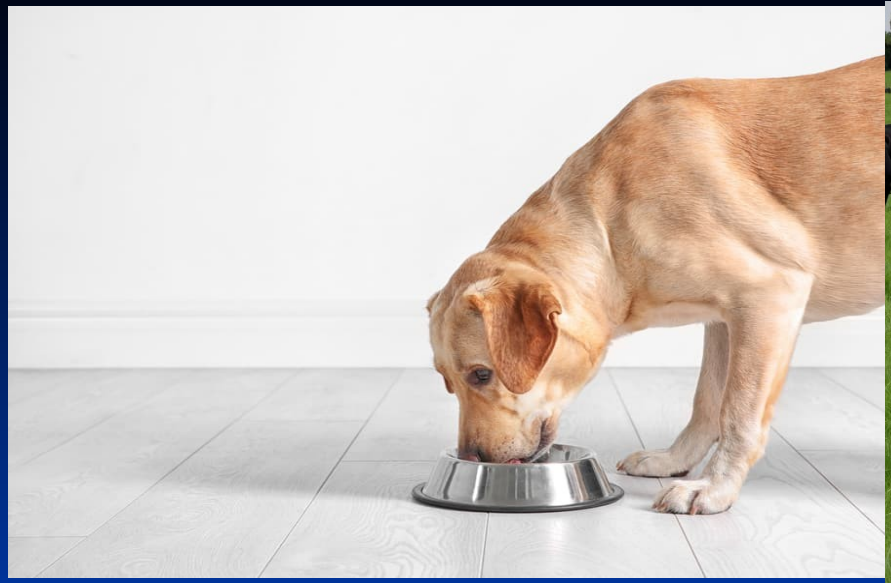
Patterns of behaviour

:Ingestive behaviour -1

It related to anatomy and physiology of animal, moreover the .nature of food

e.g. 1- chicken and turkey obtain their food by pecking, while .ducks with broad bills are more likely to scoop their food

-2 cow, buffalo, sheep and goats have rumination, eating, drinking and grazing. Cattle depend on tongue due to absence of upper incisor for wrap a mouthful of grass , then jerk head forward for cutting grass. While sheep and goat .depend on lips for select grass



Horse depends on its incisors , moreover it has eating, drinking -3 .and grazing

.Carnivores eat only one time per day in little time -4

:Elimination behaviour -2

.It include urination and defection depending on animal species

e.g. cats bury faeces and urine, whereas dogs have tendency to .deposited them at spots known as scent posts

:Sexual behaviour -3

A- Male sexual beaviour includes courtship, erection, protrusion, .intermission, ejaculation thrust and dismounting

B- Female sexual behaviour includes estrus, reception of male and .orgasm like reaction after copulation

:Care-giving or epimiletic or maternal behaviour -4

It is important in survival of young animal. And it means .feeding and keeping the daughter from danger

e.g. 1- Rabbits visits offspring only once per day and suckle .their offspring for few minutes

Bitch and queen spent almost 24 hrs per day with their -2 .offspring during first 15 days

Brooding in chickens, nest building in rabbits and cleaning or -3 .grooming in cats and dogs

Factors influence expression of maternal behaviour

A- External smell, appearance and sound

B- internal heredity, experience and hormones

Care-soliciting or Et-epimiletic or infantile behaviour -5

.Calling from offspring for care and attention from its mother

.The loudness of call determine amount of distress

.e.g. calves bowel , lambs bleat, puppies whine

:Agonistic behaviour -6

.It includes threat, escape, causes pain or injury

It is important in obtaining food, sexual partner, social hierarchy,

.territoriality and defense their young

Types of aggression

Social aggression: for social hierarchy -1

.Territorial aggression: keeping others out geographical areas -2


alamy
alamy
alamy
alamy
alamy
alamy
www.alamy.com

.Pain or fear-induced aggression: specially during treatment -3

Irritable aggression: specially during hunger, fatigue or -4 sick, and some times in old animal

.Maternal aggression: for protection of their young's -5

Sexual aggression: in cats, mating is accompanied by severe -6 biting to female, furthermore, stallion makes biting to mare. Sexual aggression also includes competition between animals .for sexual partner

Predatory aggression: it called food-getting behaviour -7

Infanticide aggression: it is killing very young daughters to -8 .achieve optimal litter size

:Allelomimetic or mimesis or mimetic behaviour -7

It is two or more animals do the same thing at the same time with some degree of mutual stimulation and coordination. It maintain on .social group, less fearful, healthier and more production

:Shelter-seeking behaviour -8

Seeking optimum environmental conditions to avoid any dangers. In some cases, the body of animal represent the shelter to others

:Investigatory behaviour -9

.Exploration the components of environment for new information

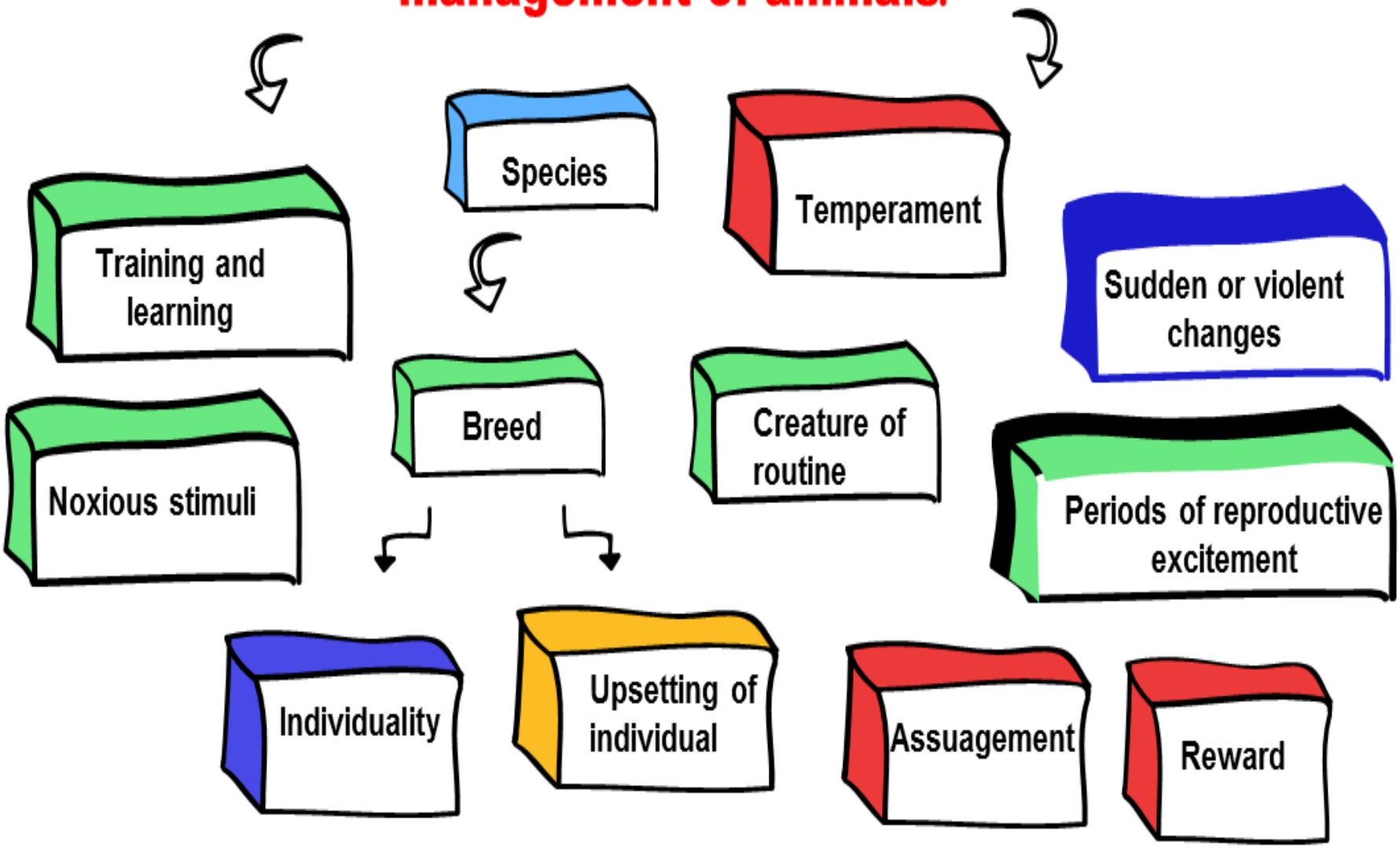
:Body care behaviour -10

.It is cleaning its body and body of other animals

e.g. 1- in large animal, it called grooming (self and mutual)

in poultry, it called dust bathing (sand bath, sham dust bathing) -2 and preening

General behavioral principles affecting management of animals:



Behavioral principles affecting animal management

:Species differences -1

.There are differences among species in reactions of animals to management

eg. Behaviour of cattle differ from horse due to anatomical, physiological and characteristic

.behaviour of each species

:Breed differences -2

."There are differences between Arabian and English horse in the same breed "equidi

:Individuality -3

.Each animal has individual characters

.eg. Twines from the same mother, one is docile & other nervous


Byelorussian Harness Horse
Russian Heavy Draft Horse
Karachay Horse
Friesian Horse
Welsh Pony
American Quarter Horse

:Upsetting of individual -4

There are changes in the same individual in different times. This maybe .due to mental, physical or emotional disturbances

:Creature of routine -5

Animal can become creature of routine during management, exercise and .feeding system

The changes in this routine leading to change in mentality and .productivity of animals

eg. Changing the time milking of cattle Decreasing milk

:Periods of reproductive excitation -6

In sexual excitation, the animals are liable to temporary changes in temperament & behaviour. This may be due to .increase the secretion of sex hormones

:Training & learning -7

.Training: animal gives response without new behaviour

.Learning: animal gives response with changing in behaviour

.Young animals are easily to train & teach than mature

:Assuagement -8

,**Def:** It is dependence of animal upon man, especially in food .drinking & relive pains

Types: assuagement of appetite, of thirst & pain

:"Noxious stimuli " stressors -9

.It is any stimuli causing fear, pain, discomfort & spoil the temper of animal

.These stressors cause loss the trust between man & animal

In young animals: stressors will badly reflect on performance in adult stage and .appear the abnormal behaviour

.eg. Cruel, rough treatment & teasing animal

:Sudden or violent changes -10

Sudden changes in any things related to animal leading to conflicts in temper & mind .of animal decrease its production

e.g. a- sudden change from green to dry food

b- sudden change in milking methods, milkier & its time

c- sudden change in temperature, humidity, ration of poultry, leading to decrease growth rate & egg production.

Reward -11:

Def: it is some things or actions which given to animal against achievement or successful performance of certain action. It is very important in veterinary practices.

Types: A) Bribe

B) Incentive:

A) Bribe

Def: it is material object (sensible) which induce the animal to make certain action usually wrong or against normal .behaviour

NB) The material objects are in the form of a favorable food according to animal, e.g. carrot, meat, liver

e.g.) → 1- Watching dogs

↓

piece of meat or liver (not daily given)

↓

Giving a chance for stealing

Zoo animal → 2

↓

a favorable food (acc. to animal)

↓

wrong manner against his wish (e.g. jumble in fire)

Horse -3

green succulent food, sugar or carrot

walking completely on hind limbs

Mastitic cattle -4

green succulent food

examination of painful udder

:B) Incentive

Def: any special inducement or stimuli offered by human to the animal in order to promote productivity or give extra .effort with high performance

:Types

Positive incentive: material (sensible) -1
immaterial (spiritual)

Negative incentive -2

:Positive incentive -1

:a) Material

e.g. favorable food to animal

:b) Immaterial

e.g. 1- racing horse: patting around neck, forelock and head .after racing

obedient cat: gentle massage by fingers under chin, -2 neck & between ears

:Negative incentive -2

Def: Its stimuli in the form of mild punishment such as hitting against wrong action from animal, specially in early .age to prevent its occurrence in future

NB) positive & negative incentive make in opposite direction, but we can apply them in one animal acc. to it action but .not in the same rime

:Temperament (temper, bias or disposition) -12

Def: it is mental & natural tendency of animal toward the environment to make certain action acc. to what is running .in the mind of animal

Origin of temperament: is partially inherited & partially .acquired

Indicator: Movement of eyes lids, ears & orbit are indicator .of temper

.e.g. high mobility of orbit → indicate of anxiety

very fixed orbit → indicate of distress

Importance: how can deal with animal acc. to its temper

:Types of temperament

:Nervous, Irritable or Excitable -1

in this type, the temper reflected inside the animal itself, .not outside. Animal in case, ready to excited under stress

.e.g. Arabian horse & dairy cow

:Dull, lymphatic or phlegmatic -2

in this type, there is no energy loss & the energy conserved in production (meat, working in field). The animal become .docile, dropped ears & not alert

.e.g. beef cattle, draught horse & donkey

:Vicious or dangerous -3

in this type, the temper reflected inside & outside the animal with aggressive behaviour against others. Animal in .case, attack the human without any reason

.e.g. camel & mule

:Docile, good, calm or sweet -4

It is the best type of temper to handle with animal, and .animal conserve the energy for milk production

.e.g. high producing dairy cattle