

# ***Bovine clinics: clinical investigation***

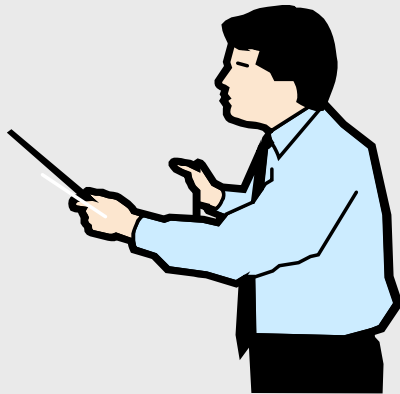


**VETERINARY CAPACITY BUILDING**  
in the context of the «One Health»

Con il contributo della  **Regione Emilia-Romagna**



CUP n. E17D20000040003



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***University of Bologna - Italy***

# ***Bovine clinics***

## ***• Clinical examination***

### **Objective**

To identify the clinical abnormalities that are present in an individual or in a population in order to collect usefull information for the determination of the most likely cause of the disease

### **Action**

Identify the presence or absence of clinical abnormalities  
proceeding through a sequence of steps that enable  
to contemplate and keep in consideration  
all the useful information



Deduce a ranked list of differential diagnoses

In many case a definitive diagnosis may not be necessary if the clinical examination indicates the prognosis is poor with due regard to the welfare and economics of the patient

# ***Bovine clinics***

- ***Clinical examination***

- *Owner's complaint and history of the patient*
- *Signalement of the patient*
- *History of the farm and observation of the environment*
- ***Observation of the animal (direct clinical examination)***
  - ***General clinical examination***
  - ***Clinical examination by body system and region***
- *Laboratory diagnostic*
- *Imaging diagnostic*

# ***Bovine clinics***

- ***Clinical examination***

The examination should always be meticulous and detailed

The consequences of not doing so can be embarrassing and potentially dangerous

<<everything could be important and decisive>>

# ***Bovine clinics***

- ***Clinical examination: technics of examination***

- **Visual inspection**
- **Palpation (touching)**
- **Percussion (tapping)**
- **Auscultation (listening)**
- **Ballotment (rebound)**
- **Shaking**

- *Visual inspection*
- *Palpation (touching)*
- *Percussion (tapping)*
- *Auscultation (listening)*
- *Ballotment (rebound)*
- *Shaking*

# ***Bovine clinics***

## • ***Clinical examination: technics of examination***

### **Visual inspection**

*This is used to identify abnormalities of conformation, gait, contour and posture.*

*Visual appraisal may help determine the size and character of a lesion*

- Visual inspection
- Palpation (touching)
- Percussion (tapping)
- Auscultation (listening)
- Ballotment (rebound)
- Shaking

# ***Bovine clinics***

## ***• Clinical examination: technics of examination***

### **Palpation**

*Changes in shape, size, consistency, position, temperature and sensitivity to touch (pain response) can be assessed by palpation.*

*To the palpation belongs also the **MANIPULATION (moving)**. In this case manipulation of a structure indicates the resistance and the range of movements possible. Abnormal sounds may be produced, and the pain produced in response to the movement can be assessed.*

*A sort of palpation is also the **BALLOTMENT** (rebound).*

*Also rectal examination is a type of palpation*

- Visual inspection
- Palpation (touching)
- Percussion (tapping)
- Auscultation (listening)
- Ballotment (rebound)
- Shaking

# ***Bovine clinics***

## ***Clinical examination: technics of examination***

### **Percussion**

*The resonance obtained by tapping a determined body surface allows to estimate the air content of a tissue or an internal organ situated under the tapped area. The resonance is determined by the resistance that a tissue put up to the spreading of the vibrations.*

*The sound produced provides information regarding the shape, size and density of a tissue or organ, but especially regarding the content of air.*

*Type of sounds*

- **Tympanic, drum-like sound**
- **Hyperresonant**
- **Normal resonant**
- **Impaired resonant**
- **Dull**
- **Stony dull**



# ***Bovine clinics***

- *Visual inspection*
- *Palpation (touching)*
- *Percussion (tapping)*
- *Auscultation (listening)*
- *Ballotment (rebound)*
- *Shaking*

## ***Clinical examination: technics of examination***

### **Auscultation**

*Changes in the frequency, rhythm and intensity of normal sounds can be detected.*

*Abnormal sounds can be identified. Stethoscopes are often used to increase the acuity.*

- Visual inspection
- Palpation (touching)
- Percussion (tapping)
- Auscultation (listening)
- Ballotment (rebound)
- Shaking

# ***Bovine clinics***

## ***• Clinical examination: technics of examination***

### **Ballotment**

*This is performed by pushing the body wall sharply and forcefully so that internal structures are first propelled against the body wall, then on recoil rebound against the operator's fingers/fist/hand.*

*This enables the presence or character of an internal structure to be assessed.*

*The movement may evoke also audible sound (see shaking).*

- Visual inspection
- Palpation (touching)
- Percussion (tapping)
- Auscultation (listening)
- Ballotment (rebound)
- Shaking

# ***Bovine clinics***

## ***• Clinical examination: technics of examination***

### **Shaking**

*The area to be explored is shaken vigorously.*

*The procedure can detect the contemporaneous presence of fluid and gas in a viscera that:*

- usually doesn't contain liquid*
- has undergone a remarkable distension (thinned and stretched wall) or displacement.*

*The shaking induces the fluid inside the viscous to produce an audible sloshing sound which can be detected by auscultation.*

# ***Bovine clinics***

- ***Clinical examination: procedure***

Owner's complaint and history of the patient

Signalement of the patient

History of the farm and observation of the environment

**Observation of the animal (direct clinical examination)**

**General clinical examination**

**Clinical examination of single body system and region**

Laboratory diagnostic

Imaging diagnostic

# ***Bovine clinics***

## ***• Clinical examination: procedure***

Owner's complaint and history of the patient

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**General clinical examination**

### **Orientation of the diagnosis**

**Animal is healthy**

**Animal is sick**

**Where might be the problem**

*(digestive, respiratory, cardiocirculatory,  
nervous, urinary system....)*

**DIAGNOSIS OF  
SYNDROME**

**Clinical examination of single body system**

**Confirmation of the whereabouts of the problem**

**DIAGNOSIS OF  
SYSTEM**

**What is the problem**

*(inflammatory, degenerative, neoplastic,...)*

**DIAGNOSIS OF  
NATURE**

**What is the cause**

*(infectious, toxic, deficiency, .....*

**ETHIOLOGICAL  
DIAGNOSIS**

# ***Bovine clinics***

## • ***Clinical examination: procedure***

### **General clinical examination**

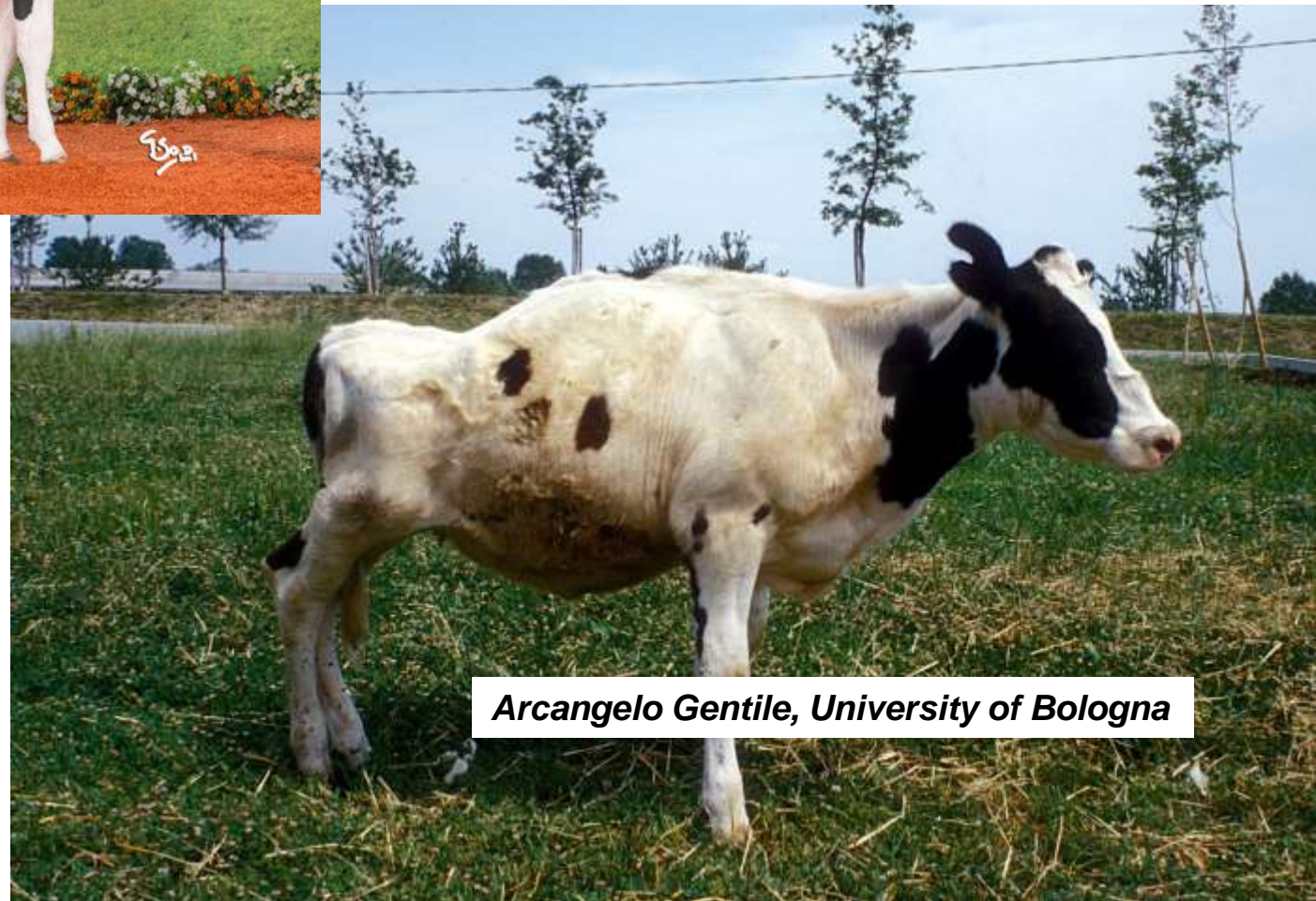
#### **General clinical examination**

1. Skeletal (body) development
2. Nutritional condition and muscle tone
3. Sensorial status
4. Behaviour and distinguishing features
5. Skin and subcutaneous tissue
6. Lymph nodes
7. Examination of the mucous membranes
8. Body temperature
9. Pulse rate and auscultation of heart
10. Respiratory rate
11. Great organic functions

## General clinical examination

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# Skeletal body development



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Hyena disease



Internal hydrocephalus



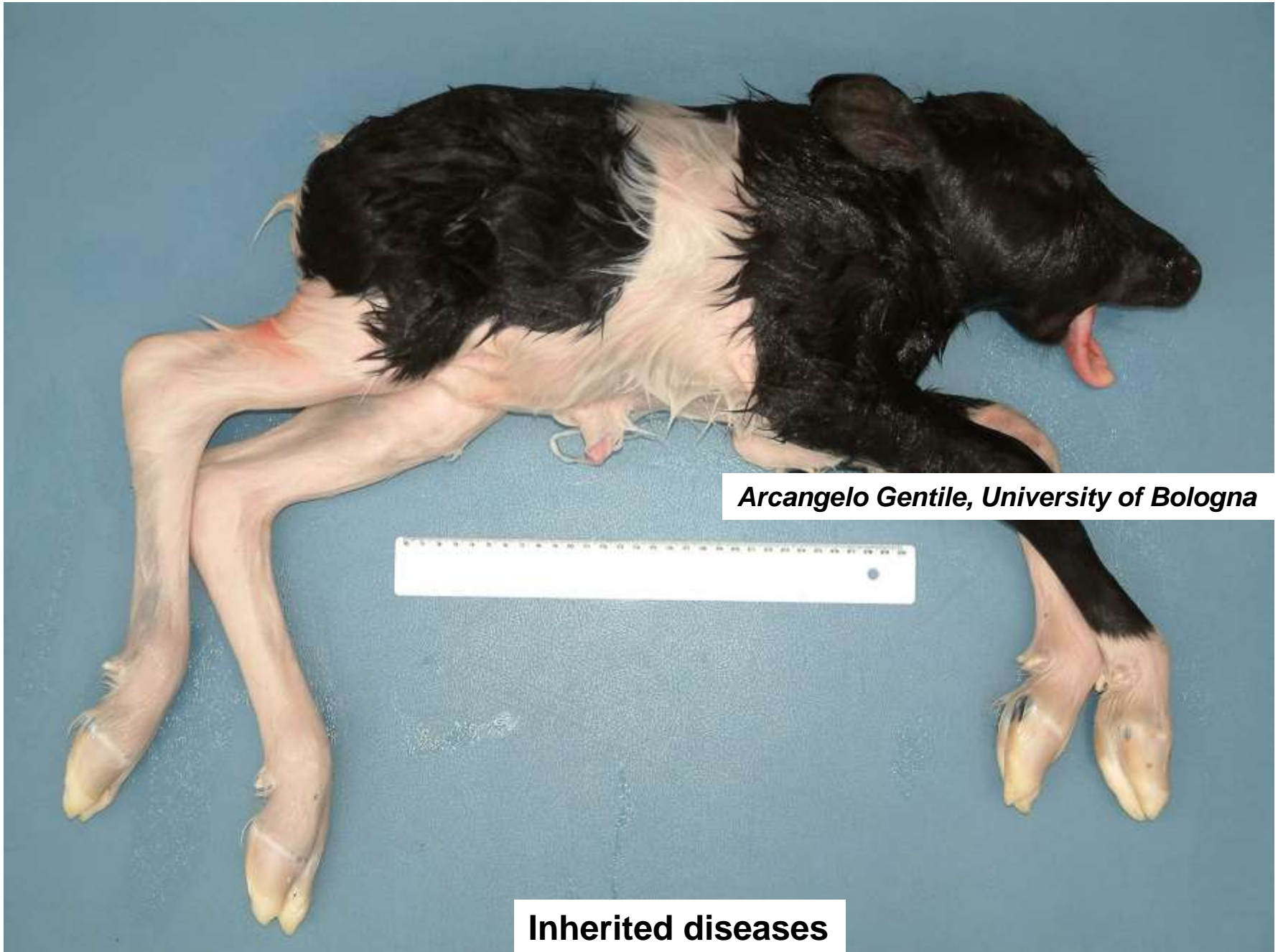
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**Orthobunyavirus:**

Aino virus,  
Shuni virus,  
Shamunda virus,  
Satuperi virus,  
Peaton virus,  
Schmallenberg virus,  
Sango virus

Transmitted by culicoids

# Brachispina





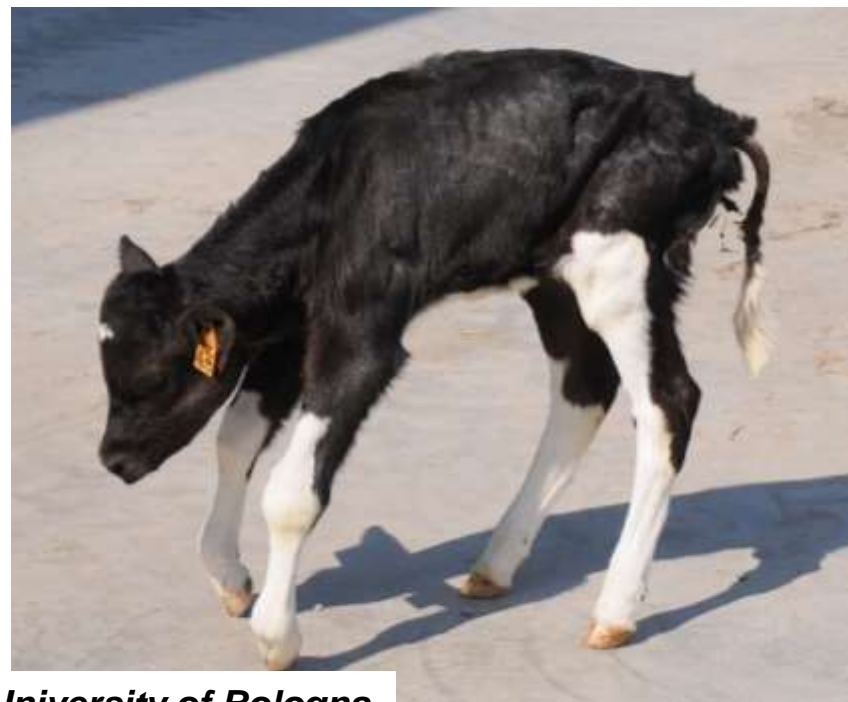
# Dwarfism



**Inherited diseases**



# Congenital contracture of the flexor tendons



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**Vitamin deficiency ?**

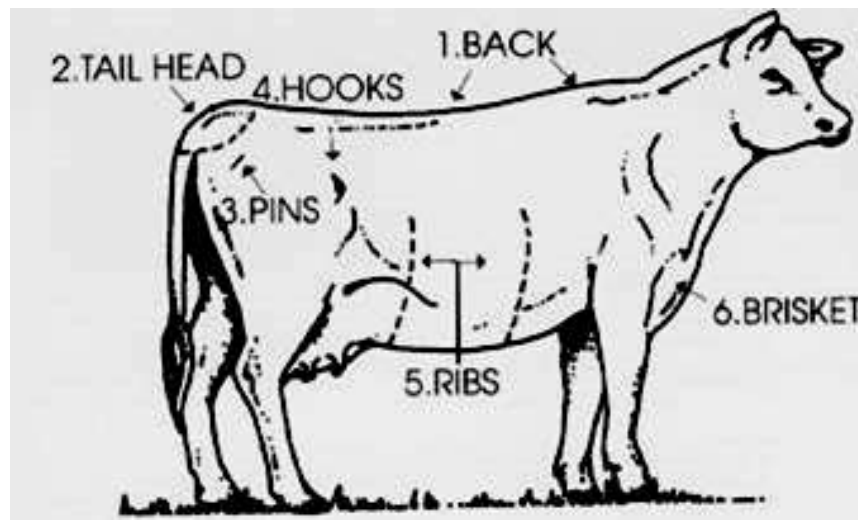
# Nutritional condition and muscle tone

















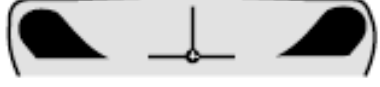








## General clinical examination

1. Skeletal (body) development
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# Nutritional condition and muscle tone

- 1) Visual appraisal of the degree of the **roundness of the “figure”**:
  - e.g. evaluation of the fullness
    - a) of the loin in the area between the vertebrae and the ends of the transverse processes and
    - b) of the tail head to assess the level of subcutaneous fat cover
- 2) Visual appraisal of the **sharpness of “osseous protrusion/protuberance”**:
  - e.g. sharpness
    - a) of the transverse processes in the loin area (between the hip bone and the last rib)
    - b) of the tail head, pinbones, hook bones
- 3) Visual appraisal of the **deepness of the intercostal space**



Body Condition Score	Vertebrae at the middle of the back	Rear view (cross-section) of the hook bones	Side view of the line between the hook and pinbones	Cavity between tailhead and pinbone	
				Rear view	Angled view
1 Severe underconditioning					
2 Frame obvious					
3 Frame and covering well balanced					
4 Frame not as visible as covering					
5 Severe overconditioning					





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# Sensorial status:

- 1) **direct sensitivity (evaluation of the mental status)**
- 2) **reflex sensitivity (evaluation of the neural pathways)**

## General clinical examination

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## **Mental status**

*(interaction with the environment)*

**Depression**

**Dullness**

**Lethargy**

**Obtundation**

**Stupor (semicoma)**

**Coma**

**Mentation** *(intensity of the reaction to external stimuli)*

**Consciousness** *(state of self-awareness)*

**Alerted consciousness**

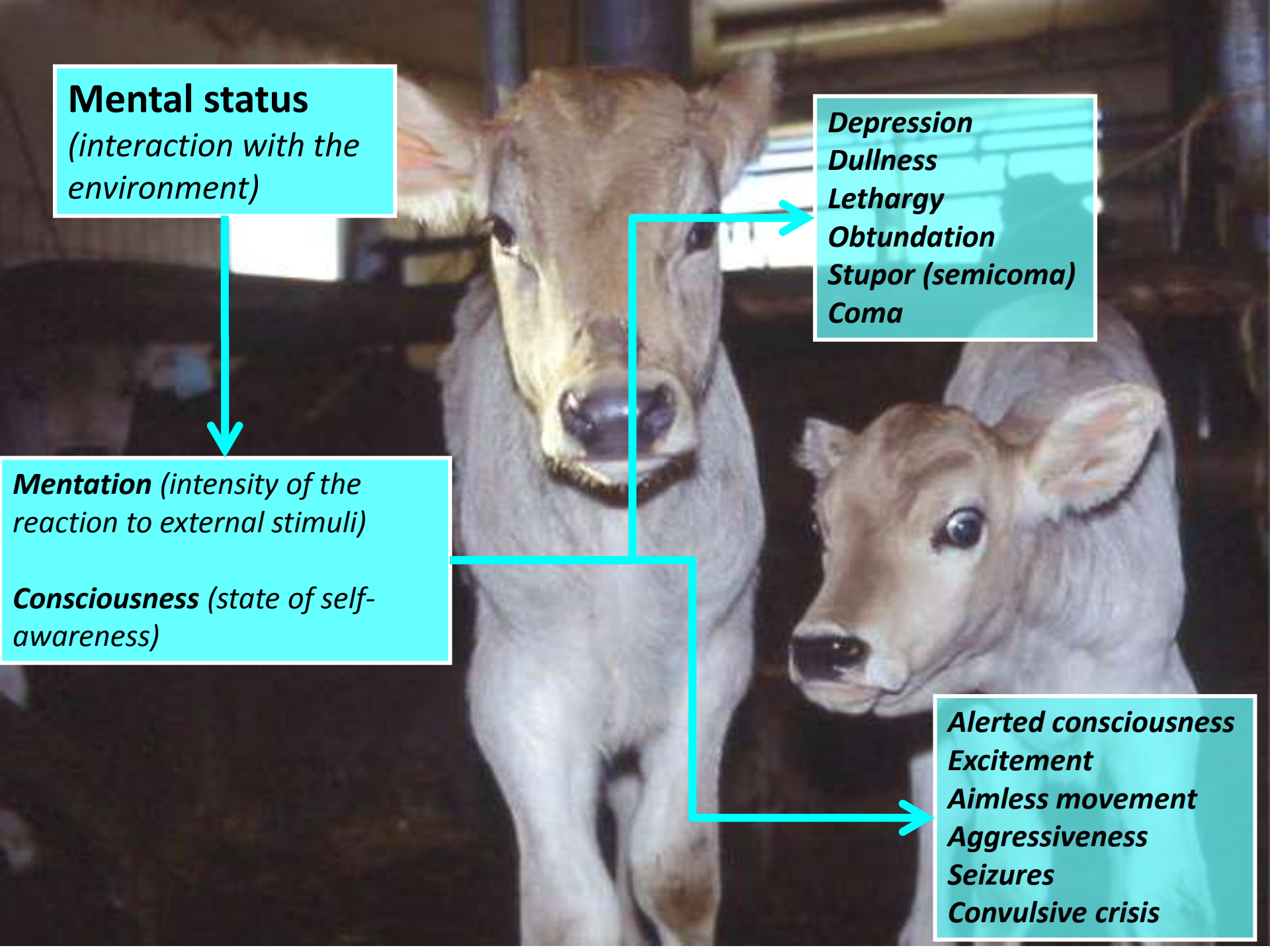
**Excitement**

**Aimless movement**

**Aggressiveness**

**Seizures**

**Convulsive crisis**

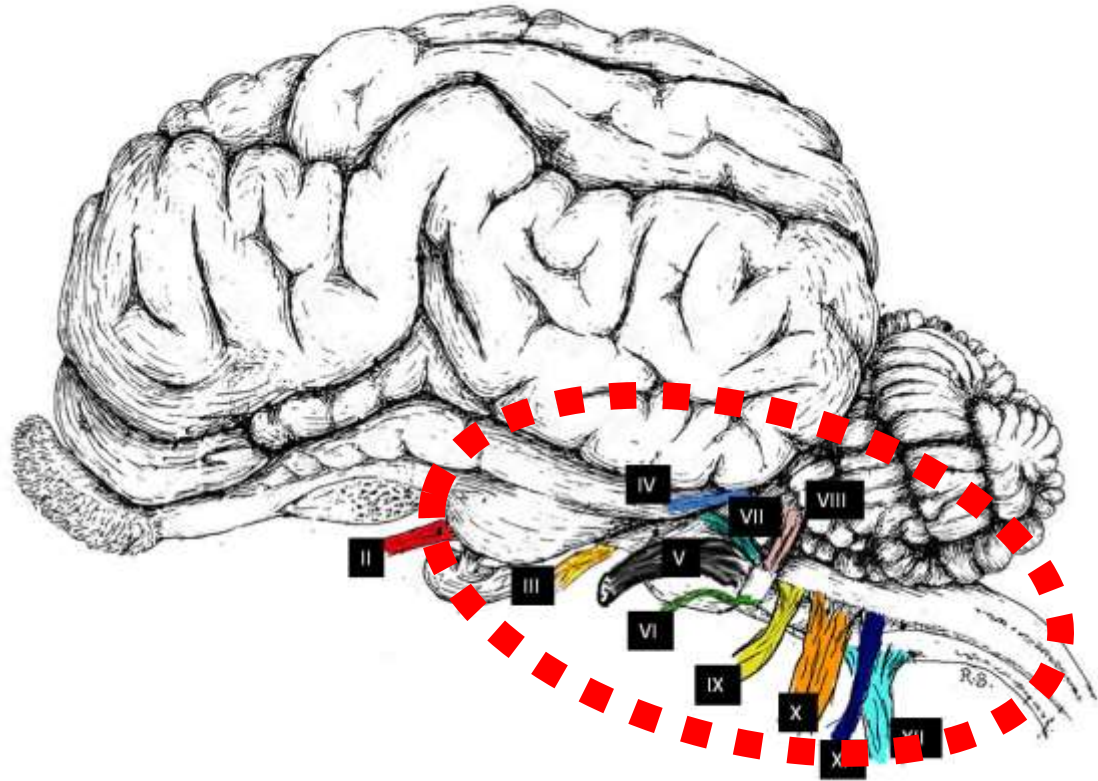


# **Sensorial status:**

- 1) direct sensitivity (evaluation of the mental status)**
- 2) reflex sensitivity (evaluation of the neural pathways)**

- **Cranial nerves**
- **Spinal nerves**

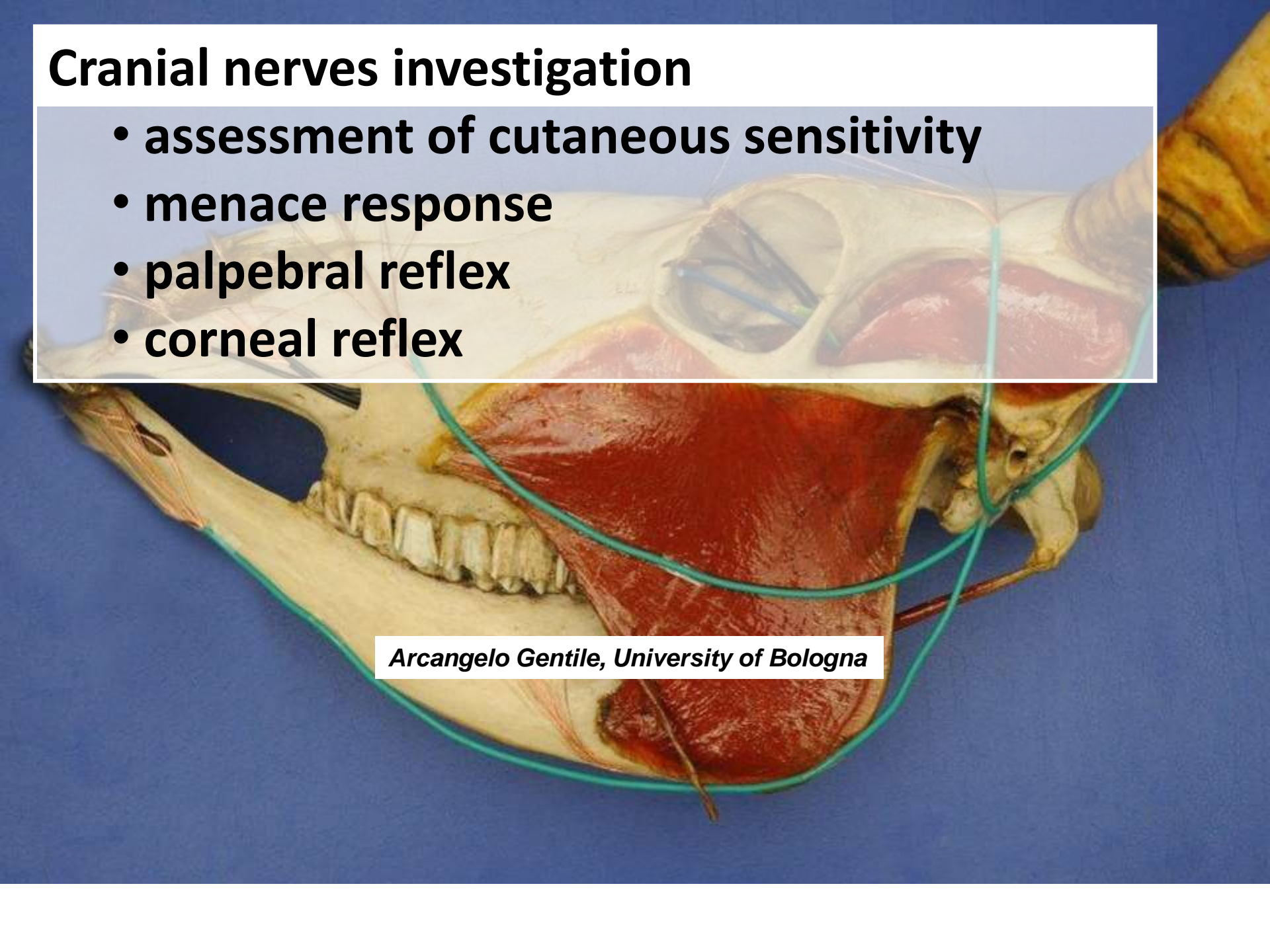
I	Olfactory
II	Optic
III	Oculomotor
IV	Trochlear
V	Trigeminal
VI	Abducens
VII	Facial
VIII	Vestibulo-cochlear
IX	Glossopharyngeal
X	Vagus
XI	Accessory
XII	Hypoglossal



# Cranial nerves investigation

- assessment of cutaneous sensitivity
- menace response
- palpebral reflex
- corneal reflex

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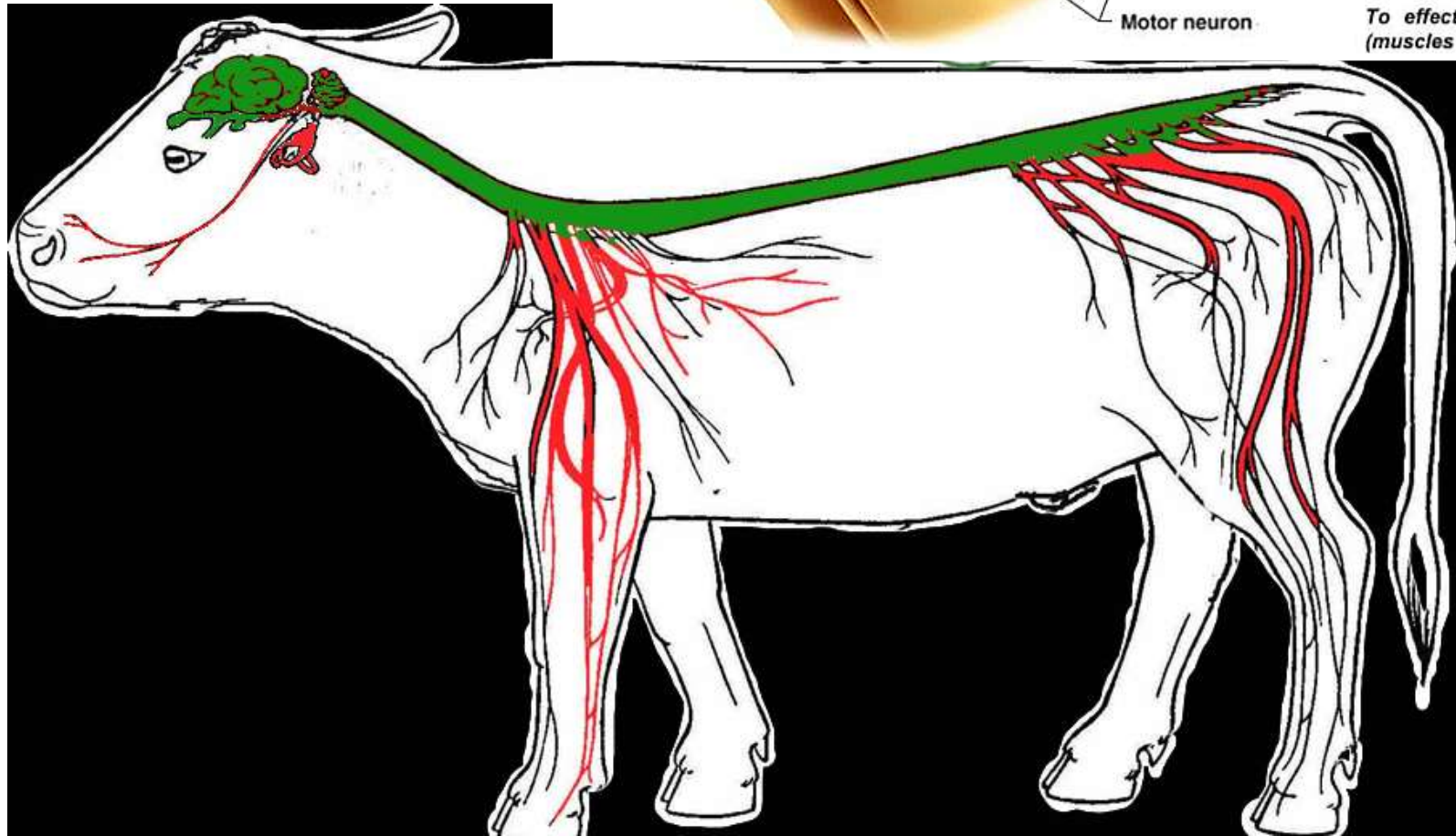
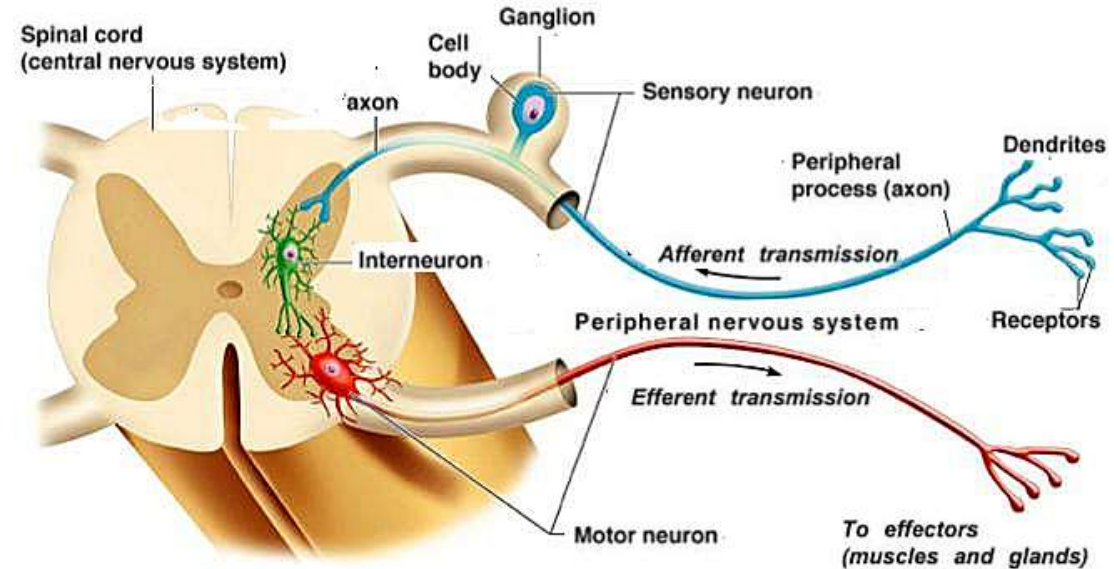


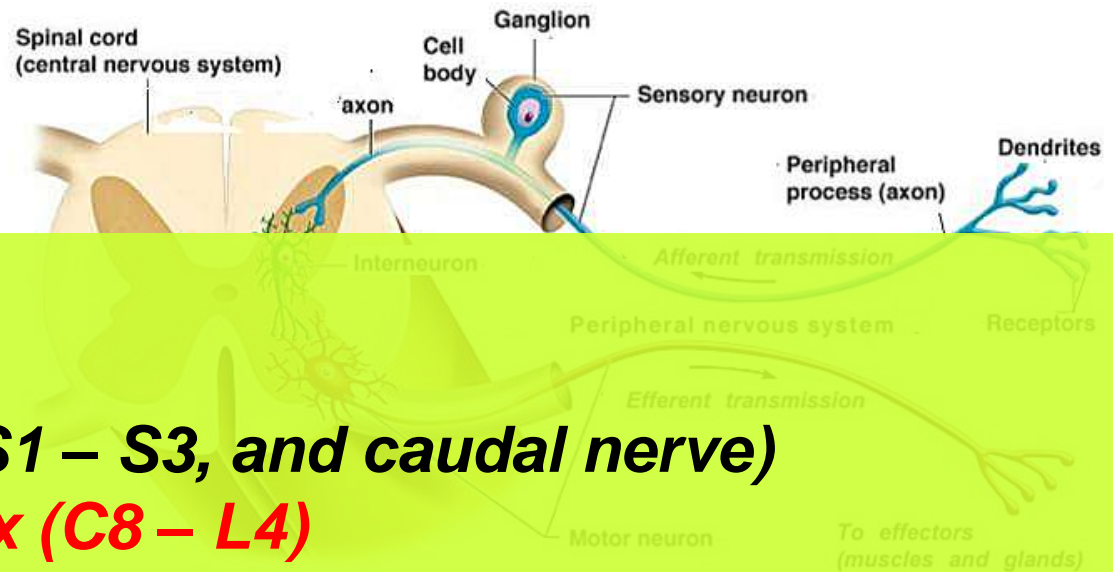
# **Sensorial status:**

- 1) direct sensitivity (evaluation of the mental status)**
- 2) reflex sensitivity (evaluation of the neural pathways)**

- **Cranial nerves**
- **Spinal nerves**

***Assessment of the integrity of the afferent and the efferent pathways of the nerves as well as the function of the corresponding specific segment of the grey substance of the spinal cord (reflex arch)***





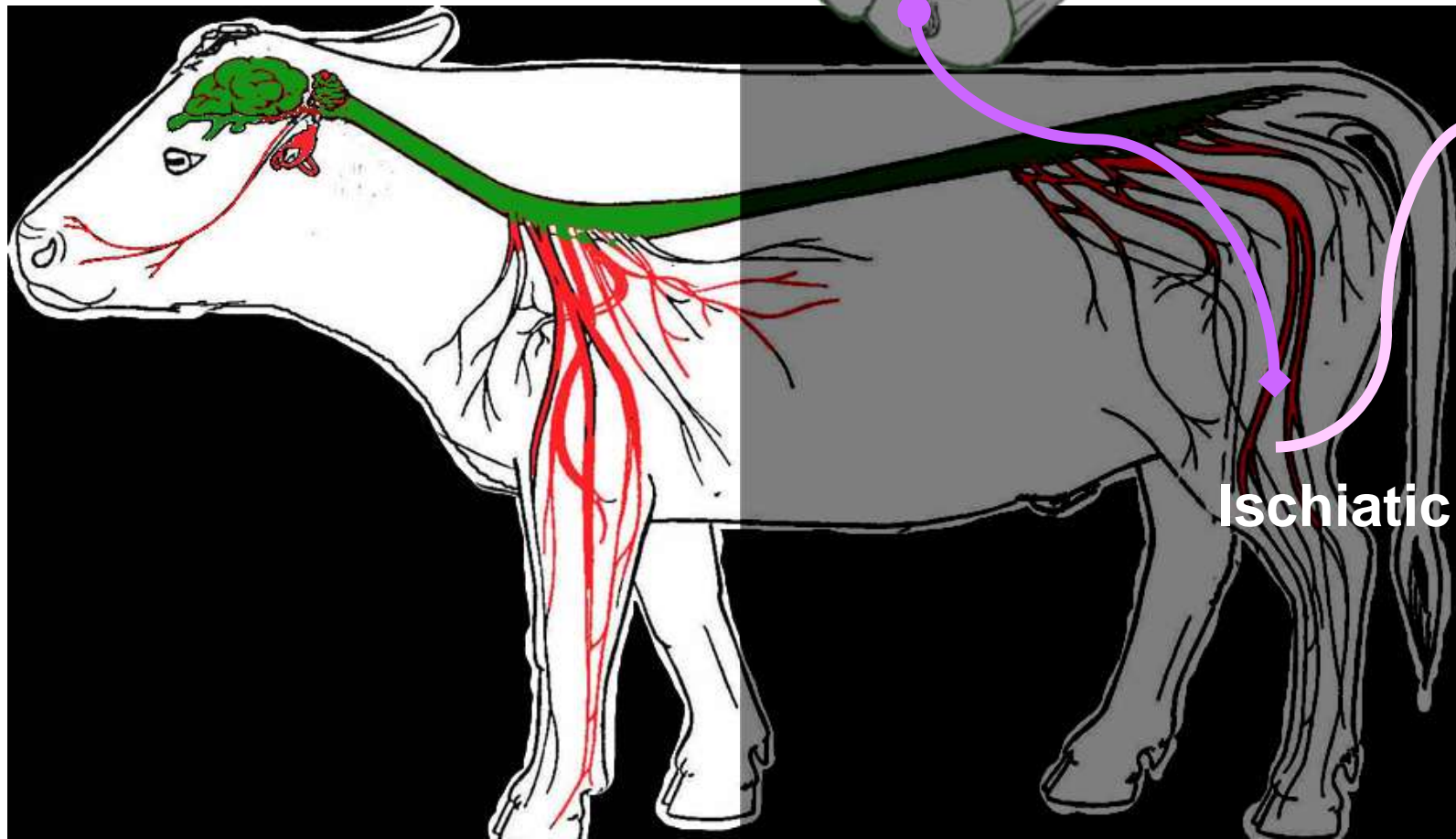
## Types of spinal reflexes

- **cutaneous reflexes**
  - *perineal reflex (S1 – S3, and caudal nerve)*
  - *panniculus reflex (C8 – L4)*
- **limb reflexes**
  - tendon reflexes
    - *patellar reflex (femoral nerve = L4 - L6)*
    - *extensor carpi radialis reflex (radial nerve = C7 – T1)*
    - *triceps reflex (radial nerve = C6 – T1)*
  - flexor or stretch reflexes
    - *posterior stretch reflex (sciatic nerve = L4 – S3)*
    - *anterior stretch reflex (axillary nerve, median nerve, ulnar nerve and radial nerve = C6 – T1)*



# Posterior flexor/stretch reflex

- *Ischiatic nerve*
- *Spinal cord segment L5-S2*



# Behaviour and distinguishing features

## General clinical examination

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Umbilical hernia



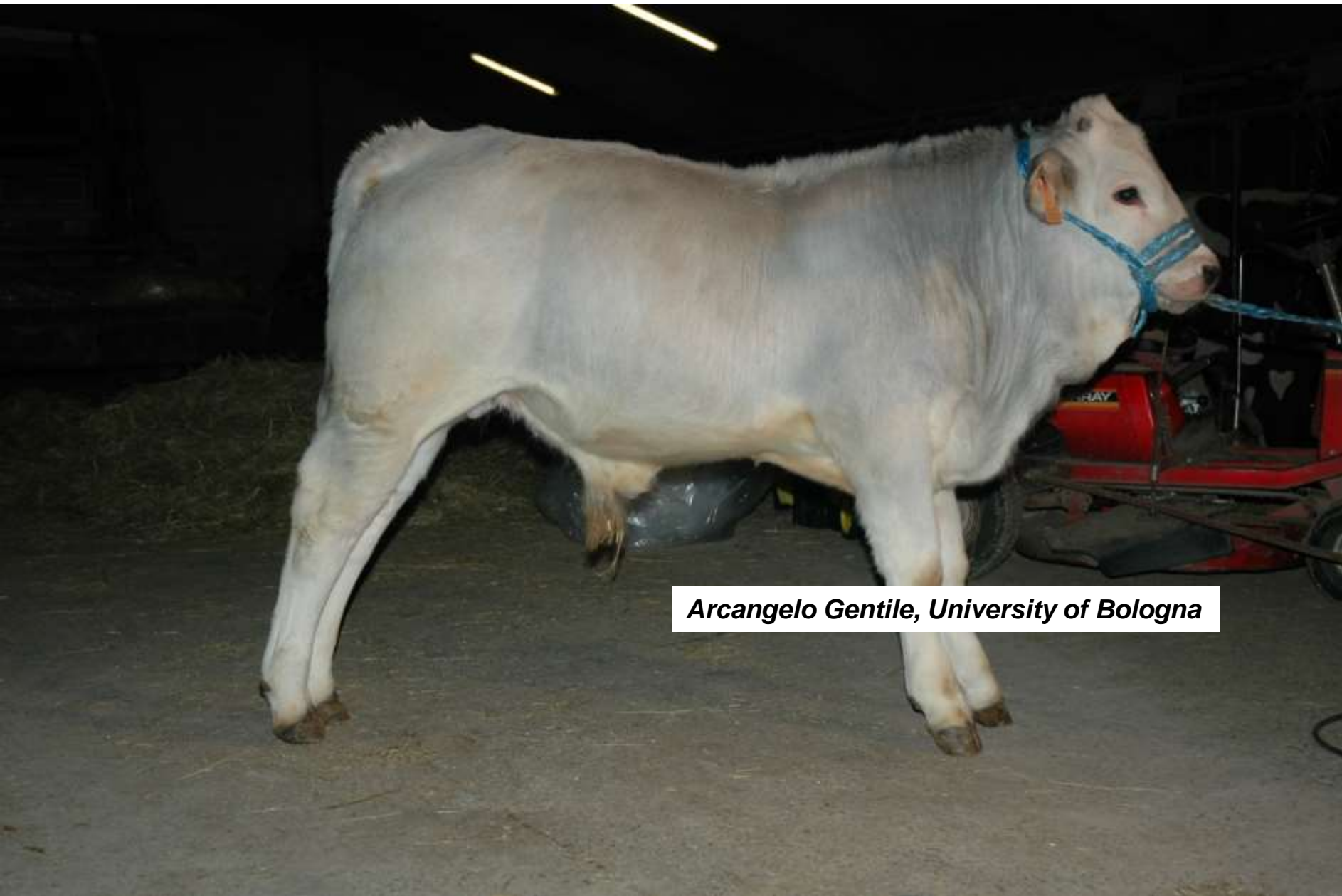
Ruminal bloat





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Ruminal bloat with colic



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Colic due to abomasal torsion





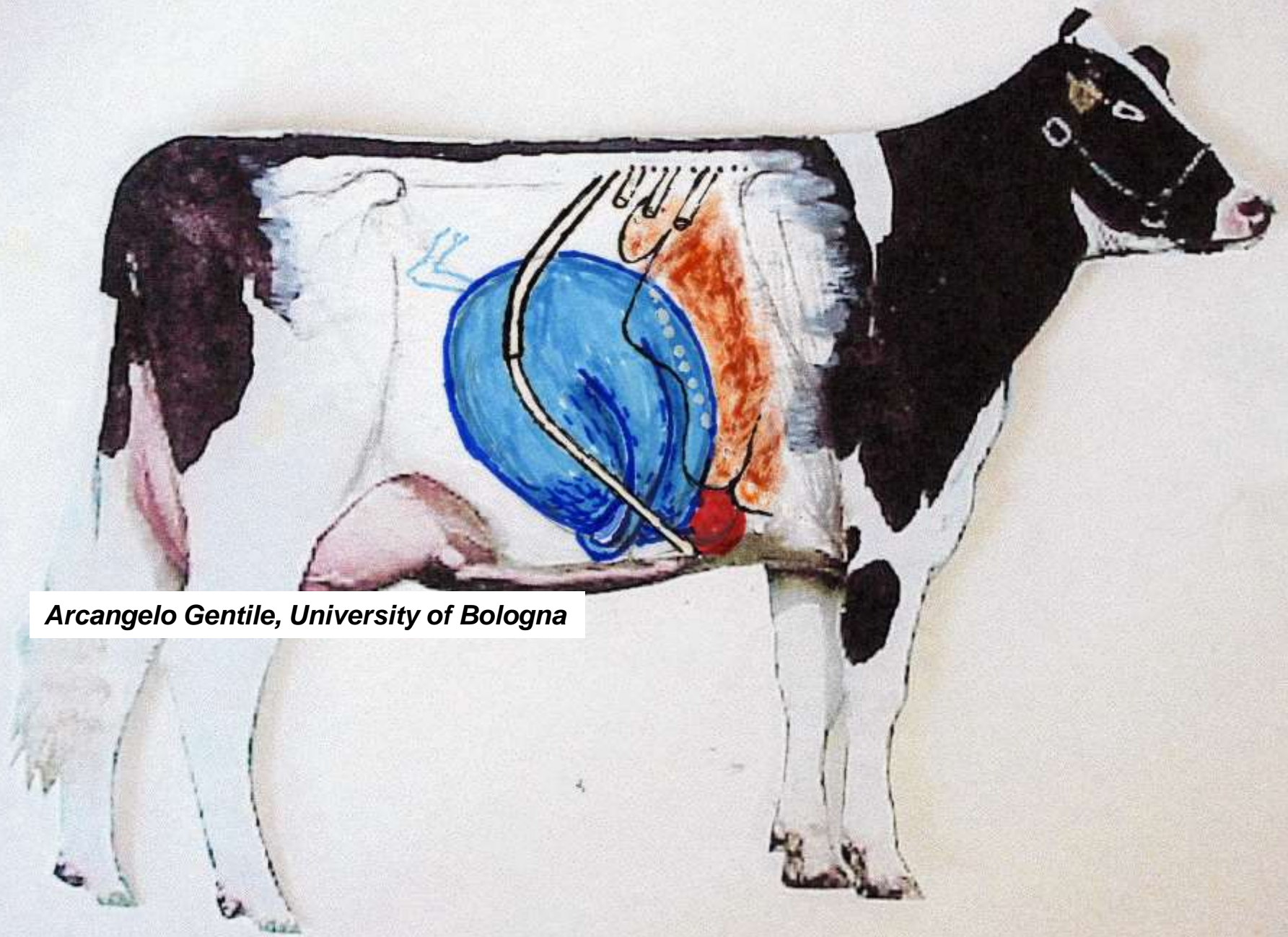
Colic due to abomasal torsion

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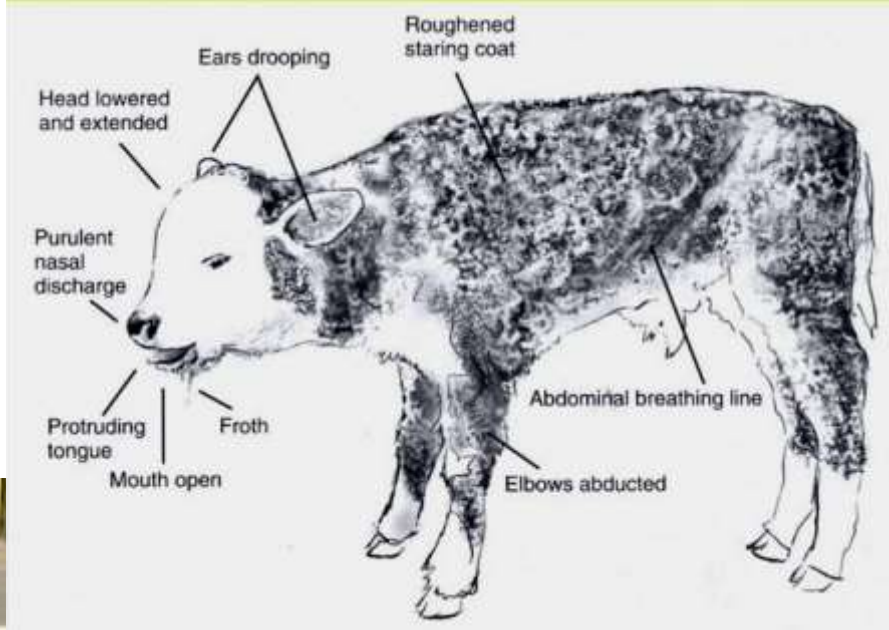
Colic due to abomasal torsion





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Right abomasal displacement with torsio



Respiratory syndrome





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Brisket edema



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# Behaviour and distinguishing features



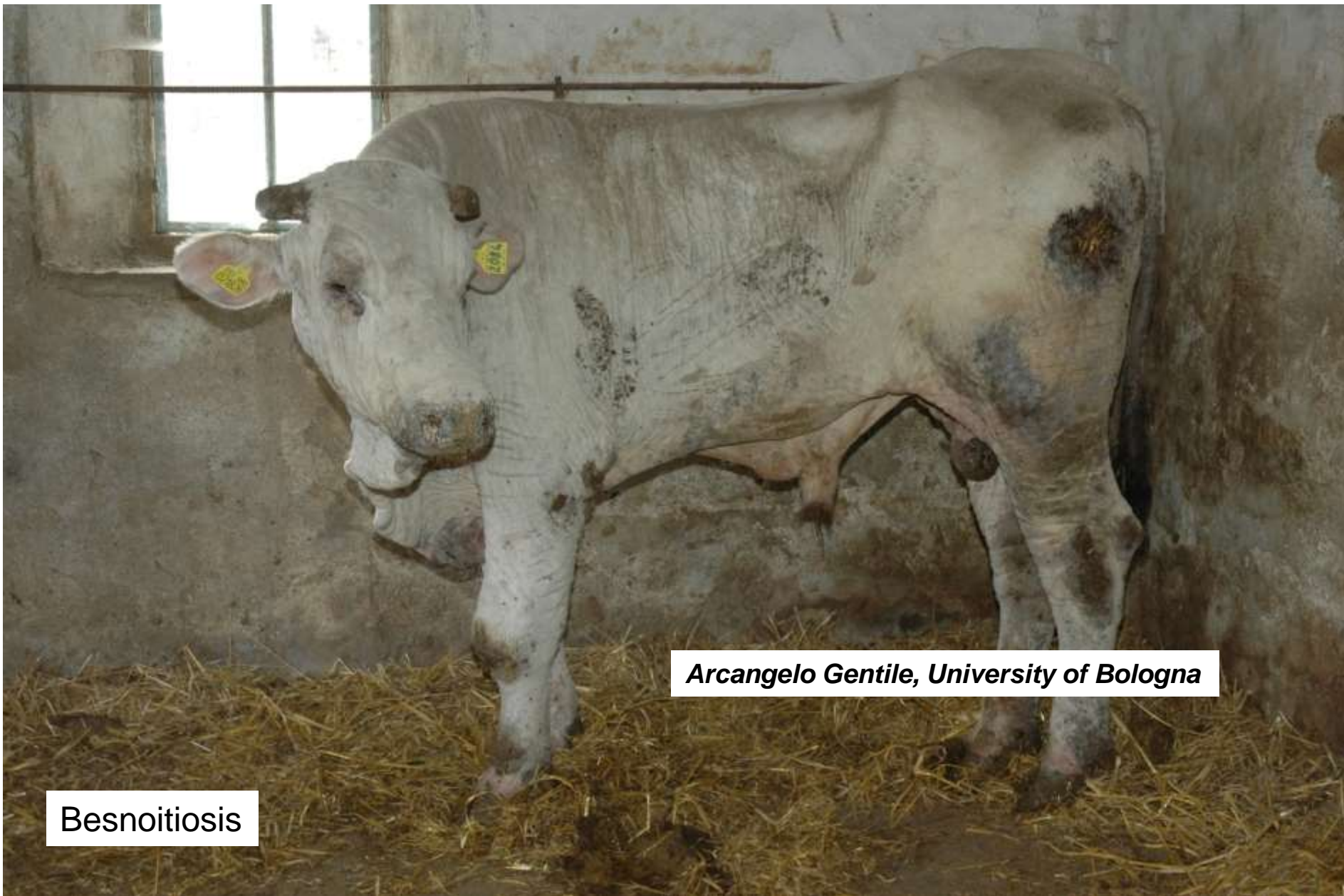
45/04, Stefania Testoni

# Skin and subcutaneous tissue

## General clinical examination

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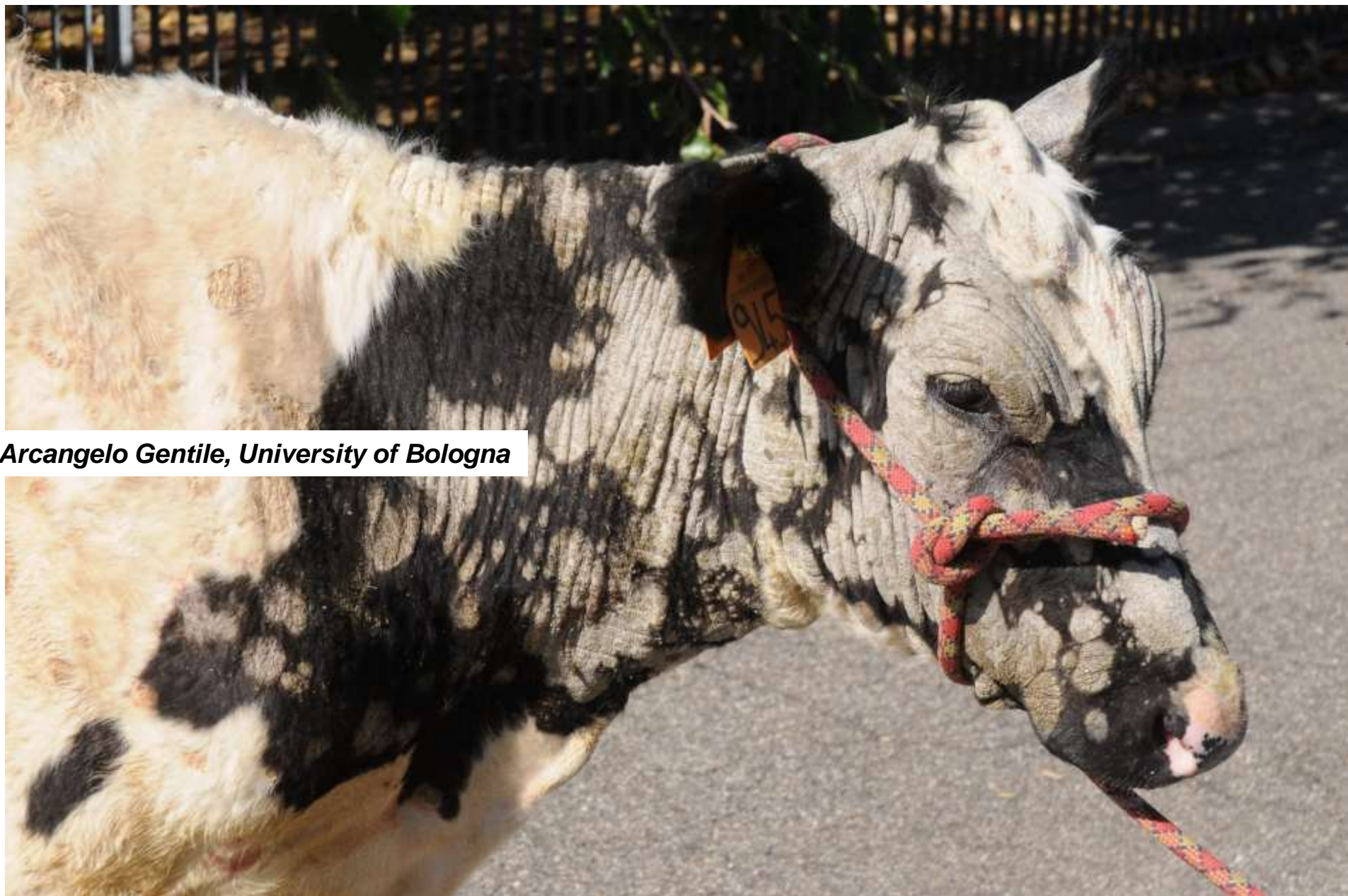
Besnoitiosis





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Besnoitiosis



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Tricophytosis





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Tricophitosis



Bovicola bovis



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Papillomatosis



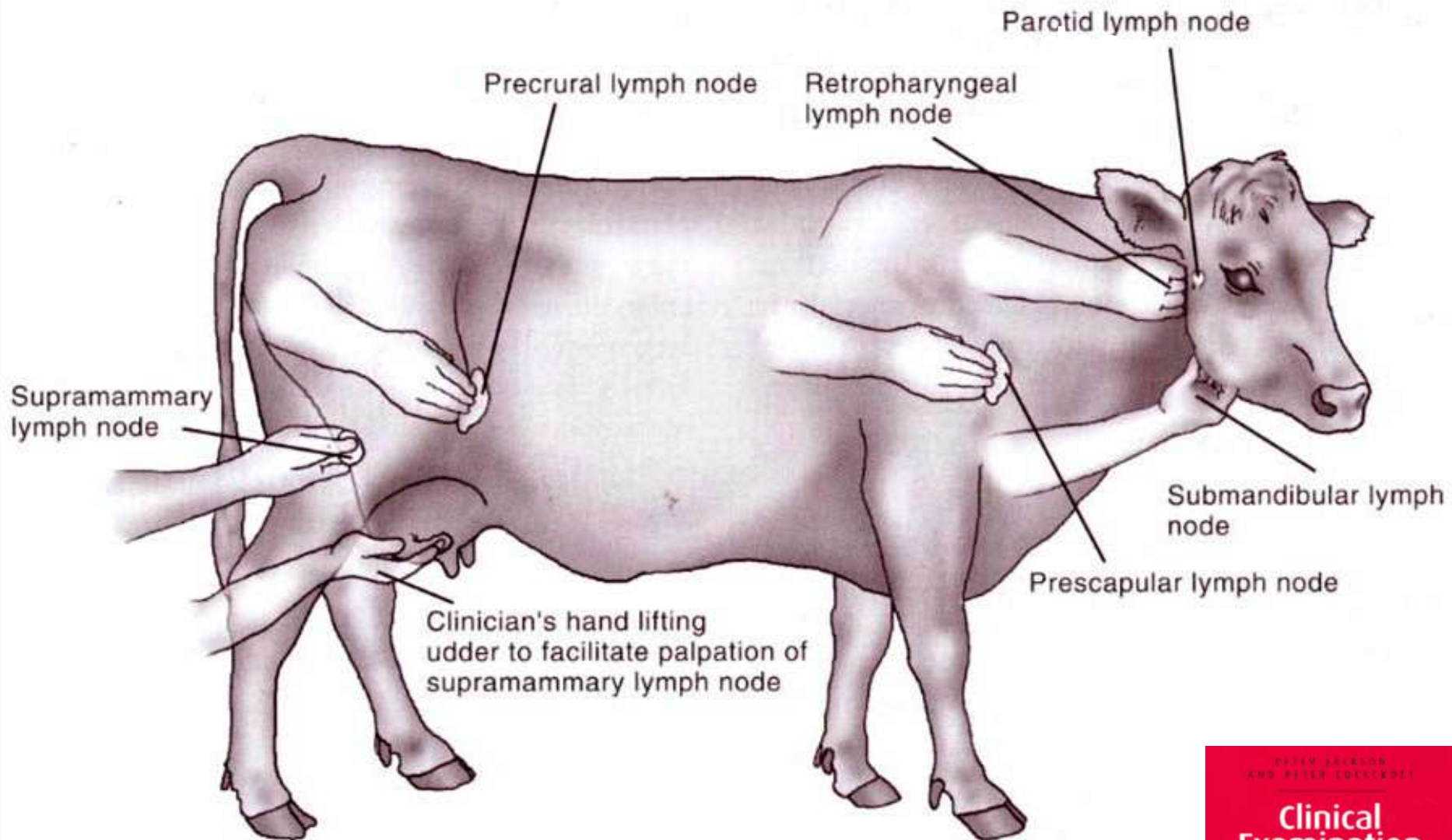
# Subcutaneous tissue = evaluation of the hydration status



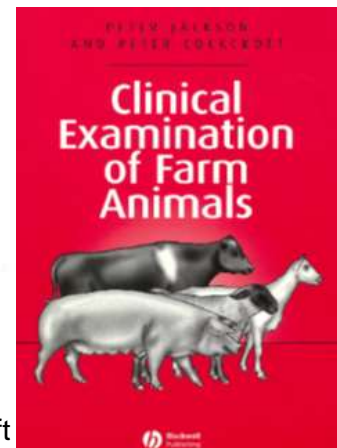
# Evaluation of the lymph nodes

## General clinical examination

1. Skeletal (body) development
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6. **Lymph nodes**
7. Examination of the mucous membranes
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Locations of the readily palpable lymph nodes in cattle showing placement of the clinician's hand. See text for details.







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Lymphoma



Lymphoma

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Lymphoma







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Lymphoma





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Lymphoma



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Juvenile lymphoma

# Diseases of cattle associated with lymph nodes affection

1. Enzootic bovine leucosis
2. Sporadic lymphoma
3. Tuberculosis
4. Johne's disease
5. Pseudotuberculosis (caseous lymphadenitis)
6. Contagious bovine pleuropneumonia (CBPP)
7. Actinobacillosis
8. Brucellosis
9. Tropical theileriosis
10. Fungal granulomatous lymphadenitis

# Examination of the mucous membrane

## General clinical examination

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# Mucous membrane





# Mucous membrane



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Papular stomatitis

# Mucous membrane



Mucosal disease (BVD virus)

# Mucous membrane



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Mucosal disease (BVD virus)





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Anemia



# Body temperature

## General clinical examination

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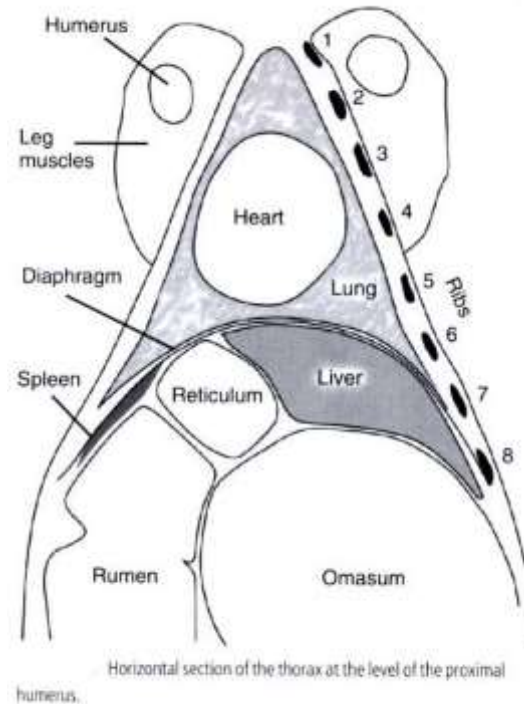
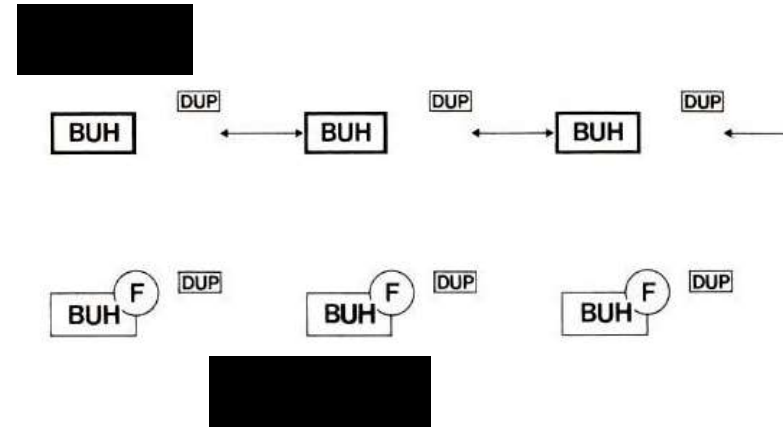
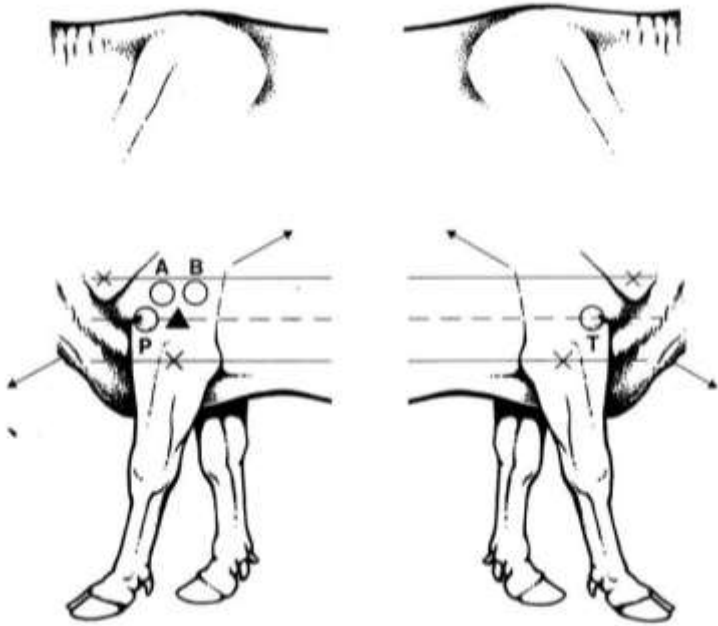
# Pulse rate and auscultation of heart

## General clinical examination

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# General examination

## Pulse rate and auscultation of heart



From: Rosenberger G.



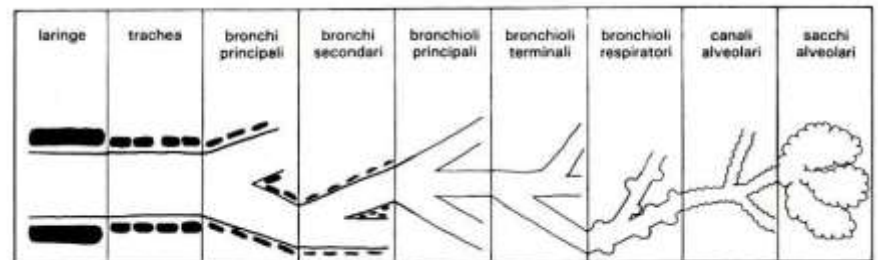
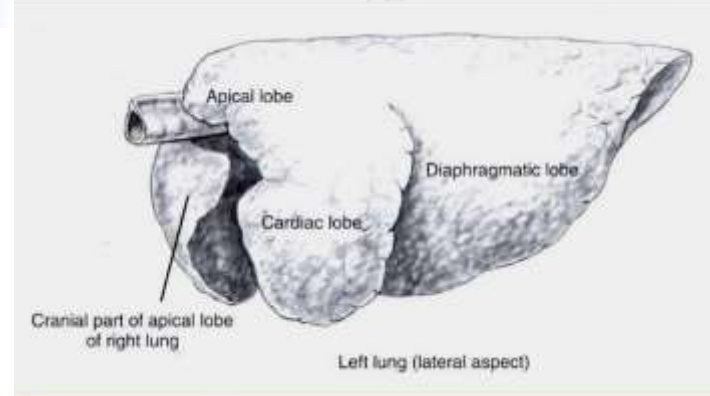
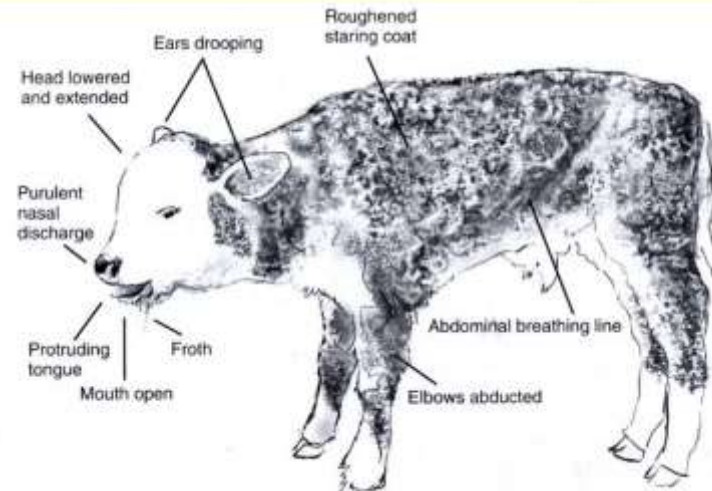
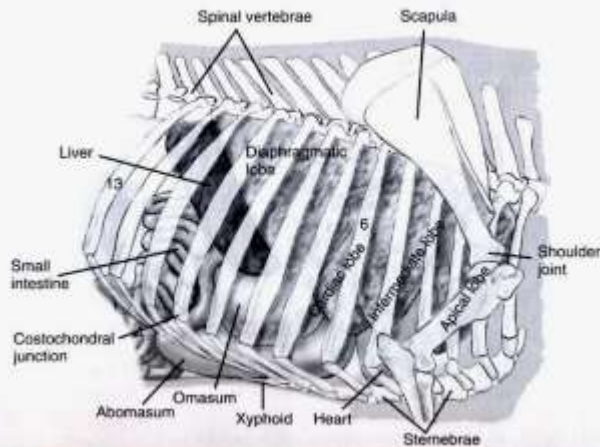
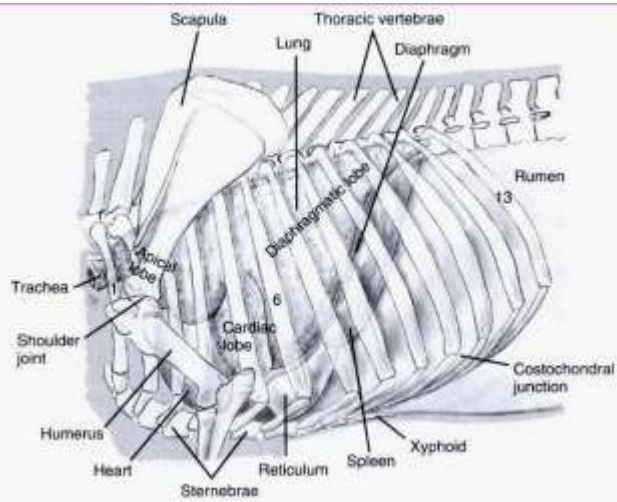
# Respiratory rate

## General clinical examination

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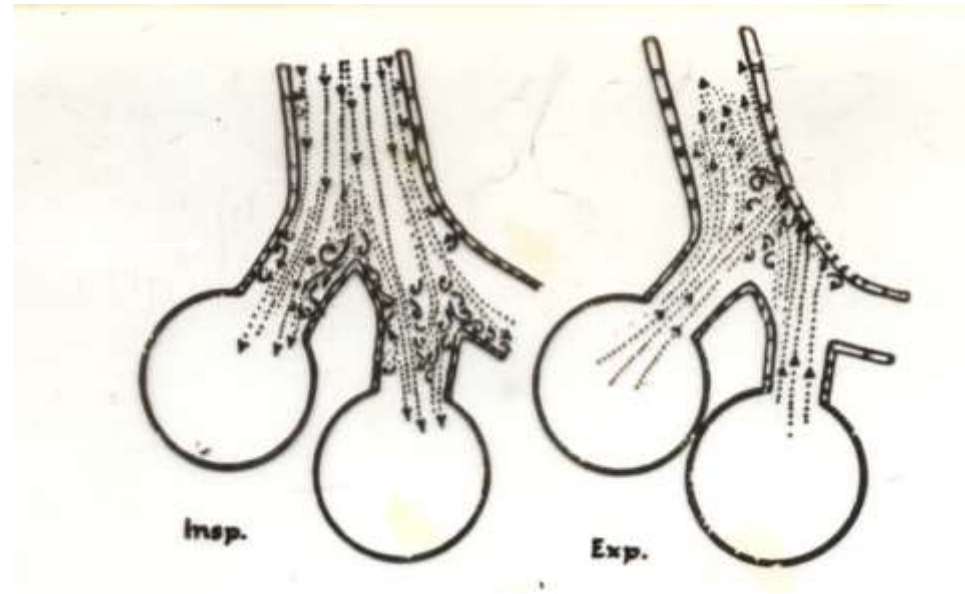
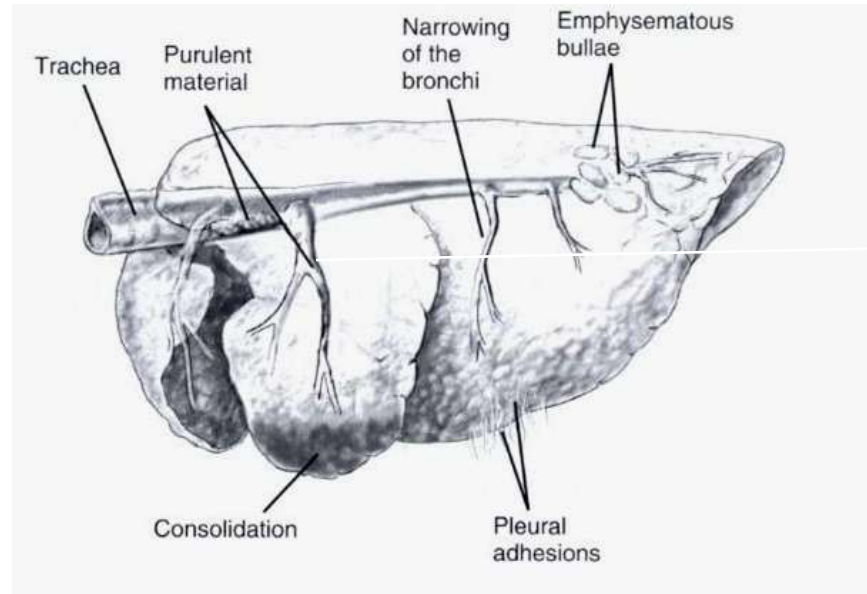
# General examination

Respiratory rate, observation of signs of dyspnea, and auscultation of the lung

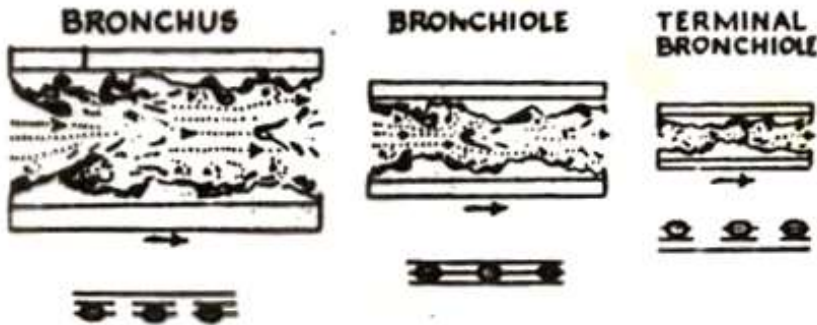


# General examination

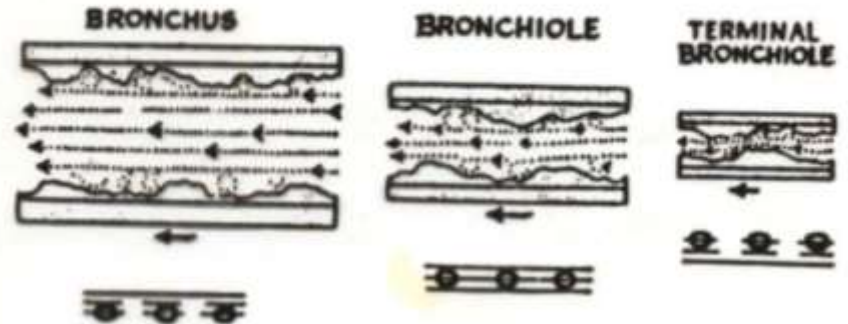
Respiratory rate, observation of signs of dyspnea, and auscultation of the lung



Moist sound **RALES** Pus & Inflamed walls  
Produced during forced, prolonged INSPIRATION



Dry sound **RHONCHI** Inflamed walls  
Produced during forced, prolonged EXPIRATION.



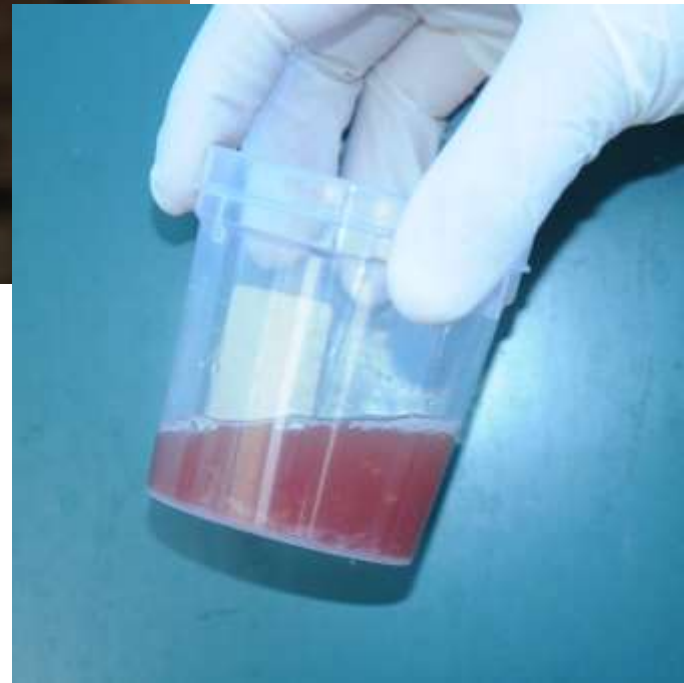


# Great organic function

## General clinical examination

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# Great organic function



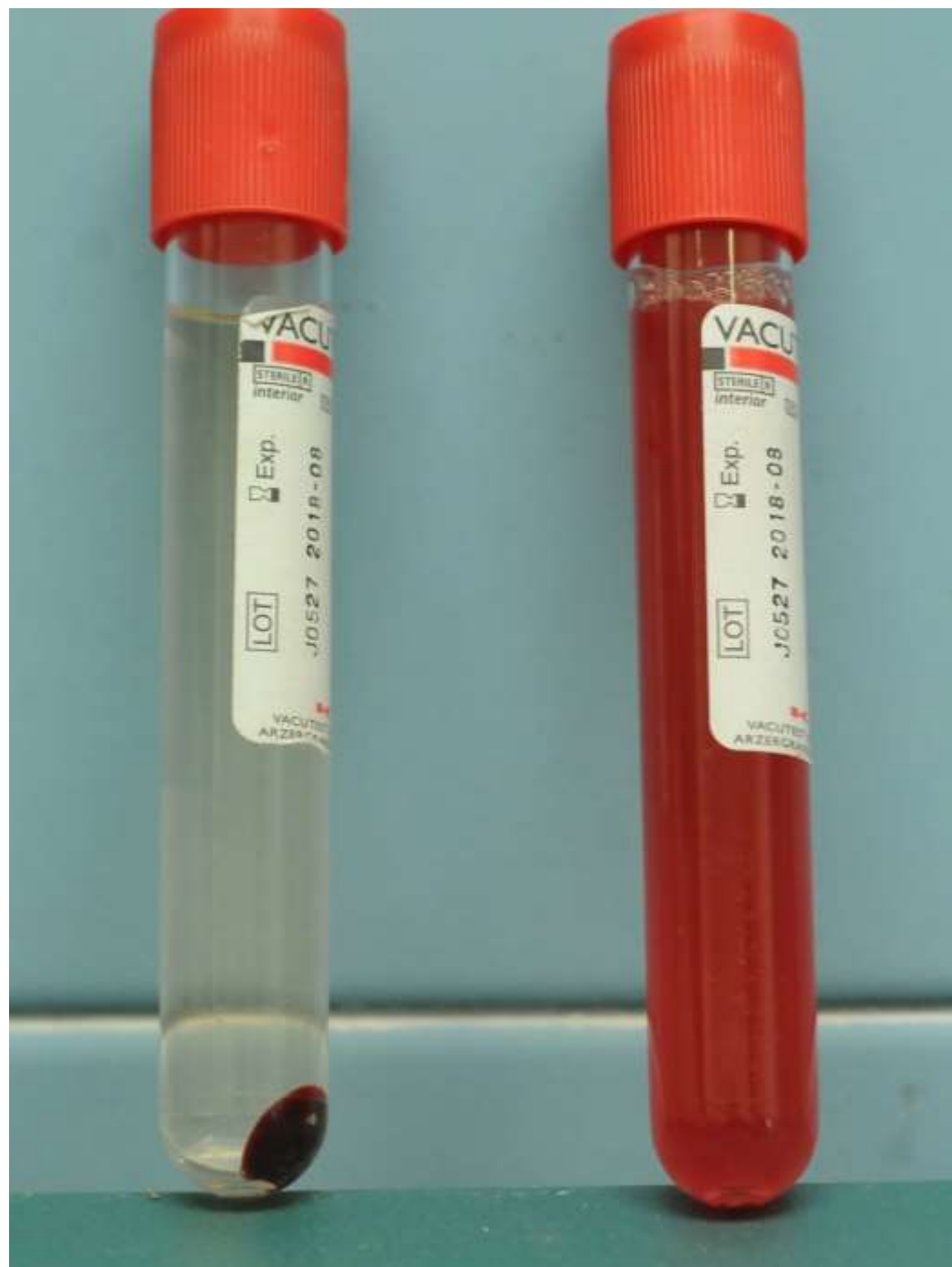
# Great organic function

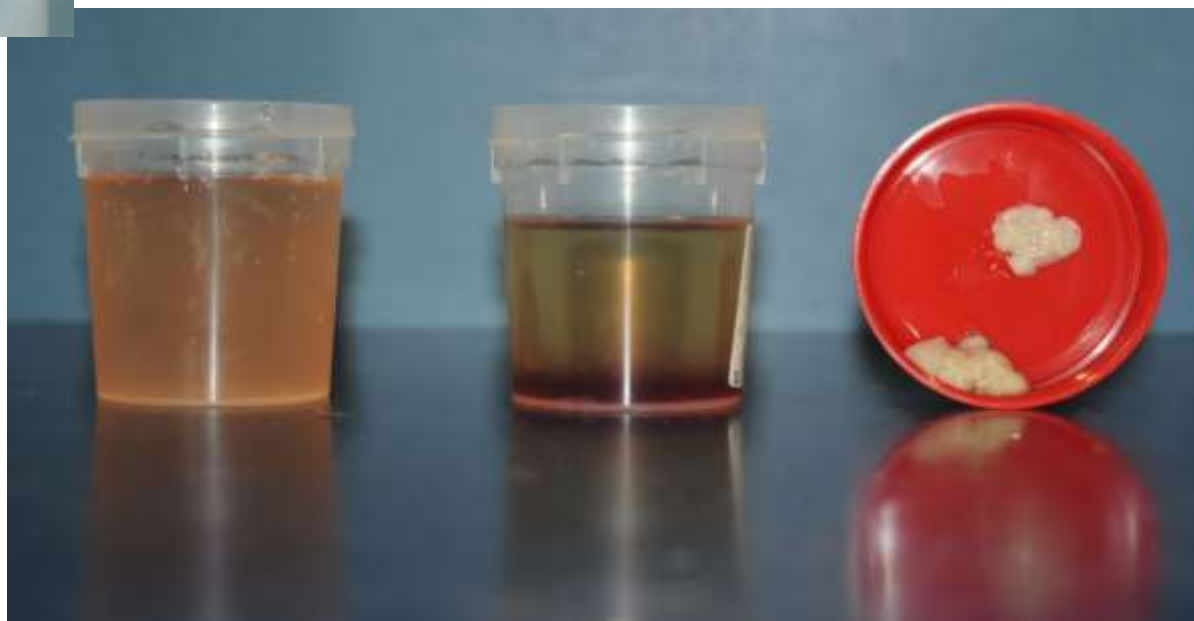
## Haematuria /haemoglobinuria

- *Pyelonephritis* *Corynebacteria renale* (good prognosis, part of normal flora) *C. pilosum* (mild, part of normal flora), *C. cystitidis* (severe, poor prognosis), *E. coli*, or *T. pyogenes*.
- *Cystitis*
- *Anaplasmosis*
- *Babesiosis*
- *Bacillary hemoglobinuria* (red water disease, *Cl. haemolyticum*).
- *Leptospirosis*
- *BVD*
- *Malignant Catarrhal Fever*
- *Acute Bracken Fern (pteridium) poisoning*
- *Enzootic Hematuria*
- *Brassica poisoning*
- *Copper poisoning*
- *Onion poisoning*
- *Ethylene glycol toxicity*
- *Oxytetracyclines*
- *Auto-immune hemolytic anaemia*
- *Urolithiasis*
- *Hypo-phosphatemia*



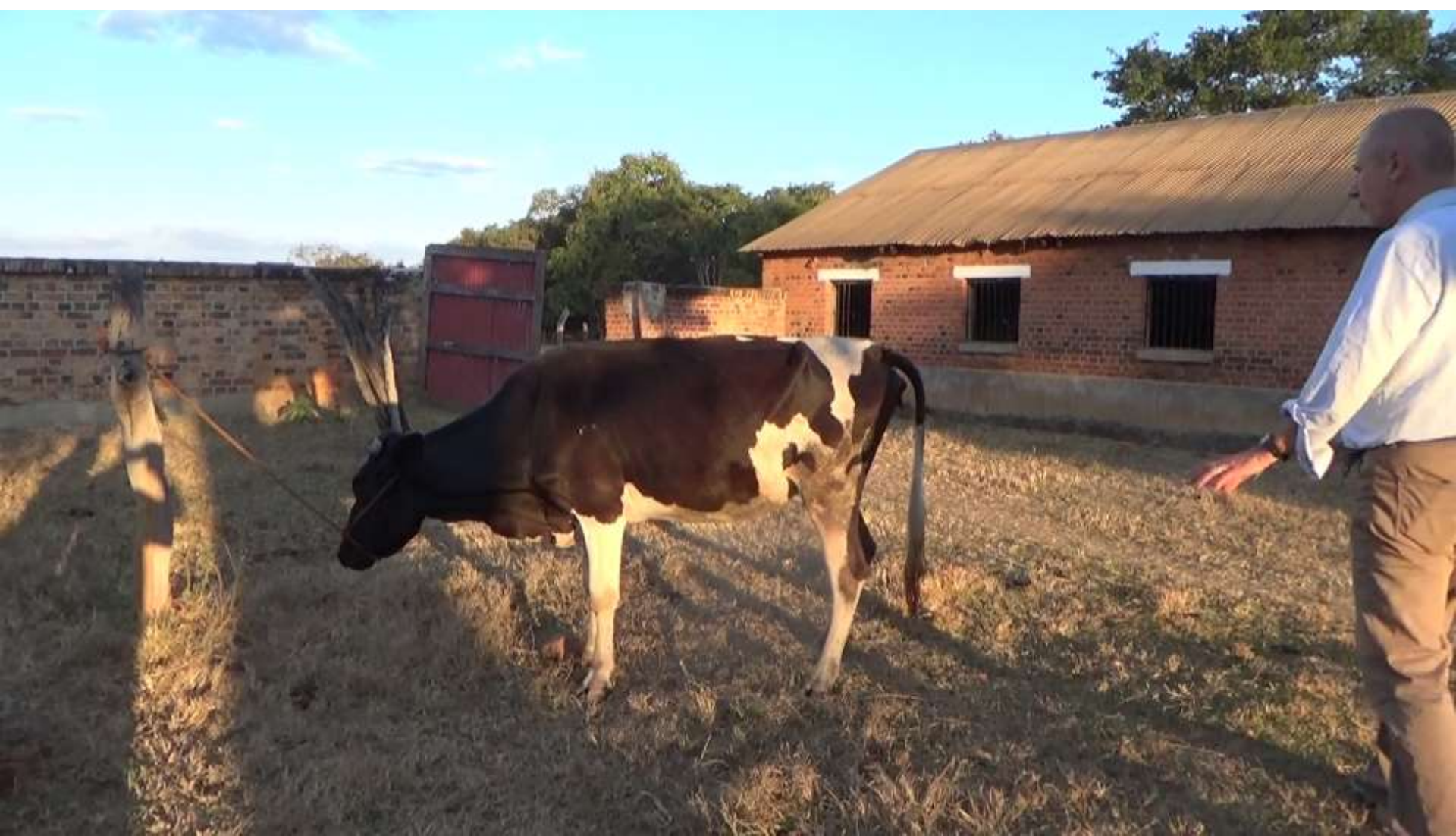












## General clinical examination

1. Skeletal (body) development
2. Nutritional condition and muscle tone
3. Sensorial status
4. Behaviour and distinguishing features
5. Skin and subcutaneous tissue

6. Lymph nodes
7. Examination of the mucous membrane
8. Body temperature
9. Pulse rate and auscultation of heart
10. Respiratory rate
11. Great organic functions

# ***Bovine clinics***

## • ***Clinical examination: procedure***

**General clinical examination**

**Orientation of the diagnosis**

**Animal is healthy**

**Animal is sick**

**Where might be the problem**  
*(digestive, respiratory, cardiocirculatory,  
nervous, urinary system....)*

**DIAGNOSIS OF  
SYNDROME**

**Clinical examination of single body system**  
**Confirmation of the whereabouts of the problem**

**DIAGNOSIS OF  
SYSTEM**

**What is the problem**  
*(inflammatory, degenerative, neoplastic,...)*

**DIAGNOSIS OF  
NATURE**

**What is the cause**  
*(infectious, toxic, deficiency, .....*

**ETHIOLOGICAL  
DIAGNOSIS**