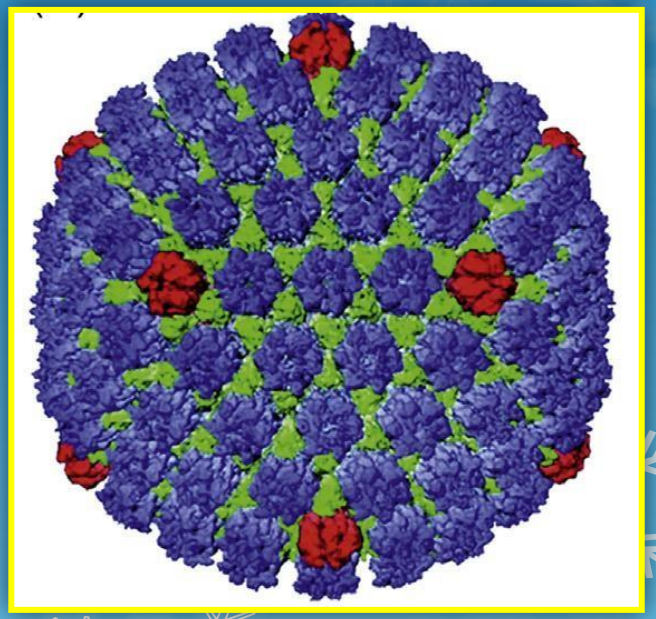
Malignant Catarrhal Fever (MCF)

Malignant Catarrh, Malignant Head Catarrh, Gangrenous Coryza, Catarrhal Fever, Snotsiekte

1- Malignant catarrhal fever (MCF) is an infectious disease primarily of ungulate species.

2- The disease is characterized by **lymphoproliferation**, **vasculitis**, and **erosive-ulcerative mucosal** and **cutaneous lesions**.

3- MCF is caused by cross-species infections with members of the MCF virus group of ruminant gammaherpesviruses (**genus** , **subfamily Gammaherpesvirinae**, **family Herpesviridae**).



4- At least 10 members of the MCF virus group have been identified, **6 of which are associated with clinical MCF under natural conditions**:

(1) **Alcelaphine herpesvirus 1 (AlHV-1),** carried by wildebeest.

(2) **Ovine herpesvirus 2 (OvHV-2),** endemic in domestic sheep.

(3) **Caprine herpesvirus 2 (CpHV-2),** endemic in domestic goats.

(4) **Caprine herpesvirus 3 (CpHV-3)** causing MCF in whitetailed deer and red brocket deer.

(5) **Alcelaphine herpesvirus 2 (AlHV-2),** carried by hartebeest, topi and causing MCF in Barbary red deer and bison.

(6) **Ibex MCF virus (Ibex-MCFV),** carried by the Nubian ibex and producing MCF in bongo and anoa.

5- **Lethality** in susceptible species **approaches 100%**, although there are rare recorded cases of chronic infection and also of recovery from the disease, especially in infected goats, bison, cattle, and pigs.

6- **The mucosa of the upper respiratory tract and/or the tonsil** is the most likely natural route of entry for the agents of MCF.

7- Most natural outbreaks of MCF are due to 2 agents originally incriminated in MCF outbreaks: **AlHV-1** and **OvHV-2**.
AlHV-1 is responsible for the "African" or wildebeestassociated form.
OvHV-2 causes sheep-associated.

8- Wildebeest are **infected for life** and **transmit AlHV-1 to their calves** without showing clinical signs. Wildebeest calves are considered to be **the main source of infection** for cattle in East Africa. They may shed virus in **nasal and ocular secretions** until they are 3-4 months old. Transmission to cattle may occur even wi thout intimate contact, suggesting aerosol spread.

9- Experimental transmission of OHV-2 between sheep has been accomplished using an **aerosol of virus-infected nasal secretions**, and natural transmission from adults to offspring probably takes that route.

10- Most sheep are presumed to be carriers of OHV-2 virus. MCF occurs where **bovids and deer come in contact with sheep**.

11- The pathogenesis, clinical signs, and lesions are similar, whatever the agent inducing MCF.

12- Incubation period 9 to 77 days experimentally (Unknown in natural infections)

13- Subclinical infections develop under stress but **Initial clinical signs** are **Depression, diarrhea, disseminated intravascular coagulation (DIC), dyspnea, high fever, inappetence and Sudden death.**

13- **MCF can take four clinical forms in cattle**:

A) Peracute form: sudden death

B) Head and Eye form: Majority of cattle cases

C) Intestinal form: Initially like head and eye form, but death occurs from severe diarrhea

D) Mild form: Inoculated animals; recovery expected

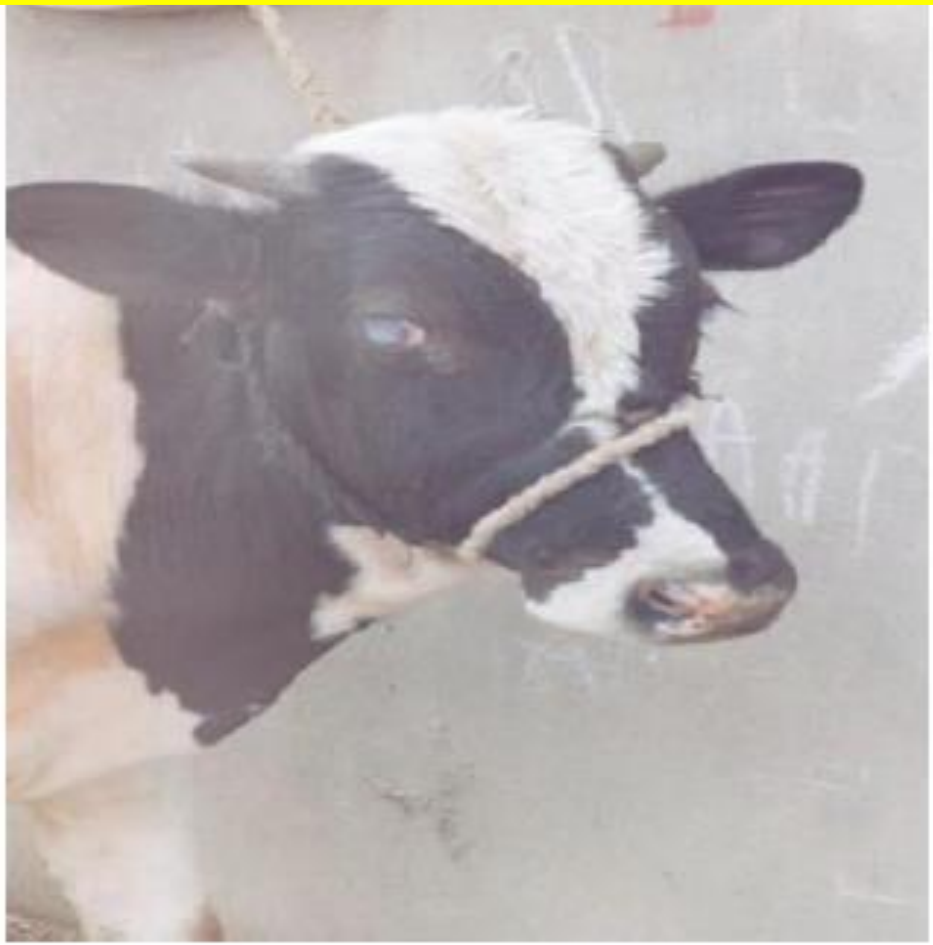
Peracute form (sudden death)

14- Gross changes may not be present, and in these the diagnosis must rest on the detection of the characteristic **histologic changes**, and **demonstration of the genome of an implicated gammaherpesvirus in tissue**.

Head and Eye form

15- In the early stages of the head and eye form, this disease can cause **conjunctivitis**, **reddened eyelids**, and **bilateral corneal opacity**, as well as **serous or thick nasal discharge**, **crusty muzzles and nares**, **open-mouthed breathing**, and **salivation.**

2 Mucous nasal discharge and crusted muzzle (MCF).



Cattle infected with malignant catarrhal fever showing corneal opacity

Corneal edema in MCF.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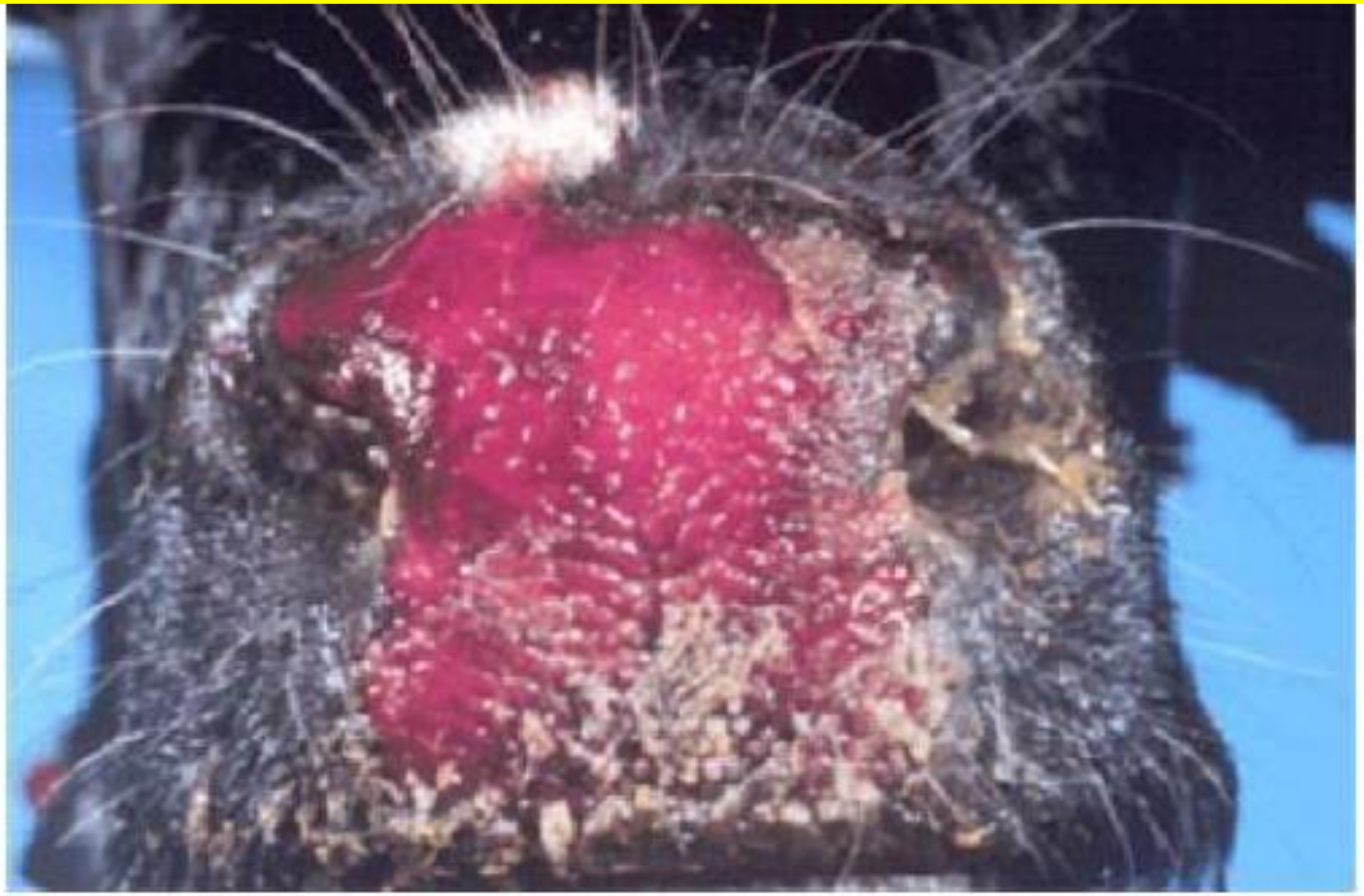
MvV



Cattle infected with malignant catarrhal fever showing red muzzle besides presence of dried crusts

MCF:Bovine, muzzle. Multiple shallow erosions are filled with dried nasal exudate.

MCF:Bovine, muzzle. The muzzle is hyperemic, multifocally covered by adherent mucopurulent exudate, and contains many shallow erosions.

MCF: Bovine, muzzle. There is diffuse superficial necrosis of the muzzle.

MCF: Bovine, skin. There are numerous raised plaques (multifocal dermatitis).

Head and Eye form

16- **Joints and superficial lymph nodes may swell**, and the horn and hoof coverings may slough in some animals.

Finally, some animals exhibit nervous signs, such as **incoordination, head pressing, nystagmus, and hyperesthesia.**

MCF: Bovine, oral mucosa. There is a gingival hyperemia and focal erosion

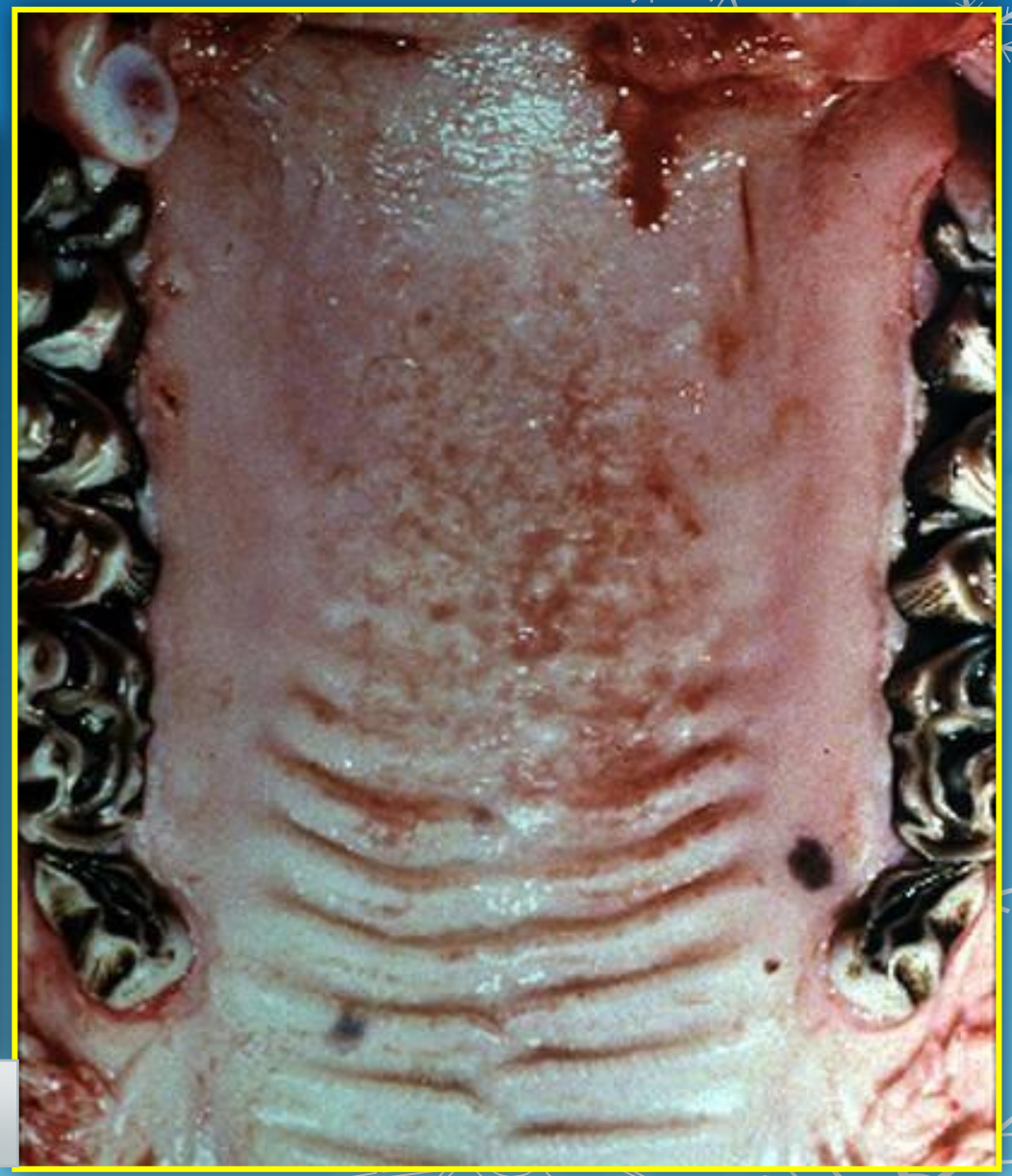
Cattle infected with malignant catarrhal fever showing congestion of the tongue with sharply irregular erosion

Head and Eye Form: Later Stages

Erosions on the tongue

Erosions on the buccal mucosa

Post Mortem Lesions



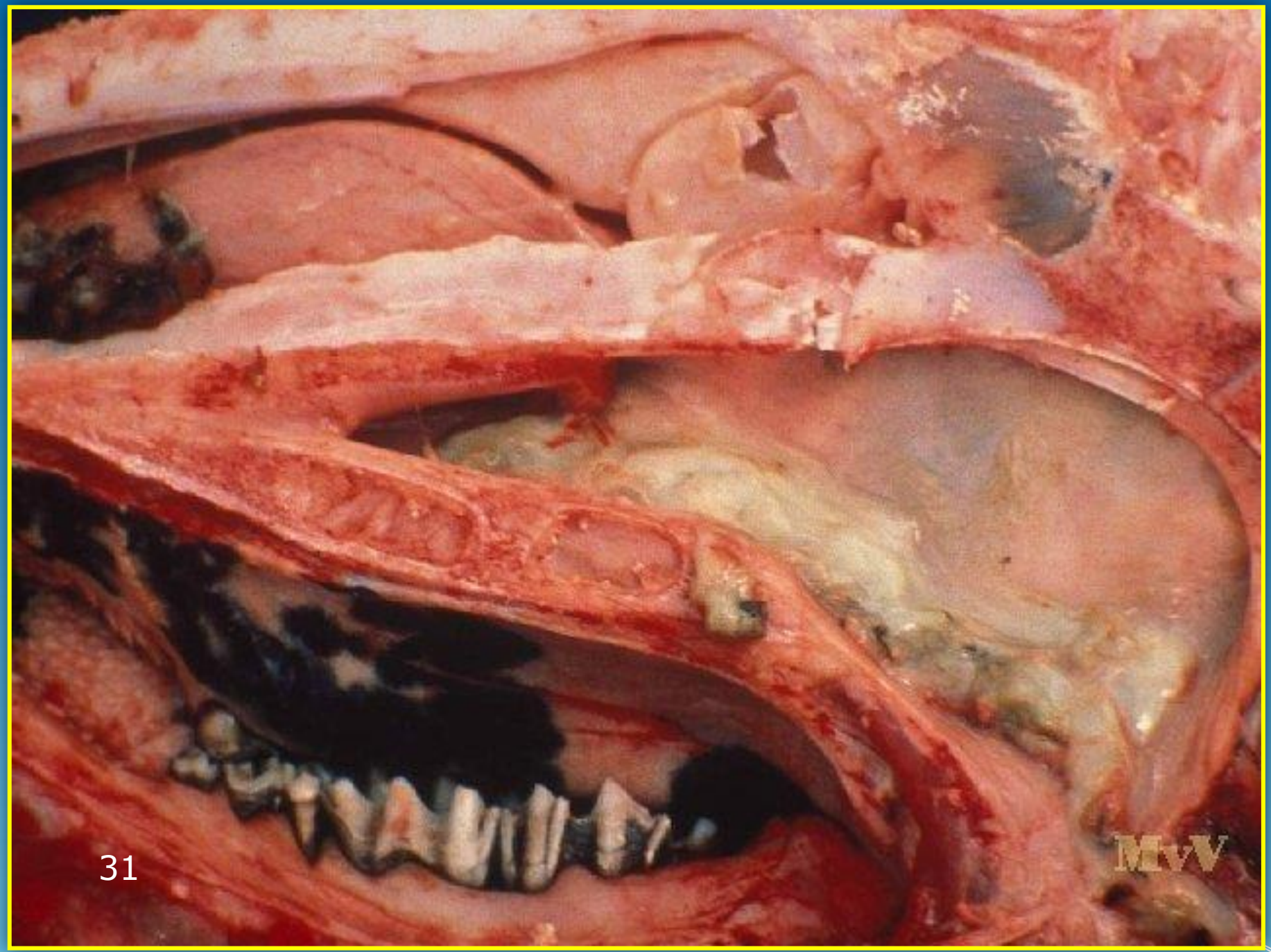
Erosions on the tongue and soft and hard palate

Ulcerative lesions in the hard palate of a bison with malignant catarrhal fever.

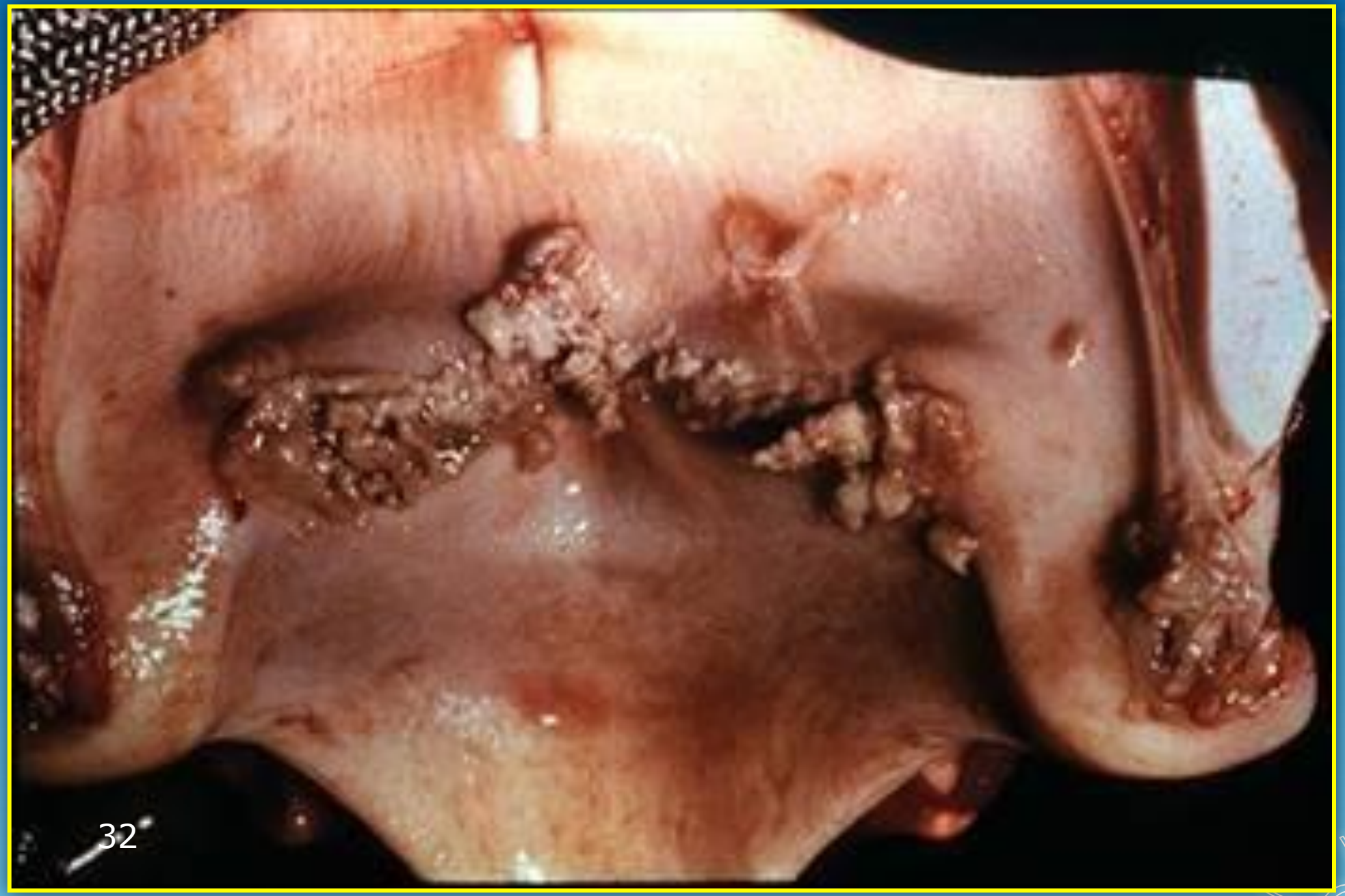
MCF: Bovine, hard palate. There are multiple coalescing mucosal erosions.

MCF: Bovine, nasal turbinate. There is a small amount of mucoid exudate.

MCF: Bovine, head, sagittal section. Mucoid exudate multifocally covers the nasal and pharyngeal mucosa



Bovine nasal turbinates, there is a small amount of mucoid exudate.

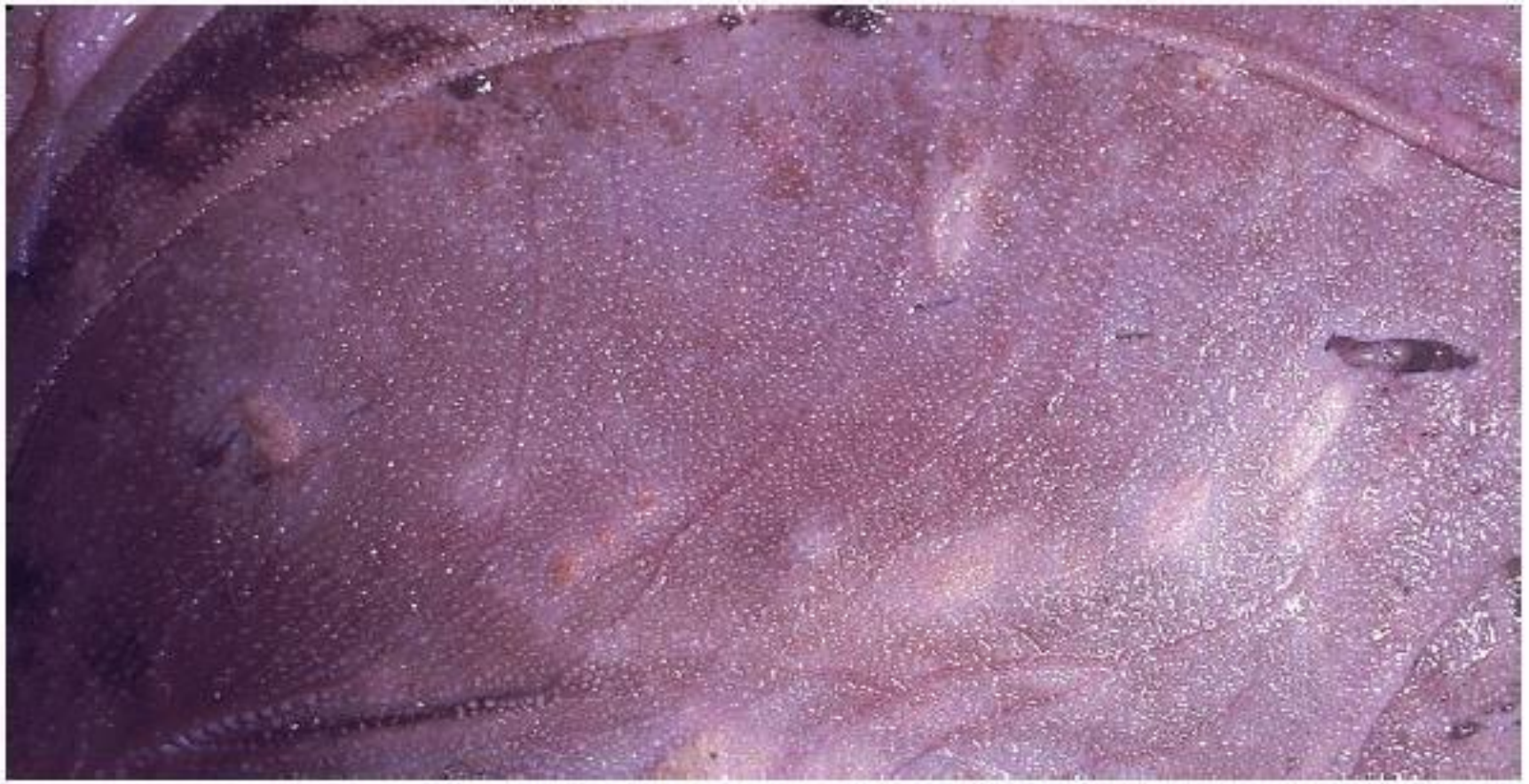


necrotic areas on the larynx; these are sometimes accompanied by a diptheritic membrane.

Greatly enlarged in the prescapular lymph node compared to normal.

Enlargement of lymph nodes is a characteristic lesion of MCF in most species, perhaps except in bison

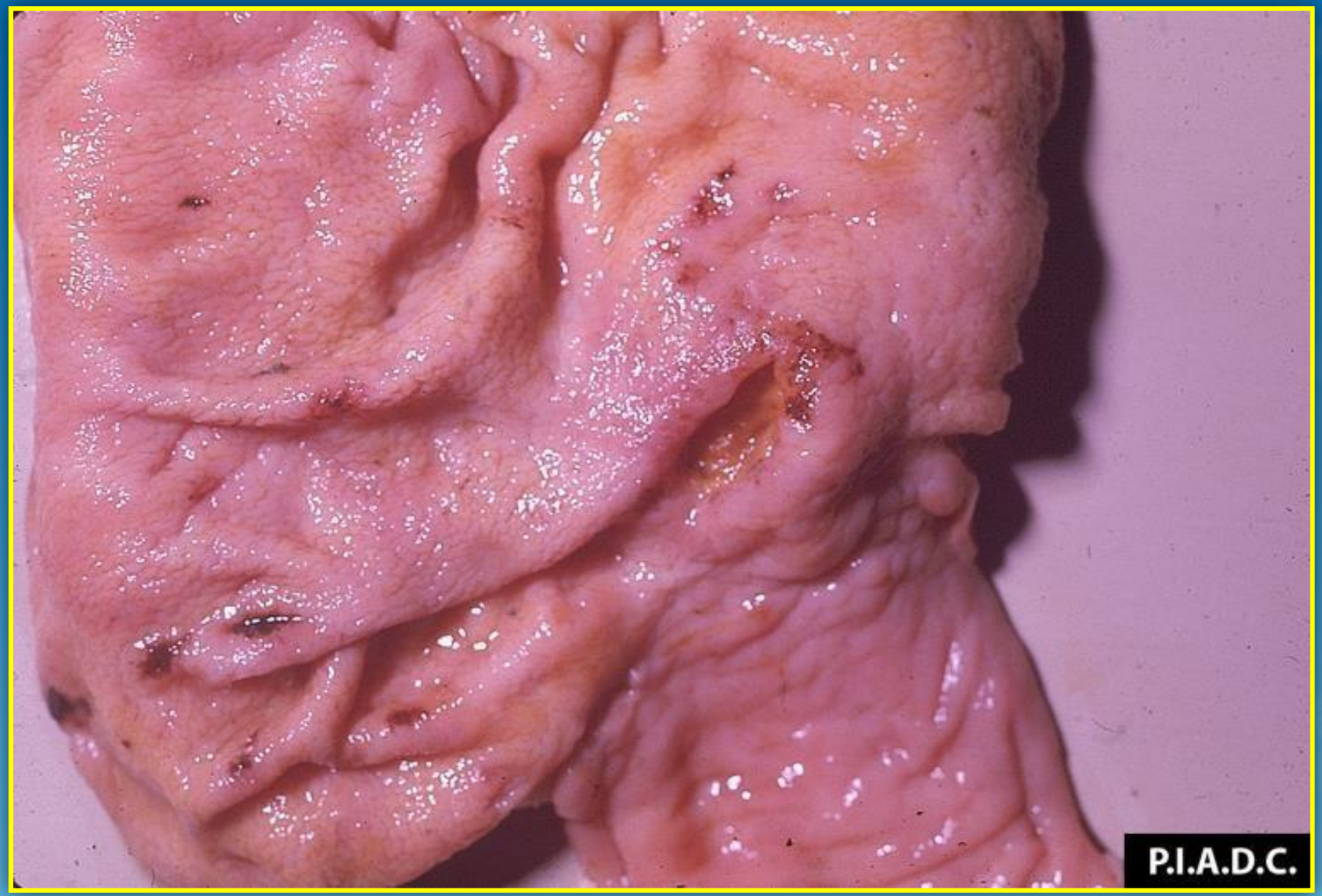
MCF:Bovine, prescapular lymph node. There are foci of hemorrhage (and necrosis) in the cortex, and the medulla is edematous



MCF: Bovine, omasum. Omasal leaves contain multiple pale foci of necrosis; on the right there are several ulcers.

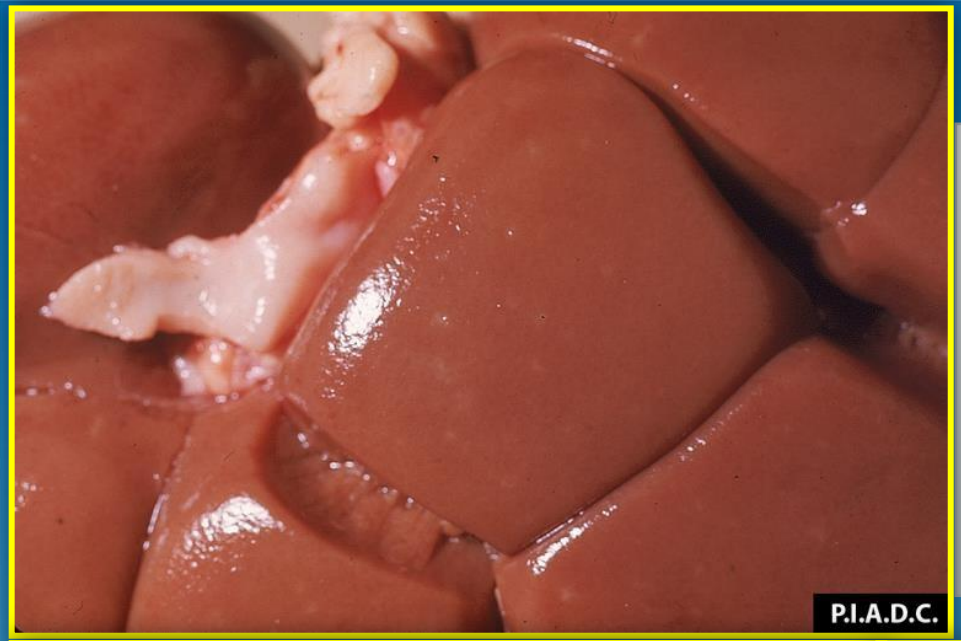
Necrotic areas in the omasal epithelium

Multiple erosions of intestinal epithelium

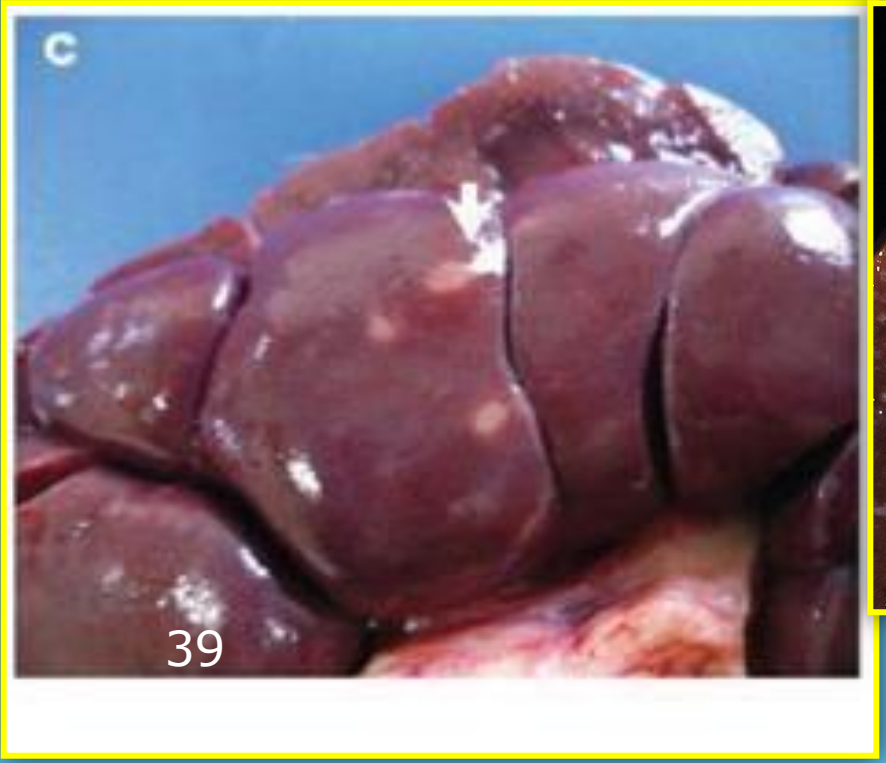


MCF: Bovine, cecum and ileum. There are scattered small foci of mucosal hemorrhage and erosion

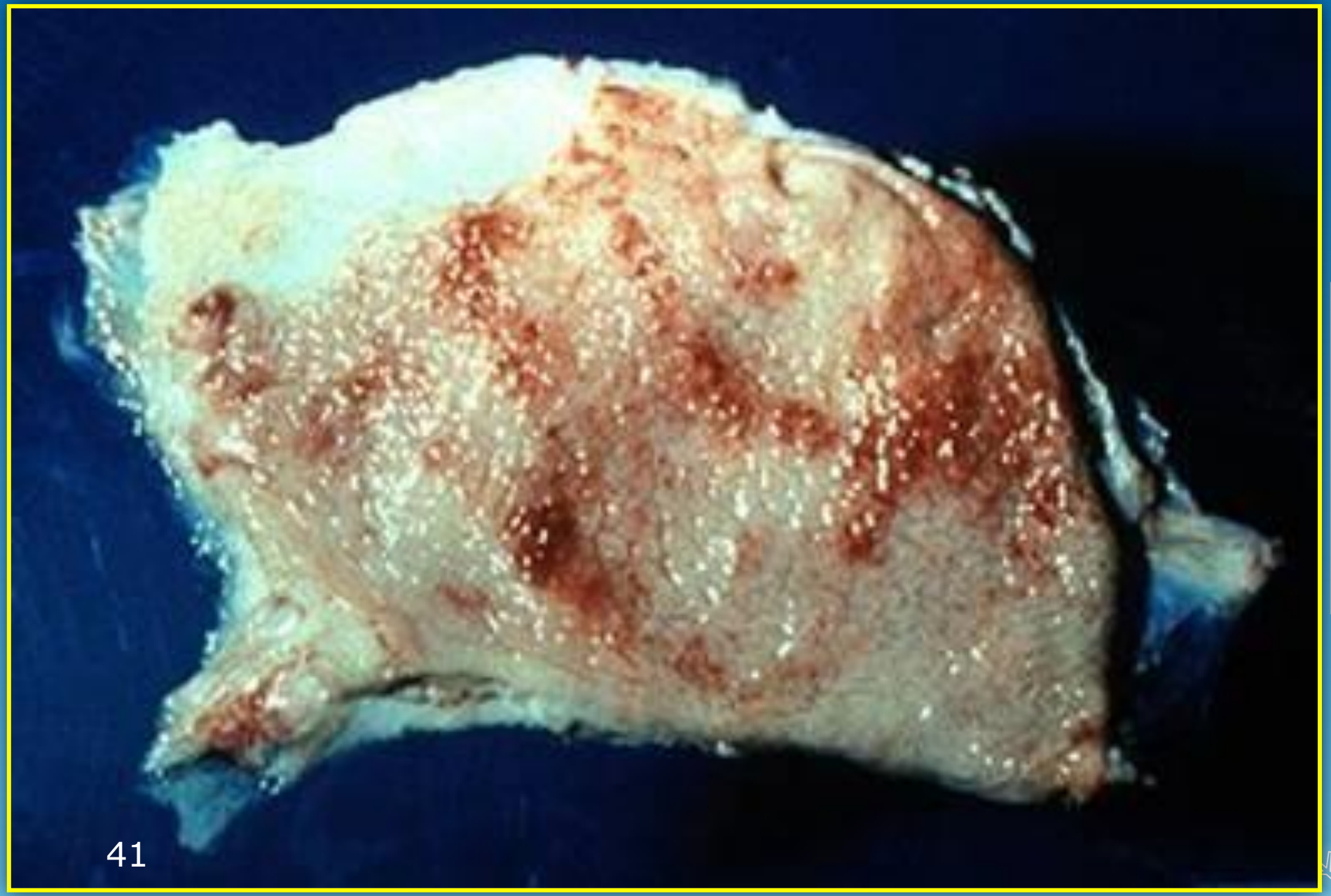
Malignant catarrhal fever showing congestion and hemorrhages in distal colon



MCF Bovine kidney, multiple pale foci of interstetial nephritis.



Malignant catarrhal fever. Focal nonsuppurative interstitial nephritis.



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The mucosa of this bladder is hyperemic and edematous due to MCF infection.

Hemorrhages in the mucosa of urinary bladder in malignant catarrhal fever.

14- Due to the similarity of lesions, differential diagnoses consist of **bovine viral diarrhea mucosal disease**, **bluetongue**, **rinderpest**, **foot and mouth disease**, **vesicular stomatitis**, **salmonellosis**, **pneumonia complex**, **oral exposure to caustic materials**, **mycotoxins**, and some **poisonous plants**.