



# ADULTS: UPPER RESPIRATORY TRACT

## INTRODUCTION

Upper respiratory tract disorders cause nasal secretions, nostril dilation, and inspiratory dyspnea, leading to exhalation of expired air through the mouth when the nasal obstruction is almost complete.

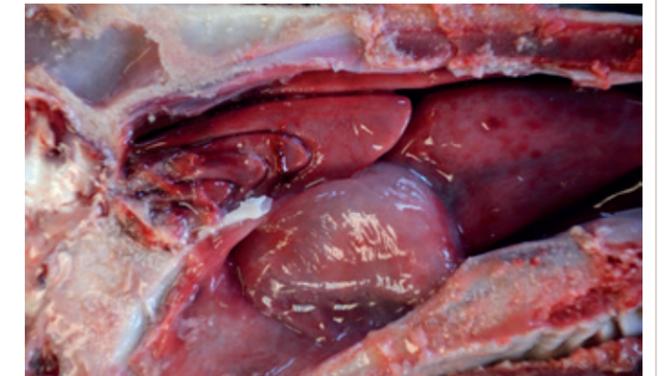


**3.33. Nostril dilatation.** The difficulty in introducing enough air causes the animal to dilate the nostrils in order to facilitate its entry (A and B).

**3.34. Puffy cheeks.** The animals show puffy cheeks exhaling expired air when the obstruction of the nostrils is almost complete (A). In addition, they open their mouth (B) and even foam can be seen around the mouth (C).



**3.35. Nasal secretions.** This is the most common clinical sign in upper respiratory tract disorders (A and B). The red fresh blood secretions caused by trauma during handling or after fights between animals should not be confused (C).



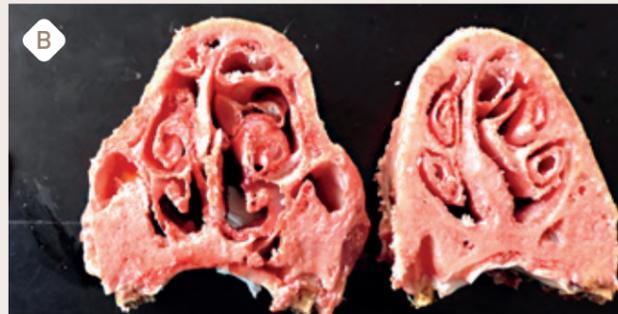
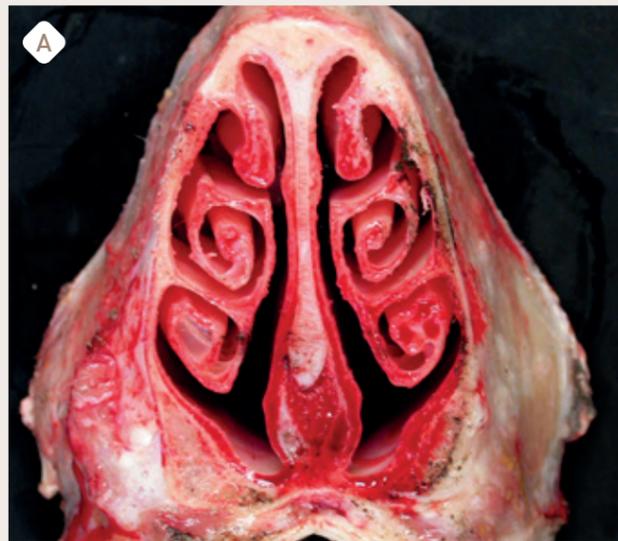
**3.36. Polyps.** In chronic respiratory disorders of the upper airways, it is common to find polyps of different shapes and sizes.



**3.37. Predisposing factors.** Respiratory disorders, in general, and especially those that affect the upper airways, are aggravated by the action of dust, heat and unfavourable environmental conditions.

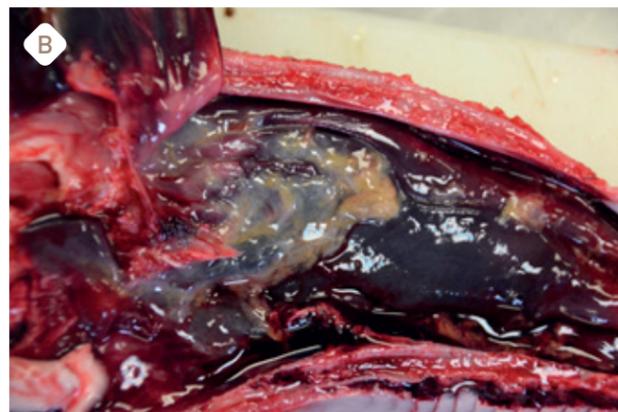
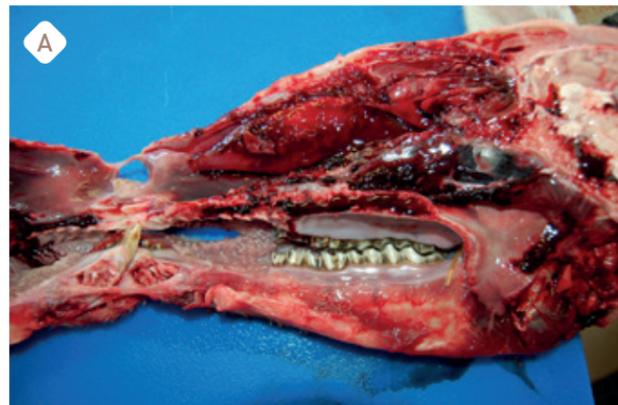


RHINITIS AND NASAL DEFORMITIES



**3.38. Normal aspect and abnormalities.** A cross-section of the nostrils at the level of the turbinates shows a symmetric image of the nasal septum and turbinates (A). In some cases, the asymmetry of the nostrils gives an image similar to that of atrophic rhinitis in pigs (B). We can find some deviations of the septum and turbinates that are difficult to associate with specific disorders (C).

ACUTE RHINITIS

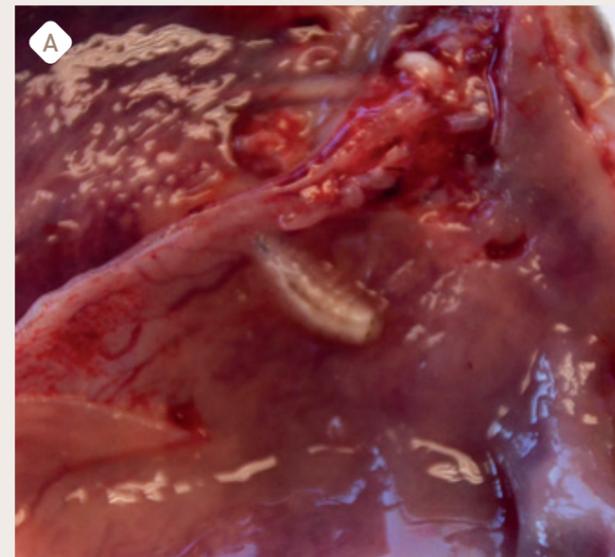


**3.39. Acute rhinitis associated with the ovine respiratory complex.** Many respiratory disorders begin with acute rhinitis, which is frequently seen in the hyperacute form of the ovine respiratory complex. In these cases, we find the nasal mucosa with a reddish and moist appearance (A), swollen regional lymph nodes and, sometimes, even fibrin in the nasal cavity (B).



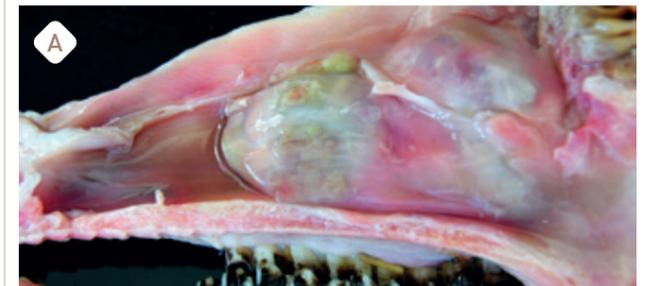
**3.40. Secretion.** In cases of acute rhinitis, it is common to see the presence of more or less bloody exudates in the nostrils.

CHRONIC RHINITIS

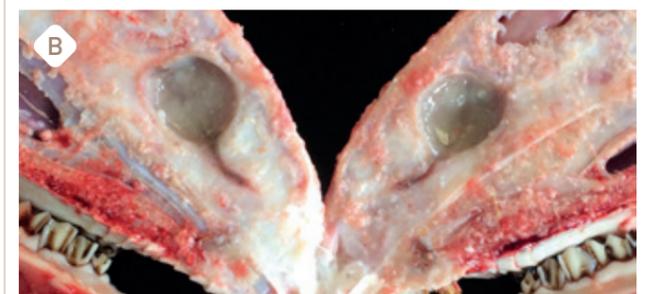
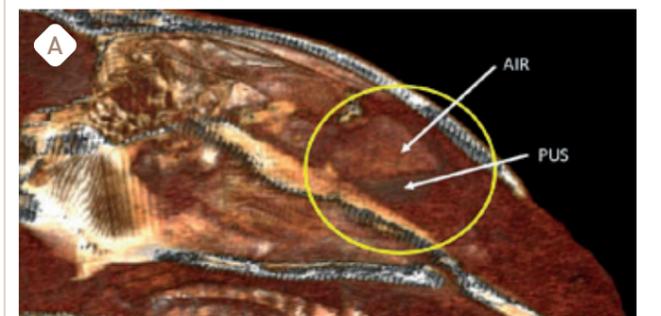


**3.41. Rhinitis caused by *Oestrus ovis*.** In the case of chronic rhinitis, as occurs in oestrosis or rhinitis due to foreign bodies (spikelets), etc., it is possible to see a thickened mucosa with a rougher surface (A). These cases are accompanied by a mucous or mucopurulent nasal discharge (B).

PURULENT RHINITIS



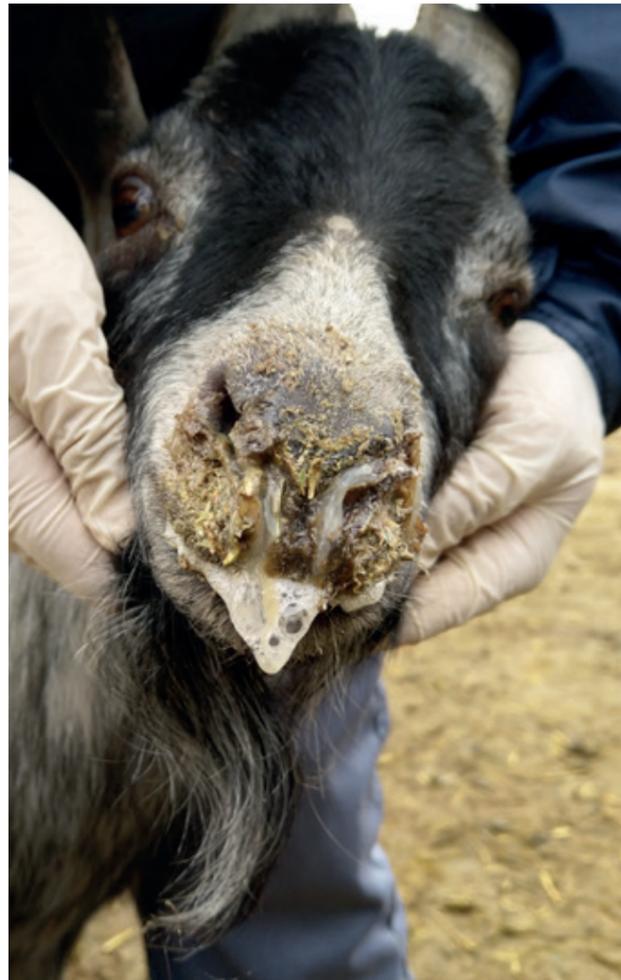
**3.42. Presence of pus in turbinates.** Different pyogenic microorganisms can settle in the nostrils. Pictures A and B show purulent rhinitis in the ventral turbinate.



**3.43. Abscess in the nasal septum.** Abscesses in the nasal septum can be found draining towards the hard palate and occluding the outlet by spikelets, as seen on CT scan image (A), or at necropsy, with a collection of purulent content (B).



**3.44. Caseous rhinitis.** Caseous rhinitis caused by *Corynebacterium pseudotuberculosis* shows the typical caseous material in nasal turbinates.

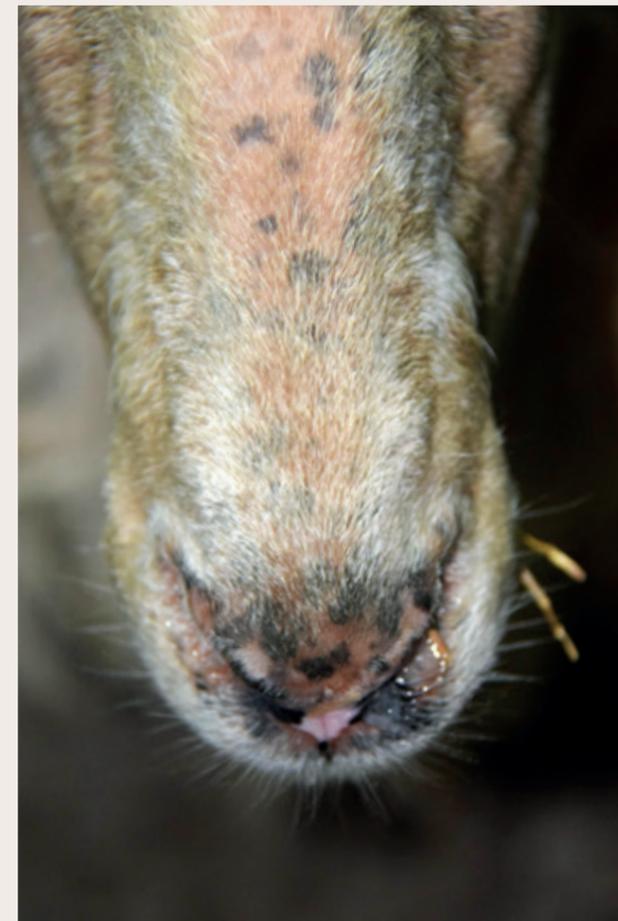


**3.45. Purulent nasal secretions.** All these disorders can produce purulent nasal secretions.

**OBSTRUCTIVE RHINOPATHY ASSOCIATED WITH PITHOMYCOTOXICOSIS**



**3.46. Nasal obstruction.** Sporidesmin, a toxin produced by the fungus *Pithomyces chartarum*, causes vascular damage in different organs, including the nostrils. Affected sheep develop a permanent narrowing of the nasal lumen, close to the nostrils, causing inspiratory dyspnea and snoring (A). These slight elevations of the alar folds can lead to almost complete airway occlusion (B).

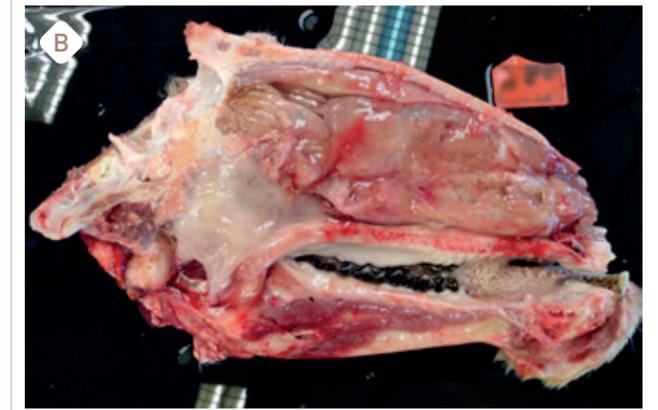


**3.47. Forced breathing.** The partial or total occlusion of the nostrils generates a snoring noise and the depression of the wings of the nostrils during inspiration.



**3.48. Postmortem findings.** Necropsy of these animals show slight elevations and roughness on the alar folds and close nasal areas, always accompanied by intense liver atrophy and fibrosis associated with chronic pithomycotoxicosis.

**CHRONIC PROLIFERATIVE RHINITIS**



**3.49. Ventral turbinate rhinitis.** Chronic proliferative rhinitis is a polypoid inflammatory disorder caused by *Salmonella enterica* subspecies *diarizonae*, serovar 61:k:1.5,(7). Ventral turbinate is always affected, unilaterally or bilaterally (A and B). Occasionally, dorsal turbinate can also be affected (C).



**3.50. Clinical signs.** The remarkable inflammation of the ventral turbinate hinders breathing, causing characteristic snoring and seromucous nasal secretions (A). Proliferative tissue appears through the nostril uni or bilaterally (B and C). The animal breathes through the mouth when the obstruction is almost complete in bilateral processes.

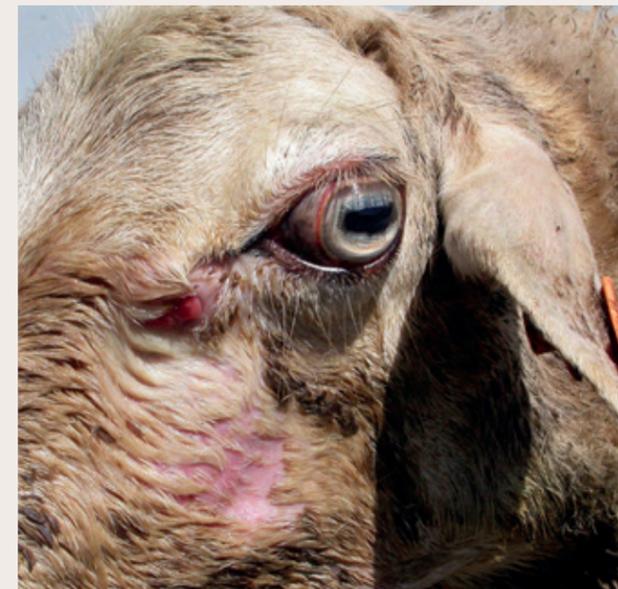
**ENZOOTIC NASAL ADENOCARCINOMA (ENA)**



**3.51. Ethmoid turbinate is affected.** Enzootic nasal adenocarcinoma of sheep and goats is a contagious tumour of the ethmoid turbinate mucosa. ENA in sheep is normally unilateral and is caused by the enzootic nasal tumour virus 1 (ENTV-1) (A). However, in goats it is usually bilateral and is caused by the ENTV-2 (B).



**3.52. Serous nasal secretion.** ENA causes abundant and fluid nasal secretion, leading to the so-called "washed nose syndrome".



**3.53. Exophthalmos.** Tumour growth can displace the eyeball and produce exophthalmos.



**3.54. Fistulisation.** If tumoural growth continues, bone rarefaction and fistulisation of the contents through the face occur (A and B).

**TUMOURS**



**3.55. Carcinoma.** Tumours affecting the skin of the face can hinder breathing, such as this squamous cell carcinoma involving and occluding the nostrils (A) or the same type of tumour in the eye socket and penetrating the nasal cavity (B).



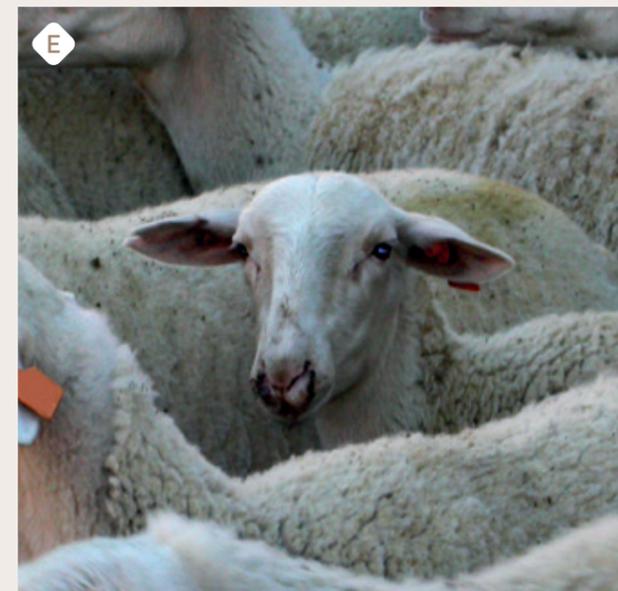
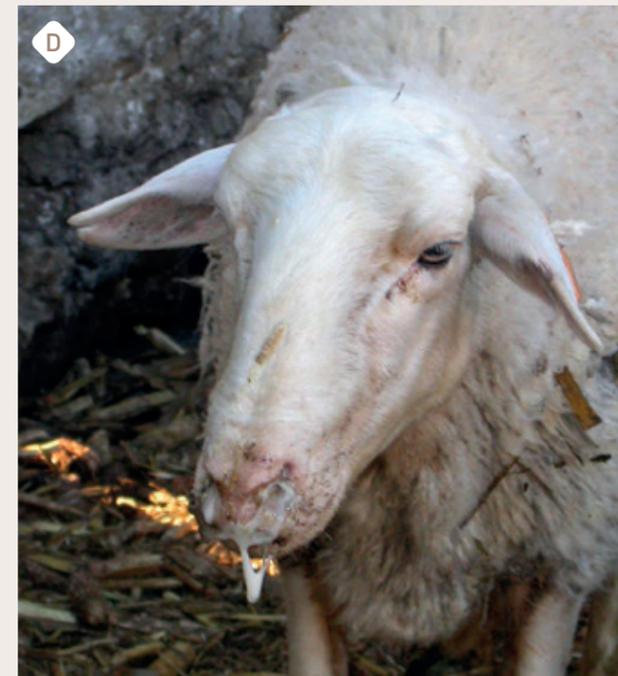
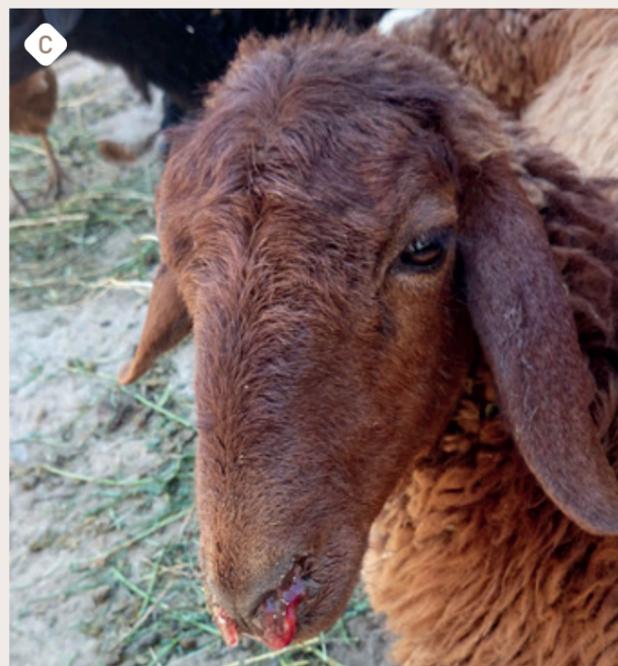
**3.56. Other tumours.** Different neoplasias can appear after repeated irritation of an area, such as the case shown in the picture associated with sinusitis caused by an aberrant puparium of *Oestrus ovis*.



OESTROSIS



3.57. *Oestrus ovis*. Oestrosis is a parasitosis of the upper airways of small ruminants. It is produced by the larval stages of *Oestrus ovis* (A). The pupa is buried in the ground (B), and only the adult flies deposit larvae in sheep's and goats' nostrils (C).



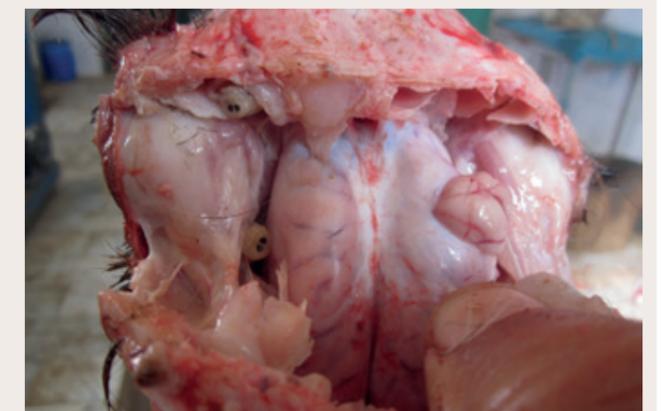
3.58. **Clinical signs.** The irritative and traumatic action of the larvae and their detritus cause rhinitis with nasal mucus secretion (A). Nasal secretion can also be haemorrhagic due to the wounds caused by the larva (B), and even threads of fresh blood can be seen in the secretion without mixing with the mucus (C). Occasionally, mucopurulent secretion can be seen due to bacterial contamination (D). In younger animals, the nasal secretion is more fluid, similar to enzootic nasal adenocarcinoma (E). Once on the pasture, the mucus is cleaned by friction with the grass, and the symptoms can disappear.



3.59. **Signs in the morning.** Very useful for the clinical diagnosis of oestrosis is the presence of mucus hanging in the nostrils when animals wake up in the morning. This mucus is eliminated when they start to move and sneeze (very frequently) or begin to eat straw or fibrous foods that clean the nose.



3.60. **Dead larvae.** After treatment, the larvae die and are eliminated. However, some large larvae cannot be eliminated from the turbinates and turn calcified, acting as a foreign body and maintaining mucus production.



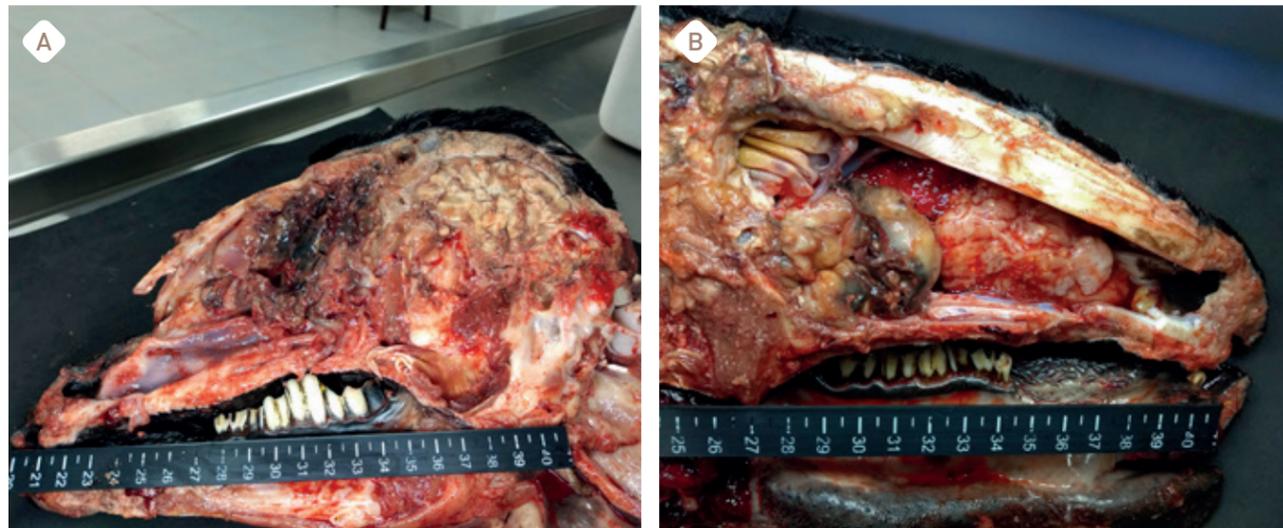
3.61. **Nervous clinical signs.** Some larvae advance to the deepest part of the nasal sinuses, very close or even reaching the brain, and the inflammatory reaction can cause neurological clinical signs.



### CONIDIOMYCOSES

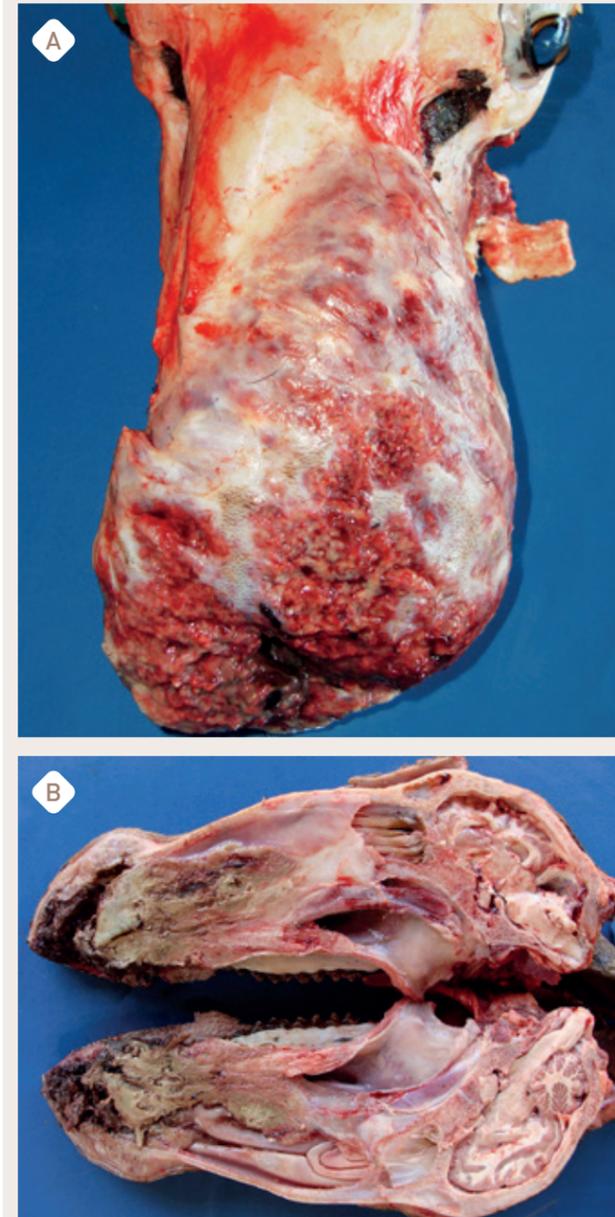


**3.62. Clinical signs.** Conidiobolomycosis is an emerging disease in tropical and subtropical areas when sheep graze around water reservoirs and fields containing decomposing plant material, associated with high humidity and temperature that favour the proliferation of fungi. It is associated with *Conidiobolus* spp. that cause granulomatous lesions in the nasal cavity, with unilateral exophthalmia being a common occurrence and enlargement of the regional lymph nodes. *Picture courtesy of Dr. Mario Belaro.*



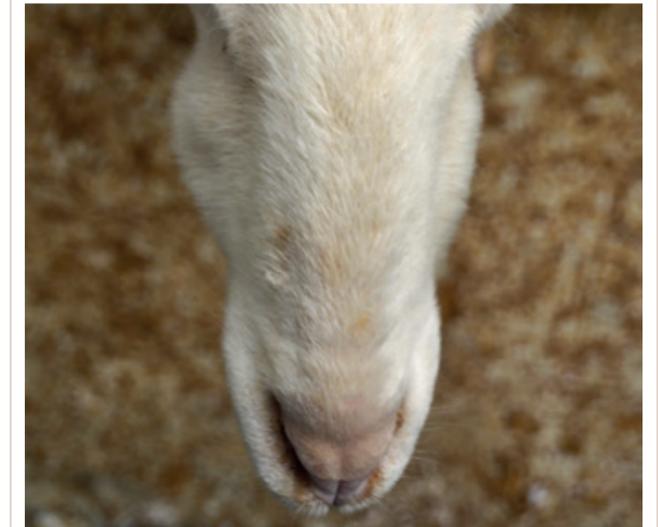
**3.63. Postmortem findings.** With an acute or chronic course, the disease begins with an abundant nasal discharge that finishes with a partial or complete obstruction of the nasal passages by granulomatous masses that causes severe respiratory distress (A). Conidiobolomycosis can present two clinical forms, rhinofacial and rhinopharyngeal. The second one is more frequent and can be concurrent with other upper airways diseases, such as chronic proliferative rhinitis (B). *Pictures courtesy of Dr. Mario Belaro.*

### PYTHIOSIS

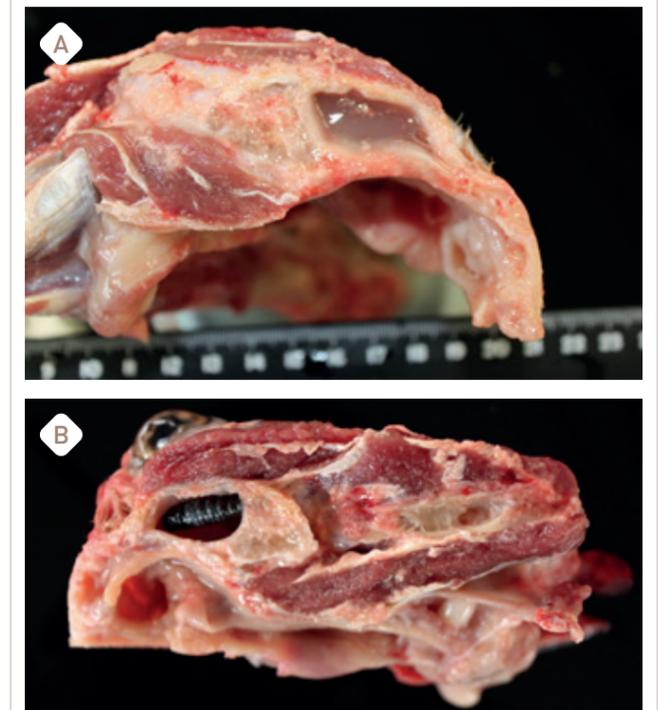


**3.64. Rhinofacial form.** This is also a common disease in tropical and subtropical areas that appears in the same environmental conditions as conidiobolomycosis. Caused by the fungus *Pythium insidiosum*, the disease can be confused with conidiobolomycosis because it also has two clinical presentations, rhinofacial and rhinopharyngeal. In the rhinofacial form, the most common, an increase in volume in the rostral portion of the nasal cavity is noticeable, often leading to deformation (bull's muzzle) (A and B). *Pictures courtesy of Lab. Patologia Animal-UFG, Patos-Brasil.*

### SINUSITIS



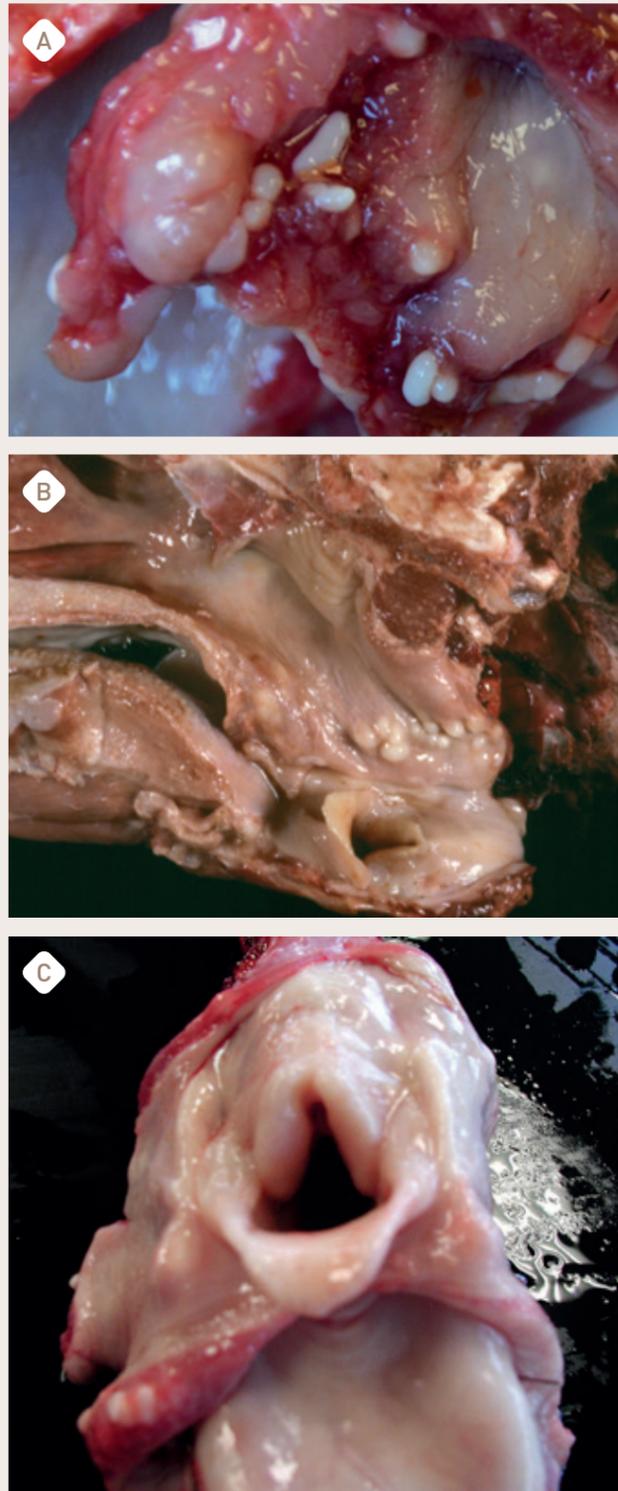
**3.65. Facial deformation.** Chronic sinusitis can lead to facial disfigurement depending on the sinus affected.



**3.66. Content of the sinus.** Affected sinuses can be filled with inflammatory fluids (A) that can become contaminated and purulent. On rare occasions, it is possible to see aberrant puparium of *Oestrus ovis* that entered the sinus as larva 1 or larva 2, being unable to exit as they grow in size (B). Some tumours that affect the area can invade the adjoining sinus as they grow.

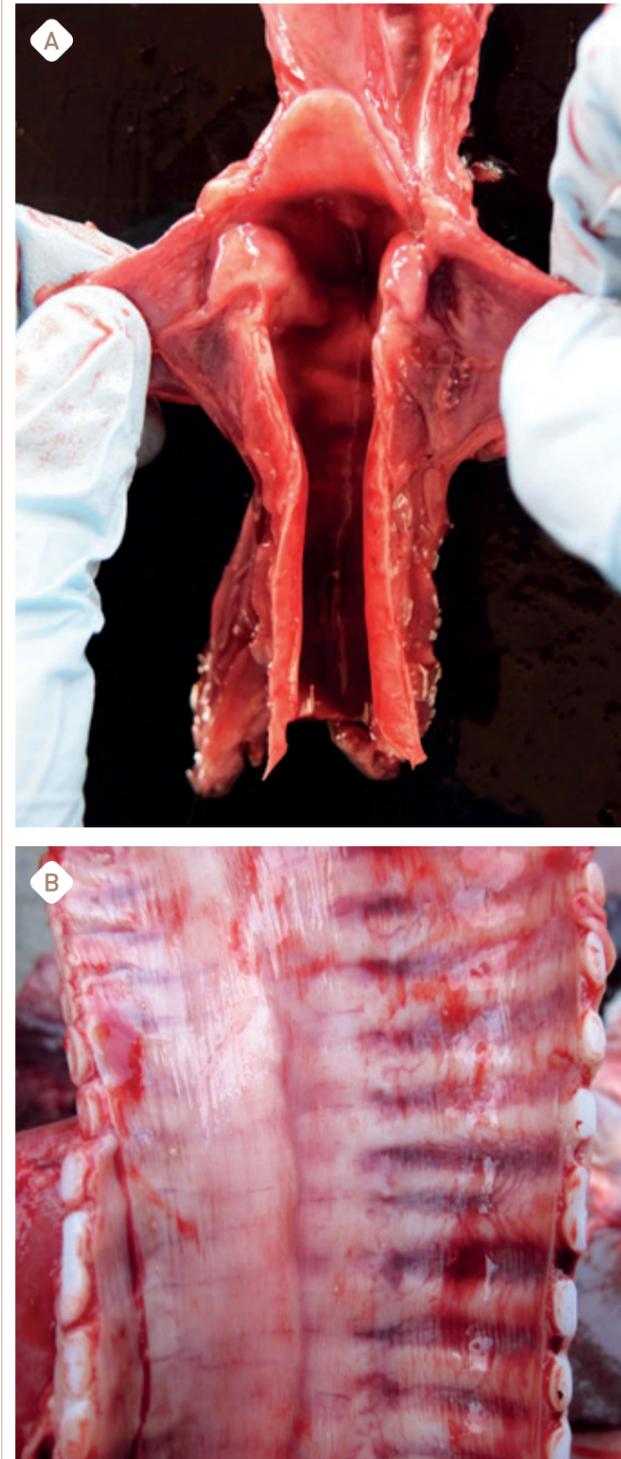


LARYNGEAL HEMIPLEGIA

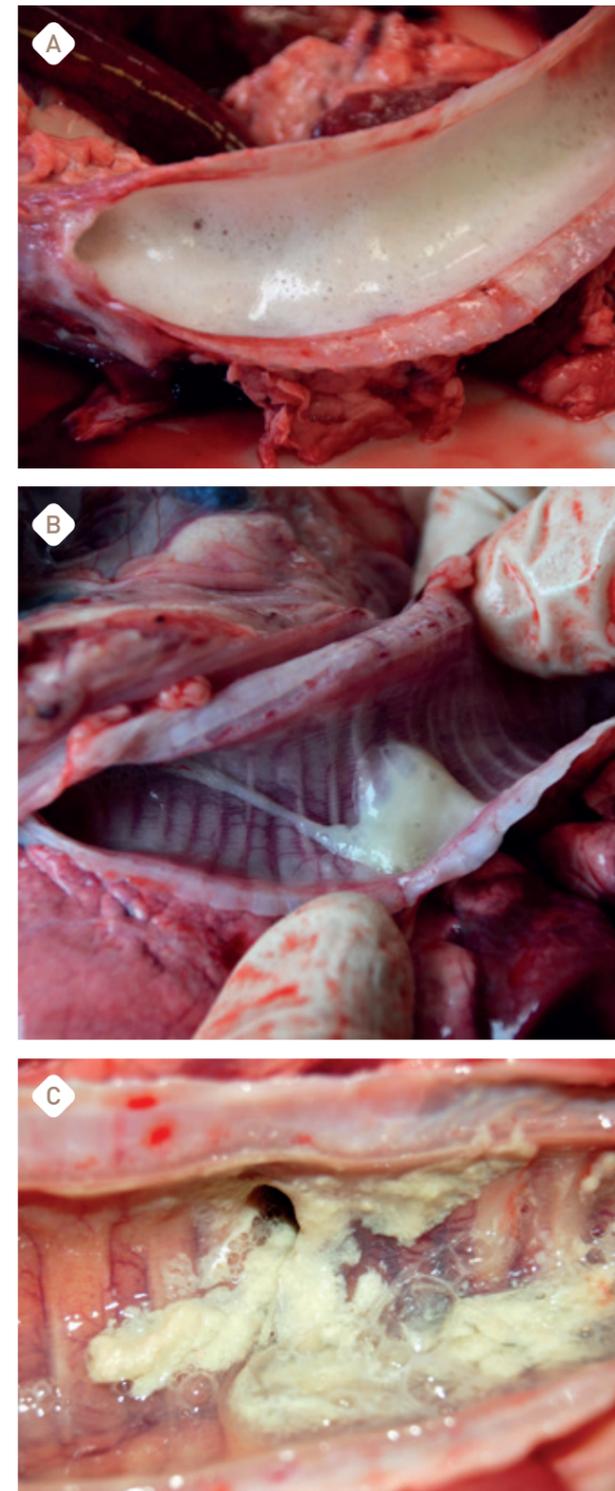


3.67. **Sarcocystis in the laryngeal area.** Severe *Sarcocystis* infestations (A and B) may lead to laryngeal hemiplegia (C).

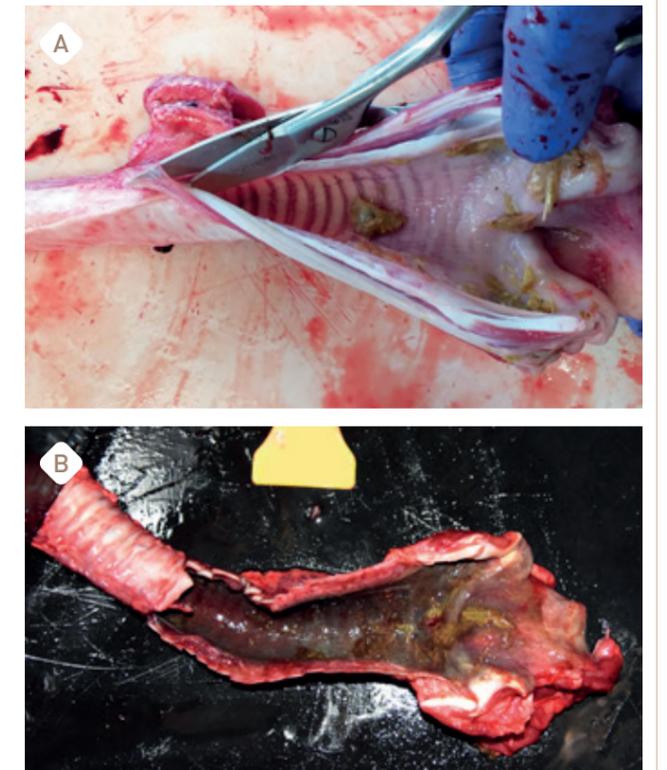
LARYNGITIS AND TRACHEITIS



3.68. **Laryngitis and tracheitis.** Inflammations of the larynx and trachea are frequently found associated with the ovine respiratory complex (A and B).



3.69. **Lung secretions in the trachea.** Many times, foam (A), mucopurulent exudates (B) or pus (C) are found in the trachea coming from the lung.



3.70. **Deviant swallowing.** Food remains reach the trachea by diverted swallowing (A), causing tracheitis (B) and pneumonia.



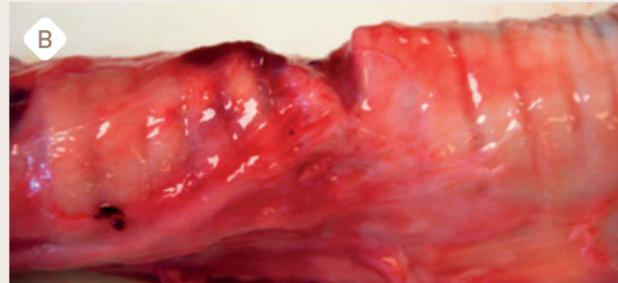
3.71. **Lymphadenitis.** Occasionally, significant enlargement of the regional lymph nodes due to caseous lymphadenitis may compress the pharynx and cause respiratory distress.



### TRACHEAL RING RUPTURE

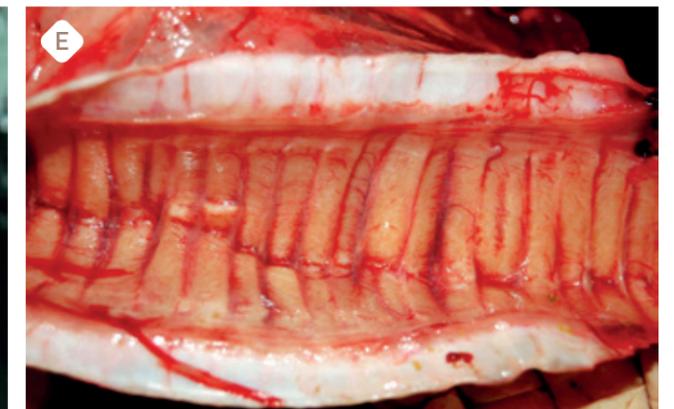
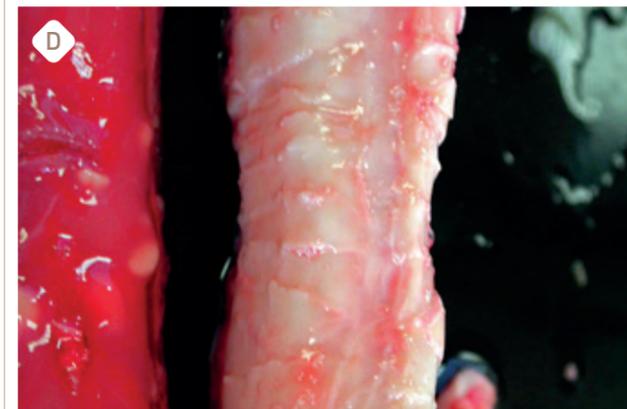


**3.72. Tracheal ring rupture.** Separation of two tracheal rings is rare, but it can occur after receiving a solid blow against a thin and robust structure (tensioned fencing wire). This condition can be easily detected during the clinical examination.

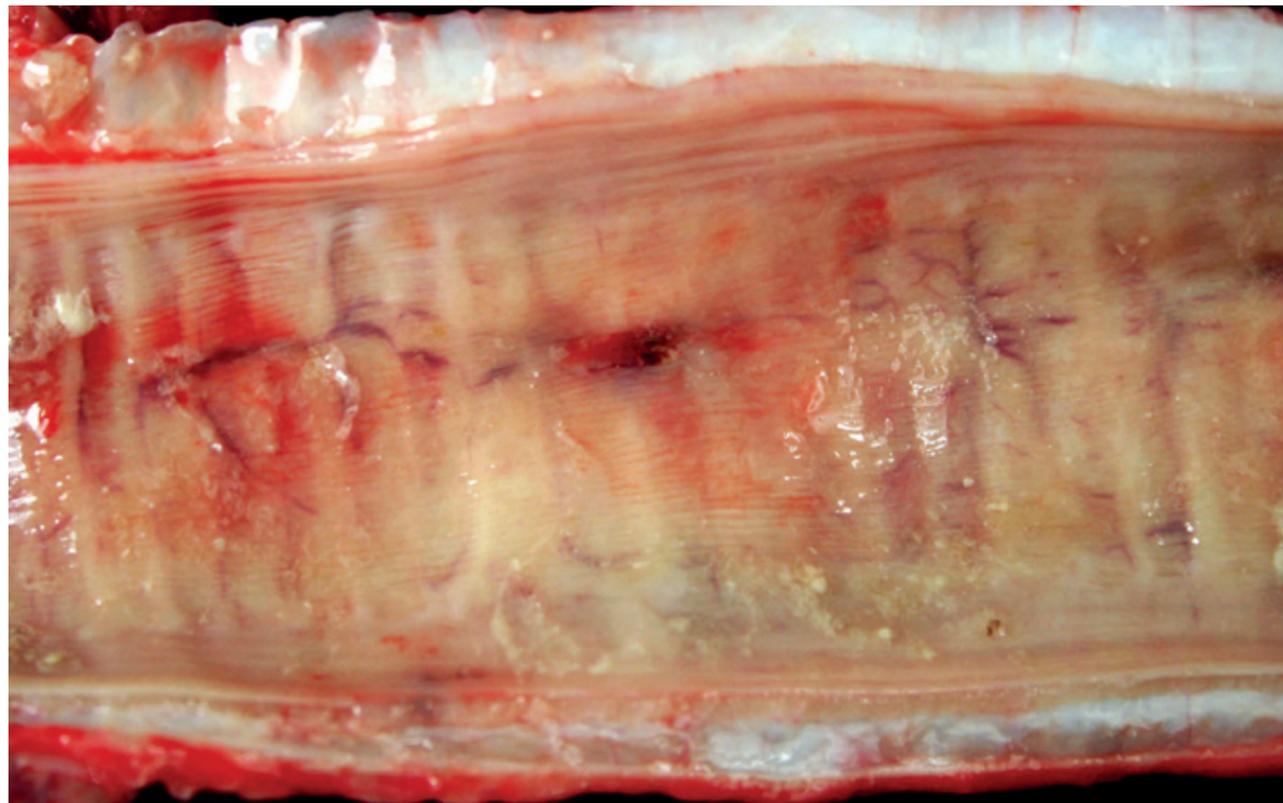


**3.73. Postmortem findings.** In this case, the dissection of the area at necropsy let us observe the healed lesion (A and B) that allowed the animal to live. The opening of the trachea showed a retracted fibrous scar that almost completely closed the tracheal lumen (C and D), making breathing difficult.

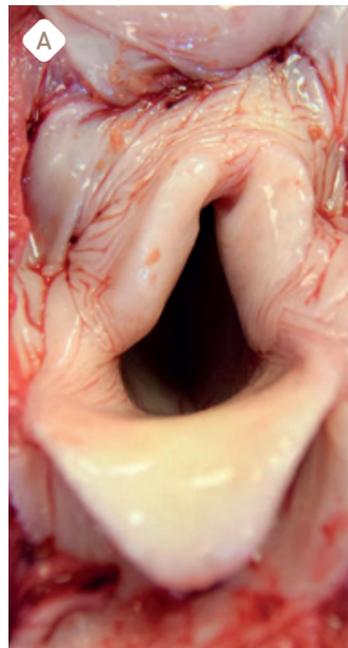
### TRACHEAL CRUSH



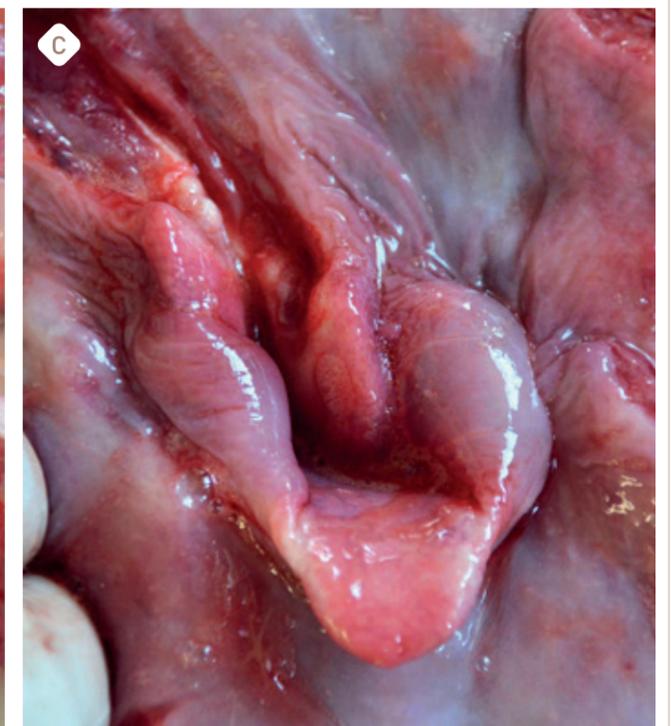
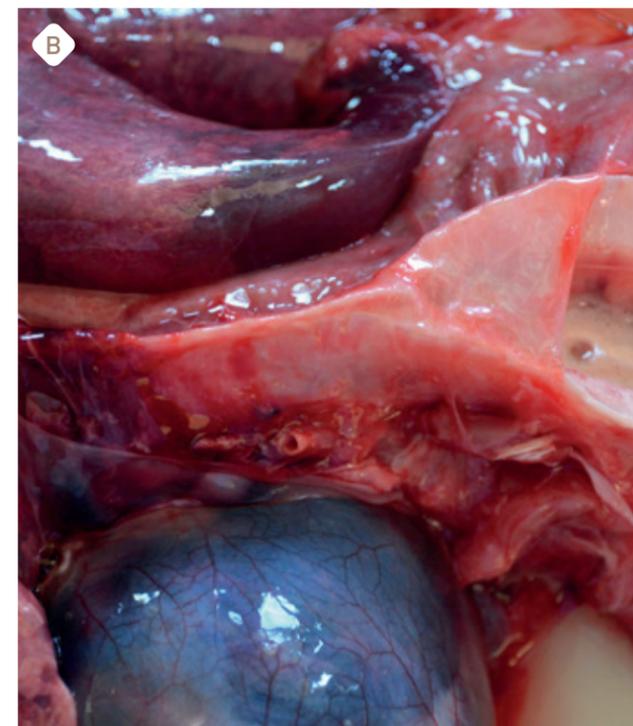
**3.74. Tracheal crush.** Various external pressures exerted by feeders, trauma, etc., can affect the cervical part of the trachea, finding up to 15% of affected animals in some flocks. These injuries can be punctual, affecting one or several rings (A), or cause the crushing of a large part or all of the cervical trachea, affecting several rings (B). The cross-sections of the trachea allow us to observe the anomalies in its structure (C). Both external (D) and internal (E) observations show the changes in the shape of the rings and the tracheitis that usually accompanies the process.



3.75. **Tracheotomy.** A particular kind of tracheal lesion can be found in animals in which a tracheotomy has been performed to take samples of pulmonary exudates. Perforation or small scars can be observed in these cases.



3.76. **Pressure deformation.** Abscesses or tumours located along with the larynx (A) and trachea (B) can cause the deformation of these structures.



3.77. **Cervical deformations.** Congenital or acquired cervical deformities (A) can affect the pharynx and trachea, hindering the proper vascularisation, innervation or generating punctual pressures and injuries (B and C).