

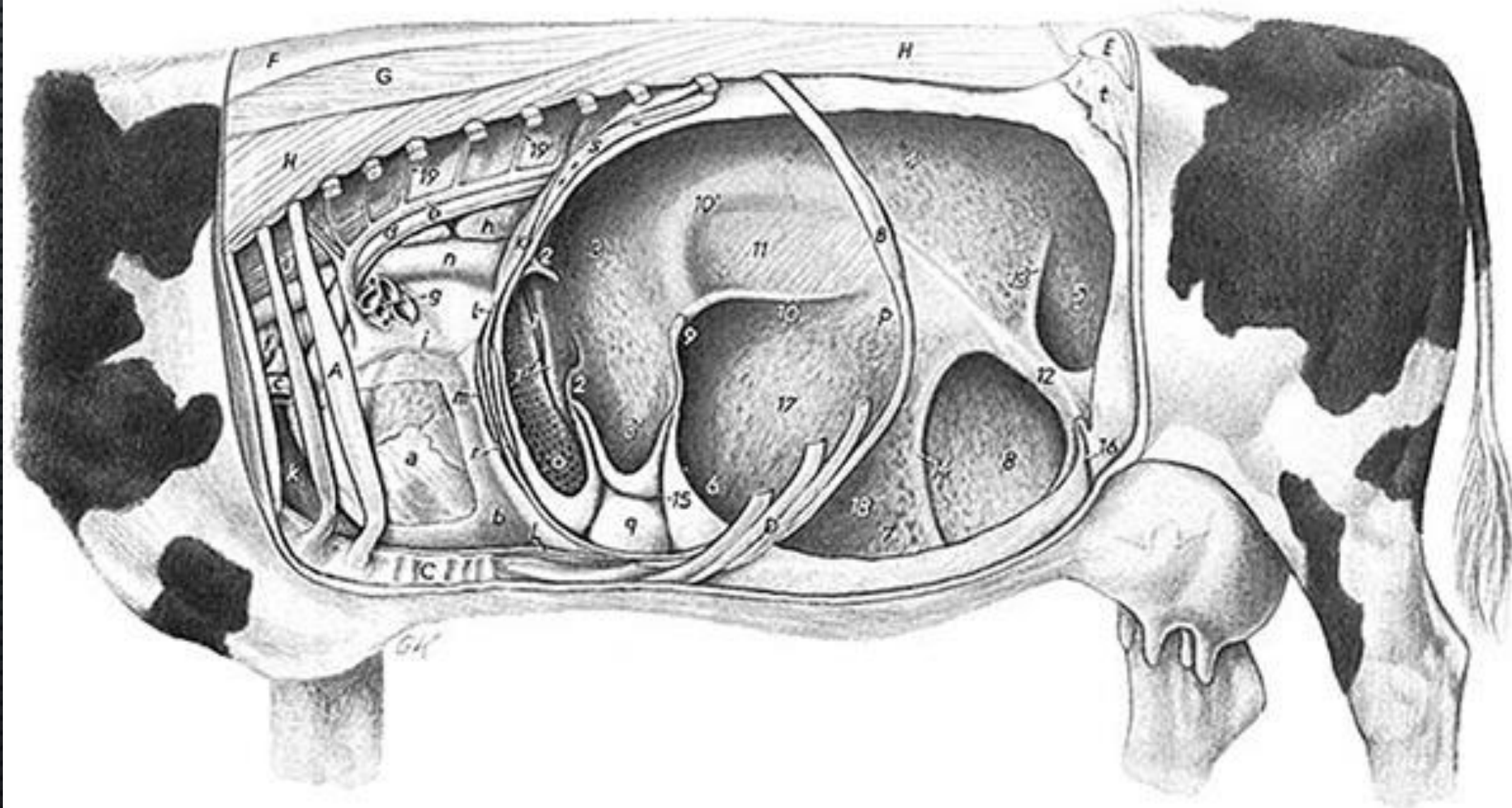
# RUMINANT STOMACH

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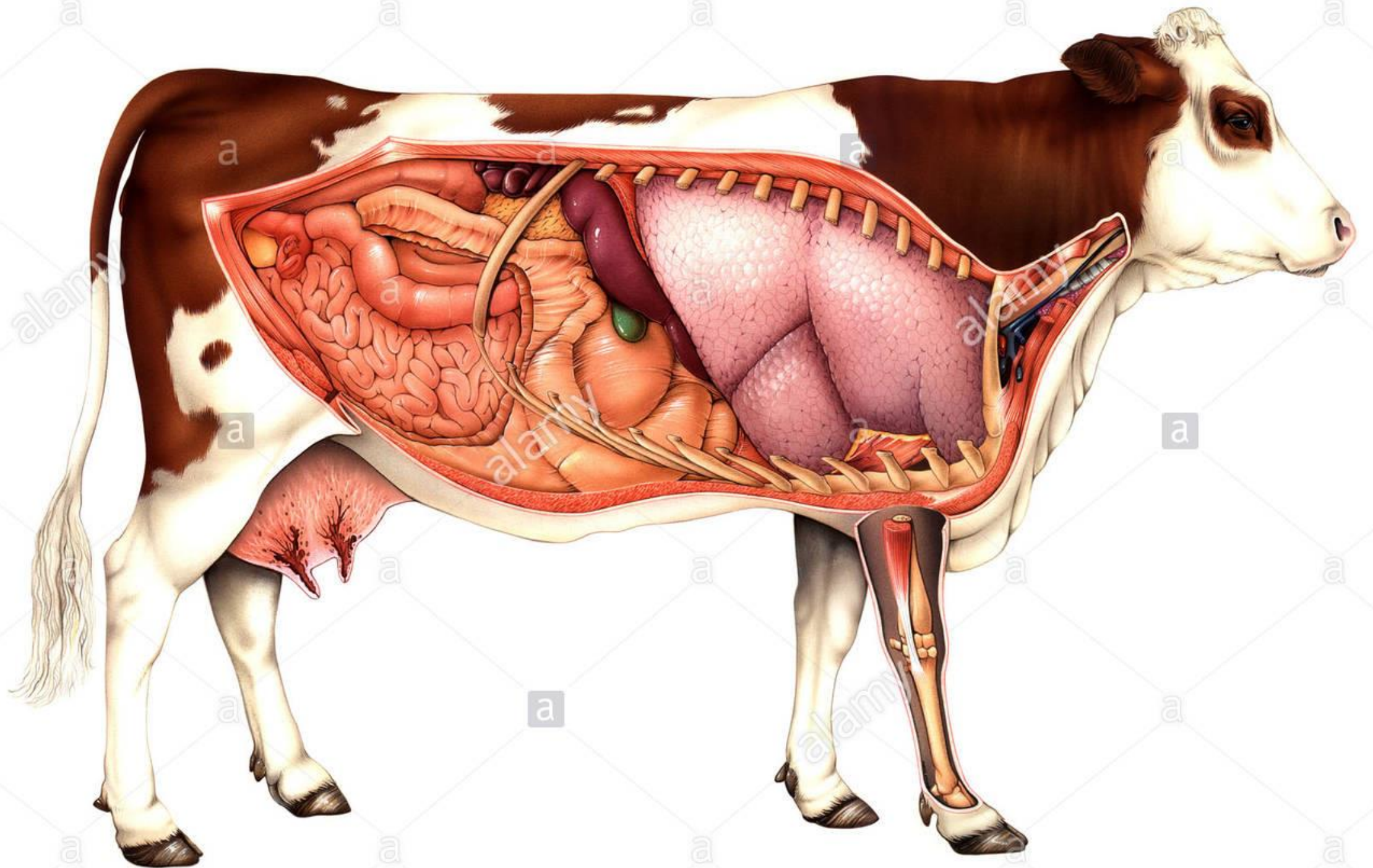
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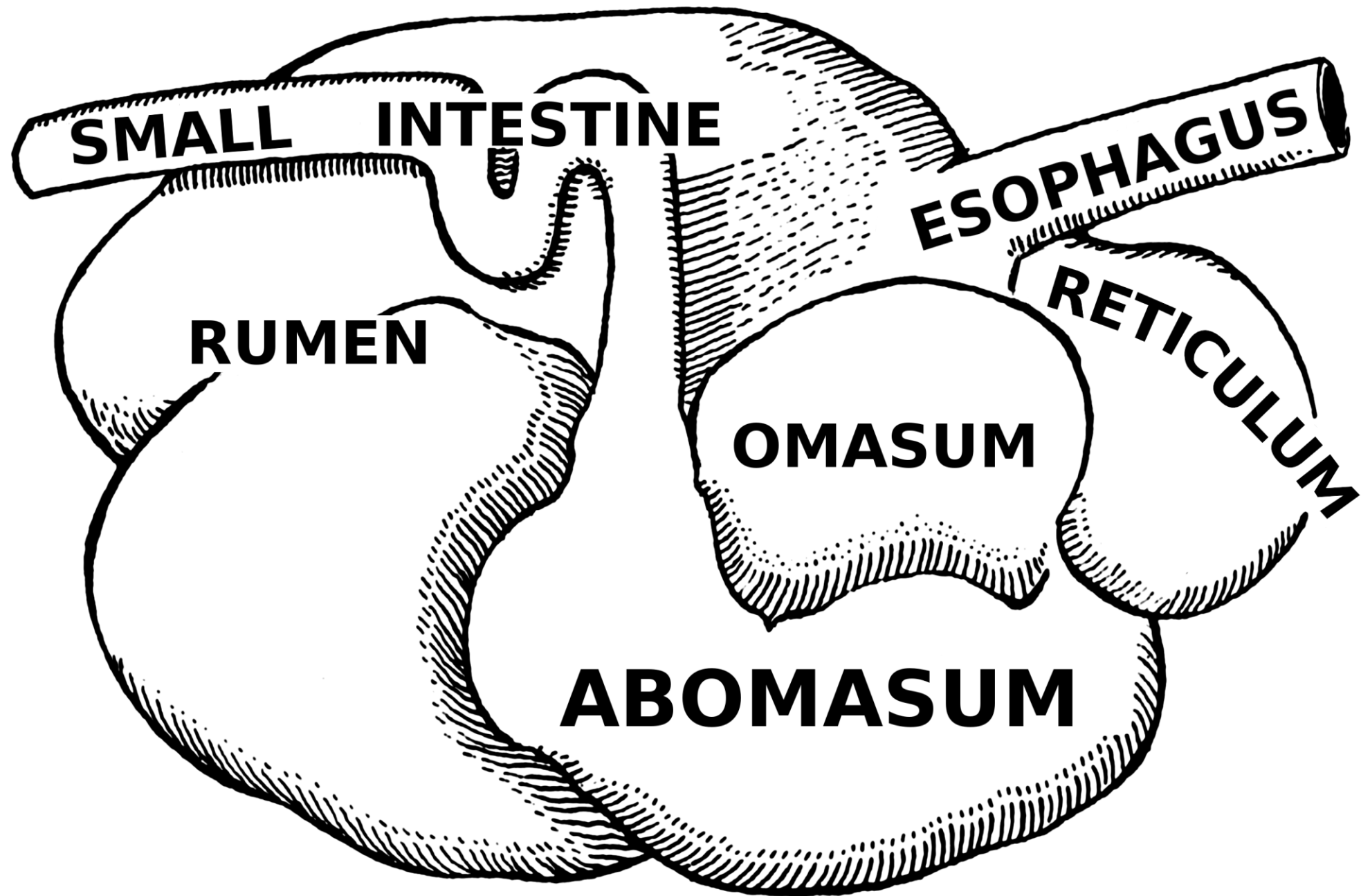
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# ANATOMICAL CONSIDERATIONS

- In ruminants, the compound stomach occupies approximately  $\frac{3}{4}$  of the abdominal cavity and almost fills the left half of it.
- The first three, namely the rumen, the reticulum and the omasum could be considered as mere sacculations of the oesophagus, lined by stratified squamous epithelium.
- The abomasum, with a glandular epithelium is the 'true stomach'.
- The rumen extends from the 7<sup>th</sup>/8<sup>th</sup> intercostal space to the pelvic inlet.
- The ruminal mucosa is free from glands. The rumen papillae help to provide a grip over the ingesta during rumen contractions.

# ANATOMICAL CONSIDERATIONS

- The reticulum lies between the 6th to 8th/9th inter costal space and almost equal parts lie on either side of the median line.
- The mucosal folds in reticulum form a typical honey comb pattern and acts like a sieve for foreign bodies.
- The reticular groove connects the cardia with the abomasum and is about 15 to 20 cm in bovines and 7 to 10 cm in small ruminants.
- The muscular lips of the groove encircle the cardia from dorsal aspect and pass steeply down the reticular wall in the direction of reticulo-omasal opening in young ruminants, the groove closes when the animal drinks milk so that it passes directly into the abomasum.



# ANATOMICAL CONSIDERATIONS

- Bovines- the omasum is on the right side of the median plane opposite the 7<sup>th</sup> to 11<sup>th</sup> intercostal spaces reaching up to a hand breadth below the costal arch.
- Small ruminants- it lies at the position between 8<sup>th</sup> and 10<sup>th</sup> intercostals spaces and does not come in contact with the right body wall.
- The omasum (many folds/plies) is related to the right abdominal wall in the ventral parts of the 7<sup>th</sup> to 9<sup>th</sup> intercostal spaces.
- The abomasum lies on the abdominal floor in the xiphoid region.

# BLOAT/TYMPANY/TYMPANITES

- Accumulation of gases of fermentation in the rumen, either in the form of persistent foam mixed with the ruminal contents, called primary or frothy bloat, or
- in the form of free gas separated from the ingesta, called secondary or free-gas bloat.
- It is predominantly a disorder of cattle but may also be seen in sheep.
- The susceptibility of individual cattle to bloat varies and is genetically determined.



# BLOAT: AETIOLOGY & PATHOGENESIS

- Frothy bloat or primary ruminal tympany:
  - The cause is entrapment of the normal gases of fermentation in a stable foam.
  - Soluble leaf proteins, saponins, and hemicelluloses are believed to be the primary foaming agents having its greatest stability at about pH 6.
  - Bloat is most common in animals grazing legume or legume-dominant pastures, rich in easily digestible protein, hence common in feedlot cattle.
  - The slimy nature helps forming bubbles which do not coalesce, hence the froth.

# BLOAT: AETIOLOGY & PATHOGENESIS

- Free gas bloat or secondary ruminal tympany:
  - The cause is physical obstruction of eructation (foreign body, stenosis, extraluminal lesions).
  - Interference with oesophageal groove function in vagal indigestion and diaphragmatic hernia may cause chronic ruminal tympany. This also occurs in tetanus.
  - Interference with the nerve pathways involved in the eructation reflex.
  - It may be secondary to rumen atony occurring in anaphylaxis and grain overload causing decrease in pH, oesophagitis/rumenitis leading to interference in eructation.
  - May also develop due to hypocalcaemia.



# BLOAT: AETIOLOGY & PATHOGENESIS

- The increased intra-ruminal pressure due to accumulation of gases exerts pressure over the diaphragm and the ribs, which results in reduced respiratory movements. This results in hypoventilation and reduced venous return to heart.
- The increased intra-ruminal pressure also causes absorption of gases, particularly poisonous methane which has a deteriorating effect on the animal.
- Bloat is a common cause of sudden death.

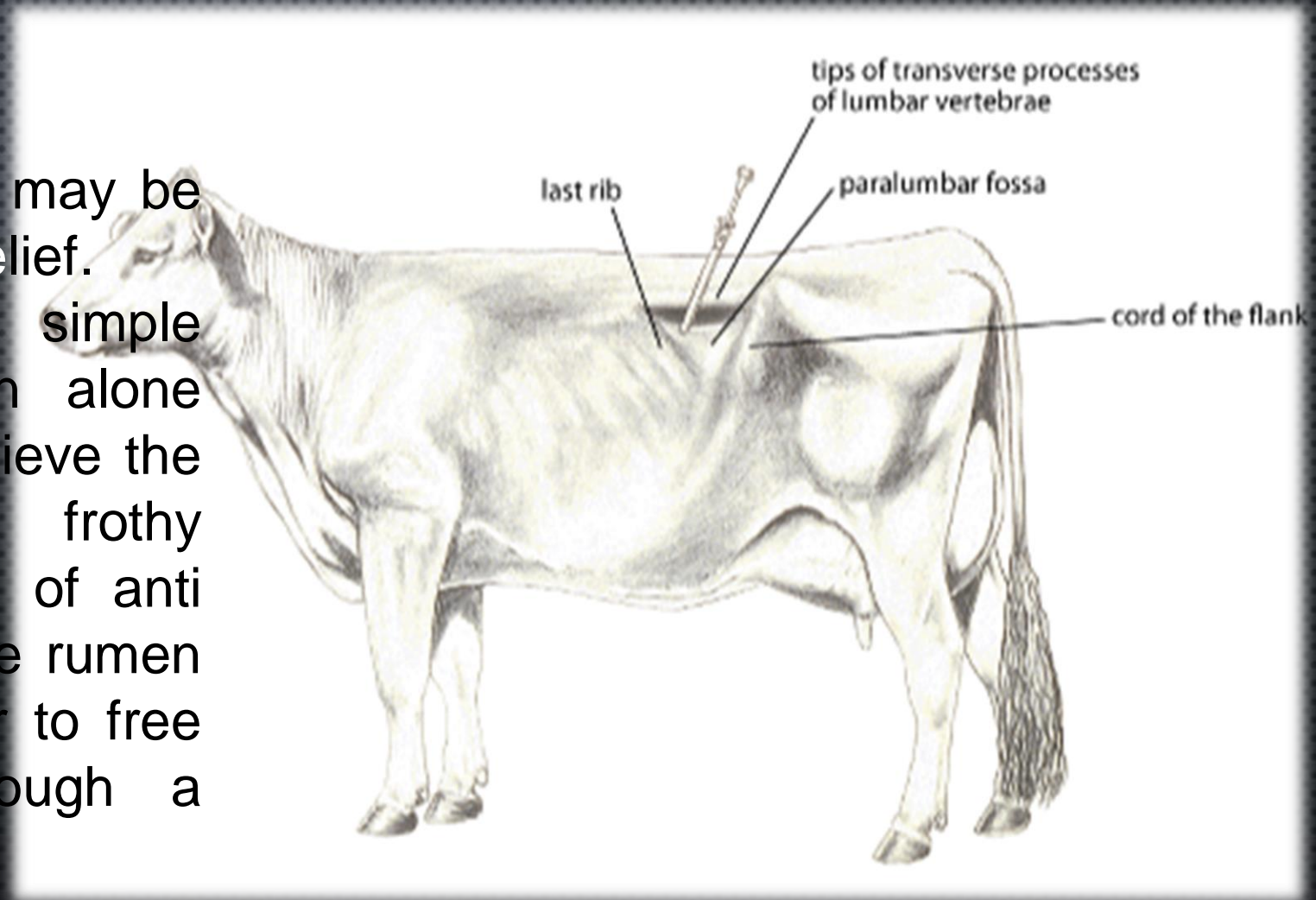
# BLOAT: CLINICAL FINDINGS

- Sudden obvious distension of the rumen.
- Contour of the left paralumbar fossa changes to protrusion and the entire abdomen is enlarged.
- The skin over the left flank becomes taut.
- Marked dyspnoea and grunting, mouth breathing, protruded tongue, extended head and frequent urination.
- If untreated the animal collapses and dies. Animal may die within an hour of being allowed to graze on a leguminous pasture.
- In free gas bloat tympanic resonance is observed on the dorsal left flank.
- Free gas produces a higher pitched ping on percussion than frothy bloat.



# BLOAT: TREATMENT

- A trocar and cannula may be used for emergency relief.
- In the case of simple tympany, trocarisation alone may be enough to relieve the gas. But, in frothy bloat, administration of anti foaming drugs into the rumen is mandatory in order to free the gas either through a probang or trocar.



# BLOAT: TREATMENT

- Oral administration of 80 ml of turpentine mixed with 500 to 1000 ml of mustard oil is found to be very effective.
- Anti-froth agents like dimethicone also can be used for this purpose.
- After severe bloat, concentrates should be avoided for at least two days and the animal should be fed with non leguminous hay.
- Rumen fistulation (Rumenostomy) may be done in chronic bloat, after which the treatment is purely medical and aimed at correction of primary disease and also the correction of fluid, acid-base and electrolyte imbalances.
- Surgical intervention may be needed in cases of physical interference in eructation.



THANKS