

A close-up photograph of a red mushroom with white spots, likely an Amanita muscaria, growing in a field of dry grass. The mushroom has a bright red cap with numerous white, irregular spots. The background is a dense field of dry, yellowish-brown grass.

# Respiratory Drugs

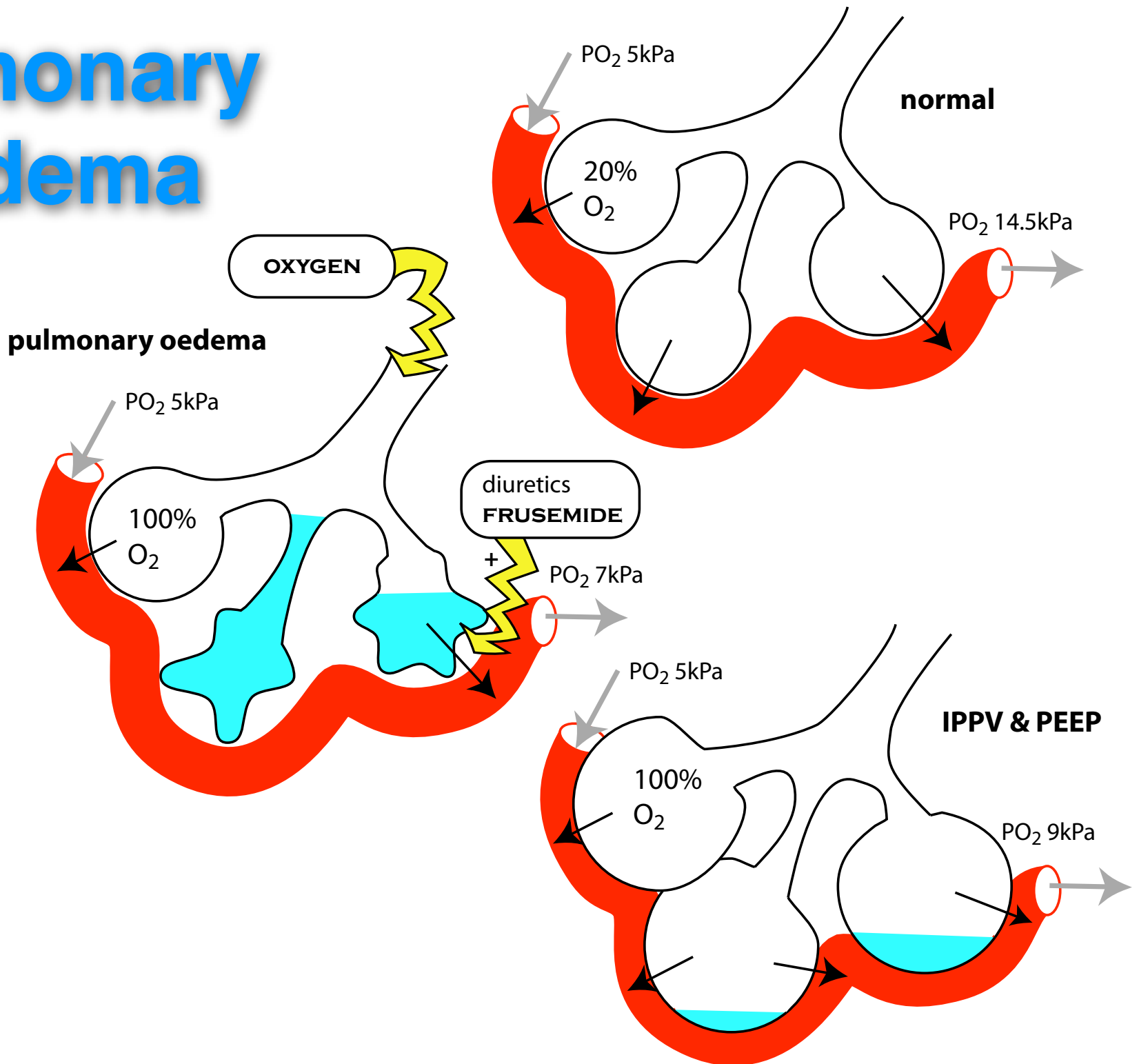


# pulmonary oedema

- lungs full of fluid
  - hypoxia
    - cyanosis
    - unconsciousness
    - death



# pulmonary oedema





# pulmonary oedema

A red mushroom with white spots, likely an Amanita muscaria, is growing in a field of dry grass. The mushroom is the central focus of the image, with its bright red cap and white spots contrasting sharply with the dry, brownish-yellow grass. The background is slightly blurred, emphasizing the mushroom.

- frusemide
- oxygen
  - IPPV?  $\pm$  PEEP?
- other drugs
  - colloids
  - morphine
  - inotropes?
  - steroids?



A large, red, convex mushroom with numerous white, irregular spots (leiothyria) is the central focus. It sits on a bed of dry, brown, needle-like grass. The background is a soft-focus field of similar grass. The word 'oxygen' is written in a bold, yellow, sans-serif font in the upper right quadrant, partially overlapping the mushroom and the grass.

# oxygen

- **indications**
  - hypoxia
- **care**
  - avoid excitement
  - avoid > 4 hours 100%
    - give air breaks
    - long term treatment use 50%
  - supports combustion!!



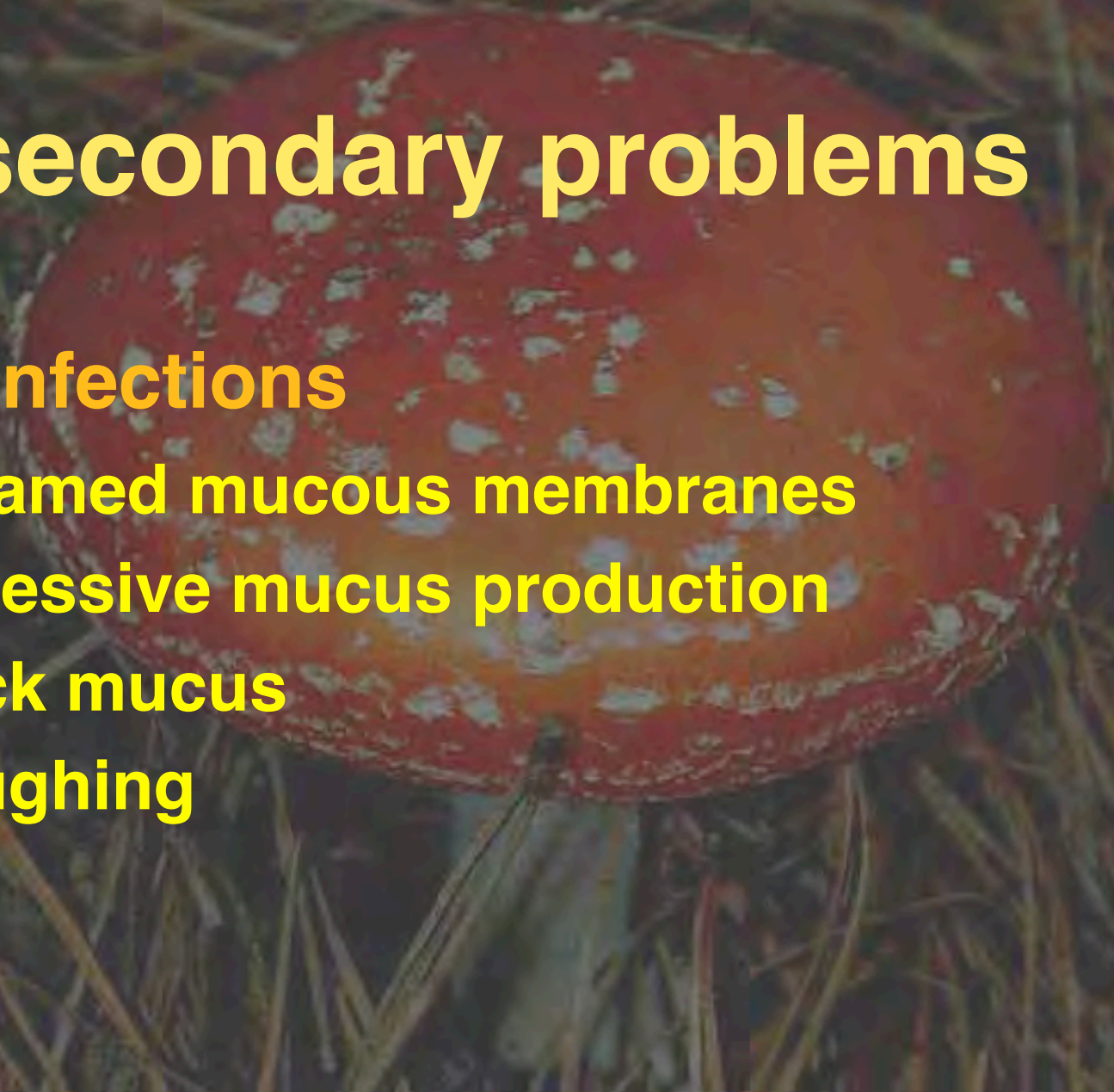
# common problems

- upper respiratory tract infections
- tracheitis / bronchitis
- pneumonia
- airway hyperreactivity



# **secondary problems**

- **URT infections**
  - **inflamed mucous membranes**
  - **excessive mucus production**
  - **thick mucus**
  - **coughing**





# secondary problems

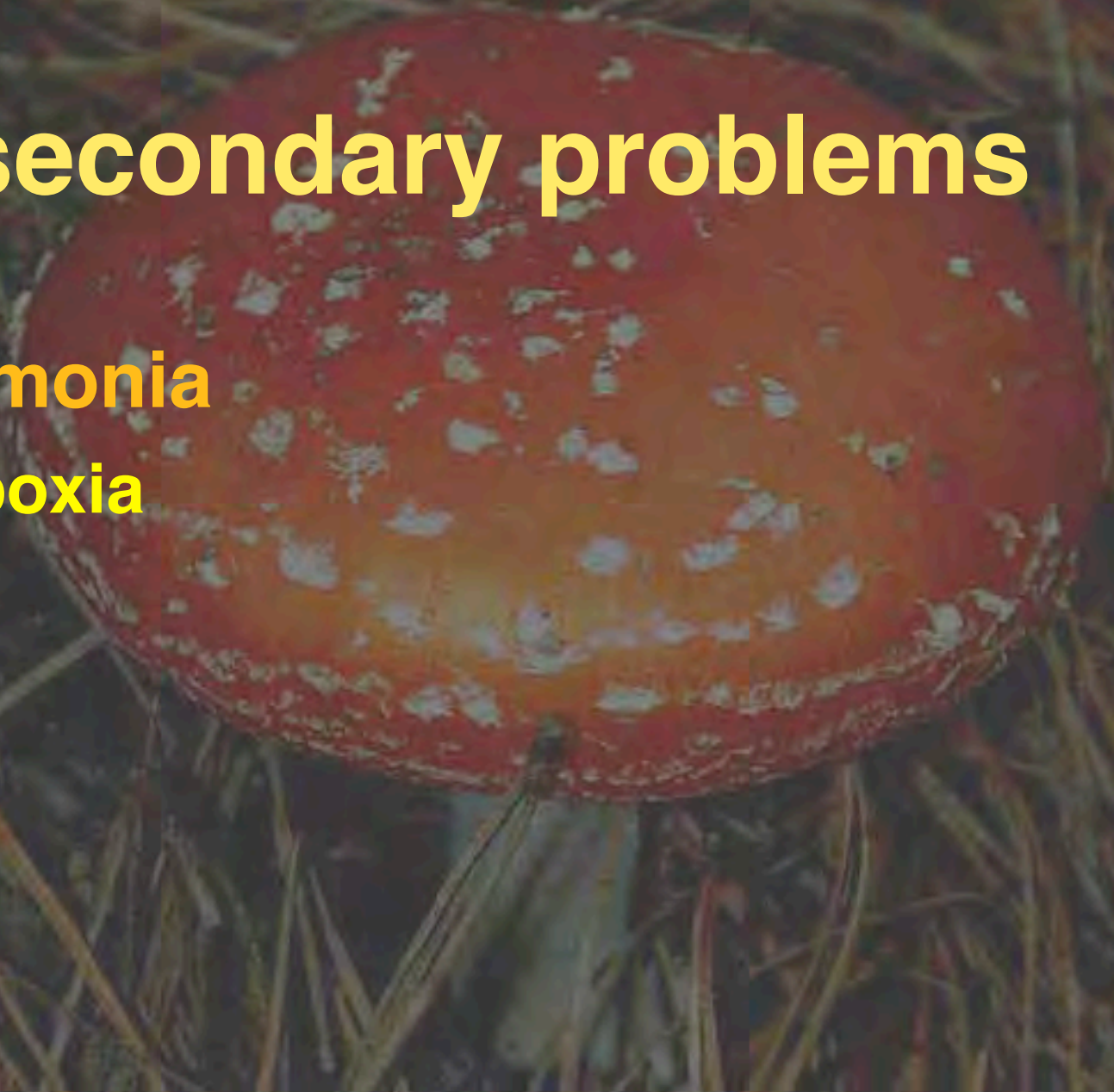
A red mushroom with white spots is centered in the background of the slide. The mushroom has a bright red cap with numerous small, irregular white patches. It is growing on a bed of dry, brown grass. The overall image has a dark, slightly desaturated tone, with the text overlaid in bright yellow.

- **bronchitis**
  - **inflamed mucous membranes**
  - **excessive mucus production**
  - **thick mucus**
  - **coughing**
  - **cilia not working**
  - **airway hyperreactivity**



# secondary problems

- pneumonia
  - hypoxia





A red mushroom with white spots, resembling a fly agaric, is growing in a field of dry grass. The mushroom is the central focus of the image, with its bright red cap and white spots contrasting sharply with the dry, brownish-yellow grass. The text is overlaid on the left side of the image.

# treatment

- **treat primary problem**
  - **but many infections are caused by viruses**
- **symptomatic treatment of secondary problem**



# **expectorants**

- **increase amount of mucus**
- **decrease viscosity**
- **increase cilia action**
- **mucus must be coughed up**



# expectorants

- potassium iodide
- guaiphenesin
- volatile oils
  - menthol
  - eucalyptol





# **mucolytics**

- **acetylcysteine**
- **bromhexine**





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# side effects

- guaiphenesin – mild effects ↓ BP ↑ HR
- acetylcysteine – bronchospasms
  - nausea, vomiting



# antitussives

- only used for unproductive coughing
- to allow animal to rest





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# antitussives

- **local**
  - **local anaesthetics**
- **central**
  - **opioids**
    - **codeine**
    - **butorphanol**



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# antitussives

- **contraindications**
  - **productive coughing**
  - **chest injury**
- **care**
  - **vomiting**



# bronchodilators

- bronchoconstriction is a major problem in man (asthma)
- some importance in cats and horses
- dogs??
- not important in ruminants
- guinea pigs are the most susceptible species



# bronchodilators

- **sympathomimetics**
- **methylxanthines**
- **antimuscarinics**
- **glucocorticoids**





# sympathomimetics

A red mushroom with white spots, resembling a fly agaric, is the central visual element. It is positioned in the upper right quadrant of the frame. The background is a dense field of dry, yellowish-brown grass, which is slightly out of focus. The overall lighting is soft, and the colors are somewhat muted, giving it a naturalistic but slightly somber appearance.

- $\alpha 1$  agonists
  - pseudoephedrine
- $\beta 2$  agonists
  - clenbuterol
  - terbutaline
  - adrenaline



# pseudoephedrine

- vasoconstrictor
- precursor for methamphetamine





# $\beta$ 2 agonists

- **clenbuterol**
  - **adverse effects**
    - tremors
    - sweating
    - restlessness
    - increased HR
    - abortion



A photograph of a red mushroom with white spots, likely an Amanita muscaria, growing in a field of dry grass. The mushroom is the central focus, with its bright red cap and white gills standing out against the brownish-yellow background of the grass. The text 'xanthines' is overlaid in yellow on the upper part of the mushroom's cap.

# xanthines

- theophylline
  - aminophylline
  - etamiphylline
- propentophylline
- (theobromine)
- (caffeine)

# xanthines

- adverse effects
  - CNS stimulation - excitability
  - gut irritation
    - nausea and vomiting
  - insomnia
  - polyuria
  - increased heart rate





# antimuscarinics

- atropine
  - historically used in horses
  - reduces secretions
  - increases viscosity of mucus
  - may be useful as an adjunct to other drugs
  - adverse effects
    - dry mouth, dysphagia, constipation, vomiting, thirst, sedation, ↑ heart rate, blurred vision, etc.



# antimuscarinics

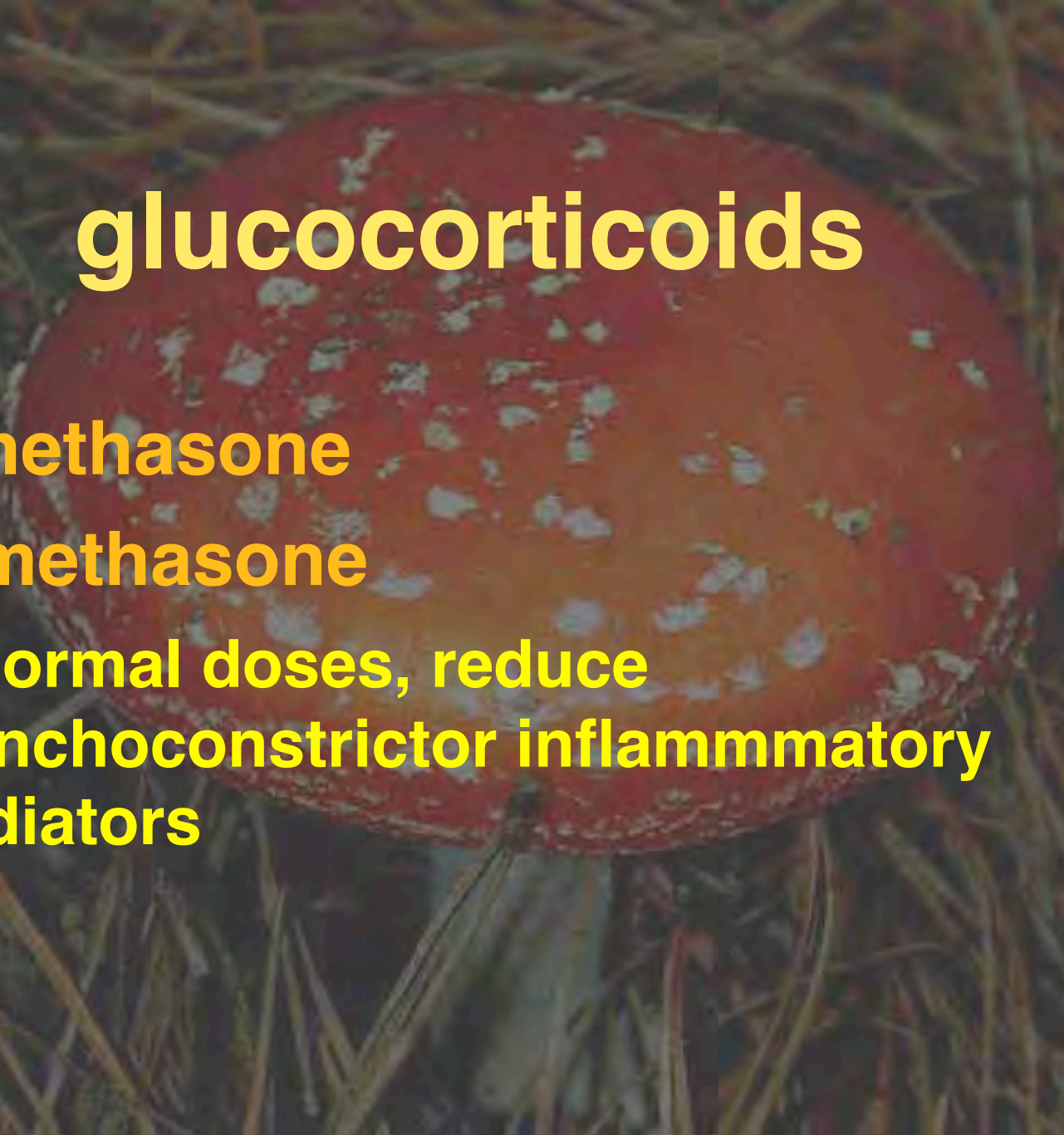
- **propantheline**
  - abused in horses
  - “blue magic”





# glucocorticoids

- **betamethasone**
- **dexamethasone**
  - **at normal doses, reduce bronchoconstrictor inflammatory mediators**





# **antihistamines**

- **mainly used for allergic reactions**
- **often included in human cough remedies - other effects?**
- **sometimes used in acute respiratory infections**



# histamine

- released from mast cells
- lungs, skin, gut, CNS
- species differences in response
  - mice very resistant
  - guinea pigs very susceptible
  - dogs act more like guinea pigs



# histamine receptors

- H1 - skin, smooth muscle
- H2 - gastric parietal cells
- H3 - presynaptic on neurones (inhibition)





# H1 antagonists

- promethazine
- chlorpheniramine
- mepyramine
- diphenhydramine





A red mushroom with white spots on a grassy background. The mushroom is the central focus, with its cap showing a pattern of white spots. The background is a dense field of dry, yellowish-brown grass.

# **cromoglycate**

- **blocks release of inflammatory mediators**
- **sometimes used in horses with chronic obstructive pulmonary disease**
- **given as an aerosol**
- **preventative only**



# respiratory stimulants

A large, red mushroom with white spots, likely an Amanita muscaria, is the central focus of the image. It is growing in a field of dry, yellowish-brown grass. The mushroom has a thick, white stem and a slightly flattened, convex cap. The background is a dense field of similar dry grass, creating a textured, natural setting.

- act on medulla
- doxapram
- obsolete
  - nikethamide
  - bemegride



# respiratory system

- **antibiotics are given for infections - stop secondary bacterial infections after viruses**
- **expectorants are used to loosen and remove mucus**
- **codeine and butorphanol stop unproductive coughing**
- **animals with fluid in the lungs require oxygen and sometimes diuretics**