Introduction to the Veterinary Profession

VETS30030 / VETS90122

Module 4 - Non-production species

Horses

Equine husbandry and management

Simon Bailey

bais@unimelb.edu.au

Intended learning outcomes

- Describe basic husbandry of horses including:
  - Evolutionary background and implications for husbandry
  - Hoof and dental care
  - Parasites and their control
  - Infectious diseases
  - Stabling/rugging
- Describe general principles of nutrition of horses
- Conditions associated with diet/management

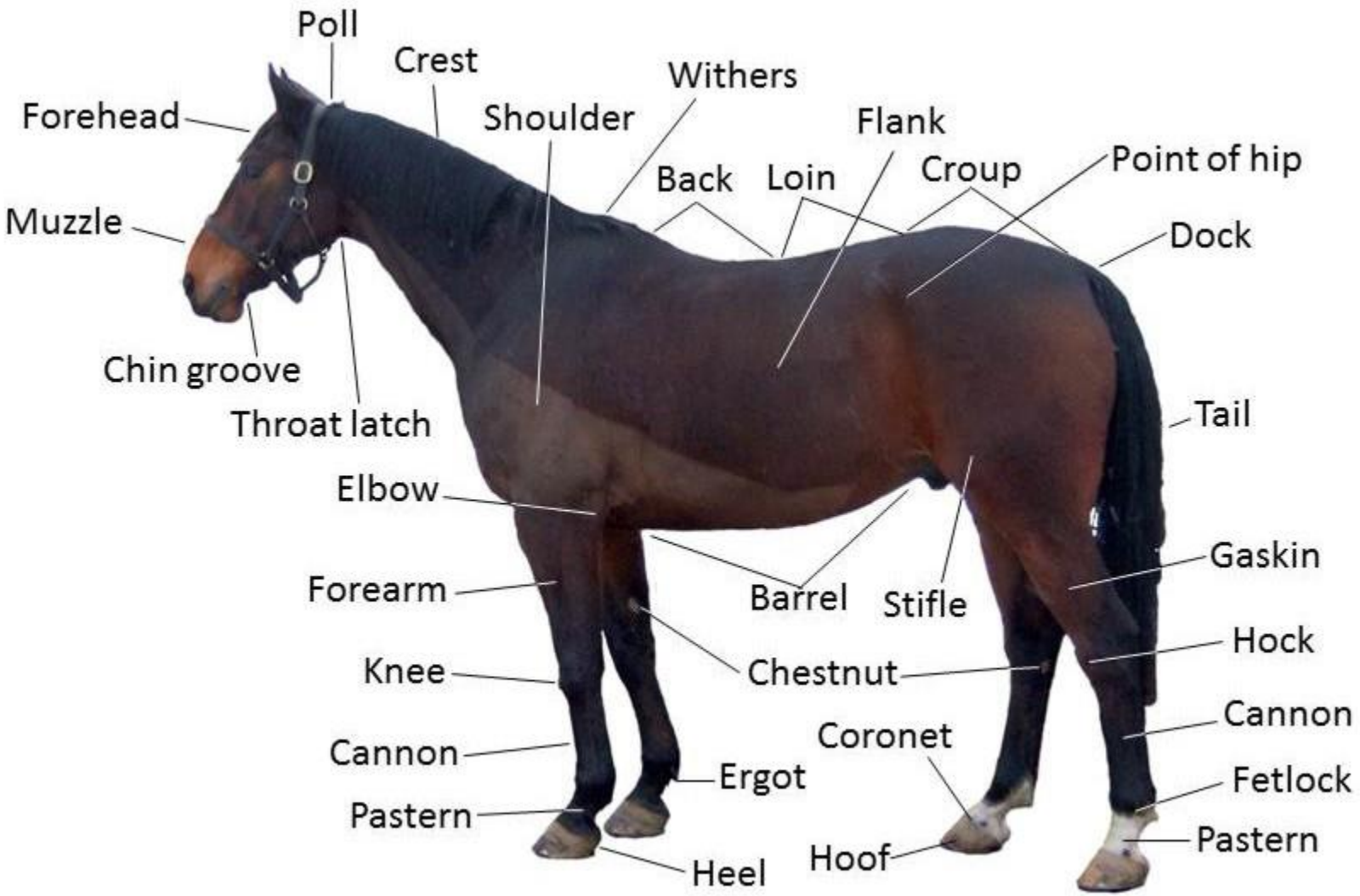
Some introductory horse terms - 101

- Foals; weanlings; yearlings
- Fillies / colts
- Older than 4 years old – mares / stallions
- Geldings – castrated male

- Puberty 10-18 months

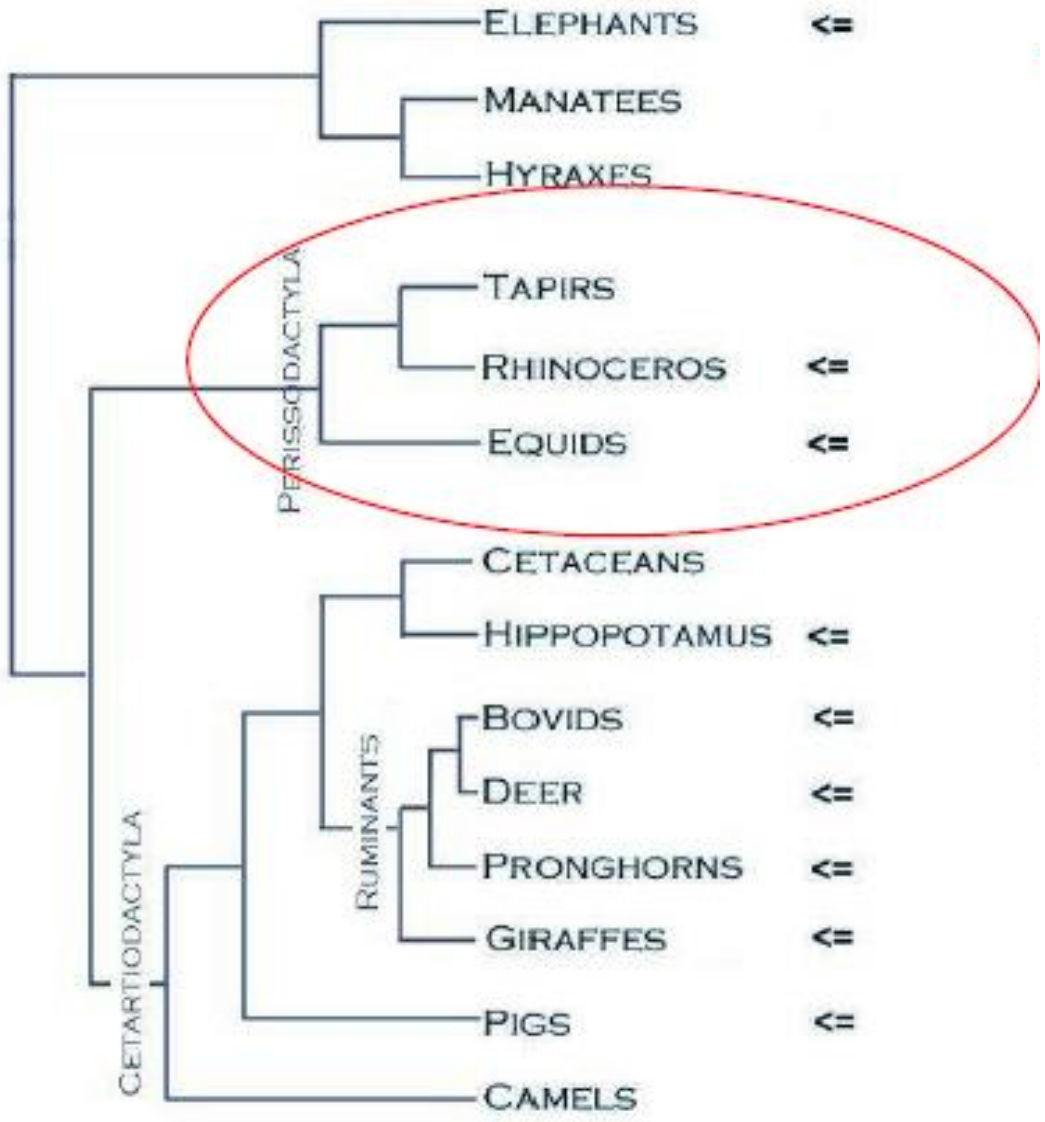
- Pony: <14.2 hands (hh) measured to the withers
  - [1 hand = 4 inches or approx. 10cm]

Points of the horse



Class: Mammalia

- Perissodactyla
  - – ungulates with uneven number of digits
- (cf. arteriodactyla
  - – even number of digits, e.g. ruminants).



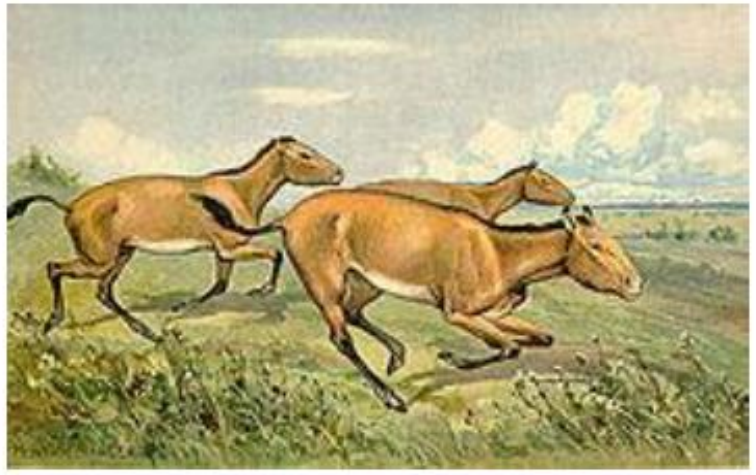
Evolution of the horse

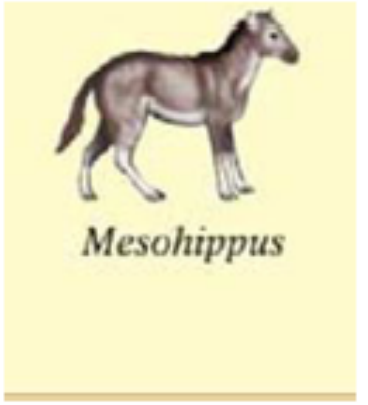
About 150 million years ago:

- Hyracotherium “goat-like” 1m tall odd toed ungulate
- Climate change caused a shift from rainforest (which covered most of the Earth) to large patches of open savannah grassland
- Since leafy food became scarce, had to adapt to new food source (grass) and lifestyle
- **Required need for serious speed – i.e. flight!**

Drivers for horse evolution

- Need for greater speed and body size to escape predators – long limbs, strong backs
- Cooling climate during Cenozoic replaced forests with grasslands. Large powerful jaws and teeth.
- Simple hooves and elongated legs adapted for speed in open (exposed) plains





Consequences of evolutionary adaptation

- Flight animals capable of serious speed (and momentum)
- Vulnerability to injury
- Preventative measures vital:
  - Require safe robust fencing and calm environment
  - Avoid environments where sudden changes in noise, movement and wind are likely!
- Vulnerability to catastrophic fractures
  - Huge forces on limb bones at top speed
  - Modelling/remodelling of bone with exercise

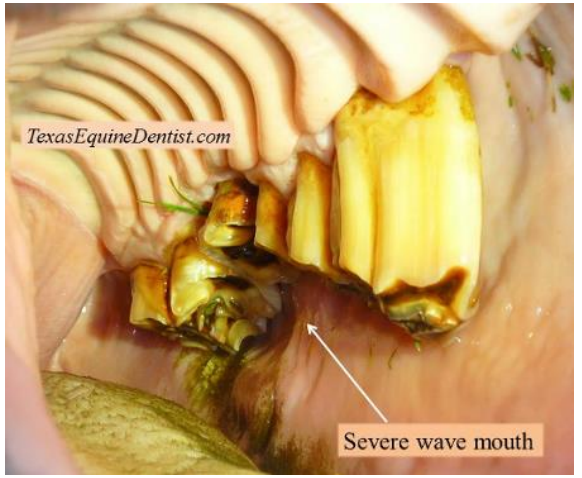
Barbaro

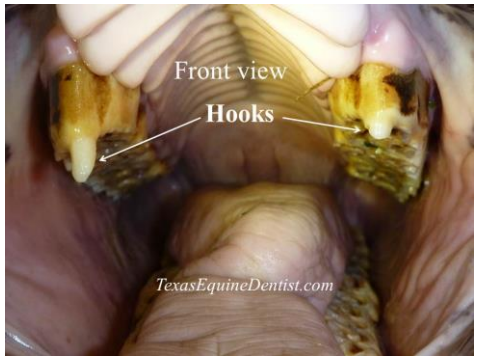
Adaptations for grazing

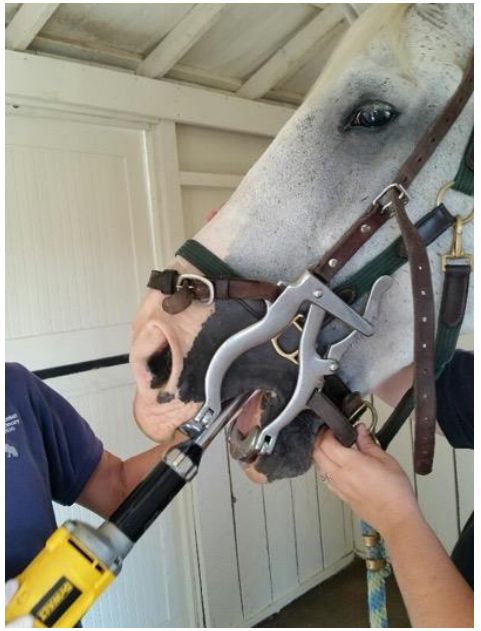
- Hypsodont type teeth for grazing
- Cheek teeth with bands of enamel and less hard cementum and dentine on the crown
- Open tooth roots permitting continuous eruption
- Larger teeth and larger skull to hold them

Problems with cheek teeth

- Difficult to examine properly
- May develop sharp edges or hooks, especially if receiving insufficient forage
- Edges/hooks may require ‘floating’ (filing) every 6 months or so
- Waves or steps in the cheek teeth arcades cause a significant problem for breakdown of long stems of forage
- Insufficient grinding of forage may be associated with choke or reduced forage digestion/utilisation

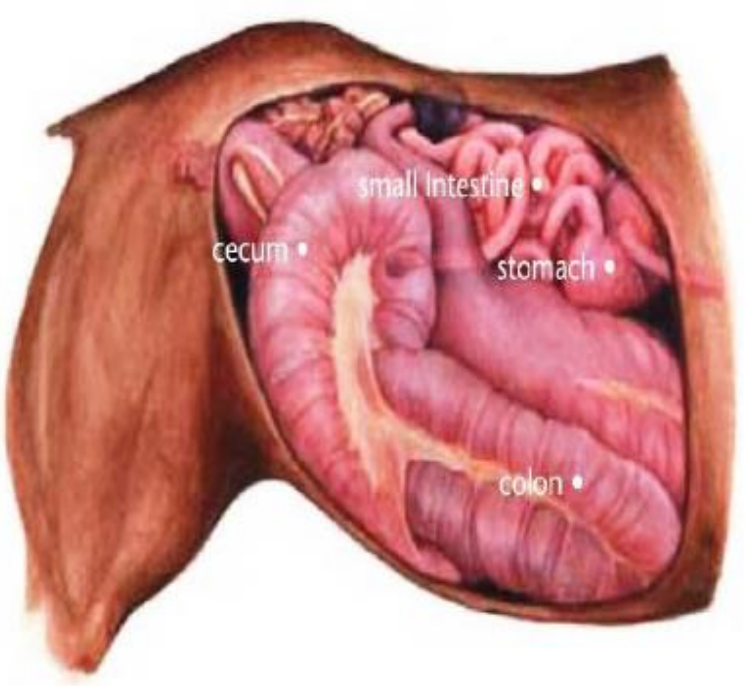






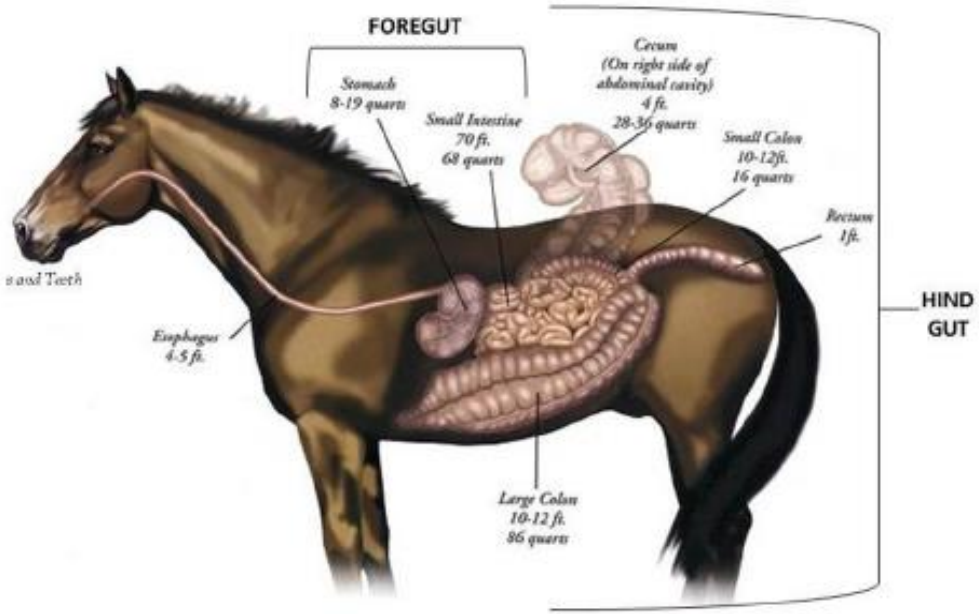
Equine digestive tract

- Simple stomach designed for small frequent meals
- Large sacculated hindgut adapted to fibre digestion
- Horses adapted to graze – with good quality fibre a critical element to digestive health



Horses are hindgut fermenters

- Adapted to grazing of pasture through most of the day
- NOT adapted to being stabled and fed infrequent large meals, especially of grain
- Always make any dietary changes gradually (over 10-14 days)
- Avoid disrupting hindgut bacteria
- Poor dietary management of horses – beware nasty surprises!
- Gastric ulceration; colic; colitis; enteritis; laminitis

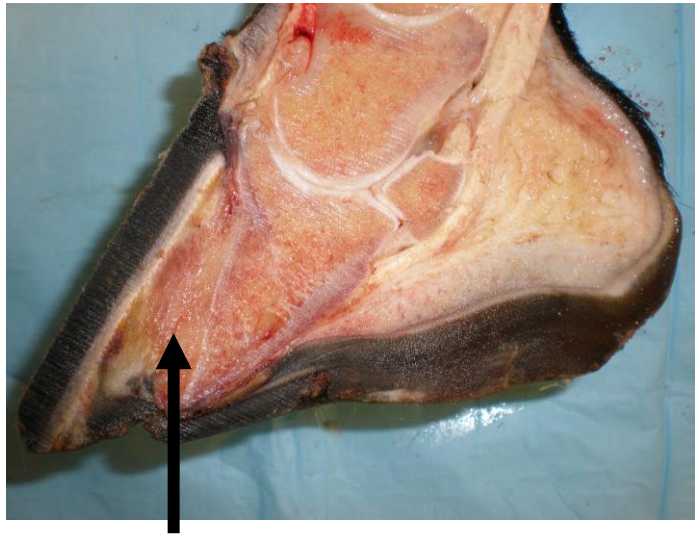


Essentials for equine digestive health

- Forage fed at a rate of at least 1.5-2% of the horse's body weight per day
- Good quality hay and pasture allow the horse to get optimal nutrition
- Ideally, no more than 1% of the horse's body weight should be fed as grain (never more than 50% of the diet)
- Include adequate amounts of all nutrients
  - (water, protein, carbohydrates, fat, vitamins and minerals)
- Proper dental care and routine deworming enhances feed utilisation

Founder (laminitis) in horses

- Stretching and separation of lamellae that attach the pedal bone to the hoof wall
- Pedal bone may lose support within the hoof and rotates downward
- Causes crippling lameness
- Long term chronic problems and recurrence
- Very common – 15% of ponies/pleasure horses suffer from laminitis at some stage



Sensitive lamellar tissues

Causes of laminitis

Most common:

- Lush pasture or high carbohydrate diet in susceptible breeds/individuals
- Very high insulin causes changes to lamellar tissues

Less common:

- Acute carbohydrate overload (free access to grain in open feed bin)
- Colic, colitis
- Retained placenta; other severe infections
- (All above cause release of inflammatory toxins)
- Excessive weight bearing or concussion

Equine metabolic syndrome

- Insulin resistance, obesity, predisposition to laminitis

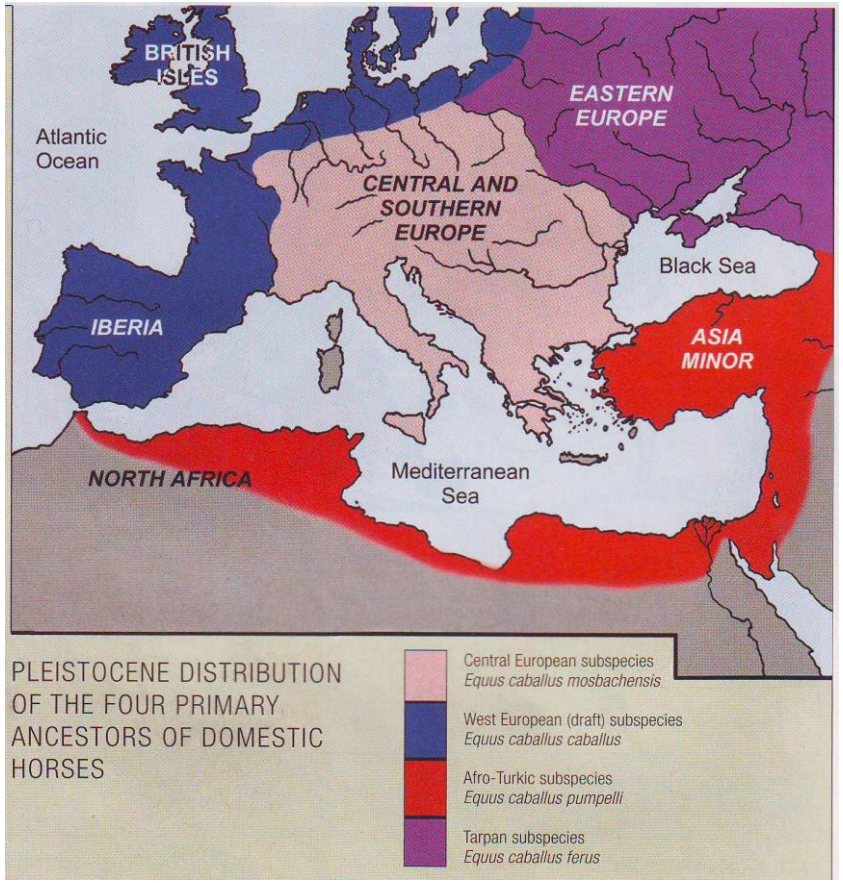
- Ponies, some horse breeds, prone to obesity
- Abnormal fat deposition (cresty neck etc.)
- Grazing on lush grass (high sugar content) can result in very high plasma insulin levels.
- Insulin dysregulation causes high insulin levels
- Predisposes to laminitis (endocrine form)

Breeds susceptible to EMS:

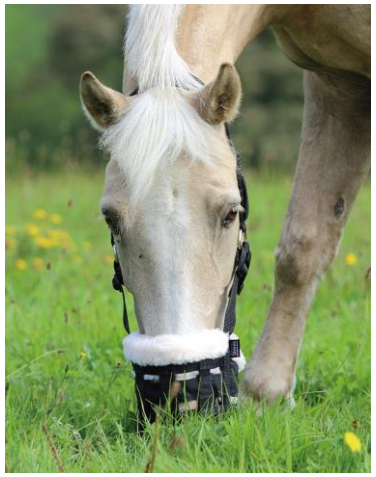
- Most pony breeds:
  - Shetlands, Welsh, New Forest, Dartmoor, Exmoor, Connemara, etc.
- A few horse breeds:
  - Andalusians, Paso Finos, Tennessee Walkers, Morgans, Spanish Mustang, some Quarterhorses

Why do some ponies/horses get EMS/laminitis and not others?

- Different subspecies arose during Pleistocene era (2.5M - 11,000 years ago) during & after last ice age
- W. European subspecies more metabolically efficient: 'good doers'; 'easy keepers': Ponies and Spanish breeds
- High insulin levels maximise body fat storage ('thrifty' phenotype)
- Can't cope with modern lush pastures (developed to maximise growth in cattle and sheep)
- Genes + Environment = 'epigenetics'



Implications for husbandry



- Owners should be very careful allowing ponies (and some horse breeds) access to lush pastures in Spring because this may cause laminitis
- Lush pastures may be up to 30% DM non-structural carbohydrates (sugars, fructans)
- If an animal has previously had laminitis, they are at high risk and should never be allowed on lush pasture (some have to be permanently managed on dirt yards)
- Other management options:
  - Grazing muzzles
  - Strip grazing
- Obesity indicates that insulin levels may be high and animals could be at risk of laminitis if inappropriate feeding or pasture management
- Obesity v common in Aus population (32% in ponies and 9% in horses) (similar in US, UK)
- Owners perceptions of what optimal body condition should look like

External parasites

Lice, mange

- Biting and sucking lice cause pruritus
- Found in main and tail; eggs may be seen with the naked eye

Flies

- Bot flies – lay eggs on skin; larvae develop in stomach
- Midges (culicoides) – may cause hypersensitivity (allergy) reactions

Internal parasites

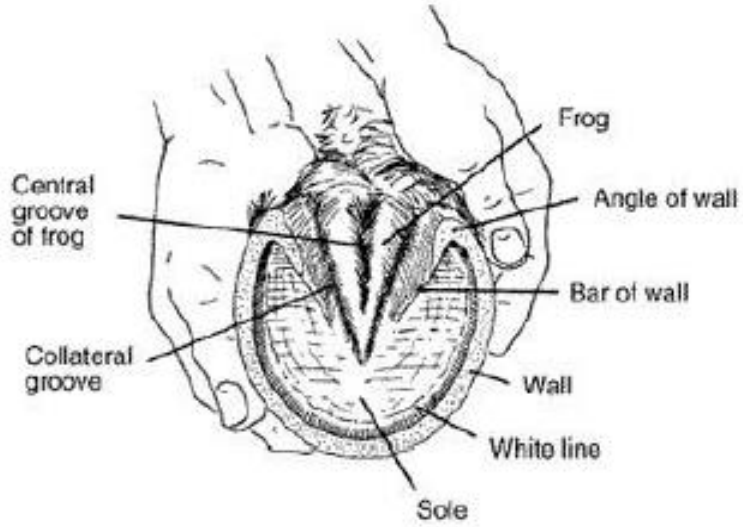
- Larvae from pasture - lifecycles evolved as horses evolved
- Include large and small stronglyes; ascarids; tapeworms; pinworms; (bots)

- Reliance over the last 60 years on regular anthelmintic treatment
- Benzimidazoles; pyrantels; macrocyclic lactones (avermectins, moxidectin)
- BUT resistance is becoming a major problem
- Need to prevent both severe infestations AND resistance
- Requires smarter strategies

Routine internal parasite control

- Should be tailored to individual needs
- Use of routine faecal egg count to identify horses that shed high levels
- Anthelmintic treatment to provide evidence around resistance
- Surveillance of anthelmintic efficacy
- Knowledge of risk factors (e.g. target weanlings for ascarids)
- Management strategies: Faecal collection; fungus *(Duddingtonia flagrans)*

Farriery



- Hooves grow at
- Wear depends on ground surface and work
- Goals for good hoof trim include:
  - Bottom of the hoof parallel to coronet
  - Both heels not too far forward and same height
  - Distance from centre of frog to the wall should be same on both sides
  - Angle of the hoof is in line with angle of the pastern

Shoeing

Aims:

- Provides a well balanced foot that enables work for longer periods of time without excessively wearing the hoof down and to help maintain the hoof shape.
- The use of horse shoes can give the horse a secure grip
  - groove called a fuller which runs around the surface of the shoe
  - grip also can be aided by use of studs
- Correcting conformation
  - Horses with hoof ailments and poor conformation can be assisted with the use of specific horse shoes which are specially designed to help with that ailment.
  - Specialist shoes: egg bar, heart bar, racing plates, rolled toe quarter clips

- Shoes: steel, aluminium (plastic)
- The well shod foot should allow the internal and external structures to expand on impact and therefore assist in lower limb circulation.
- Barefoot hoof trimming – advocated by some

Breeding

- **Gestation -** ~11 months
- Horses are seasonal (long day) breeders
- **Artificial insemination:**
  - Not permitted in Thoroughbreds!
  - Now routine for other breeds
  - Common role for veterinarians
  - More mares can be bred to a single stallion
  - Mare and stallion do not have to be in same location
- **Castration (gelding)**
  - Male horses in Australia are predominantly geldings –
  - Testosterone provides breeding and some athletic advantages –
  - but huge management (& safety) challenges!!! –
  - Castrated prior to 2-3 years of age generally (though occasionally much older)
- **Twinning**
  - Intervention before day 16

Foaling and foal management

- **Foaling**
  - Stage I (1-4 hours) restless, may lay down
  - Stage II (5-20 min) birth - very rapid
  - Stage III (must be within 3-4 hours) foetal membranes expelled (important)
- **Neonatal foal management**
  - Colostrum intake important for antibody transfer
  - Worm regularly from 2-3 months (ascarid worms)
  - Vaccination around 3-4 months when maternal antibodies are waning
- **Weaning**
  - Often between 4-7 months of age
  - Various strategies

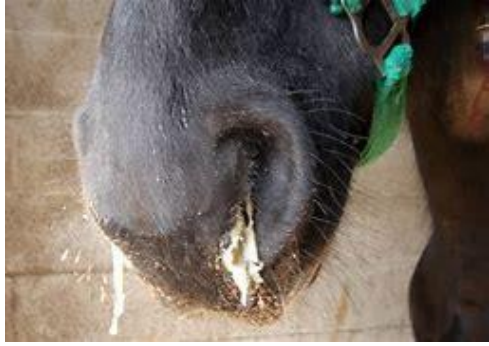
Vaccination of adult horses

Tetanus:

- Caused by production of toxins from Clostridium tetani, which is found in soil and can contaminate any wound. Horses v. susceptible
- Primary course: two injections 4 weeks apart
- Initial booster: 12 months from the second primary injection
- Following on: Vaccination every 2 years

- Vaccinations can start after 3 months of age
- Pregnant mares should receive a booster vaccination one month prior to foaling
- Horses with unknown vaccination history should receive their primary course again

Vaccination of adult horses



Strangles:

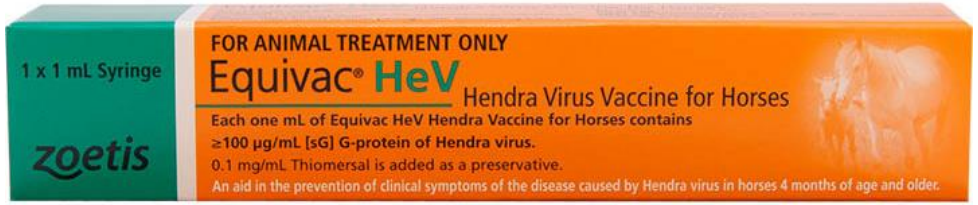
- Caused by infection with the bacteria Streptococcus equi subspecies equi. Highly contagious. Causes fever, nasal discharge and sometimes abscesses in lymph nodes.
- Vaccine often combined with tetanus vaccine.
- Primary course: three injections at two week intervals
- Boosters: 6-12 months from the third primary injection (depending on exposure risk)

- Vaccinations can start after 3 months of age
- Pregnant mares should receive a booster vaccination one month prior to foaling
- Horses with unknown vaccination history should receive their primary course again

Vaccination of adult horses

Hendra:

- Caused by a virus which has bats as its natural reservoir which occasionally infects other species, including horses and humans.
- Primary course: two injections 3-6 weeks apart for microchipped horses over 4 months of age
- Boosters: 6 months from the second primary injection



- Vaccinations can start after 4 months of age
- Vaccinations are recorded in a central database

Horse rugs

- Horses have evolved to cope with climatic extremes – Gobi desert, Arabian peninsula, northern Europe
- Rugging requirements not necessary under habituated conditions
- However may be necessary for particular requirements:
  - E.g. reduce calories required to stay warm (Thoroughbreds especially)
  - Aesthetics – keeping condition and maintaining sleek coat
  - Insect or UV protection

Code of Practice for the Welfare of Horses

- Prevention of Cruelty to Animals Act (1986) – Victorian State Legislation
- Details of obligations under this act are set out in Codes of Practice
- The Code of Practice for the Welfare of Horses sets out minimum level of conduct required to avoid cruelty to horses
- Provides information to improve awareness of good welfare practices
- Encourages the considerate treatment of horses

http://agriculture.vic.gov.au/agriculture/animal-health-and-welfare/animal-welfare/animal-welfare-legislation/victorian-codes-of-practice-for-animal-welfare/code-of-practice-for-the-welfare-of-horses-revision-1

Code of Practice for the Welfare of Horses

Guidelines and standards for:

- Behavioural needs
- Supervision
- Food
- Water
- Exercise
- Housing, shelter structures and yards
- Fencing and gates
- Agistment
- Tethering and hobbling
- Rugging
- Health
- Foot care
- Dental care
- Treatment and surgical procedures
- Identification
- Breeding
- Training
- Transport
- Euthanasia or slaughter

Summary

- Basic husbandry of horses:
  - Evolutionary background and implications for husbandry
  - Hoof and dental care
  - Parasites and their control
  - Infectious diseases
  - Stabling/rugging
- General principles of nutrition of horses
- Conditions associated with diet/management
- Horse welfare

- Body condition scoring: see supplementary slides
- Horse nutrition: PRE-READING for case study