

Introduction to the Veterinary Profession

VETS30030 / VETS



Equine Husbandry and Management

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Intended Learning Outcomes

At the end of this week of study you should be able to:

- Describe feeding and general principles of nutrition of horses
- Describe the management of foals, including weaning, nutrition, vaccination and worming strategies
- Describe basic husbandry of horses including evolutionary background and implications for husbandry, hoof and dental care, parasites and their control and infectious diseases

Keywords

Horses; horse nutrition; laminitis; parasite control; vaccination; horse breeding; hoofcare

Classification and evolution of the horse

Horses belong to the order Perissodactyla (within the class of Mammalia), which are the ungulates with an uneven number of digits. Therefore they are most closely related to the rhinoceros and tapir.

About 150 million years ago, horses evolved from Hyracotherium, a “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, these animals had to adapt to new foodsource (grass) and lifestyle. This drove many evolutionary changes:

- Good long distance eyesight to spot predators.
- Quick reactions
- Need for greater speed and body size to escape predators – long limbs, strong backs
- Simple hooves and elongated legs adapted for speed in open (exposed) plains
- Large powerful jaws and teeth for grazing

However, the consequences of this adaptation are that these flight animals, capable of serious speed (and momentum) are vulnerable to injury. They require safe robust fencing and a calm environment, avoiding sudden noises and movement. The huge forces on limb bones at top speed mean that horses are vulnerable to catastrophic fractures, particularly if there are deficits in the modelling/remodelling of limb bone with exercise.

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

This may lead to problems with cheek teeth:

- 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

The Equine digestive tract

- Simple stomach designed for small frequent meals
- Large sacculated hindgut adapted to fibre digestion
- Horses are hindgut fermenters and adapted to graze – with good quality fibre a critical element to digestive health
- They are 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, otherwise this may precipitate a number of serious conditions such as colic; colitis; enteritis; laminitis

Essentials of nutritional management 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)
- See separate pre-reading notes for case study on nutrient requirements for horses.
- Note: proper dental care and routine deworming enhances feed utilization.

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, causing crippling lameness that is very difficult to manage and treat.
- Very common – 15% of ponies/pleasure horses suffer from laminitis at some stage in their lives
- The most common causes of laminitis is lush pasture or high carbohydrate diet in susceptible breeds/individuals
- Very high insulin levels cause changes to lamellar tissues
- Less common causes include acute carbohydrate overload (free access to grain in open feed bin); colic, colitis, retained placenta; other severe infections; All of these conditions causing release of inflammatory toxins.
- Excessive weight bearing or concussion may also cause laminitis.

Equine metabolic syndrome (EMS)

- Insulin resistance, obesity, predisposition to laminitis
- Ponies and some horse breeds (mainly Spanish breeds) are prone to obesity, and often get regional fat deposition (cresty neck etc.)
- Grazing on lush grass (high sugar content) can result in very high plasma insulin levels, which predisposes these animals to the common endocrine form of laminitis.
- Ponies and the Spanish breeds of horses were derived from the Western European subspecies of horses that existed during the Pleistocene era (2.5M - 11,000 years ago) during & after last ice age.
- This subspecies was distinct from the Eastern European and middle Eastern subspecies from which Thoroughbreds, Standardbreds and Arabian horses were derived.

- The Western European subspecies came from colder regions with sparse grazing, and so were more metabolically efficient. They produced high insulin levels to maximise body fat storage (the ‘thrifty’ phenotype).
- On modern lush pastures with high non-structural carbohydrate levels (developed to maximise growth in cattle and sheep) they develop excessively high insulin levels.
- The term for an underlying genetic trait which is exacerbated by the physical or dietary environment to which the animal is exposed is termed ‘epigenetics’.

Implications for husbandry of ponies and horse breeds prone to EMS

- 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 some can never be allowed on lush pasture (have to be permanently managed on dirt yards).
- Other management options include grazing muzzles and 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 is very common in the Australian equine population (32% in ponies and 9% in horses) (similar in US, UK).

External parasites

Lice

- Biting and sucking lice cause pruritus
- Found in mane 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 strongyles; ascarids; tapeworms; pinworms; (bots)
- There has been a reliance over the last 60 years on regular anthelmintic treatment with benzimidazoles; pyrantels; and macrocyclic lactones (ivermectins, moxidectin)
- BUT resistance is becoming a major problem
- Routine internal parasite control these days should be tailored to individual needs, including those that shed a lot of eggs; or particular groups of animals (e.g. target weanlings for ascarids).
- Use of routine faecal egg count to identify horses that shed high levels
- Monitoring anthelmintic efficacy is important.
- Other management strategies may be useful, e.g. faecal collection; or using the fungus *Duddingtonia flagrans* to kill larvae in the manure.

Hoofcare

- 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** 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
- Shoes can also be useful for correcting foot 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.
- Examples of specialist shoes: egg bar, heart bar, racing plates, rolled toe quarter clips
- 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 is advocated by some.

Breeding

- Horses are seasonal (long day) breeders
- Breeding season is usually September to January
- Gestation is approximately 11 months
- Artificial insemination is routine in many breeds, but is not permitted in Thoroughbreds. It enables more mares to be bred to a single stallion, and means that the mare and stallion do not have to be in same location.

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
- **Neonatal foal management**
 - Colostrum intake is important for antibody transfer
 - Foals should be wormed regularly from 2-3 months (ascarid worms)
 - Vaccination is conducted around 3-4 months of age when maternal antibodies are waning
- **Weaning**
 - Often occurs between 4-7 months of age.
- **Castration (gelding)**
 - Male horses in Australia are predominantly geldings –
 - Testosterone provides breeding and some athletic advantages, but horses are harder to handle and can be dangerous (and may not focus in races).
 - Castrated prior to 2-3 years of age generally (though occasionally much older)

Vaccinations

Tetanus:

- Caused by production of toxins from *Clostridium tetani*, which is found in soil and can contaminate any wound. Horses are very 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

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

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

- Booster
- Horses have evolved to cope with climatic extremes – Gobi desert, Arabian peninsula, N. Europe
- The thermoneutral zone of a horse extends down to approx. 5 °C.
- Rugging requirements are not always necessary under habituated conditions
- However rugs 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

- Animal welfare laws are enshrined under Victorian State Legislation in the Prevention of Cruelty to Animals Act (1986), and the 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. It provides information to improve awareness of good welfare practices and encourages the considerate treatment of horses.
- The Code sets out guidelines and standards for the following areas:

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

[Code of Practice for the Welfare of Horses \(Revision 1\) | Victorian codes of practice for animal welfare | Prevention of Cruelty to Animals \(POCTA\) Act | Animal Welfare Victoria | Livestock and animals | Agriculture Victoria](#)