Conditioning the Driving Horse
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Monitoring Heart and Respiratory Rates
Respiration/Heart Rate

- Stethoscope
- Heart Rate Monitor -- $$
  - (Polar Company)
Objective: Long slow distance

- 60 minutes of work at average speed of 8kph
- Aerobic endurance = exercise for a prolonged period at low to moderate intensity.
- Resting HR = 28-40 bpm
- Measure a distance 1-3 kilometers then calculate average speed with a Stopwatch.
- Measure pulse or heart rate, 100-160 bpm
Start your distance component first

- For example: Start long slow distances three times per week at a walk and trot.
- As the work gets easier for the horse do one long work at the full distance
- Then 2-6 shorter conditioning drives at faster speed.
- HR may rise to 70-180 bpm.
- This work should be accomplished over a minimum of a two week period.
Conditioning

- Cardiovascular: The objective is to raise the aerobic capability while still maintaining sufficient anaerobic power and muscle strength for bursts of high intensity activity. (e.g., pulling a big hill or driving through a hazard)
Anaerobic conditioning

- Later stage of conditioning
- Heart rates 170 – 200 bpm
- Working horse at fast speeds, on a steep hill, through a hazard or on sandy ground.
Questions?
Duration of High Speed or Intense Work

- Controlled to Minimize Risk or Injury Due to Fatigue or Overloading
- Uphill gradients are best at the trot
- Load cardiovascular and respiratory systems without high stress to bones and joints
Respiratory Conditioning

- Rate and depth of breathing controlled in part by chemoreceptors which respond to levels of blood $O_2$, $CO_2$, and arterial pH.
- Increased respiratory rate $\rightarrow$ decreased $O_2$, increased $CO_2$, decreased pH
Respiratory Conditioning

- Normal Breaths per minute 12-20
- Can go as high as 180 bpm
- When exercise stops, horse’s respiration rate will settle to 60-100 bpm
- And breaths will be deep until $O_2$ debt is repaired/replaced.
- One factor in determining the speed of recovery is the ambient temperature.
Respiratory Conditioning

- If overheating is a problem, the horse will pant.
- Panting = Fast and Shallow Breaths
- Panting is a heat exchange mechanism.
- Panting does **NOT** provide adequate $O_2$ to lung tissue.
Thermoregulation

- Rectal temperature at rest averages 38° C/100.5° F
- During warm up, the body temperature rises about 1 degree F to get muscles up to optimal functional temperature.
Thermoregulation

- The rate of heat build up depends on:
  - Duration of exercise
  - Intensity of exercise
  - Environmental temperature, humidity and wind velocity.
  - Hydration status of horse
  - Hair coat and body mass

- Body temperature peaks 10 minutes after heavy exercise and should drop to normal within 10-20 minutes.
Questions?
Strength Training

- Pull up hills
- Add weight (gradually!) to carriage to 30-50% over competition weight
- Vary traveling surfaces (in moderation)
  - Deep ground (sand)
  - Water (provides drag)
Tapering work load prior to competition allows glycogen storage in muscles to be replenished.

Do NOT over train.
Dynamic Suppling

- Good warm-up and cool-down
- Dressage under saddle
- Large and small circles with carriage
Passive Suppling

- Stretching exercises
Peaking and Tapering

- Low level horses 5 days prior to competition
- Upper level horses decrease long slow work and add more speed work two (2) weeks before the competition
- Allow the horse’s body to be fully hydrated
- Allow the horse’s body to have a high storage of glycogen
- Feed well prior to competition
Peaking and Tapering

- Exercise daily but decrease level
  - Allows any minor tissue damage to heal
- After a fitness peak, let the horse down slowly over a 2-3 week period.
- Stay at a low workload until about halfway to your next fitness peak, then increase work again.
Questions?
Heat Dissipation

- Exercise = heat production
- Dissipation - Most important Evaporation
- Sweat facilitates evaporation which leads to high Water and electrolyte losses
Water

- Idle horse, cool day: 28 L/day (4-5 gallons minimum)
- Idle horse, hot day: 80 L/day (9-10 gallons minimum)
- Exercise increases consumption, need for water
Fluid losses

- Hard to estimate
- Weight loss during exercise is about 90% water
- Horses body 65% water
- Foxhunter 3 hrs of steady going (24-100lbs)
  - Endurance horse at 50 mi.(22-88lbs)
- Thoroughbred after a good gallop(10-15lbs)
Equine Body Water

- Most intracellular
- Some extracellular - Blood Plasma
  Large part of horses blood volume – Is the extracelluar water pool.
Plasma Volume Depletion

- Occurs if sweat losses are large
- Horse has less blood flow to the muscles
- Dehydration has occurred
- Less sweating
- > body temperature
Electrolyte losses

- Horse Sweat:
  - Calcium
  - Sodium
  - Chloride
  - Potassium
  - Protein
  - Trace Minerals
Electrolyte losses with activity

- Fox Hunter - 3 hours of going (33-148g sodium) (12-51g potassium) (63_284g chloride)
- Thoroughbred – good gallop (16-23g sodium) (12-51g potassium) (31-44g chloride)
- Endurance Horse at 50 mi. (13-132g sodium) (12-48g potassium) (63-252g chloride)
- Heavy sweat leads to both electrolyte and water loss
Results of electrolyte imbalances

- Acid – Base Imbalance in body
- Muscle cramping, Tying up, Thumps
- Less sweating > body heat
Thirst Response and Desire to Drink

- High sodium loss in horse causes less response to drink > plasma sodium causes the drinking response
- In humans we lose < sodium but more water so we want to drink
Questions?
How do we get horses to drink well

- Access to forage – hay = MOST IMPORTANT
- Adapt them to drinking strange water by flavoring the water at home.
- Let them see other horses drinking
- Hold a bucket up for them
Pre-event feeding practices

- Diets that maximize water intake and retention
- > dry feed > water consumption good Hay
- Mineral block availability
- Electrolyte supplementation in feed

- Water and electrolytes can be retained in the large intestine
Event practices

- Train your horse to drink in the rest after the walk section
- Electrolyte paste can be helpful but only if your horse drinks some at the rest
Feeding on Competition Day

- Old theory was to starve horse on the day of the competition, which leaves them with an empty gut
- Current theory is feed small meal of hay and grain 4 hours prior to start of the competition or long drive
Veterinary issues in a dehydrated horse

- Administration of water without electrolytes
- Administration of electrolytes without water
- Veterinarian will give balanced I.V. solution
Post Event

- Monitor your horse carefully right after the event and for a day or two.
- If you have a long trailer trip home it is best to wait a few hours before starting your trip home.
Transportation can be a dehydrating experience on its own and transporting a dehydrated horse may lead to another problem like colic.
Prevention of overheating

- How much work will the horse do and how strenuous will it be above and beyond what he has done in the past?
- How hot will it be and has your horse been trained to acclimate to the heat (do you have an idea of his pre work and post work body temperatures)? Heat Load?
- How fit is your horse?
Cooling a Hot Horse

- Apply copious amounts of water and scrape it off with a sweat scraper
- Use ice cooled water in large volumes
- Alcohol is also beneficial
- Get the horse in the shade in the breeze or in front of a fan
- Monitor his temperature
Remember….

- Without proper care & conditioning you’ll have a carriage, but no horse to pull it.
Thank You!!

Drive Safely
Have Fun!