

Key to Completing: Continually Evaluate Your Horse Adjust Your Plan

Stagg Newman and Jeannie Waldron

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Drubin and Stagg Newman, Strut and Cheryl Newman, '93 Old Dominion, Shenandoah River Crossing at Dawn, Photo by Jeannie Stewart-Spears.
Rambow and Jeannie Waldron, Winning Team and Best Condition, '93 Old Dominion, Shenandoah Crossing at Dusk.

Outline

➤ When to check your horse

- Before leaving home
- Before the ride at camp
- On trail
- At each check
- Post ride
- After returning home

➤ The basic check

- Heart Rate
- EDPP and attitude
- Check point for holds

➤ In competition–

- Evaluate and adjust
- The Heart of This Talk

➤ Post ride and after returning home

- Tune-in for October Webinar with Dr. Jeannie Waldron

• Summary and Q and A

Rambow and Jeannie Waldron, Team Gold, '93 North American, Championship.

Maggie Price and Annie and Drubin and Stagg Newman, Team Gold, '93 North American along with Rio Judith Ogus, Individual Gold.



Know Your Horse

1. Heart Rate at Working Paces
 - Walk, Trot, Canter
2. Ability to Handle Terrain
 - Uphill or downhill horse
 - Sand, good footing, or rocks
3. Ability to Handle Weather
 - Hot weather or cold weather horse
 - Humid or arid
4. Mental Attitude
 - Hot headed or cool
 - Leader or follower
 - Groupie or loner

- Avoid over heating
- Avoid excessive anaerobic work
- *Ride to your horse's capability*

➤ Recommendation: Heart Rate Monitor

I ride my horse as fast I think he can go that day and no faster. The other horses in the ride have nothing to do with it (my pace).

Dr. Jeannie Waldron

Pre-Ride

- **Before Leaving Home**
 - Check temperature and any sign of infectious disease
 - Check soundness
- **During trailing**
 - Monitor hydration
 - Monitor feed and keep feed in stomach
 - Stopping every 2 to 3 hours
- **At ride site**
 - Mini-vet exam upon arrival
 - Monitor feed (moist)
 - Electrolyte after arrival

The Check - Basics

➤ Attitude

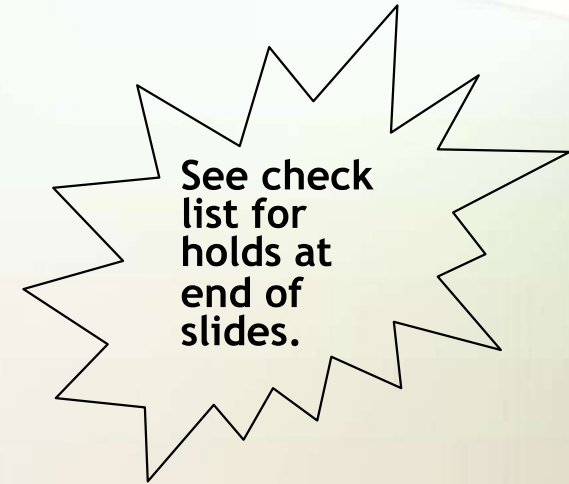
- EDPP (Eating, Drinking, Peeing, Pooping)
- No ADR (Ain't Doin' Right)
- Willing and Listening, Not Hyper, Not Reluctant

➤ Pulse

- Time to pulse recovery for *your* horse..
- CRI
- Progressive Recovery
- Working Pulse

➤ **Check the shoes**

➤ Recalculate Your Plan

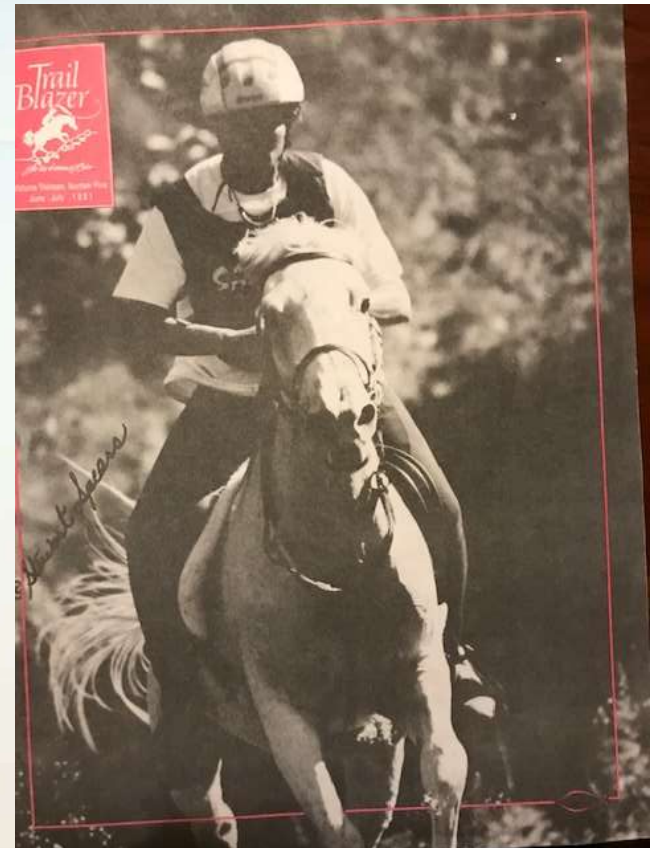


**The rides vets and your crew are
key members of your team!
You may have DIMR.**

On the Trail

Avoiding Disaster

- Identify issue before a significant problem
- Factors causing issue
- Dealing with issue on trail



Behavioral Challenges

- **The anxious horse**
- **Provide**
 - **Guidance**
 - **Direction**
 - **Kindness**
- **Horse should enjoy the competition**



The anxious horse

- **Goals**
- **How to start**

Maintain Your Independence



The anxious horse needs:

- **Fitness**
- **Proper warm-up**
- **Skilled Rider**



Fitness

Can you horse your horse trot and canter at the same heart rate? You might want to think about that.

Dr. David Kronfeld



The Warm-Up

Old Dominion – 1993



Rambow and Jeannie Waldron, Best Condition and Winner in 11:54, Old Dominion Course Record. (Photo from 1993 North American later that year, where Rambow and Jeannie earned Individual Bronze and Team Gold.)

Environmental Challenges

- **Footing**
- **Weather**
- **Availability of food and water**



The Footing

- **Soft or slippery footing**
 - Poor purchase footing
 - Tiring
 - Soft Tissue Strain
- **Hard Footing**
 - Less Fatiguing
 - More Concussion
- **Slick Footing**

Cramping versus tying-up



Clockwise: 20 Mule Team, High Desert, Sandy Footing. Drubin and Stagg (1st; Hard Gravel Road, Concussive footing, '93 North American – see early citation; 2006 AERC National Championship, Old Dominion Course, Hard and Rocky, Jayel Super and Stagg (2nd) and Heraldic and John Crandell (1st)

Weather

- **Effect of increased body temperature**
- **High Heat**
- **Humidity**
 - High humidity
 - Low humidity
- **Horse color and sun**

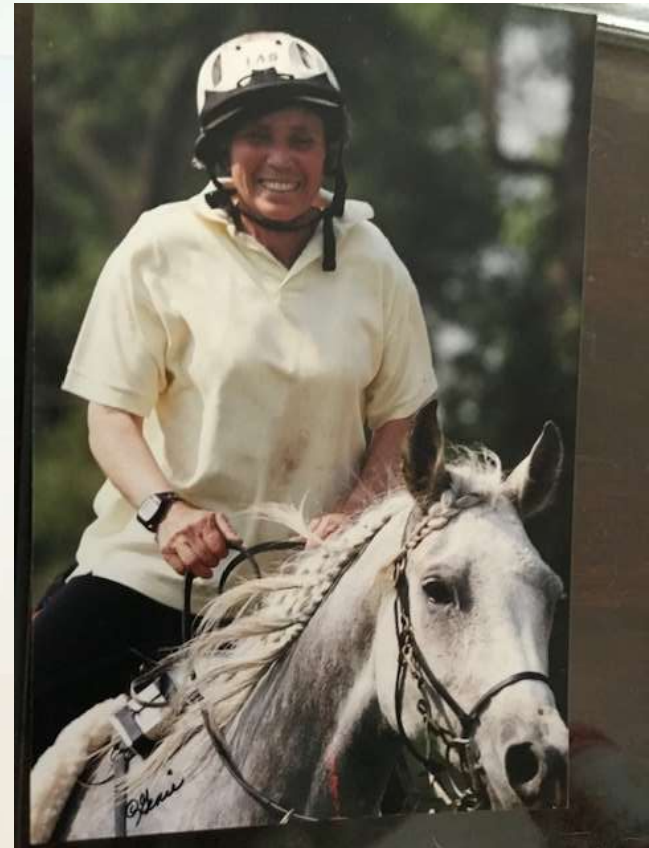


Temp + Humidity	<130	130-150	>150
Conditions	Moderate	Challenging	Dangerous

Energy

Food, Water, Electrolytes

- **Availability of food and water**
- **Gut motility**
- **Core Temperature**
- **Electrolytes**



Brombie and Jeannie Waldron, European Championship, Germany, 1990, Gold Medal Team.

Observation from Dr. Matthew Mackay-Smith

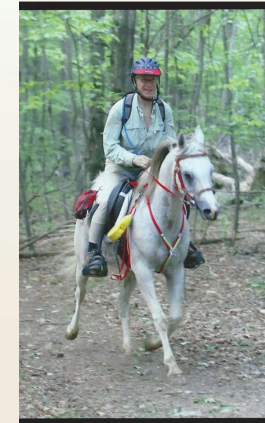
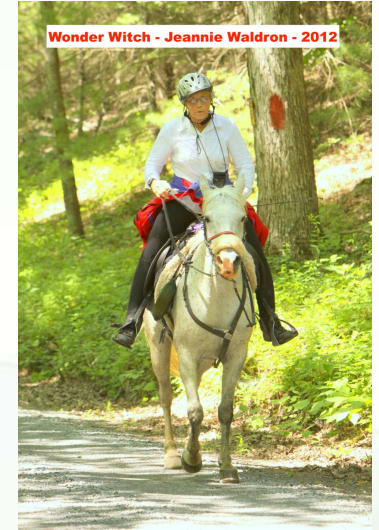
“Let no one think it was coincident that both the first and second place horses were ridden by veterinarians. Sandy and Jeannie knew their physiology.” Quote after Sandy Shuler and Jeannie Waldron finished 1st and 2nd at First World Championship.



Dr. Matthew Mackay-Smith, AERC Hall of Fame Vet and Vet, AERC President. First person to win Tevis and Old Dominion in same year. Mentor to many of us. Banquet at First World Championship.

Summary

- When to check your horse
 - Before leaving home
 - Before the ride at camp
 - On trail
 - At each check
 - Post ride
 - After returning home
- The basic check
- On trail – check and adjust
- At each check
 - Progressive Recovery
 - EDPP and attitude
 - Check shoes



“Learn your physiology!! It will make you better competitors and keep your horses safer.”
Dr. Jeannie Waldron

Rambow and Jeannie Waldron, Brombie and Jeannie Waldon, Jeannie Waldron and Wonder Witch, Super and Stagg Newman, Winston and Stagg Newman. All horses have won Old Dominion with 10 wins collectively and 21 Old Dominion completions.

QUESTIONS THANK YOU!!!

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Old Dominion 100, 1993

Drubin and Stagg Newman, Strut and Cheryl Newman, '93 Old Dominion, Shenandoah River Crossing at Dawn, Photo by Jeannie Stewart-Spears.
Rambow and Jeannie Waldron, Winning Tam and Best Condition, '93 Old Dominion, Shenandoah Crossing at Dusk.

Check List for Holds

Checklist for Holds at AERC Rides

Ensuring You and Your Horse are Ready for a Successful Next Leg

Before the Ride	V1	V2	V3	V4	V5	Final
Horse water, food (hay, grain)						
Water for cooling out, sponges, sweat scraper						
People food and drink						
People clothes						
Blankets, rain sheets, rump rugs						
Electrolytes						
Stethoscope, heart monitor						
Flashlight, glow sticks						
Ice, ice boots						
Extra tack, saddle pads, shoes						
Chairs, tent						
Other						
During Hold	V1	V2	V3	V4	V5	Final
Blanket, if necessary						
Eating						
Drinking						
Peeing						
Pooping						
Hydration						
Attitude						
Tack rubs and sounds						
Progressive recovery (P1, P2, P3)						
Electrolyte during hold						
Check all 4 shoes / hooves						
Review next leg of trail and strategy						
Polite to crew						
Leaving Hold	V1	V2	V3	V4	V5	Final
Electrolytes for trail						
Helmet, fanny pack, water bottle, rider card						
Tack check						
Departure trot-out and attitude						
If in doubt, wait						
Water on horse if appropriate						
Thank crew						
Other:						

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Check List for Holds

Pre-Arrival Checklist

The crew or the rider if no crew should check to make sure everything is ready in the proper place.

- ✓ **Horse water, food (hay, grain)**
Fresh water, hay, grain, mash—ready for horse in appropriate places
- ✓ **Water for cooling out, sponges, sweat scraper**
Buckets of water, sponges, sweat scrapers—ready for use
- ✓ **People food and drink**
Rider's favorite foods, sports drinks, water, human electrolytes, medicines (e.g., aspirin)
- ✓ **People clothes**
Fresh change of clothes, rain gear, warmer clothing available for rider
- ✓ **Blankets, rain sheets, rump rugs**
All of the gear to keep the horse warm readily accessible
- ✓ **Electrolytes**
Electrolytes for use during the hold and replacements for on-trail use
- ✓ **Stethoscope, heart monitor**
Equipment to check horse's pulse
- ✓ **Flashlight, glow sticks**
Flashlights and glowsticks if the rider will be going into night riding on next leg
- ✓ **Ice, ice boots**
Ice and/or ice boots for cooling horse and for soaking feet and legs as needed
- ✓ **Extra tack, saddle pads, shoes**
Replacement tack, dry clean saddle pads, extra shoes, and hoof boots
- ✓ **Chairs, tents**
Set-up chair for rider, tent for shade if needed

During Hold

- ✓ **Blanket if necessary**
Put blanket and/or rump rug and/or rain sheet on horse as needed
- ✓ **Eating**
Monitor the horse's eating—is the appetite normal?
- ✓ **Drinking**
Monitor the horse's drinking; amount of drinking normal
- ✓ **Peeing**
Check to see if the horse pees; color of urine and volume. If dark, consult vet
- ✓ **Pooping**
Check to see if horse poops; is the texture good, amount OK?
- ✓ **Hydration**
Check the hydration factors: skin pinch, jugular refill, gut sounds, capillary refill, membrane color
- ✓ **Attitude**
Bright, alert, interested in surroundings

- ✓ **Tack rubs and wounds**
Check for tack rubs, wounds, heat or swelling in legs, back soreness
- ✓ **Progressive Recovery (P1, P2, P3)**
Check for progressive recovery during hold period. The pulse should continue dropping during the hold. Check 5 to 10 minutes before leaving (before resaddling); should be 8 or more beats lower than arrival. If pulse is hanging in 60s or has gone up from arrival or is cycling up or down, check with vet.
- ✓ **Electrolyte during hold**
Electrolyte at appropriate time during hold period
- ✓ **Check all 4 shoes/hooves**
Check all 4 shoes if shod or boots or hooves; also any leg protectors
- ✓ **Review next leg of trail and strategy**
Directions and marking, length, pace to ride, challenges, where to leave check, crew can find check
- ✓ **Polite to crew**
Your crew is your critical support system; be kind to them so they will be there when you return!

Leaving Hold

- ✓ **Electrolytes for trail**
Electrolytes and doser with rider for on-trail electrolyting; one full dose and backup
- ✓ **Helmet, fanny pack, water bottle, rider card**
Rider has gear normally worn or carried; also trail map directions
- ✓ **Tack check**
Tack is all in good repair
- ✓ **Departure trot-out and attitude**
Check the horse's overall appearance, look in eye; trot-out and check for lameness and way of going
- ✓ **If in doubt, wait**
If horse is "not quite right" (e.g., not eating or drinking well), give the horse more time and/or check with vet
- ✓ **Water on horse if appropriate**
In hot weather, sponge the horse before leaving
- ✓ **Thank crew**
As you leave, cheerily thank your crew and apologize for any nasty words
- ✓ _____
- ✓ _____
- ✓ _____
- ✓ _____

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VETERINARY
EVALUATION AND
MAINTENANCE OF THE
ELITE ENDURANCE
HORSE

KENNETH L. MARCELLA DVM, AAT

KLM EQUINE

CANTON, GEORGIA

- **WHEN WE LOOK AT HORSES FOR UPPER LEVEL COMPETITION IT IS IMPERATIVE THAT WE KNOW ALL THE ISSUES THAT WE WILL FACE WITH TRYING TO KEEP THAT HORSE SOUND AND COMPETING AT THE HIGHEST LEVEL.**

What is Wrong- and by the time horses get to this level they all have something wrong-

How do we treat/maintain it

SOUNDNESS/LAMENESS EVALUATION

Standard pre-work examination- EENT, Cardiovascular and respiratory systems, palpation- heat, swelling, tenderness; hoof and shoeing evaluation, evaluation of ROM of all joints and limbs, flexions

Kinetic or post-exercise evaluation repeating all observations and looking for exercise-stress induced changes

Diagnostic modalities that help us “see what we cannot see”-

Radiographs, Ultrasound, Thermography, Video, Lameness locator, Nuclear Scintigraphy, CATScan, MRI



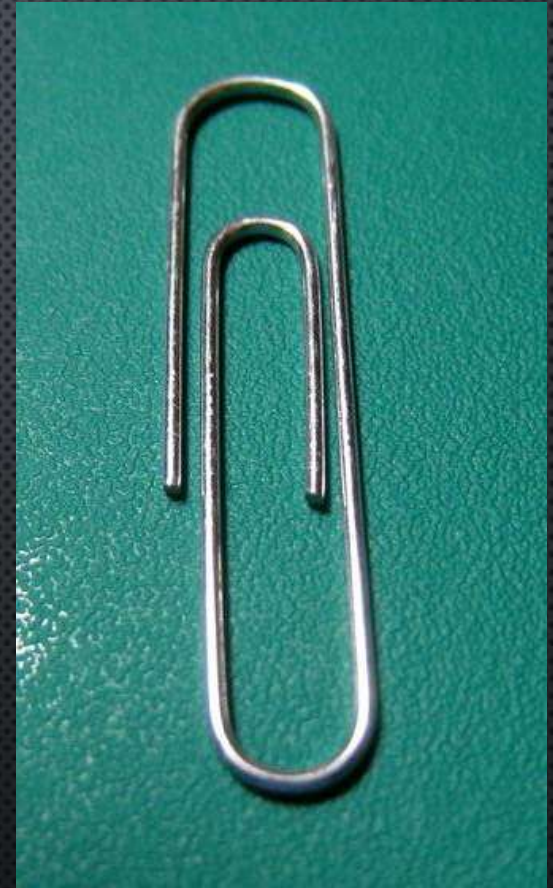
Average stride length is 12 feet

$5,280 \text{ feet/mile} = 440 \text{ strides}$

$100 \text{ miles} = 44,000 \text{ strides}$

"Most competition horses get too unsound, not too old"

Any problems, issues or conditions that cause imbalance will cause overloading, uneven stress and ever increasing repetitive damage that will eventually result in unsoundness



Balance is the Answer

Foot balance is #1 - absolutely even landing and loading

Muscle balance (conditioning) is #2

Joint Balance (maintenance) is #3

Tack is #4

Rider balance is #5

IN ORDER TO KNOW AS MUCH AS WE CAN ABOUT EACH HORSE AND TO ADDRESS ANY “BALANCE” ISSUES, WE NEED AS MUCH INFORMATION AS POSSIBLE



Evaluation



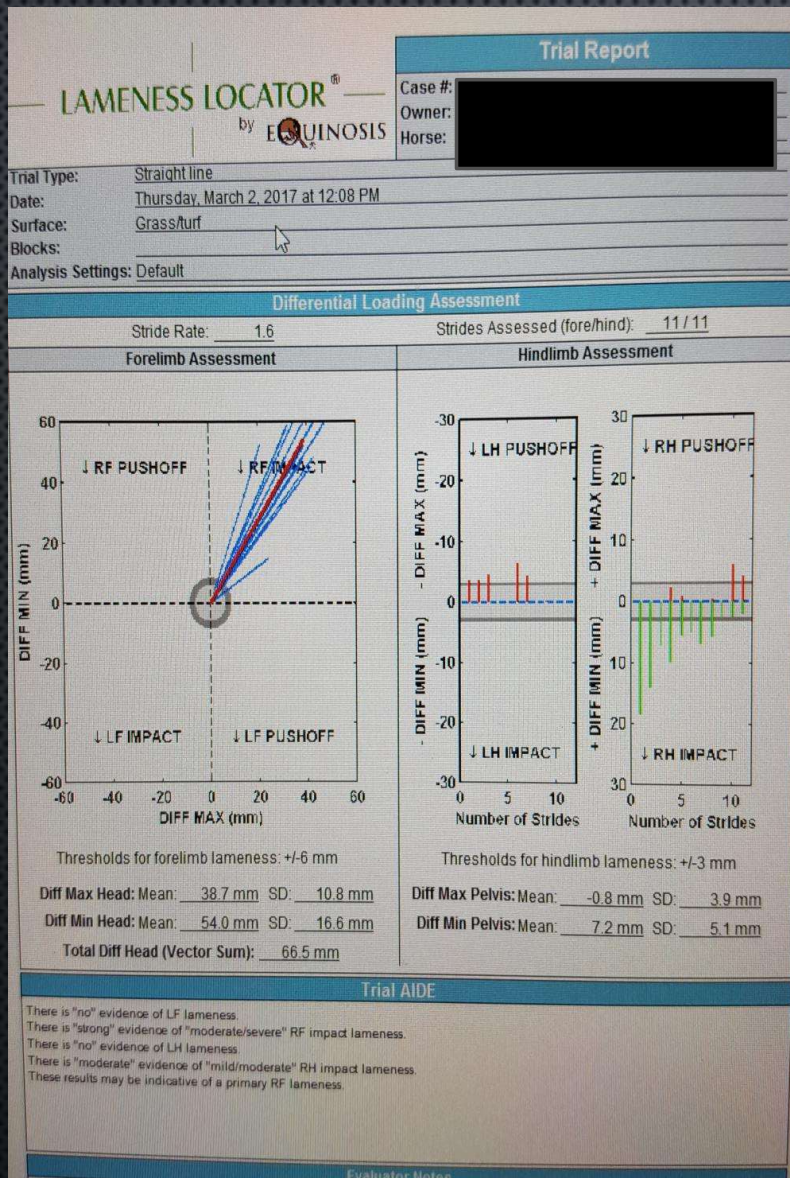
SECTION 6: EXTRA EDGE

KI Performance Bloodwork	A multiple month bloodwork program to improve your performance through nutrition and dietary interventions personalized for you
Travel Science	Personalized travel protocols for the individual traveling extensively
Sleep Science	Advanced sleep assessments and personalized analysis
Stress Science	Advanced stress reduction techniques
Hydration Profile	Personalized hydration profile and daily suggested hydration guidelines
Sweat & Electrolyte Analysis	Unique sweat analysis to determine the electrolyte loss during exercise. A unique personalized plan is provided for pre, during and post activity
Heat and Humidity	Utilization a heat and humidity chamber to evaluate the physiological responses to challenging environmental conditions
Lactate Profiling	Assessment of lactate levels through exercise and recovery to optimize training adaptations



Lameness Locator





Find the problem

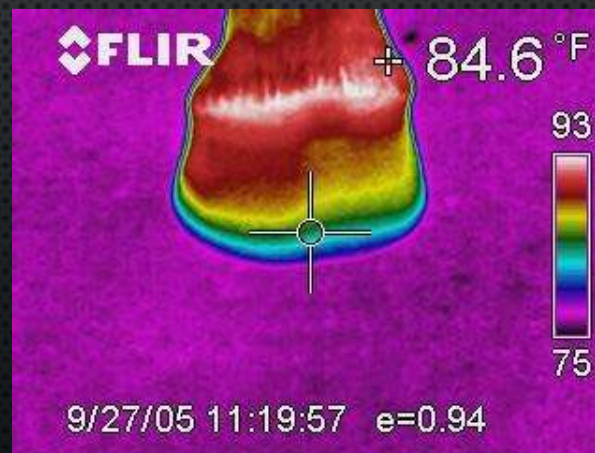
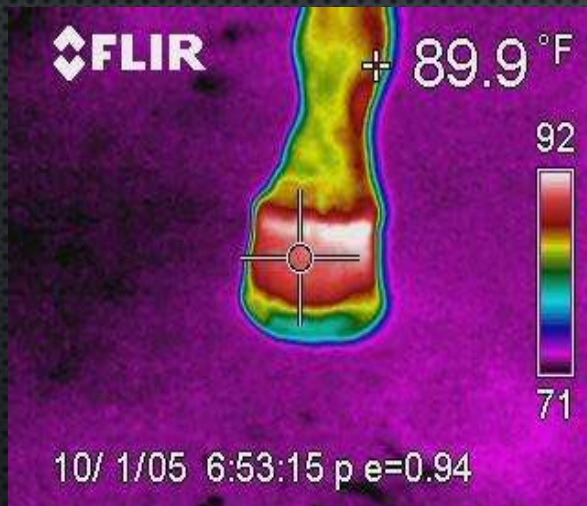
Identify the cause

Come up with a treatment/prevention plan

Work the plan consistently

Modify the treatment plan as needed

FOOT BALANCE -

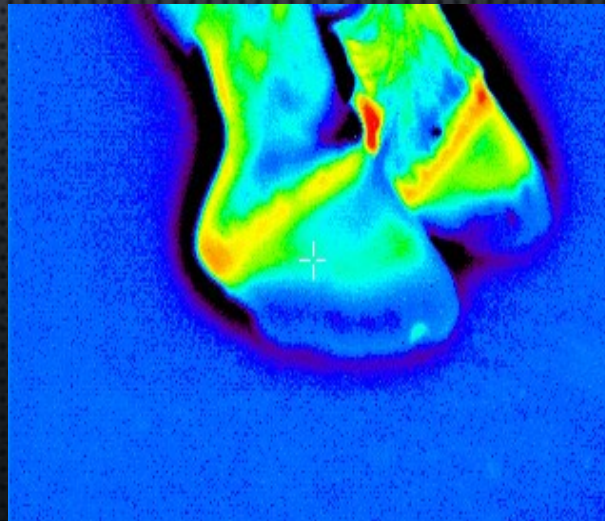


HOOF ANGLES

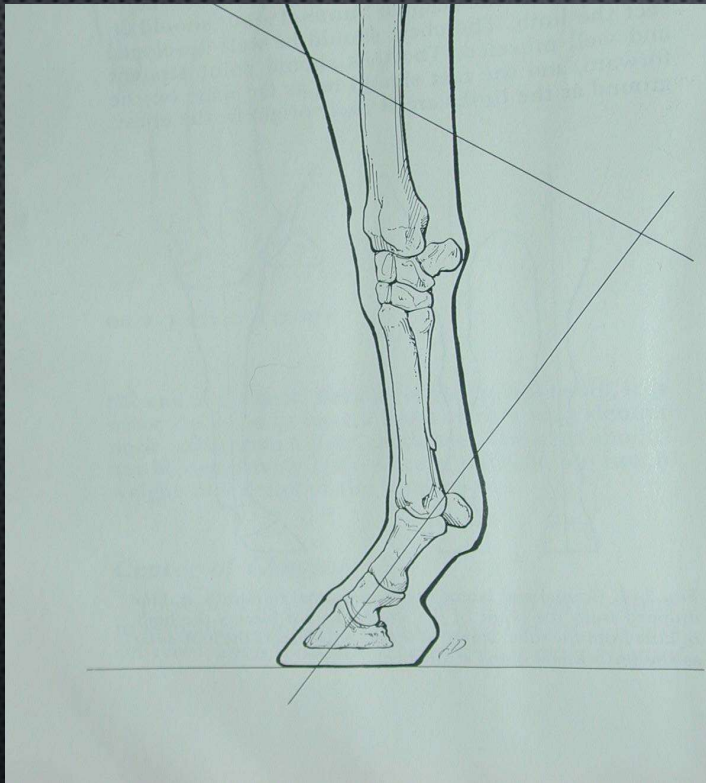
- LOW ANGLES CAUSE TOE FIRST LANDING
- ANGLES INFLUENCE TENSION ON DDF TENDON AND COMPRESSIVE FORCES ON NAVICULAR BONE
- LOW ANGLES CAUSE CONGESTION OF BLOOD IN HEELS
- LOW ANGLES CORRELATED WITH CAUDAL HOOF PAIN AND POOR PERFORMANCE
- HOOF ANGLES CONTROL WEIGHT DISTRIBUTION

39 degree hoof angle- 75% heel, 25% toe
47 degree hoof angle- 63% heel, 37% toe
55 degree hoof angle- 43% heel, 57% toe

The greater the load, the slower the growth.



ADAM'S LAMENESS IN HORSES



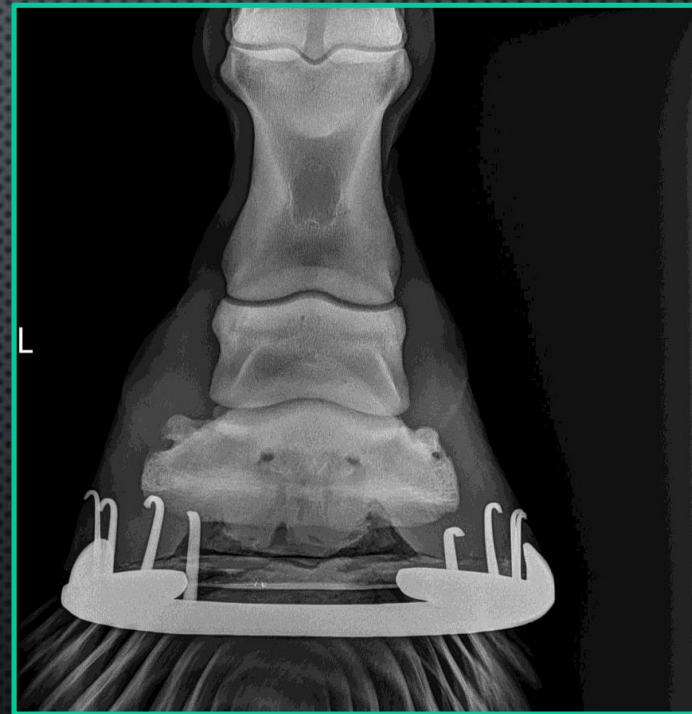
- FRONT FOOT SHOULD BE 45-50 DEGREES
- HAYES (1898) 47-57
- OVNIECK (WILD HORSES IN MONTANA AND WYOMING) 54-58
- H. CLAYTON 54
- THERE IS A DISCONTINUITY BETWEEN WHAT WE KNOW AND WHAT WE SAY

Every horse is an individual and what works best for that particular horse must be worked out over time with a bit of trial and error and close observation and good records

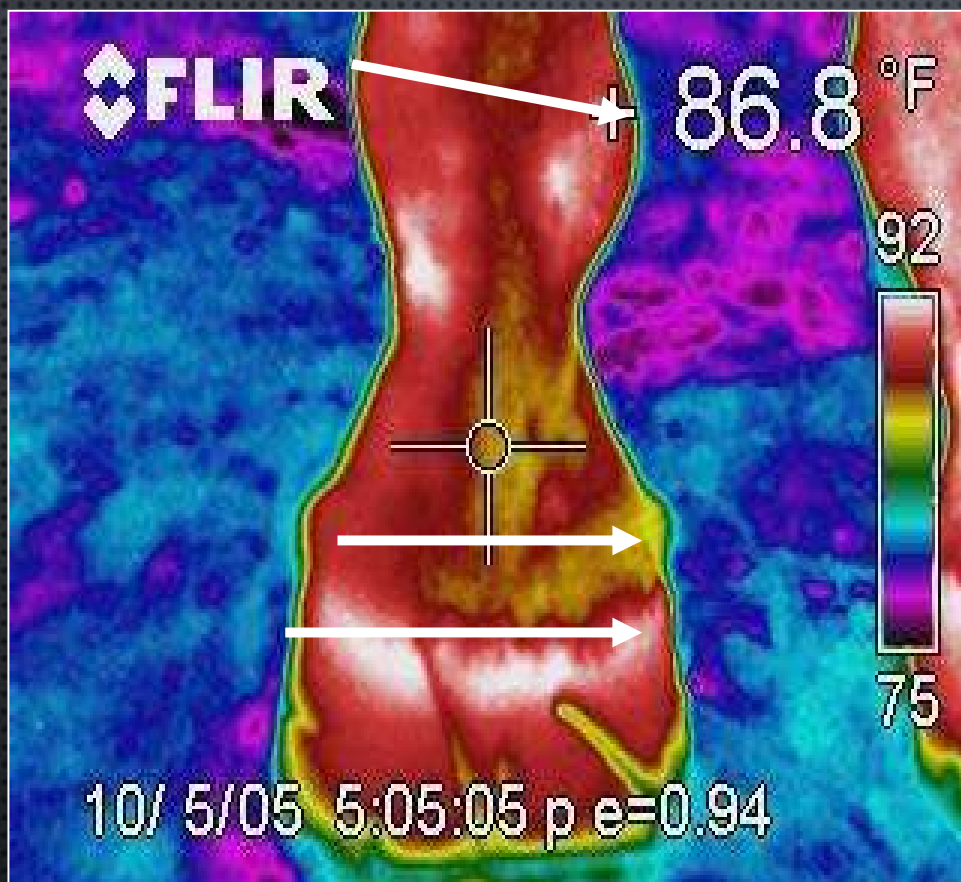


“Athletes are 75% genetics and 25% outside influences and it is the 25% that will determine if they become elite or not”

Radiographs are crucial







10 year old, grey Arab gelding

Multiple 50 mile completions but....

2 pulls for RF lameness (mild and at the later stages of rides) over the last year

AP view of RF at second hold (27 miles) –not lame (21st)



Beginning of slight osteophyte on medial edge of P1, thickening collateral ligament

P1 – P2 offset laterally over P3

Narrowing of medial coffin joint

The more we know the
better we can manage
problems and keep the elite
performance horse
functioning at that level

NUTRITIONAL MANAGEMENT OF THE ENDURANCE HORSE



Marty Adams, PhD, PAS
Equine Nutritionist
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Energy or Calories for the Horse

- Dietary energy is expressed in terms of kilocalories (kcal or 1,000 calories) or megacalories (Mcal or 1,000,000 calories) of digestible energy
- Digestible energy (DE) refers to the amount of total energy in the diet that is actually absorbed by the horse (more accurate food values than for humans, which is only gross energy)
- Digestible Energy = Gross Energy – Fecal Energy

Digestible Energy Requirements

(Mcal/day)*

CLASS OF HORSE	400 kg	500 kg	600 kg
Maintenance <small>no work, minimum</small>	12.1	15.2	18.2
Maintenance <small>no work, average</small>	13.3	16.7	20.0
Maintenance <small>no work, elevated</small>	14.5	18.2	21.8
Light work	16.0	20.0	24.0
Moderate work	18.6	23.3	28.0
Heavy work	21.3	26.6	32.0
Intense work	27.6	34.5	41.4

*Nutrient Requirements of Horses, Sixth Revised Edition. 2007.

Quality Estimates for Types of Hay for Horses¹

	High Quality	Average Quality	Low Quality
Legume			
Crude Protein (%)	18-23	16-17	<15
Acid Detergent Fiber (%)	<35	38-42	>42
Neutral Detergent Fiber (%)	<55	58-62	>62
Digestible Energy (Kcal/lb)	1200-1000	1000-900	<900
Mixed			
Crude Protein (%)	15-18	11-14	<10
Acid Detergent Fiber (%)	<38	40-42	>45
Neutral Detergent Fiber (%)	<58	60-62	>65
Digestible Energy (Kcal/lb)	1000-950	950-850	<850
Grass			
Crude Protein (%)	12-14	8-11	Below 7%
Acid Detergent fiber (%)	<40	40-45	>45
Neutral Detergent Fiber (%)	<60	60-65	>65
Digestible Energy (Kcal/lb)	950-900	900-850	800 or less
Estimated Daily Intake (% of body weight)	2.0-2.5	1.5-2.0	1.0-1.5

¹Values are expressed on 100% dry matter basis.

Effects of Nonstructural Carbohydrates or NSC

- Dietary nonstructural carbohydrates or NSC (starch and sugar) are causal factors for excitable behavior, insulin resistance, colic, laminitis and tying up diseases.
- NSC is defined as Starch + ESC (simple sugars) or Starch + WSC (simple sugars and fructans).



Nonstructural Carbohydrate Content of Selected Equine Feedstuffs*

Feedstuff	Sugars	Starch	NSC
Oat Hay	16.0%	6.3%	22.1%
Barley Hay	14.9%	5.8%	20.4%
Alfalfa Hay	8.9%	2.5%	11.3%
Bermudagrass Hay	7.5%	6.1%	13.6%
Grass Hay	11.1%	2.9%	13.8%
Alfalfa Pellets	7.2%	2.3%	9.3%
Alfalfa Cubes	8.3%	2.0%	10.2%
Grass Pasture	10.3%	3.4%	12.1%
Rice Bran	6.2%	17.7%	21.2%
Oats	4.8%	44.4%	54.1%
Corn	3.7%	70.3%	73.3%
Barley	6.0%	53.7%	61.7%
Beet Pulp	10.7%	1.4%	12.3%
Wheat Bran	8.3%	22.8%	31.1%
Soybean Hulls	4.3%	1.9%	6.3%
Wheat Middlings	10.1%	26.2%	32.0%
Soybean Meal	14.3%	2.1%	16.2%

*Values are from Equi-Analytical Laboratories, Ithaca, NY, reported on dry matter basis.



Nutrena Horse Feeds and Supplements	Form	Crude Protein (min)	Crude Fat (min)	Crude Fiber (max)	NSC ¹ (max)	DE (kcal/lb) ²
SafeChoice Original	Pelleted	14.0%	7.0%	15.0%	22%	1,350/1,534
SafeChoice Special Care	Pelleted	14.0%	7.0%	15.0%	15%	1,300/1,477
SafeChoice Senior	Pelleted/Extruded	14.0%	8.0%	16.0%	20%	1,250/1,420
SafeChoice Perform	Pelleted	14.0%	9.0%	15.0%	28%	1,400/1,591
SafeChoice Mare & Foal	Pelleted	16.0%	7.0%	15.0%	22%	1,350/1,534
SafeChoice Maintenance	Pelleted	12.0%	5.0%	8.0%	25%	1,200/1,364
ProForce Fuel	Pelleted/Extruded	12.0%	13.0%	10.0%	20%	1,500/1,705
ProForce XTN	Textured	12.0%	12.0%	10.0%	33%	1,550/1,761
ProForce Fiber	Beet Pulp/Textured	12.0%	13.0%	16.0%	20%	1,550/1,705
ProForce Senior	Beet Pulp/Textured	14.0%	11.0%	17.0%	18%	1,450/1,648
Empower Boost	Extruded	12.0%	22.0%	8.0%	26.0%	1,750/1,989
Empower Topline Balance	Pelleted	30.0%	5.0%	8.0%	14.0%	1,200/1,364

Weight Gain/Loss Energetics

- **Weight Gain**

- Feed 6 Mcal or 6,000 kcal DE/day more for 60 days to increase BCS by 1.0 (50 lbs BW)

- One of the following:

- > Feeding rate by 4 lbs/day (1.5 Mcal DE x 4)
- > Hay by 6-8.5 lbs/day (1-0.7 Mcal DE)
- > Grazing by 4-12 hours/day

Pasture Quality:

- Best: 1.5 Mcal DE/hour
- Moderate: 1.0 Mcal DE/hour
- Fair: 0.75 Mcal DE/hour
- Poor: 0.5 Mcal DE/hour
- Dry Lot: 0 Mcal DE/hour

- **Weight Loss**

- Feed 6 Mcal or 6,000 kcal DE/day less for 60 days to decrease BCS by 1.0

- One of the following:

- < Feeding rate by 4 lbs/day
- < Hay by 6-8.5 lbs/day
- < Grazing by 4-12 hours/day

Pasture quality:

- Best: 1.5 Mcal DE/hour
- Moderate: 1.0 Mcal DE/hour
- Fair: 0.75 Mcal DE/hour
- Poor: 0.5 Mcal DE/hour
- Dry Lot: 0 Mcal DE/hour

Equine Digestible Energy (DE) Requirements for Maintenance

<u>Body Weight (lbs)</u>	<u>DE (Mcal)</u>
800	12.1
900	13.6
1000	15.1
1100	16.7
1200	18.1

Digestible Energy (DE) Requirements Above Maintenance at Various Speeds

<u>Gait</u>	<u>Speed</u> <u>(meters/min)</u>	<u>DE</u> <u>(Mcal/kg</u> <u>BW/hr)</u>
Slow Walk	59	0.0017
Fast Walk	95	0.0025
Slow Trot	200	0.0065
Medium Trot	250	0.0095
Fast Trot	300	0.0137
Medium Canter	350	0.0195

Calculating Daily Digestible Energy (DE) Requirements

- Body Weight - 900 lbs (409 kg)
- Maintenance DE = 13.6 Mcal
- Activity DE = Medium trot (250 meters/min) with 165 lb (75 kg) rider/tack for 1 hour = 484 kg (409 kg + 75 kg = 484 kg) X .0095 kcal/kg = 4.6 Mcal DE
- 3 hour ride: $484 \times .0095 \times 3 = 4.6 + 13.6 = 18.2$ Mcal DE
- 5 hour ride: $484 \times .0095 \times 5 = 23 + 13.6 = 36.6$ Mcal DE
- 10 hour ride: $484 \times .0095 \times 10 = 46 + 13.6 = 59.6$ Mcal DE
- **Total DE for 3 hour ride at medium trot = 31.8 Mcal**
(13.6 Mcal + 18.2 Mcal = 31.8 Mcal)

Feeding According to Digestible Energy Expenditure

- Body Weight - 900 lbs (409 kg)
- Maintenance DE = 13.6 Mcal
- Feed according to average weekly activity
- For 900-pound horse:
 - Light activity = 16.31 Mcal DE
 - Moderate activity = 19.03 Mcal DE
 - Heavy activity = 21.7 Mcal DE per day
- Use weekly DE estimation as guide and increase or decrease feed according to body condition

Body Condition Scoring

- **1-3 Poor - Thin**
- **4 Can see ribs, vertebral ridge evident**
- **5 Back flat, can't see ribs, but can feel them**
- **6 Crease down back, fat deposits**
- **7-9 Fleshy - Extremely fat**

Feed to maintain score of 5.0-5.5 for endurance/competitive trail horse



Main Fuels for Performance

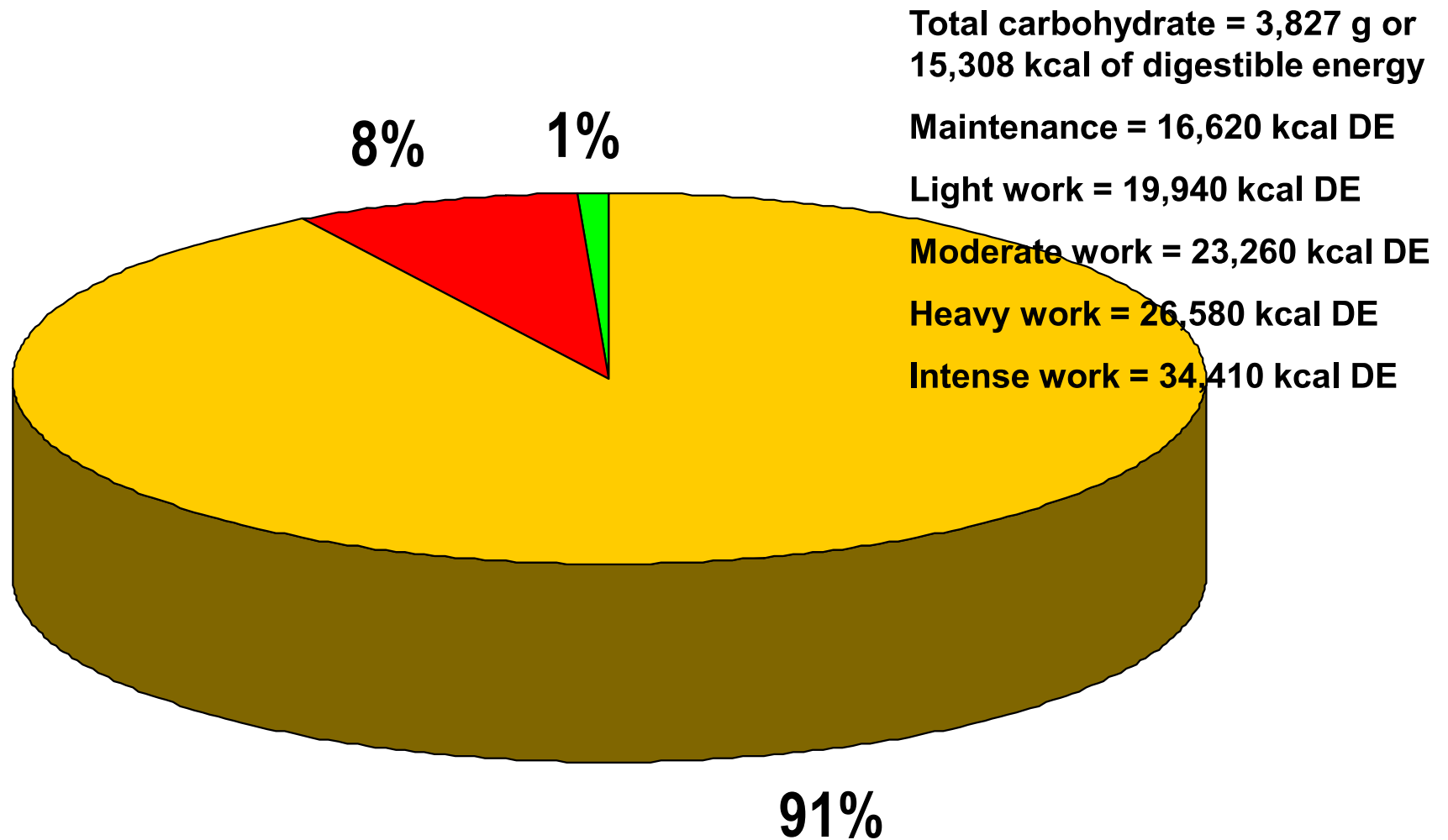
- Glucose in blood
- Glycogen in muscle and liver (stored as glycogen)
- Fatty acids in blood (stored as fat)
- Fat in adipose tissue



Reasons for Fatigue

- Anaerobic Work
 - Lack of energy (glycogen)
 - Lactic acidosis
 - Hyperthermia (high body temp. - 105° F)
- Aerobic Work
 - Dehydration
 - Electrolyte depletion
 - Lack of energy (glycogen or fatty acids)
 - Hyperthermia (high body temp. - 105° F)

Distribution of Carbohydrate Energy in 1,100-Pound Horse

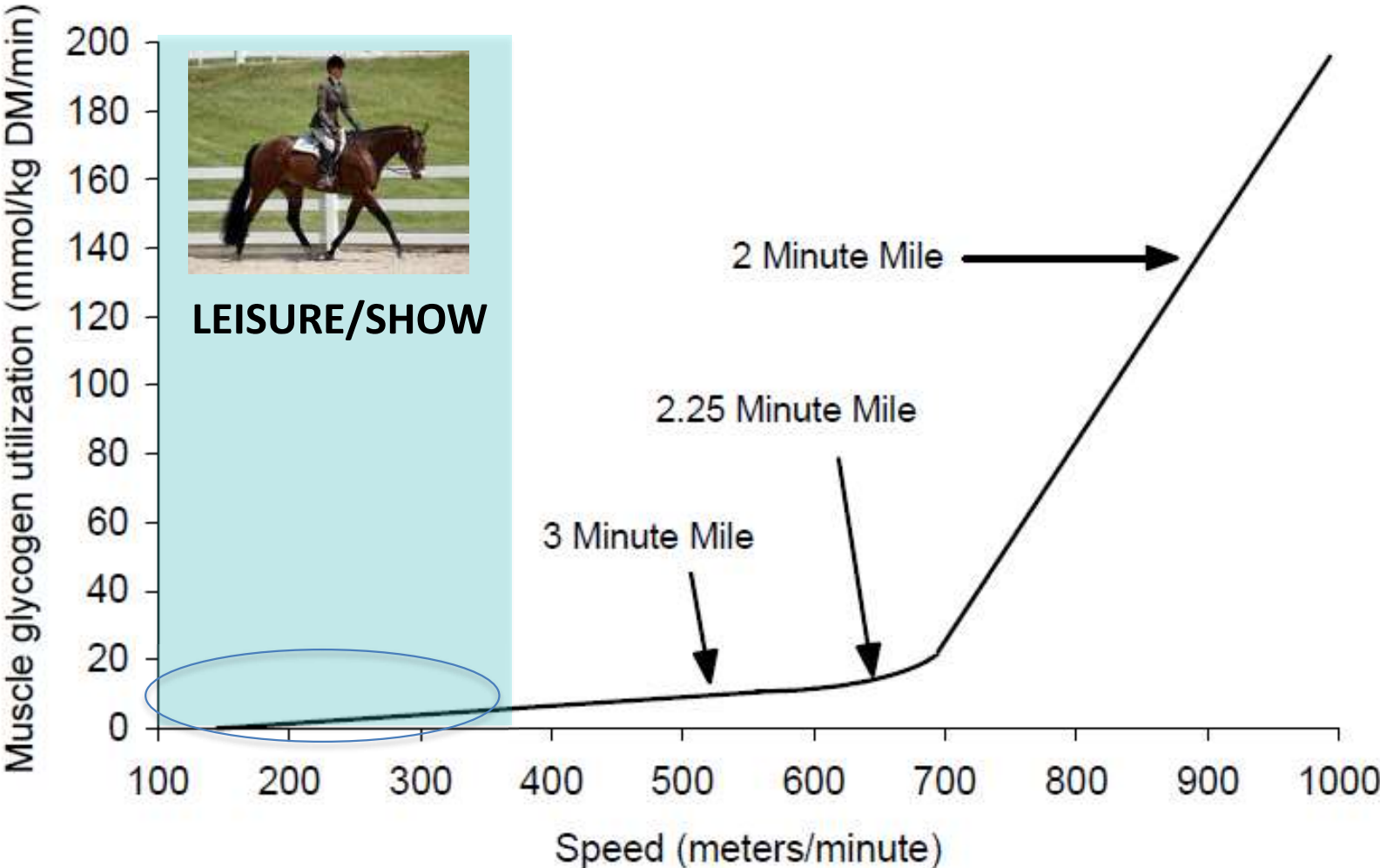


■ Muscle Glycogen ■ Liver Glycogen ■ Plasma Glucose

Muscle Fiber, Metabolism and Fuel Use Due to Work Intensity in the Horse

Work Intensity	Muscle Fiber Type Used	Metabolism	Fuel Used
Light	Slow twitch	Aerobic	Glucose, Fat
Moderate	Fast twitch IIA	Aerobic & Anaerobic	Glucose, Fat
Intense	Fast twitch IIX	Anaerobic	Glucose

Muscle Glycogen Utilization as Function of Speed



Advantages of Feeding Fat

- ↓ Metabolic heat
 - lowers thermal load
- Enhanced stamina
 - shifts anaerobic threshold, less lactate produced
 - spares muscle glycogen, burns fat first
- ↓ Acid production
 - Improves oxygen carrying capacity
- Increased energy density
 - Lower feeding rate
 - Reduced bowel ballast
 - Improved power-to-weight ratio



Why won't he drink?



- “Thirst” caused by
 - lowered blood volume (sweat loss)
 - high sodium concentration in extracellular fluid
- Horses sweat out water AND sodium, so may not get “thirsty” signal!

Electrolytes

- Minerals that function in ionic form in body fluids - muscle contraction, blood pH, fluid balance, nerve function
- Lost in sweat, reserves are in digestive tract - sodium, chloride, potassium, calcium, magnesium
- Loss causes fatigue, muscle weakness and decreased thirst response to dehydration

Electrolytes:

Conduct energy

Regulate fluid balance

Transport nutrients

Support proper muscle function

Support mental function

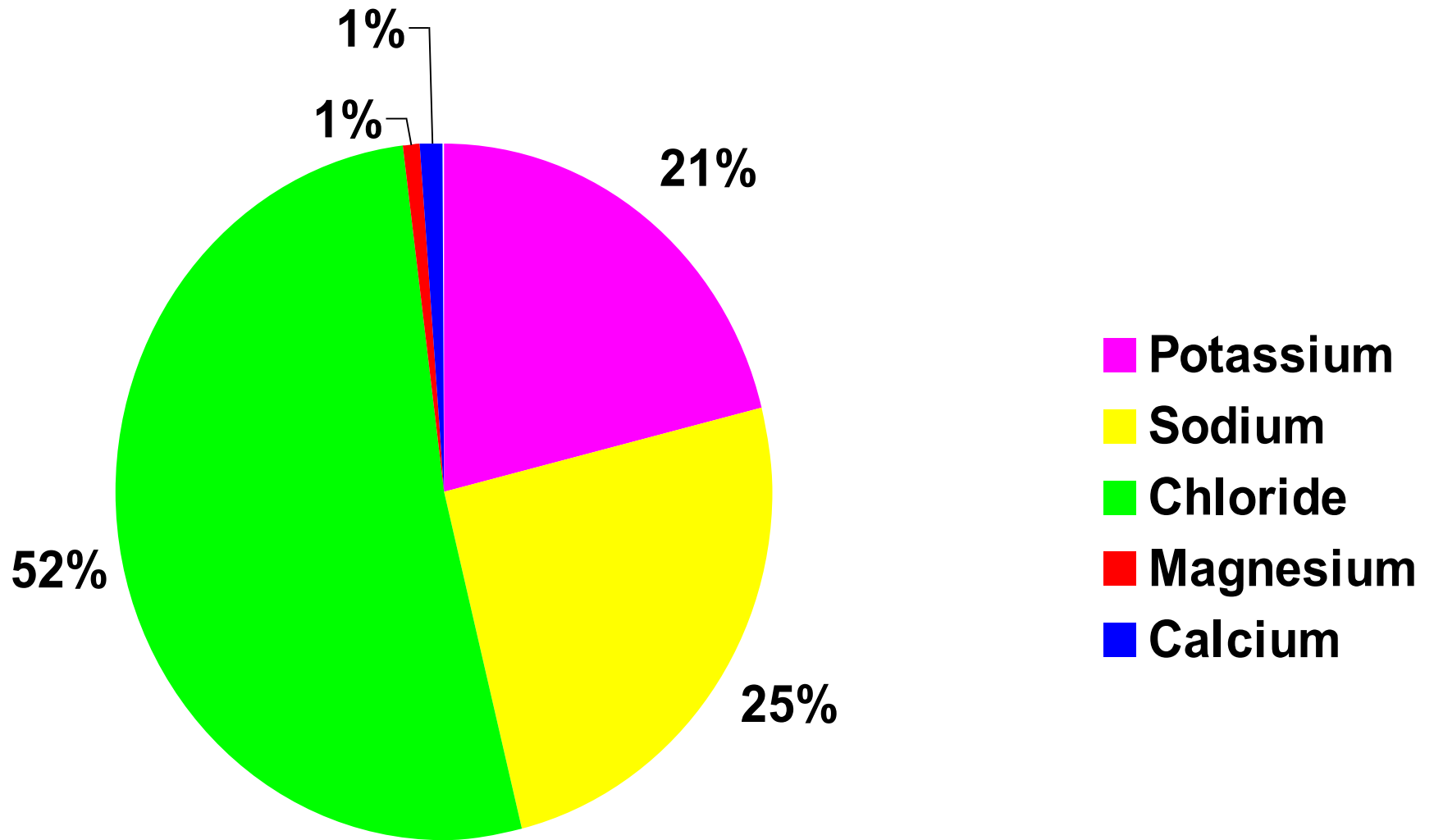
Help convert calories into energy

Regulate pH

And much, much more



Composition of Electrolytes in Equine Sweat



Electrolyte Supplementation

Sodium

Chloride

Potassium

Magnesium

Calcium

Buffer mouth and
gut - ulceration

Problems with
excess?



Electrolyte Selection and Use

Progressive Nutrition Aqua Aide

- Use when traveling or working one or more hours/day
- Helps replenish electrolyte losses for performance horses
- Increases water intake
- Delays onset of fatigue and improves recovery time
- Can be top-dressed on feed or mixed in water
 - Mixed in water
 - 4 scoops per gallon of water and provide free-choice to horses after exercise
 - Top-dressed in feed
 - 1 hour/day of work: 1 scoop
 - 1-3 hours/day of work: 2 scoops
 - Over 3 hours/day of work: 3 scoops



Relationship of Fiber and Water

- Equine digestive tract can hold enough fiber and water to equal 25% of horse's body weight
- Horses on high fiber diet have 75% more water and 33% more electrolytes in digestive tract than horses on low fiber diet
- High fiber diet provides more water and electrolytes and maintains blood flow to digestive system during exercise - prevention of colic, increased absorption of water, electrolytes and VFA



Feeding Recommendations for Competitive Trail/Endurance Horses

%BW

%BW

% of Diet

% of Diet

Forage

Grain

Forage

Grain

1.5-2.0

0.5-0.75

60-75

25-33

Summary: Feeding to Increase stamina and prevent fatigue

- Feed a high fat feed and/or fat supplement (goal is dietary fat level of 5% or more) to spare muscle glycogen and increase fatty acid metabolism
- Provide sufficient protein for amino acids for muscle repair (requires a ration balancer for low feeding rates)
- Feed more starch and sugar as speed work increases to provide more glycogen to muscles
- Provide electrolytes to insure proper sweating, water intake and muscle function
- Feed enough hay (fiber) to maintain proper gut function and maintain water and electrolyte reserve

High Fat Feeds for Endurance Horses



10% Fat



12% Fat



13% Fat



11% Fat

NSC Values of High Fat Feeds for Endurance Horses



Max. 20%



Max. 33%



Max. 20%



Max. 18%

Diet Balancer for Endurance Horses

(minimum feeding rate of 1 lbs/day)



Fat Supplement for Endurance Horses



22% Fat

Daily Feeding Program for 900-Pound Endurance Horse at Moderate Activity

- ProForce Fuel, Fiber or Senior: 3 lbs/day
- Empower Boost: 1.5 lbs/day
- Empower Topline Balance: 1 lbs/day
- Grass Hay: min. 14 pounds/day
- Dietary Fat Level: $\geq 5\%$
- Electrolytes: 2 ounces salt or 4 ounces electrolytes
- If more body condition is desired, increase amount of feed only
- If more speed work, switch to ProForce XTN

Nutrena Horse Feeding Guide

Type of Horse or Condition	Recommended Feed or Supplement
Older Horse (over 20 years of age) – feed senior feed and processed forage	SafeChoice Senior, ProForce Senior
Equine Cushing’s Disease - requires low NSC feed and forage	SafeChoice Senior, ProForce Senior, SafeChoice Special Care
Equine Metabolic Syndrome - requires low NSC feed and forage	SafeChoice Senior, SafeChoice Special Care
Tying Up Diseases (Type 1 and 2 PSSM and RER) – requires low NSC feed and forage	SafeChoice Senior, ProForce Senior, SafeChoice Special Care, ProForce Fuel, ProForce Fiber
Lay Up, Easy Keepers, Insulin Resistant, Growing Horses with Physitis or DOD, Miniature Horses and Ponies - feed limited amounts of feed and forage	Empower Topline Balance
Foals and Growing Horses, Pregnant Broodmares, Breeding Stallions and Lactating Mares	SafeChoice Mare & Foal
Show and Performance Horses - calm, focused behavior and stamina required	ProForce Senior, ProForce Fuel, ProForce Fiber
Show and Performance Horses – speed and stamina required	SafeChoice Perform, ProForce XTN
Weight Gain - add fat supplement in addition to feed	Empower Boost
Lack of Muscle or Topline - low feeding rate or low protein forage requires addition of diet balancer with feed for more amino acids to build muscle mass	Empower Topline Balance

Feeding horses can be scary!

We can help! Come to our websites at www.nutrenaworld.com and www.prognutrition.com.



Email me at marty_adams@cargill.com.

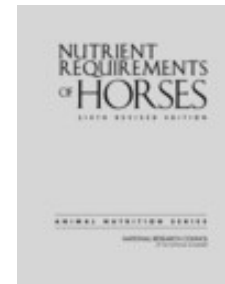
Energy for the Horse

Marty Adams, PhD, PAS

Unit of Energy = CALORIE

- **calorie (cal)** = heat required to increase the temperature of 1 g water 1°C (from 14.5 to 15.5°)
- **1 kilocalorie (kcal or Cal)** = 1,000 calories
 - Used to express “calories” in human food and horses, gross energy for human foods, digestible energy for horse feedstuffs
- **1 Megacalorie (Mcal)** = 1,000 kcal = 1,000,000 cal
 - Used for horses

Estimation of Digestible Energy (DE) Requirements for Mature Horse (500 kg/1100 lb)



- NRC¹⁹⁸⁹ Nutrient Requirements of Horses - 16.4 Mcal DE for maintenance – one value.
- NRC²⁰⁰⁷ has three digestible energy requirements for maintenance:
 - 1) NRC²⁰⁰⁷ - 15.2 Mcal DE no work, minimum - Horses and ponies in confinement or sedentary lifestyle, also draft breeds
 - 2) NRC²⁰⁰⁷ - 16.7 Mcal DE no work, average - Horses with moderate voluntary activity - 10% over NRC²⁰⁰⁷ no work, minimum
 - 3) NRC²⁰⁰⁷ - 18.2 Mcal DE no work, elevated - Horses with nervous temperaments and high level of voluntary activity - 20% over NRC²⁰⁰⁷ no work, minimum

DE Requirements (Mcal/day)

CLASS OF HORSE	400 kg	500 kg	600 kg
Maintenance <small>no work, minimum</small>	12.1	15.2	18.2
Maintenance <small>no work, average</small>	13.3	16.7	20.0
Maintenance <small>no work, elevated</small>	14.5	18.2	21.8
Light work	16.0	20.0	24.0
Moderate work	18.6	23.3	28.0
Heavy work	21.3	26.6	32.0
Intense work	27.6	34.5	41.4

NRC Requirements Calculator: <http://nrc88.nas.edu/nrh/>

Exercise Categories for NRC²⁰⁰⁷ Digestible Energy Requirements



Exercise Category	Mean Heart Rate	Description	Types of Events
Light	80 bpm	1-3 hr/wk	Recreational and show riding
Medium	90 bpm	3-5 hr/wk	School and show riding, polo, training, breaking
Heavy	110 bpm	4-5 hr/wk	Ranch work, polo, show, race training, upper level dressage, reining
Intense	110-150 bpm	1 hr/wk speed work or 6-12 hr/wk slow work	Racing (all types), 3-day eventing, endurance

NUTRITIONAL MANAGEMENT OF THE ENDURANCE HORSE



Marty Adams, PhD, PAS
Equine Nutritionist
Marty_Adams@cargill.com



Energy or Calories for the Horse

- Dietary energy is expressed in terms of kilocalories (kcal or 1,000 calories) or megacalories (Mcal or 1,000,000 calories) of digestible energy
- Digestible energy (DE) refers to the amount of total energy in the diet that is actually absorbed by the horse (more accurate food values than for humans, which is only gross energy)
- Digestible Energy = Gross Energy – Fecal Energy

Digestible Energy Requirements

(Mcal/day)*

CLASS OF HORSE	400 kg	500 kg	600 kg
Maintenance <small>no work, minimum</small>	12.1	15.2	18.2
Maintenance <small>no work, average</small>	13.3	16.7	20.0
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Intense work	27.6	34.5	41.4

Nutrient Requirements of Horses, Sixth Revised Edition. 2007.

Quality Estimates for Types of Hay for Horses¹

	High Quality	Average Quality	Low Quality
Legume			
Crude Protein (%)	18-23	16-17	<15
Acid Detergent Fiber (%)	<35	38-42	>42
Neutral Detergent Fiber (%)	<55	58-62	>62
Digestible Energy (Kcal/lb)	1200-1000	1000-900	<900
Mixed			
Crude Protein (%)	15-18	11-14	<10
Acid Detergent Fiber (%)	<38	40-42	>45
Neutral Detergent Fiber (%)	<58	60-62	>65
Digestible Energy (Kcal/lb)	1000-950	950-850	<850
Grass			
Crude Protein (%)	12-14	8-11	Below 7%
Acid Detergent fiber (%)	<40	40-45	>45
Neutral Detergent Fiber (%)	<60	60-65	>65
Digestible Energy (Kcal/lb)	950-900	900-850	800 or less
Estimated Daily Intake (% of body weight)	2.0-2.5	1.5-2.0	1.0-1.5

¹Values are expressed on 100% dry matter basis.

Effects of Nonstructural Carbohydrates or NSC

- Dietary nonstructural carbohydrates or NSC (starch and sugar) are causal factors for excitable behavior, insulin resistance, colic, laminitis and tying up diseases.
- NSC is defined as Starch + ESC (simple sugars) or Starch + WSC (simple sugars and fructans).



Nonstructural Carbohydrate Content of Selected Equine Feedstuffs*

Feedstuff	Sugars	Starch	NSC
Oat Hay	16.0%	6.3%	22.1%
Barley Hay	14.9%	5.8%	20.4%
Alfalfa Hay	8.9%	2.5%	11.3%
Bermudagrass Hay	7.5%	6.1%	13.6%
Grass Hay	11.1%	2.9%	13.8%
Alfalfa Pellets	7.2%	2.3%	9.3%
Alfalfa Cubes	8.3%	2.0%	10.2%
Grass Pasture	10.3%	3.4%	12.1%
Rice Bran	6.2%	17.7%	21.2%
Oats	4.8%	44.4%	54.1%
Corn	3.7%	70.3%	73.3%
Barley	6.0%	53.7%	61.7%
Beet Pulp	10.7%	1.4%	12.3%
Wheat Bran	8.3%	22.8%	31.1%
Soybean Hulls	4.3%	1.9%	6.3%
Wheat Middlings	10.1%	26.2%	32.0%
Soybean Meal	14.3%	2.1%	16.2%

*Values are from Equi-Analytical Laboratories, Ithaca, NY, reported on dry matter basis.

LEGENDS

Legends Horse Feeds & Supplements	Form	Crude Protein (min)	Crude Fat (min)	Crude Fiber (max)	NSC¹ (max)	DE (kcal/lb)²
Legends CarbCare Show & Pleasure	Pelleted	12.0%	6.0%	18.0%	20%	1,350/1,534
Legends CarbCare Senior	Pelleted/Extruded	14.0%	7.0%	18.0%	20%	1,375/1,563
Legends CarbCare Performance	Pelleted/Extruded	12.0%	10.0%	18.0%	20%	1,550/1,761
Legends CarbCare Balancer Pellet	Pelleted	28.0%	28.0%	12.0%	14%	1,200/1,364
Legends Race & Compete	Beet Pulp/Textured	12.0%	8.0%	12.0%	30%	1,450/1,648
Legends Sport Horse	Textured	12.0%	6.0%	12.0%	41%	1,400/1,591
Legends Sport Horse Plus	Textured	12.0%	10.0%	12.0%	39%	1,600/1,818
Legends Growth	Textured	14.0%	6.0%	12.0%	30%	1,400/1,591
Legends Growth	Pelleted	14.0%	6.0%	15.0%	30%	1,375/1,563
Legends Fortified Pelleted Rice Bran	Extruded/Pelleted	12.0%	18.0%	13.0%	NA	1,500/1,705
Legends Omega Plus	Extruded Nugget	12.0%	25.0%	10.0%	NA	1,800/2,046
Legends GastroCare Supplement	Pelleted	12.0%	3.5%	12.0%	NA	1,100/1,250
Legends EquiMin Bag	Granular	NA	NA	NA	NA	NA
Legends EquiMin Block	Block	NA	NA	NA	NA	NA

¹NSC or Nonstructural Carbohydrates is defined as NSC = Starch + ESC (ethanol soluble carbohydrates) or simple sugars and listed as “Dietary Starch” and “Sugars” under guaranteed analysis.

² Average values listed on “as fed basis” and “dry matter basis”, respectively.

Weight Gain/Loss Energetics

- **Weight Gain**

- Feed 6 Mcal or 6,000 kcal DE/day more for 60 days to increase BCS by 1.0 (50 lbs BW)

- One of the following:

- > Feeding rate by 4 lbs/day (1.5 Mcal DE x 4)
- > Hay by 6-8.5 lbs/day (1-0.7 Mcal DE)
- > Grazing by 4-12 hours/day

Pasture Quality:

- Best: 1.5 Mcal DE/hour
- Moderate: 1.0 Mcal DE/hour
- Fair: 0.75 Mcal DE/hour
- Poor: 0.5 Mcal DE/hour
- Dry Lot: 0 Mcal DE/hour

- **Weight Loss**

- Feed 6 Mcal or 6,000 kcal DE/day less for 60 days to decrease BCS by 1.0

- One of the following:

- < Feeding rate by 4 lbs/day
- < Hay by 6-8.5 lbs/day
- < Grazing by 4-12 hours/day

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- Poor: 0.5 Mcal DE/hour
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Equine Digestible Energy (DE) Requirements for Maintenance

<u>Body Weight (lbs)</u>	<u>DE (Mcal)</u>
800	12.1
900	13.6
1000	15.1
1100	16.7
1200	18.1

Digestible Energy (DE) Requirements Above Maintenance at Various Speeds

<u>Gait</u>	<u>Speed</u> <u>(meters/min)</u>	<u>DE</u> <u>(Mcal/kg</u> <u>BW/hr)</u>
Slow Walk	59	0.0017
Fast Walk	95	0.0025
Slow Trot	200	0.0065
Medium Trot	250	0.0095
Fast Trot	300	0.0137
Medium Canter	350	0.0195

Calculating Daily Digestible Energy (DE) Requirements

- Body Weight - 900 lbs (409 kg)
- Maintenance DE = 13.6 Mcal
- Activity DE = Medium trot (250 meters/min) with 165 lb (75 kg) rider/tack for 1 hour = 484 kg (409 kg + 75 kg = 484 kg) X .0095 kcal/kg = 4.6 Mcal DE
- 3 hour ride: $484 \times .0095 \times 3 = 4.6 + 13.6 = 18.2$ Mcal DE
- 5 hour ride: $484 \times .0095 \times 5 = 23 + 13.6 = 36.6$ Mcal DE
- 10 hour ride: $484 \times .0095 \times 10 = 46 + 13.6 = 59.6$ Mcal DE
- **Total DE for 3 hour ride at medium trot = 31.8 Mcal**
(13.6 Mcal + 18.2 Mcal = 31.8 Mcal)

Feeding According to Digestible Energy Expenditure

- Body Weight - 900 lbs (409 kg)
- Maintenance DE = 13.6 Mcal
- Feed according to average weekly activity
- For 900-pound horse:
 - Light activity = 16.31 Mcal DE
 - Moderate activity = 19.03 Mcal DE
 - Heavy activity = 21.7 Mcal DE per day
- Use weekly DE estimation as guide and increase or decrease feed according to body condition

Body Condition Scoring

- **1-3 Poor - Thin**
- **4 Can see ribs, vertebral ridge evident**
- **5 Back flat, can't see ribs, but can feel them**
- **6 Crease down back, fat deposits**
- **7-9 Fleshy - Extremely fat**

Feed to maintain score of 5.0-5.5 for endurance/competitive trail horse



Main Fuels for Performance

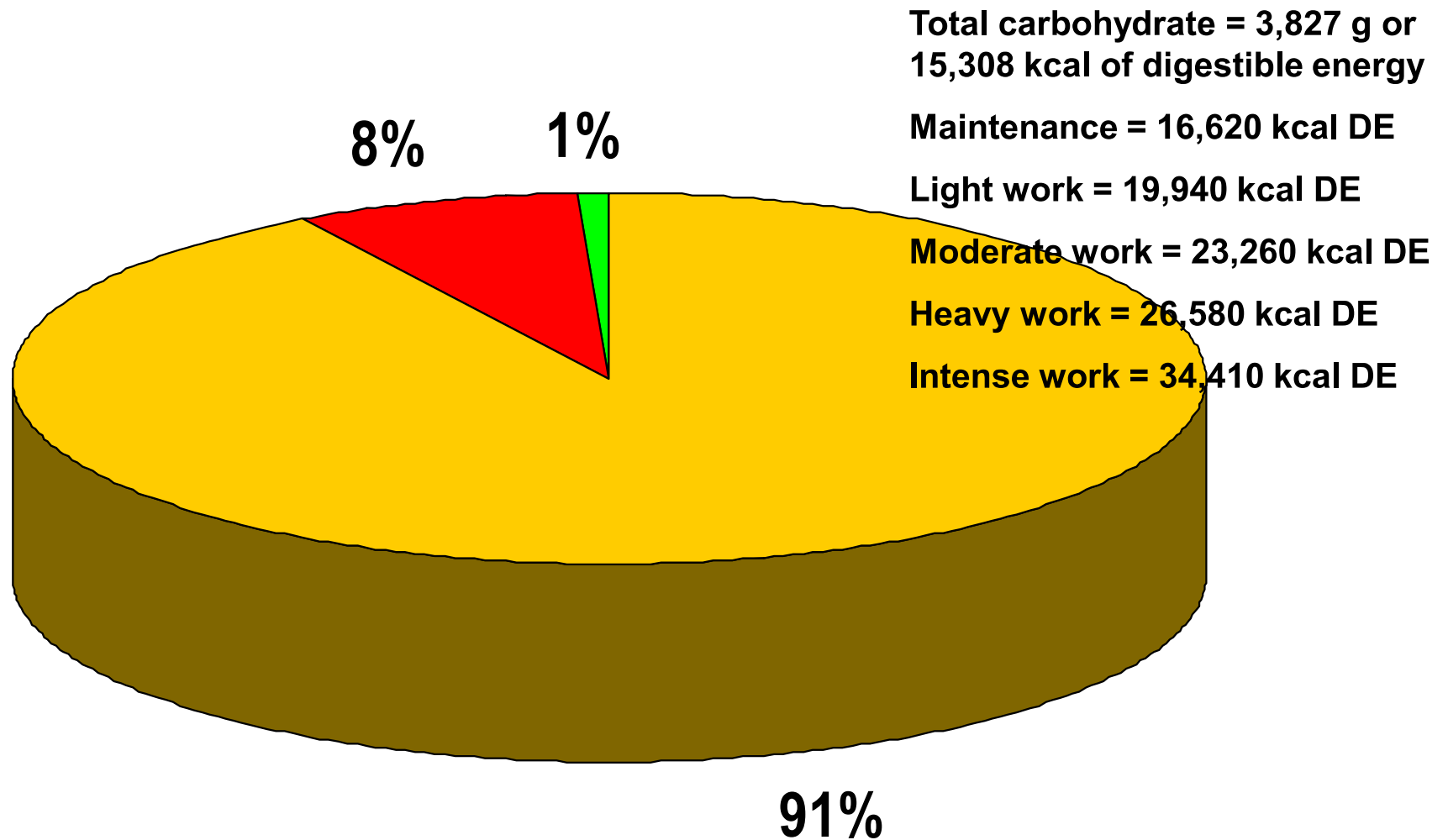
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 - Hyperthermia (high body temp. - 105° F)
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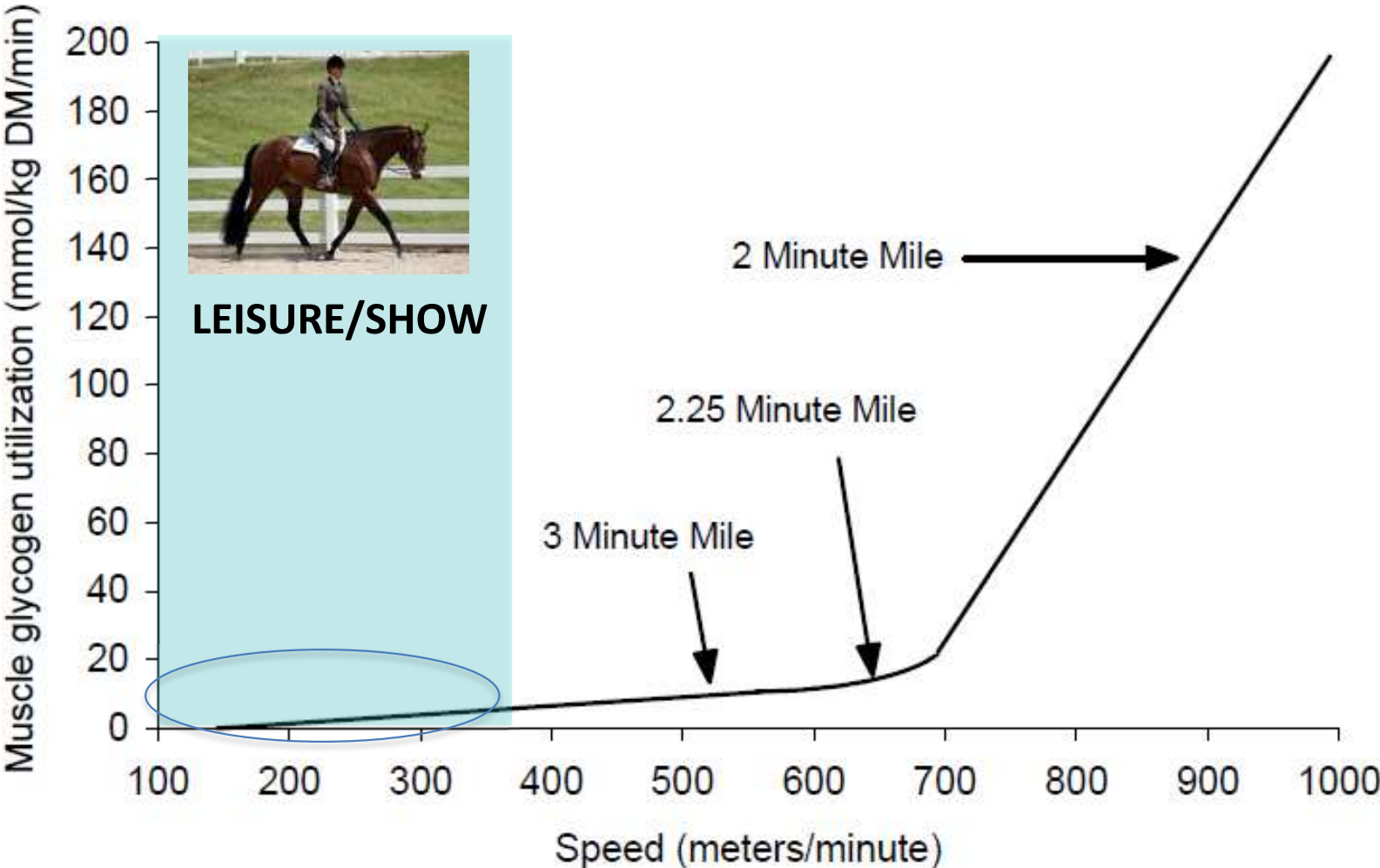


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Regulate fluid balance

Transport nutrients

Support proper muscle function

Support mental function

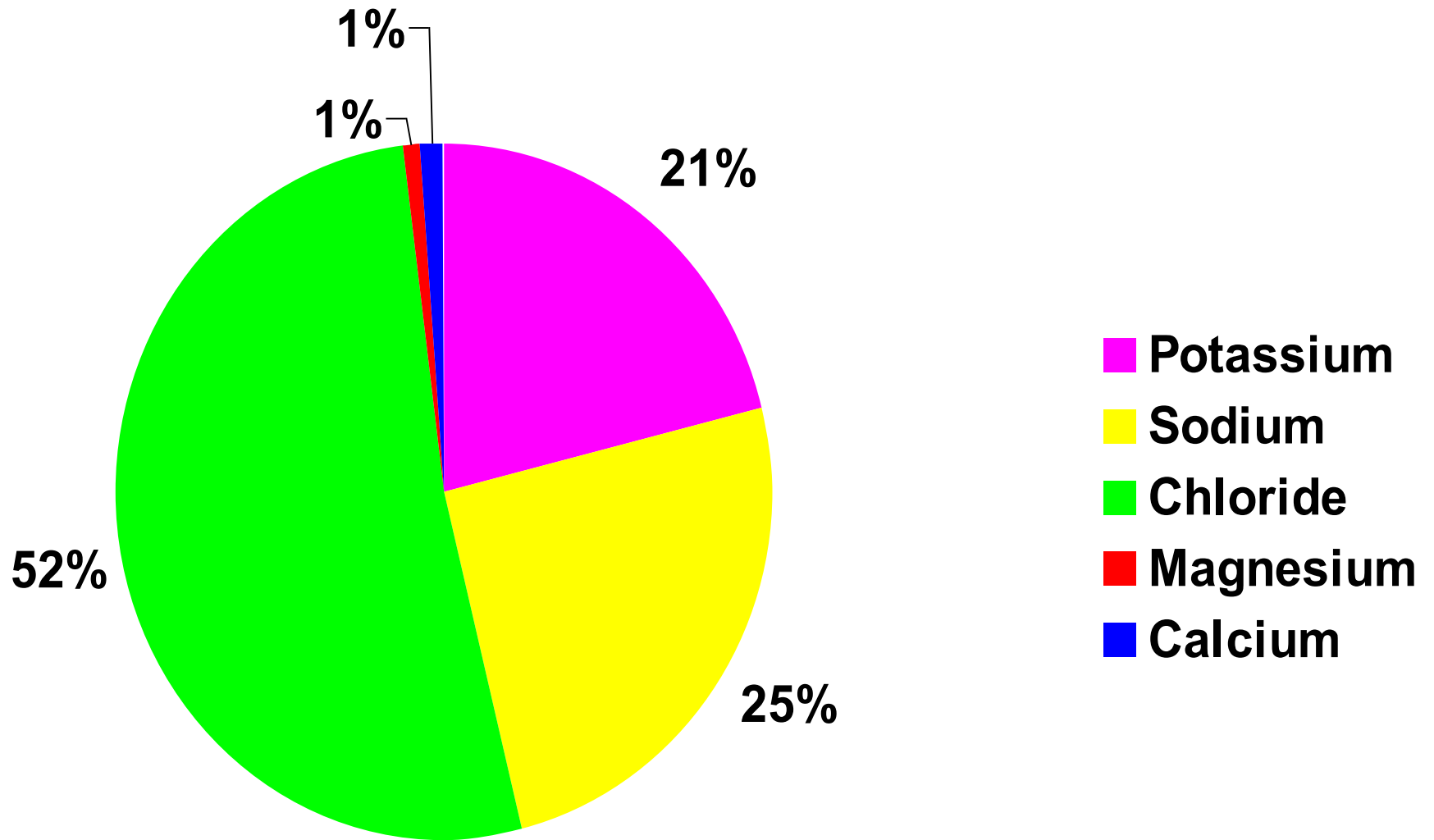
Help convert calories into energy

Regulate pH

And much, much more



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Chloride

Potassium

Magnesium

Calcium

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Forage

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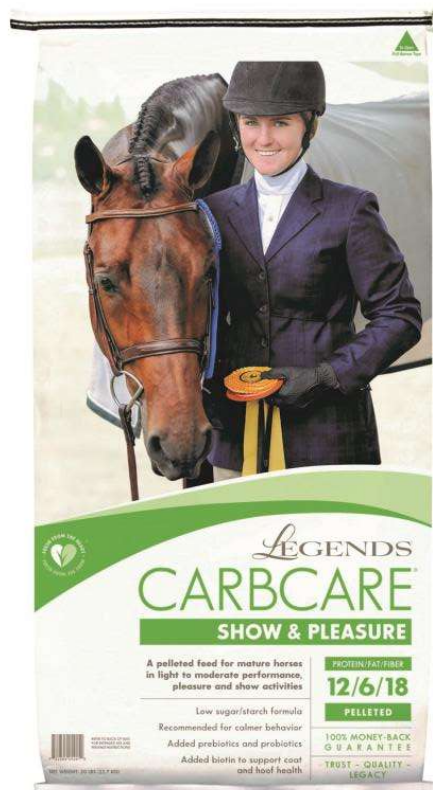
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25-33

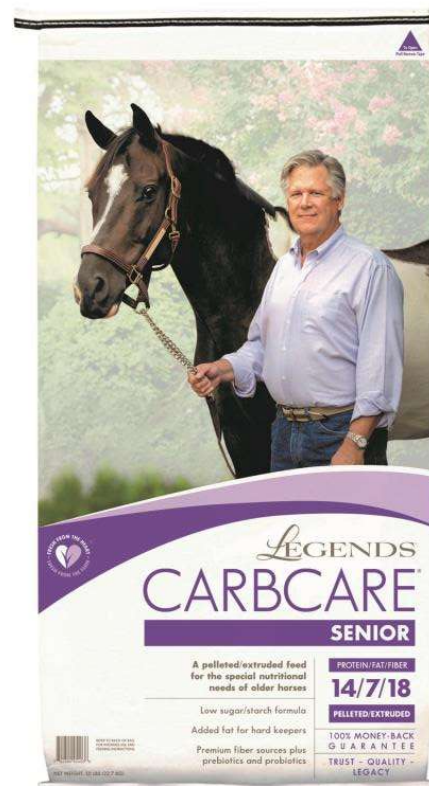
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- Feed enough hay (fiber) to maintain proper gut function and maintain water and electrolyte reserve

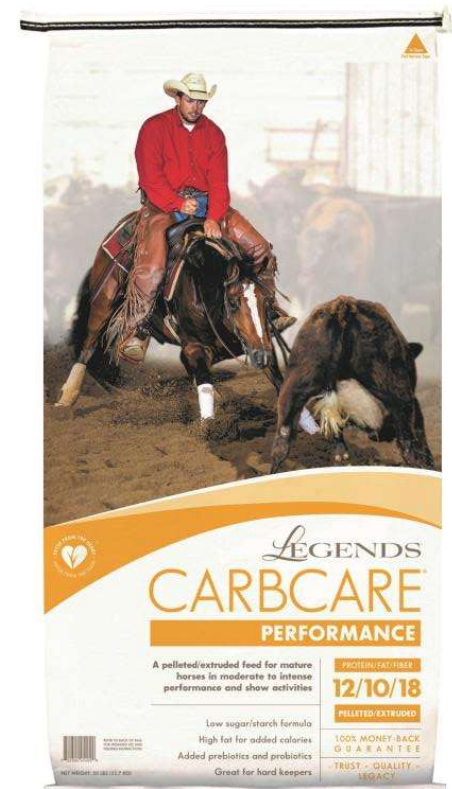
Low NSC Feeds for Endurance Horses



Max. 20% NSC

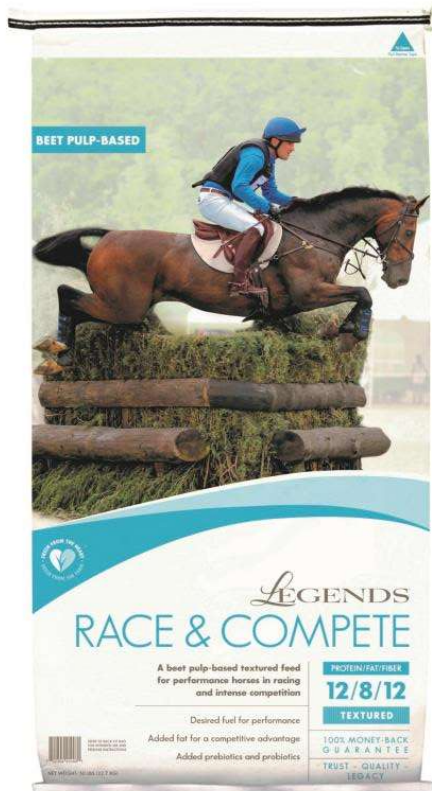


Max. 20% NSC

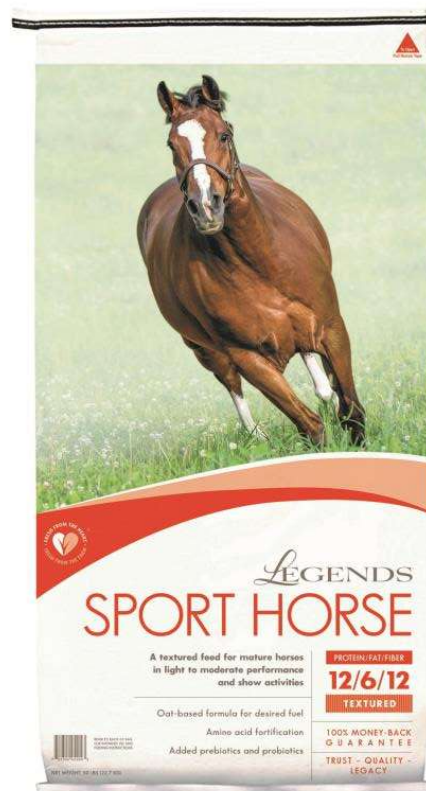


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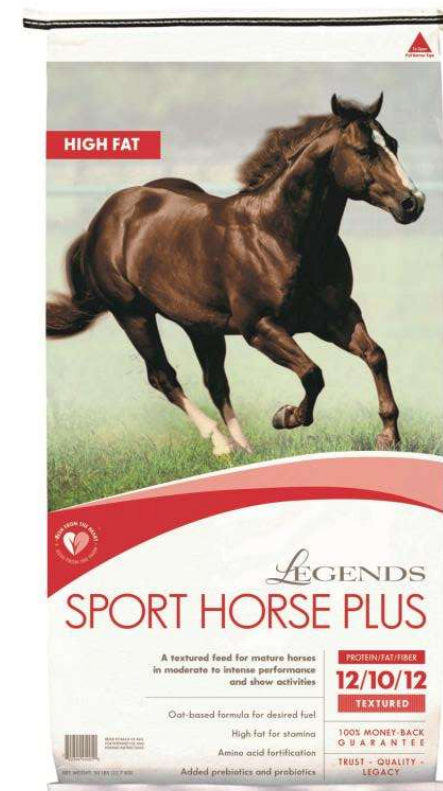
Moderate NSC Feeds for Endurance Horses



Max. 30% NSC



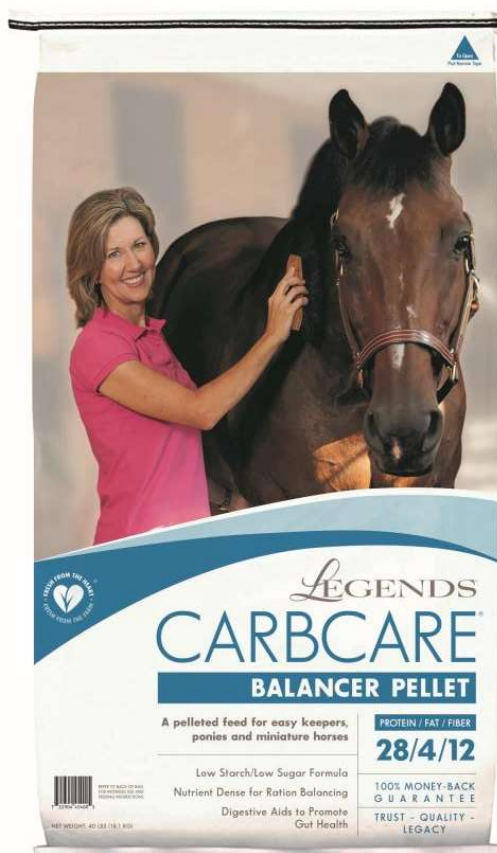
Max. 41% NSC



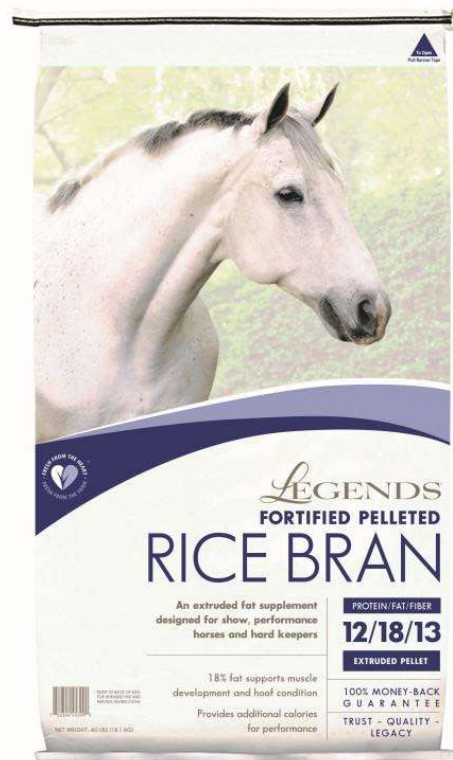
Max. 39% NSC

Diet Balancer for Endurance Horses

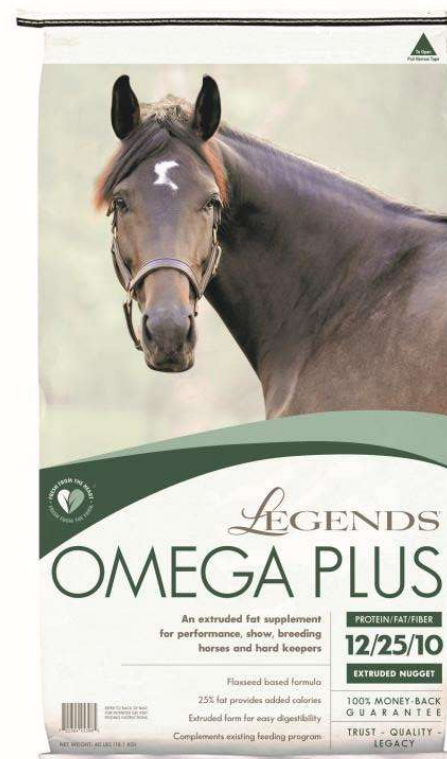
(minimum feeding rate of 1 lbs/day)



Fat Supplements for Endurance Horses



18% Fat



25% Fat

Daily Feeding Program for 900-Pound Endurance Horse at Moderate Activity

- Legends CarbCare Performance/Senior/Show & Pleasure: 3 lbs/day
- Legends Omega Plus or Pelleted Rice Bran: 1.5 lbs/day
- Legends CarbCare Balancer Pellet: 1 lbs/day
- Grass Hay: min. 14 pounds/day
- Dietary Fat Level: $\geq 5\%$
- Electrolytes: 2 ounces salt or 4 ounces electrolytes
- If more body condition is desired, increase amount of feed only
- If more speed work, switch to Legends Sport Horse Plus/Sport Horse/Race & Compete

Legends Horse Feeding Guide

Type of Horse or Condition	Recommended Horse Feed or Supplement
Older Horse (over 20 years of age) – feed senior feed and processed forage	Legends CarbCare Senior
Equine Cushing’s Disease - requires low NSC feed and forage	Legends CarbCare Senior, Legends CarbCare Show & Pleasure
Equine Metabolic Syndrome - requires low NSC feed and forage	Legends CarbCare Senior, Legends CarbCare Show & Pleasure, Legends CarbCare Performance
Tying Up Diseases (Type 1 and 2 PSSM and RER) – requires low NSC feed and forage	Legends CarbCare Senior, Legends CarbCare Performance
Lay Up, Easy Keepers, Insulin Resistant, Growing Horses with Physitis or DOD, Miniature Horses and Ponies - feed limited amounts of feed and forage	Legends CarbCare Balancer Pellet
Foals and Growing Horses, Pregnant Broodmares, Breeding Stallions and Lactating Mares	Legends Growth
Show and Performance Horses - calm, focused behavior and stamina required	Legends CarbCare Show & Pleasure, Legends CarbCare Performance
Show and Performance Horses - speed and stamina required	Legends Sport Horse, Legends Race & Compete, Legends Sport Horse Plus
Weight Gain - add fat supplement in addition to feed	Legends Fortified Pelleted Rice Bran, Legends Omega Plus
Digestive Issues including Gastric Ulcers	Legends GastroCare Supplement
Additional Nutrient Supplementation of Growing and Pregnant Horses, Mature Horses for Coat and Hoof Improvement and Horses on Pasture Receiving Little or No Grain	Legends EquiMin Bag and Block
Lack of Muscle or Topline - low feeding rate or low protein forage requires addition of diet balancer with feed for more amino acids to build muscle mass	Legends CarbCare Balancer Pellet

Feeding horses can be scary!

We can help! Come to our websites at www.legendshorsefeed.com and www.prognutrition.com.



Email me at marty_adams@cargill.com.

Proper Pacing
Never Hurry, Never Tarry

Thank you to those who joined the first webinar in the SERA 100 Mile Mentor series. For those who missed the webinar, we have posted the webinar with the audio and all visuals on SERA website. See www.seraonline.org and click on 100 Mile Mentor Project to access. The charts are also posted separately.

People who just want to listen to the audio over a phone connection can:

Dial (605) 475-4970

Enter Access Code 929007 #

Enter Reference Code 10 #

From a pacing standpoint, I believe the three most important actions that a rider should take to ensure success in a 100 mile ride:

- Never hurry, never tarry. That is, never go faster than your horse's comfortable working gaits and never waste time by going too slow. In particular, do not walk unless the terrain and weather is so challenging that walking is necessary. Note that for the Hunting for Big Foot ride, this means using a steady trot after dark since all riders will need to do considerable riding at night.
- Be conservative in the first loop. Do the first loop at a moderately easy pace so your horse relaxes and saves energy for the second half of the ride. Do not be part of a mass start of excited horses. If necessary, wait a few minutes and go out in a small group or alone. Most front running fast horses do not finish 100s.
- Train yourself mentally and physically to maintain the pace. I have seen many riders who are tired and walk their horses when the horses are doing fine. The rider thinks the horse is tired because the rider is tired. You must keep your energy up through proper nutrition, hydration, personal electrolytes and mental discipline.

Here is a simple example of the value of maintaining a simple pace.

Consider two riders who both go two miles:

- Rider A's horse does a 7.5 minute a mile trot for two miles, a typical easy working trot.
- Rider B's horse does a moving hand gallop at 5 minutes a mile for 1 mile, and then a strong working walk at 15 minutes for 1 mile.

Rider A will do the two miles in 15 minutes.

Rider B will do the two miles in 20 minutes.

Moreover, Rider A's horse will probably have a cooler body temperature and have used fewer total heart beats over the two miles.

Over 100 miles, Rider A will finish over 4 hours ahead of rider B!

I also recommend that you start training with a pulse monitor so you learn what the paces of your horse's comfortable working gaits and the corresponding heart rates. Training with a heart monitor really increases your awareness of pace and your horse. We will have a separate webinar on use of the pulse monitor.

We have also posted a AERC-I webinar from last year that I did: "Preparing to Perform Well as a Specific Endurance Competitions—Using Planning for a Certificate of Capability at Biltmore as an Example". Here is a description of that webinar:

The properly prepared rider analyzes the topography, footing, likely weather conditions including extremes, and past ride results if available in preparing for and setting goals for a specific ride. This webinar will use the Biltmore Challenge 100 as an example of how to analyze, train, and prepare for a specific ride including shoeing, planned pace for the ride given the rider's goal, etc. The pace planned in the example will be the Certificate of Capability pace of 14 km/hour.

Before the webinar, participants are encouraged to find

- i) information about the trail on the Biltmore Endurance website (www.biltmoreendurance.com);
- ii) information about the likely weather at <https://www.usclimatedata.com/climate/asheville/north-carolina/united-states/usnc0022>;
- iii) information about past results at www.aerc.org.

The webinar will be hosted by Stagg Newman. Stagg has completed over 50 1-day 100s with over 20 wins including 33 100s on his horse Ramegwa Drubin. He and his horse Jayel Super won and earned Best Condition at the Biltmore Challenge 100 three times. Stagg has finished first 6 times in the Old Dominion 100 including five times on Jayel Super.

Best of luck as you prepare for your riding season and hopefully for doing the 100 at the Hunting for Big Foot Ride. Please feel free to contact me with questions.

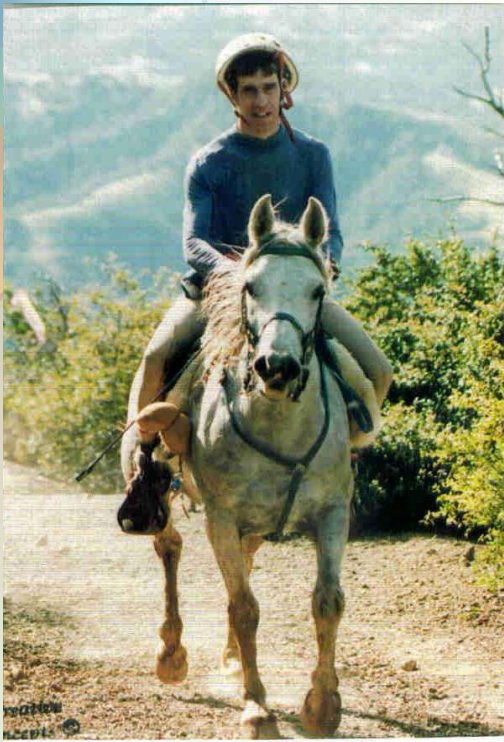
Stagg Newman
202-669-3248
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Proper Pacing

“Never Hurry, Never Tarry”

Stagg Newman

stagg@pisgahvu.com, 202-669-3248



Quiz

- The finishing rate for the 2001 and 2003 Biltmore Challenge 100 was just over 40%. What % of riders at the Biltmore 100 in 2001 and 2003 in the top ten coming into the first check point finished?
- Did the winner of the Biltmore 2001 and 2003 come into the first check point in the first ten, second ten, or third ten?
- The fourth check point at the Biltmore Challenge is over 70 miles from the start. Over the last ten years, what % of the riders who came into the fourth check point after dark finished the ride?
- At the 2018 National Championship 48% completed. What was the finishing % among the first 20 riders into the first check point?
- What was the finishing % among the next 12 riders?
- What was the finishing % among the remaining riders?
- How many heart beats will it take your horse to walk a mile, trot a mile, or cantor a mile?

Before we start - acknowledgements

- Thank mentors, particularly Maggie, Kerry, Jeannie, Matthew, John, Ann, Jeff, Cheryl, ...
- And partners, Drubin, Super, Winston, Jake, Tanka, and Cheryl
- I hope take away some of new insights and lots more questions!



**Maggie Price, mentor and AERC President on Annie and Stag on Drubin,
1993 North American Championship**

Outline

- ***Know***
 - Your horse
 - Your self
 - The Course
- **The Ride**
 - Pre-ride training and conditioning
 - Pre-ride planning
 - Riding the loops in the competition



Know Your Horse

1. Heart Rate at Working Paces

- Walk, Trot, Canter

2. Ability to Handle Terrain

- Uphill or downhill horse
- Sand, good footing, or rocks

3. Ability to Handle Weather

- Hot weather or cold weather horse
- Humid or arid

4. Mental Attitude

- Hot headed or cool
- Leader or follow
- Groupie or loner

- Avoid over heating

- Avoid excessive anaerobic work

- *Ride to your horse's capability*

➤ Recommendation: Heart Rate Monitor

I ride my horse as fast I think he can go that day and no faster. The other horses in the ride have nothing to do with it (my pace).

Heart Beats to Go a Mile

	Heart Rate	Time	Number of Heart Beats
Walk	70-90 (80)	15 minutes	1200
Trot	100-125 (110)	7 minutes	770
Canter	100-130 (110)	5.5 minutes	605

The walk is the least efficient gait. The spring system is not engaged.

Never Hurry, Never Tarry

Know Yourself

1. Riding in rhythm, balance, and alignment
2. Physical Fitness
 - Endurance
 - Flexibility
 - Strength
 - Ability to Handle Weather
 - Hot weather or cold weather horse
 - Humid or arid
3. Mental Discipline
 - You dictate pace
 - Food, fluids, and electrolyte balance for you
 - Pain tolerance

A tired rider makes a tired horse

Know The Course

1. Terrain

- Footing
- Elevation Change
- Ask ride manager for
 - Maps
 - profiles
 - footing

2. Weather

- Temperature
- Humidity
- Moisture
- www.timeanddate.com

3. Prior Performance

- Go to ride results for prior years at www.aerc.org
- Talk to riders
- Talk to ride manager



***Pace
for Your Horse
for Yourself
for that Day***

The 100 Mile Ride

- Pre-ride Preparation
- Pre-ride Planning
- The Warm-up, Start, and First Loop
- On-Going Loops

**Focus on riding 5 to 7 Training Loops.
Not 1 100 Mile Ride**

Stagg Newman

Pre-ride Preparation

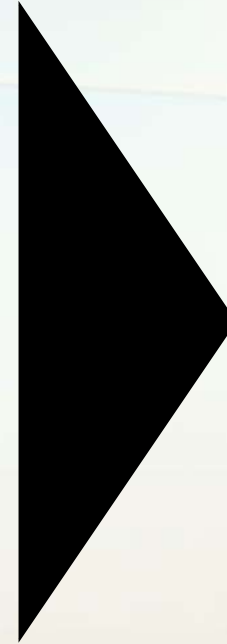
- Pre-ride Preparation
- Pre-ride Planning
- The Warm-up, Start, and First Loop
- On-Going Loops

**Focus on riding 5 to 7 Training Loops.
Not 1 100 Mile Ride**

Stagg Newman

Pre-ride Planning

- Know the course
- Learn the Weather
- Know your horse for ride day
- Know you goals for ride day
- Develop a plan for the ride, particularly the first loop



Your goals?

- Completion
- Top Ten
- Best Condition
- CoC
- Win
- Earning 10th Belt Buckle
- Earning Cavalry Buckle

The first 50 miles are a conditioning ride before the real competition begins.

Maggie Price

The Warm-up, Start, and First Loop

- Warm-up - Mental and How Much Physical
- Riding partners
- Start with pack or in small group or alone
- No race brain (neither rider nor horse) - scary for horse
- Moderate pace

The electrolyte loss is far more intense of the first loop.

Dr. Gayle Ecker

On-going Loops

➤ CHECK POINT ASSESSMENT

◆ The horse

- Time to pulse recovery for *your* horse.
- PPED (Peeing, pooping, eating and drinking). No ADR.
- CRI
- Progressive Recovery
- Attitude

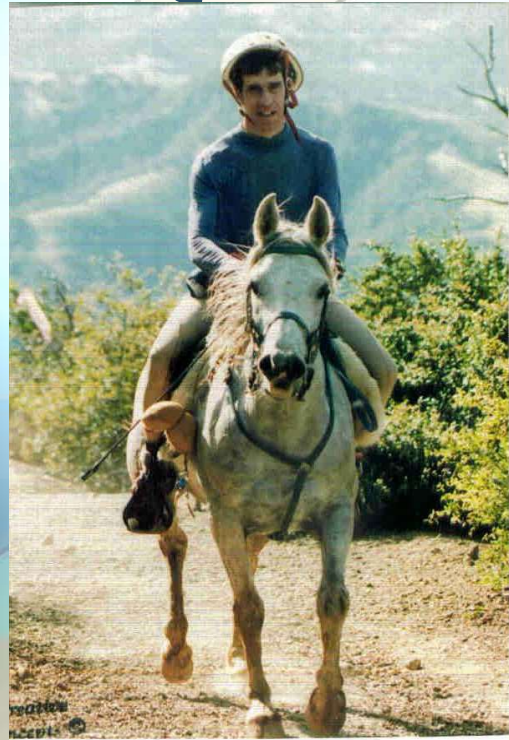
◆ You

- EDPP
- Mental Assessment
- Riding with others or alone

➤ Recalculate Your Plan

- ## ➤ The rides vets and your crew are key members of your team. You may have DIMR.

Quiz: Which horse would you select?



THANK YOU!!!

Stagg Newman, 202-669-3248, stagg@pisgahvu.com



Cheryl and Strut, Stagg and Drubin, Old Dominion 100, 1993
“Never Hurry, Never Tarry”



TAKING CARE OF YOU!

**Sudi Lenhart
Lani Newcomb
Lara Worden
Tim Worden**



Photo by Becky Kirchner Pearman



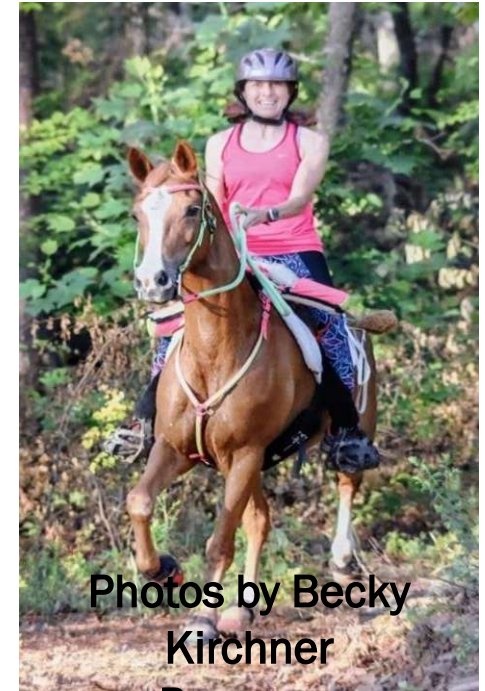
MENTALLY PREPARE FOR A 100

- **Ride one loop at a time**
 - Think of it as several short training rides
 - Only focus on the loop in front of you
- **At each hold, review the trail map or trail info for the next loop**
- **DO NOT panic if everything does not go as planned.**
 - Plenty of time to make changes or adjust your sails, so to speak



DRESS SMART

- **Hot, humid weather**
 - Clothing that is light and breathable (UPF protection)
 - Cool medics vests, helmet liners, and neck bands
 - Icefill tights/shirts
 - Compression socks
- **Colder/wet weather**
 - Layers
 - Waterproof gloves
 - Warm socks that wick moisture
 - Rain gear that breathes (Frogg Toggs/ Muddy Creek)
 - Compression socks



Photos by Becky
Kirchner
Pearman



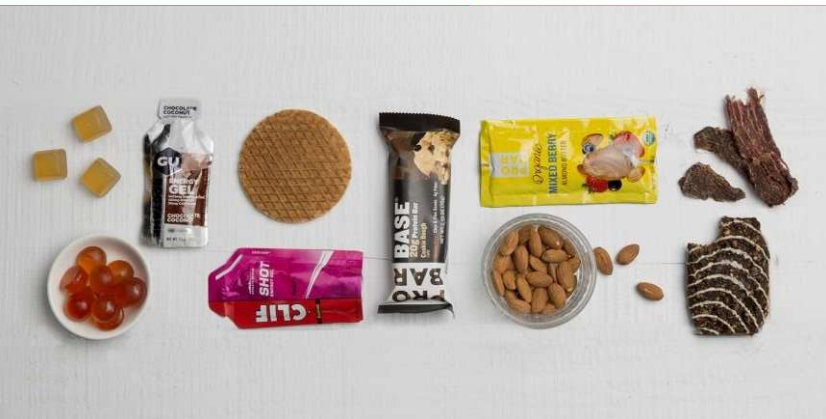
KNOW YOUR ELECTROLYTE NEEDS

- We all have different sweat rates and varying stomach issues
- Experiment with various products at home first
- **“Drink to Thirst”**
 - Avoid the urge to drink too much plain water
 - Avoid over hydration (hyponatremia → low sodium)
 - Monitor you urine color (should be pale yellow)
 - Avoid a lot of sugary beverages
- **Water bottles vs hydration packs**
- 17-25 fl oz/hour will fulfill most athlete hydration requirements
- **Various human electrolytes:**
 - Hammer Nutrition products
 - Succeed S Caps
 - Nuun tablets
 - Tailwind
 - Skratch Labs
 - Gu Energy gels
 - Crank Sports
 - Sports beans (many caffinated)
 - Pedialyte
 - Himalayan salt/No Salt (KCl) in lots of water with flavoring of your choice
 - Etc., etc....



EAT “TRIED & TRUE” FOODS

- Eat real food, NOT Frankenfood (smart food choices)
- Start hydrated
- Don't change eating habits drastically
- Eat small, but frequent meals/snacks
- Carry something with you that is quick to eat
- Consider protein-rich foods, moderate carbs, as well as some fat
 - Staying power
- Eat moderate amounts of fiber
- Watch your alcohol intake
 - Can dehydrate you
- Eat breakfast
 - Maintain blood sugar & fuel the brain



SOME FOODS THAT HAVE BEEN FOUND TO BE BENEFICIAL:

- **Chocolate milk**
 - Soothing to the stomach
- **Coconut water**
 - Helps with muscle cramps
- **Trail mix**
 - Quick and easy to eat
- **Apple sauce pouches**
 - Quick, easy, source of sugar
- **Chicken soup/broth**
 - Think cold weather and easy to eat
- **Something someone else has**
 - We are no different than horses



FITNESS TO AVOID FATIGUE

- **How to mitigate:**
 - Embark on your own fitness program
 - Be able to get off and walk/run along side your horse or tail up hills if the conditions warrant
 - Fuel Yourself
 - Try not to over exert yourself
 - Stay cool in the heat/warm in the cold



BABY YOUR FEET & YOUR BODY

- Find shoes/boots that work for you - comfort
- Make sure they support your foot/ankle
- Buy two pairs of shoes/boots (backup)
- Wear comfortable clothes
- Multiple pairs of socks
- **Blisters/damp/sore feet**
 - Baby powder
 - Vaseline
 - Trail Toes
- **Invest in shin/calf protection**
 - Compression socks/half chaps
- **Avoid chaffing**
 - Body glide



THE IMPORTANCE OF A GOOD CREW

- A crew on a 50 is nice, but a crew on a 100 is indispensable
- A good crew will take care of both the rider and the horse
- A good crew allows the rider a brief respite and time to concentrate all energies on rest/recovery, the ride strategy and demands of the trail itself

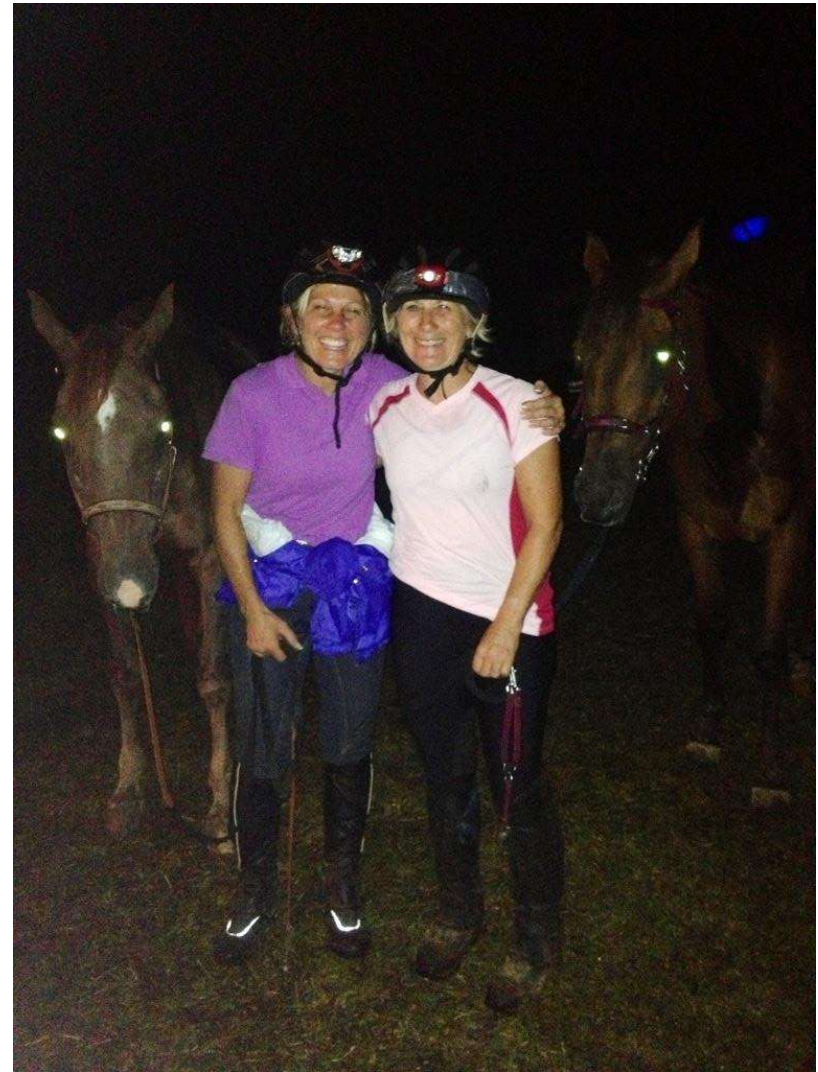


Photos of the Reynolds Tevis crew.



RIDING AT NIGHT

- If you are going to do a 100, you need to be comfortable with riding in the dark
- Practice at home
- Head lamp/glow sticks
 - Ride with light on or off?
- Carry a small flashlight



VARIOUS ISSUES THAT MIGHT ARISE

- Muscle cramps
- Upset stomach/feeling puny
- Vertigo



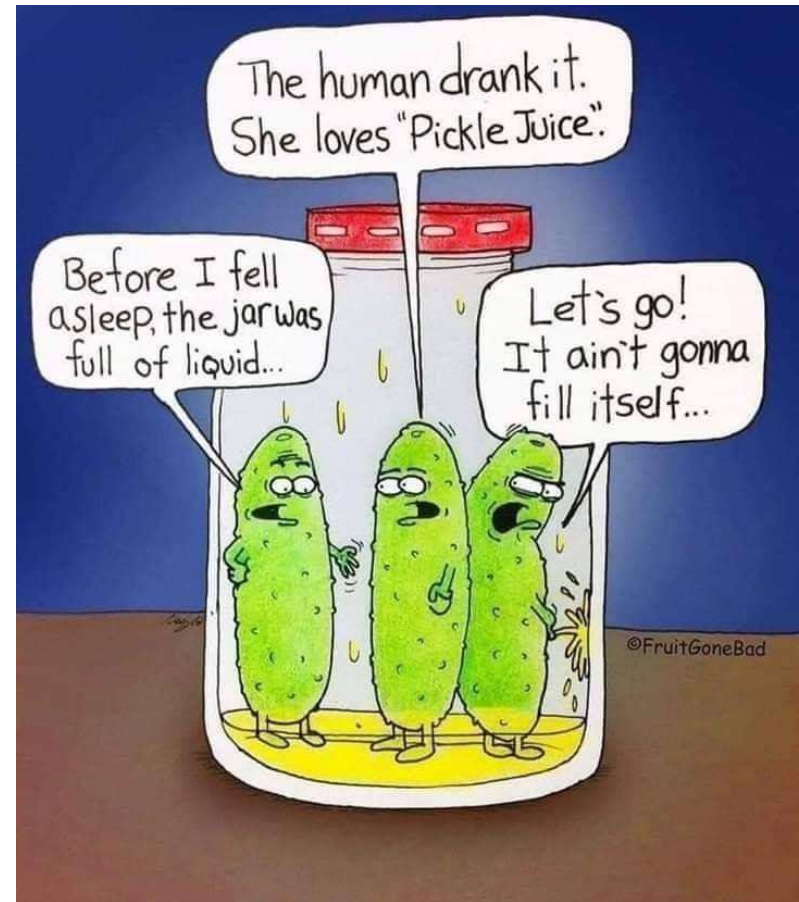
MUSCLE CRAMPS

- How to mitigate:
 - Avoid over hydration (hyponatremia)
 - Eat regularly – think small, but frequent
 - Pickle juice
 - Coconut water
 - Tomato juice/V-8
 - Bananas
 - Potassium/Magnesium capsules
 - Magnesium sprays (topical)



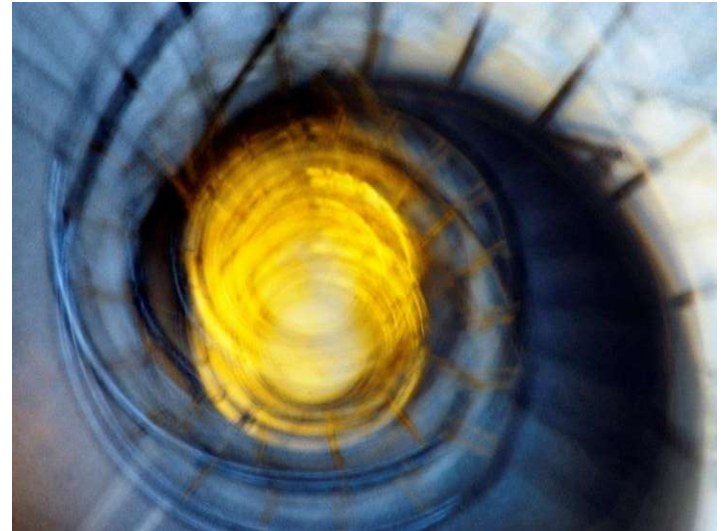
UPSET STOMACH/FEELING PUNY

- How to mitigate:
 - Avoid over hydration (hyponatremia)
 - Eat regularly- think small, but frequent
 - Pickle juice
 - Defizzed soda
 - Ginger/ginger ale
 - Pedialyte/Pedialyte popsicles
 - Anti-nausea meds?



VERTIGO

- **How to mitigate:**
 - Stay hydrated/avoid over hydration
 - Electrolytes
 - Eat regularly – think small, but frequent
 - Don't/Do ride with a head lamp
 - Epley maneuvers
 - Ginger
 - Gingko biloba
 - Peppermint
 - Bonine/Dramamine non-drowsy (Meclizine HCl)
 - A patch for motion sickness
 - Acupressure bracelets
 - Anti-nausea meds?



FIND WHAT WORKS FOR YOU!

- **Try everything at home first!**
 - This includes food, electrolytes (human & horse), tack, clothing, hydration packs, fanny packs, how to carry water, etc...
- **Don't be afraid to ask for help!**
- *“If at first you don't succeed, try, try again.”*
- *“Its supposed to be hard. If it wasn't hard, everybody would do it.”*

