

C3 STUDY GUIDE

See manual pp. 188-195

Nutrient	Source	Why needed	Other
Water	Water (>12 gal per day) Lush grass	Essential part of every cell & fluid in the body	Pony is 50% water Dehydration can be fatal
Carbohydrate	Grass, Hay, Grain Created during photosynthesis (plant starches)	Sugar & Starch = Most of the fuel for pony's energy (digested in small intestine) Cellulose = found in plant fiber & required for proper digestion (digested in large intestine)	Hay belly from feeding excess fiber especially coarse, stemmy hay or weeds Azoturia results from feeding usual carbohydrate ration to active horse who is idle in stall 1 or 2 days.
Protein	Oilseed meals (linseed, cottonseed, soybean meal), oats, barley, corn, alfalfa	Essential to every cell & needed for growth, maintenance & tissue repair	Proteins are made up of amino acids. Lysine & methionine are the 2 most important amino acids because horse can't use any other amino acids without these 2.
Fatty Acids (Lipids)	Corn oil, wheat germ oil	Carry vitamins thru blood & necessary for metabolism. Can also effect condition of skin, coat & growth rate of young horses	Fat produces 2.5X as much energy as carbohydrate & act as an emergency source of energy (ie. illness, stress, hard work, cold weather)
Vitamins	Hay, grain, sunlight, vitamin supplements	Nonmineral substances required in small amounts to regulate chemical reactions in body	Fat soluble & water soluble Only small amts needed Normally plenty in good quality hay & grass, but in winter may supplement (check with vet)
Minerals	Hay, grain, salt, mineral supplements. Plants derive mineral from the soil.	Inorganic elements	90% of skeleton made up of mineral (ie. Ca, P)

- Protein ration (% of total ration he gets every 24 hours)
 - 8% protein for fat, mature pony
 - 14% protein for growing, young foal
 - feeding more protein than needed causes pony to waste energy excreting the excess & can lead to kidney & liver damage. It is also expensive.
 - Soybean meal is 44-50% protein & is the cheapest, most available & commonly used in the USA
 - Oats & barley are about 13% protein

- Corn is about 10% protein
- High quality alfalfa can have up to 21% protein while dead grass & weeds may contain less than 5% protein.
- Fat in diet
 - Horses need only small amount of fat in diet, with old animals needing a little extra because their metabolism slows down.
 - ½ to 1 cup of corn oil added to grain each day as supplement
 - Wheat germ & corn oil (cheaper) best sources since feeds with high fat content tend to spoil easily especially in hot weather.
- Vitamins
 - Fat soluble (ADEK): carried in liquid fat. Can be stored in liver & body fat until needed.
 - Vitamin A: made from carotene by the horse. Carotene is found in green pasture grasses & good quality hay. Keeps eyes, skin, hair, nerves & hooves healthy
 - Vitamin D: Comes from sunlight or sun cured hay. Helps body use calcium for strong bones.
 - Vitamin E: Necessary for fertility, production of red blood cells & the red blood cells ability to carry oxygen in the blood. Vitamin E is lost when feed is heated during processing or stored for long periods. Closely tied to the mineral, selenium.
 - Vitamin K: Responsible for proper clotting of the blood.
 - Water Soluble: carried in water & produced in the intestine from natural plant sources & cannot be stored in the body.
 - Vitamin C: Healthy horses produce adequate amount in their intestines
 - Thiamine: Helps carbohydrates release energy. Necessary for appetite.
 - Riboflavin: related to energy release & the nervous system.
 - Vitamin B₁₂: Helps in metabolism of protein, carbohydrate, fatty acids. Helps prevent anemia.
 - Niacin: Necessary for metabolism
 - Vitamin B₆: Necessary for tryptophan metabolism (necessary amino acid)
 - Folic acid: Aids formation of red blood cells
 - Biotin: Necessary for metabolism. Moldy feed can tie up the vitamin.
 - Others: choline, pantothenic acid, p-aminobenzoic acid (PABA)
- Minerals
 - Salt: lost in sweat, so horses need more than most animals. All feeds are low in salt so free choice salt must always be present
 - Calcium: 99% of Ca in body found in the bones. Vitamin D necessary for Ca to be absorbed. Hay (especially legume) & grass good source of Ca but low in P.
 - Phosphorous: 80% of P found in body in the bones. Grains are high in phosphorous but low in Ca.
 - Mature horses need a Ca:P ratio in diet of 2:1
 - Growing horses need Ca:P at 1:1
 - Magnesium: closely associated with Ca & P (bone) & needed for enzyme function.
 - Potassium: important in maintaining pH & fluid level in the cells. Lose potassium in sweat & can be replaced with electrolytes.
 - Sulfur: found in molasses
 - Trace minerals: most are supplied in normal diet
 - Iodine: regulates thyroid gland activity.
 - Iron: for hemoglobin, therefore prevents anemia
 - Cobalt: ? Maybe red blood cell formation
 - Copper: normal blood, bone, hair & skin formation

- Zinc: enzyme functions
- Manganese: bone & cartilage
- Selenium: antioxidant (cleans up oxidative byproducts formed in body after exercise). Not mentioned in PC manual but believed by nutritionists to be much more important than cobalt.

Noncontagious Diseases	Cause	Signs
Colic (C manual p. 219-221)	<p>Spasmodic: cramps of the bowel Often result of eating spoiled feed, overeating or drinking cold water when overheated</p> <p>Flatulent: gas buildup often result of eating spoiled feed, frozen grass or lawn clippings that ferment.</p> <p>Impaction: caused when nondigestible material collects & blocks the bowel.</p> <p>Thromboembolism: caused by worm larvae invading blood vessels of intestines. A clot forms & blocks blood supply to part of gut.</p> <p>Obstruction (twisted gut): when bowel twists on self which can happen during other types of colic especially if horse rolls while intestines extended with gas.</p>	<p>Early colic is usually mild</p> <ul style="list-style-type: none"> • Stops eating • Restless • Looks at his barrel • Paws • Curls lip • Stretches out as if needs to urinate • Increased pulse rate • May get up & down <p>More serious stage</p> <ul style="list-style-type: none"> • Tries to lay down & roll • Kick at belly • Anxious, sweating • High pulse rate • Heavy breathing • Violent rolling & thrashing when severe • Gums may become bright red or bluish
Azoturia (C manual p. 221-222)	<p>Serious metabolic disorder arising in very active horses held idle in stall 1 or 2 days on normal grain ration.</p>	<ul style="list-style-type: none"> • When horse begins to work again muscles in hindquarters spasm until he cannot move. • Muscles tense in quivering in hindquarters • Dark, coffee-colored urine due to release of myoglobin from the muscle • Elevated TPR • Sweating, restless, anxious
Laminitis (C manual p. 222-223)	<p>Serious metabolic disorder that develops when toxins are released into the horse's bloodstream damaging circulation in the foot. These toxins usually come from overeating grain or lush grass but can be a side effect for other diseases or reaction to a drug. Laminae inside hoof begin to tear away & the coffin bone may sink</p>	<ul style="list-style-type: none"> • May effect front feet or all 4 feet (not just 1 foot) • Severe pain & does no want to walk • Stands with hind legs drawn up under body & front legs forward. • Feet feel hot & hard pulse in digital artery at back of pastern

	down causing severe pain & can lead to permanent damage.	
Heaves (C manual p. 224-225)	Breathing problem caused by eating dusty or moldy hay, by allergies, or by living in dusty conditions. The alveoli in lungs lose elasticity & horse must use abdominal muscles to push air out of lungs. (incurable)	<ul style="list-style-type: none"> • Chronic cough • Noticeable double lift of flanks & belly as horse exhales.
Choking (C manual p. 225)	Blockage of esophagus occurring when something eaten horse cannot finish swallowing. Horse CAN still breathe.	<ul style="list-style-type: none"> • Stops eating • Keeps trying to swallow • Distress • Drool
Tooth Problems (C manual p. 215)	Quidding: sore mouth often due to hooks Parrot mouth: an overbite that leads to inability to graze adequately	Quidding <ul style="list-style-type: none"> • Dropping chewed up food out of mouth
Skin diseases (C manual p.226-227)	Ringworm: fungal infection Rainrot: skin infection caused by a bacteria that lives in dirty, ungroomed coats especially during wet weather. Common in spring & fall. Scratches: Results from loss of skin oils thru contact with mud, urine, manure or harsh detergents or long exposure to wet, muddy conditions. Common in fall, winter & spring.	Ringworm: <ul style="list-style-type: none"> • Painless crusts on skin that fall off leaving round hairless patches • Contagious Rain rot: <ul style="list-style-type: none"> • Small scabby crusts that adhere tightly to skin • When crusts removed spots underneath are wet & raw • Appears on body wherever coat stays wet • Not contagious Scratches: <ul style="list-style-type: none"> • Painful chapped pasterns • Pasterns crack open, ooze & can become infected.

Communicable Disease	Symptoms	Prevention
Influenza (C manual p. 217) Upper respiratory viral infection spread thru air by sneezing, coughing, contact with infected horses.	<ul style="list-style-type: none"> • Depression • Loss of appetite • Fever (103-106) • Runny nose with white mucus • coughing 	Vaccination every 2-3 months
Encephalomyelitis (C manual p. 218) Viral infection causes brain damage & can be fatal. Carried	<ul style="list-style-type: none"> • Fever (104-106) & excitability (early) • Depression & drowsiness 	Yearly vaccination, but in the South may need every 6 months since mosquitoes active all year.

by birds & transmitted thru mosquito bites. Three types are Eastern, Western, & Venezuelan.	<ul style="list-style-type: none"> • May walk in circles or stand with head pressed against wall • Eventual paralysis & death 	
Tetanus (C manual p.216) Caused by bacteria, Clostridium tetani, which infects deep puncture wounds releasing toxins that attack nerves	<ul style="list-style-type: none"> • Tense & jumpy • Cannot eat or drink normally • Stands stiffly in 1 place • 3rd eyelid exposed • Severe muscle spasms 	<ul style="list-style-type: none"> • Yearly tetanus shot • If horse suffers deep puncture wound may need booster shot
Strangles (C manual p.217) Respiratory infection caused by the bacteria, Streptococcus equi. Spread by mucus from infected horse.	<ul style="list-style-type: none"> • Loss of appetite • Sore throat • Fever (104-106) • Runny nose • White mucus later turning thick & yellow • abscesses 	<ul style="list-style-type: none"> • Yearly vaccine, but not 100% effective • Avoid exposure to strange horses & isolate new horses
Rhinopneumonitis (C manual p.217) An upper respiratory infection caused by virus. Spread same as influenza.	<ul style="list-style-type: none"> • Similar to a cold • Pregnant mares abort • Fever (102-105) 	Vaccination every 2-3 months normally in conjunction with flu shot.

Internal Parasites: (C manual p. 208-211) Damage to blood vessels, intestines, heart & lungs. Can lead to

fatal colic. About 90% of all cases of colic are believed to be caused by parasite damage according to the PC manual. However, with the availability of new wormers (ie. Ivermectin) this is not as common today.

- Life cycle of the internal parasite
 - Infective larvae eaten along with grass
 - Larvae migrate thru bloodstream to various organs where mature & lay eggs in intestines
 - Eggs excreted in manure
 - Eggs hatch into larvae in soil & mature into infective larvae
- Types of Parasites
 - Large strongyles (bloodworms): invade blood vessels of intestines causing serious damage to digestive tract & other vital organs. Damage is most common cause of colic & can be fatal.
 - Small strongyles: another type of bloodworm that can cause severe damage to blood vessels & internal organs. An infected pony may have pot belly, dull coat, anemia, diarrhea or colic. Tends to stay in the intestine (less harmful than large strongyles) & larvae can “encyst” becoming dormant for up to 3 years.
 - Ascarids (roundworms): Large worms that live in the small intestine found most often in foals & young horses. Cause coughing, inflammation of intestinal lining & even intestinal rupture. Worms invade blood vessels from intestine & can circulate to the lungs (& other organs) where they can then be coughed up & reingested.
 - Bots: Larvae of botfly lay eggs on hair of pony’s legs, shoulders & chin. As eggs hatch, larvae enter the pony’s mouth & are swallowed. These mature into bots which attach to the stomach lining & can cause ulcers. Larvae eventually are excreted & hatch into botflies.
 - Pinworms: Live in end of the large intestine. They irritate rectum & cause pony to rub his tail. Dry, gray or yellow discharge is a sign of pinworms. Least invasive & harmful of the worms.
 - Tapeworm: invade intestinal lining where can cause ulcers & subsequent infection. May cause colic.

- Testing for worms: vet can perform a fecal parasite count on a single manure ball
- Parasite control:
 - Deworming: every 8-12 weeks (rotate the wormer)
 - Avoid keeping too many horses in small pastures (increases possible exposure)
 - Avoid overgrazing (horses won't eat grass around manure unless rest of grass is gone)
 - Rotate pastures (breaks the lifecycle of the parasite)
 - Pick manure from small pastures weekly & small paddocks more often. (reduces exposure)
 - Keep hay, feed & water from becoming contaminated with manure
 - Separate age groups since younger horses are more susceptible
 - Avoid ground feeding
 - Clean & disinfect water containers regularly

Teeth (C manual p. 211-215)

- Horse's teeth & mouth designed for grazing
 - Incisors (12, 6 top & 6 bottom): front teeth used to tear off grass
 - Premolars & molars (24): back teeth used to grind food. Molars are found at the back of the jaw & premolars in front of them. There are 6 on each side, top & bottom.
 - Canines or tusks (4): smaller, pointed teeth found in the upper & lower jaw just behind the incisors. Usually only in males.
 - Wolf teeth (some horses have 1-4): small extra premolars (not canines) found in some horses located right in front of the 1st premolars. They may cause discomfort if the bit touches them & can be easily removed.
 - Interdental space: toothless space between the front & back teeth where the bit rests
 - Bars: the bit rests on the bars which are quite sensitive
- Number of teeth: Males have 40, females 36
- Baby teeth are replaced by permanent teeth
 - Foal is born with both baby & permanent teeth in its jaws
 - 1st baby teeth grow out thru gums in pairs between birth & about 9 months of age
 - permanent teeth are also growing & when horse is about 2 ½ years old, they begin to appear & push the baby teeth out.
 - All baby teeth lost by 5 years. Horse is then said to have a "full mouth"
- Horses teeth grow constantly & wear down. Each tooth has a long root that reaches deep into the jaw. As tooth grows, it meets the opposite tooth which grinds with it to wear the tooth down. As each tooth grows out & wears down its appearance changes & new parts of the tooth appear. This is how we age the horse. Past 8 years age is only estimated.

Toxic plants common to Midwest (C manual p.167-169)

Plant	Location Found (but not all inclusive)	Toxic portion	Symptoms
Ornamental Yew (evergreen landscaping shrub w/ red berries)	Northeast & Midwest	Entire plant year round	Even a mouthful can be fatal. Trembling, labored breathing, collapse.
Rhododendron (ornamental house & garden plant but also found in the wild in the South)	All over	Leaves	Depression, difficulty breathing, collapse, coma.
Poison Hemlock (grows in low wet areas)	All over	Roots (only harmless in the Spring)	Loss of muscle strength, especially in hind legs, tremor, coma

Horsetail (grows in wet marshy or meadow areas)	Midwest to Pacific Northwest & Southwest	Poisoning occurs only when eaten in hay. Eating hay containing horsetail for 30-60 days causes thiamine deficiency	Lack of appetite Loss of coordination
Chokecherry (grows in fence rows & hedges)	Southeast, Northeast, Midwest	Leaves. Especially dangerous when leaves are wilted. Wilting releases cyanide & makes them sweet.	10-20 lbs can be fatal Heavy breathing Agitation Weakness Rapid death
Black Nightshade, Horse Nettle (vine with purple flowers, green & red berries grows in fence rows, hedges & pastures)	All over	Leaves. Most toxic from early summer thru late fall.	1-10lbs can be fatal Colic Lack of coordination Weakness Depression
Bracken Fern (fern found in woods)	Northeast, Pacific Northwest, upper Midwest	Entire plant. Usually eaten in fall with pasture is poor.	Large amounts (30-60 lbs) eaten before symptoms appear Causes inability to use thiamine Loss of appetite Loss of coordination May stand with legs braced
Frosted Grass & Lawn clippings	All over	Not a toxic plant but can cause serious & even fatal problems in pastured horses. Grass ferments when 1s' killed by frost & if eaten produces lots of gas & can cause colic. Lawn clipping also ferment after cut.	Gas & colic
Larkspur (wild or cultivated from gardens) Found growing about anywhere (woods, along streams, roadsides, old fields)	More common in the West but found wild in southern 2/3 of Indiana & also grown in gardens	All parts. Spring, summer & fall (dry toxic too)	¼ pd/100pds body weight in cows but takes more in horses. Salivation, Staggering Bloating Abnormal pulse & respiration Paralysis Death
White Snakeroot Found in woods, damp & shady pastures	Found all over Indiana	Leaves & stems. Roots less toxic. Primarily danger in late summer thru fall when pasture poor.	Trembling Sweating Depression Stiff gait Death
Ragwort Found along roadsides,	Found all over Indiana	All above ground parts, especially the seeds	Weight loss Poor coat

in pastures & wet or waste areas			Anorexia Liver failure & death
Red Maple Tree Grows wild or where planted as ornamental	Found all over Indiana	Leaves especially when fallen, damaged or wilted	Affects only horses Eating 1 ½ pds is toxic, 3 pds is lethal Breathing difficulties Jaundice Dark brown urine Death
Jimsonweed Commonly grows in cultivated fields, barnyards, abandoned pastures, roadsides	Found all over Indiana	All parts, especially seeds Animals avoid it but the danger lies in eating seeds contaminating prepared feeds/hay	Extreme thirst Dilated pupils Agitated Increased pulse rate Tremble Delirious Coma Possible death
Ohio Buckeye/Horsechestnut Found in moist woods, along riverbanks or planted as ornamental	Found all over Indiana	Buds, nuts, leaves, bark, seedlings, honey	Colic Diarrhea Salivation Staggering Trembling Breathing difficulty Paralysis Coma & Death

NOTE: if the plant is toxic due to the leaves, it is only toxic when the plant is in leaf. Therefore, NOT toxic in winter when there are NO leaves.

Safety around the stable (C manual p. 172-176)

- A neat stable is a safer stable. Keep trash picked up, tools hung up, & aisles clear
- Check stalls & aisles for nails or other sharps
- Always handle horses with lead rope & halter
- When handling a horse, keep your attention on him & be aware of things that could spook him or injure him
- No running, yelling or rough play
- Keep other pets under control out from underfoot
- Make sure gate & stall openings open wide & latches aren't sticking out to catch a horse.
- Make sure before releasing a horse in pasture that he is facing you
- Remove halters when in stall or pasture unless it is a breakaway safety halter
- Tie safely
 - Tie only to a halter never a bridle
 - Use quick release knots & safety strings
 - Tie in a safe place
 - Tie with 18 inches from knot to halter
 - Don't tie a nervous horse
 - Don't leave tied horse unattended
- Fire Prevention
 - NO smoking
 - Adequate fire extinguishers & faucet with hose outside & inside barn

- Keep aisles & doorways clear
- Keep aisles swept, trash picked up, cobwebs cleaned & loose hay & bedding cleaned up. Very flammable.
- Cut brush & weeds away from barn
- Unplug all electrical appliances when not used or before leaving stable. Avoid hot plates & heaters.
- Keep manure piles away from wooden buildings, they generate heat. Hay can cause a fire if baled or stored damp & packed too tightly.
- Never store flammable liquids (ie. gasoline)
- Have barn wiring checked by an electrician
- In case of fire
 - Sound alarm & evacuate PEOPLE 1st
 - Call fire department (911)
 - Evacuate horses only if can do safely
 - Fight the fire with extinguishers & hoses only if can do safely

Conformation & Blemished/Unsoundnesses or Movement problems (C manual p.324 -334)

- Bowed tendon: when tendon between knee & fetlock is stretched too far often because of accident or slip when horse overtired
 - Tendon fibers torn causing pain, heat, swelling
 - Later scar tissue forms creating a thickening (bow) in the tendon (high & low bow)
 - Contributing conformation
 - Calf knees (back at the knee)
 - Long sloping pasterns
 - Long toes & low heels
 - Weak “tied in” tendons putting more strain on the tendon
- Splint: hard lumps (calcium deposits) that appear between splint bones & cannon bones of front legs.
 - Usually hot & painful when 1st happens
 - Blemish, not an unsoundness. Does NOT cause lameness.
 - Contributing conformation
 - Bench knees - splint bone carries more than its share of the weight.
 - Knock knees
- Navicular: Problem deep in foot where navicular bursa (a pad), navicular bone or the end of the flexor tendon becomes inflamed & sore. In navicular disease the navicular bone becomes porous like Swiss cheese
 - Heels hurt causing horse to tiptoe & stumble
 - Contributing conformation (promote concussion)
 - Small feet
 - Narrow heels
 - Upright pasterns
 - Long toes with low heels
 - Camped out in front
 - Flat soles
- Ringbone: in pastern area where a bony lump forms on pastern bones (due to concussion)
 - High ringbone: arthritis in the joint tween the 2 pastern bones
 - Low ringbone: between the pastern bone & coffin bone inside hoof which is more serious causing permanent lameness
 - Contributing conformation
 - Upright pasterns
 - Crooked legs causing horse to carry extra weight on one side of the foot & leg
 - Toe in, Toe out
 - Base wide

- Sidebone: collateral cartilages of the coffin bone in bulb of heel turn to bone.
 - Contributing conformation
 - Large heavy horses with big feet especially with straight pasterns
- Curb: Sprain of the plantar ligament which runs down back of hock. Appears as swelling below olechrenon.
 - Contributing conformation
 - Sickle hocks (standing under)
- Interfering: horse strikes 1 leg against the other
 - Contributing conformation
 - Toe out
 - Base narrow
- Overreaching: toe of hind foot grabs the heel of the front foot
 - Contributing conformation
 - Toes too long
 - Short back with long legs
- Forging: horse hits a front foot (not the heel) with the toe of the hind foot usually at the trot
 - Contributing conformation
 - Toes too long
 - Short back with long legs
- Thoroughpin: increased synovial fluid surrounding flexor tendon sheath in hock resulting in a cool swelling on the upper inside of the hock
 - Contributing conformation: sickle hocks
- Bone Spavin: arthritis in the joints of the small hock bones resulting in a hard swelling low & inside on the hock
 - Contributing conformations: Cow hock, Bow hock
- Bog Spavin: Increased synovial fluid in the hock joint resulting in a swelling (no heat or pain) on the front of the hock
 - Contributing conformation: post leg

HAY & GRAIN IN YOUR AREA:

- Grain:
 - Availability = good
 - Origin = Wallace Feed, oat based sweet feed, 10% protein
 - Price = \$6.65/50 pounds
- Hay
 - Availability = good
 - Origin = Phil Achenbach, \$2.50 - \$3.25 per bale depending if grass or alfalfa
 - Origin = Dave Zeller, \$3.25 per bale
 - Origin = Laura Fischer, \$1.25 per bale, grass/alfalfa/clover
 - Prices do not include unloading charges

DETERMINING NUTRIENTS REQUIRED FOR OWN HORSE:

- Condition & health
- Age & Breed
- Time of year
- Temperament
- Appetite
- Stabled vs. Pastured
- His "job" & variations in daily work

ACTIONS OF BITS

- Snaffle: pressure on tongue, lips & bars. One ounce of pressure on reins yields one ounce of pressure on mouth
- Curb (ie. kimberwicke): leverage bit where pressure from hand is multiplied at the mouth. This bit squeezes mouth between the bit & the curb
- Pelham: leverage bit using double reins where one rein activates a snaffle action & one rein controls the curb action.

CONFORMATION & LAMENESS (PP. 317-324) See diagrams

- Foreleg conformation faults (sideview)
 - Standing under: puts horse's balance too far forward
 - Camped out in front: puts more strain on the legs
 - Over at the Knee: puts lower leg too far back
 - Back at the Knee: extra stress on tendons & fetlock joints & bones of knee. Can lead to bone chips or fractures.
- Foreleg conformation faults (front)
 - Base narrow: leads to interfering or plaiting (walking like on a tightrope)
 - Base wide: increases concussion & can lead to ringbone
 - Knock-knee: Extra stress on knee & can lead to splints
 - Bowed knee: Extra stress on knee & outer leg
 - Benched knee: Extra stress on lower leg & can lead to splints
 - Toeing out: May lead to interfering or even lameness & increased concussion leading to ringbone
 - Toeing in: May lead to ringbone due to extra strain
- Hindleg conformation faults (sideview)
 - Standing under/Sickle hock: extra stress on hocks can lead to curb, thoroughpin, bog spavin or bone spavin
 - Camped out behind: hind leg harder to engage & is weaker
 - Post leg (too straight) stresses the hock & pastern
- Hindleg conformation faults (rear)
 - Cow hocks: extra stress on inside of hock which may lead to bone spavin, bog spavin or thoroughpin
 - Bowed hock: extra stress on hocks & outside of leg & may lead to bog spavin or thoroughpin
 - Too wide: Causes short strides
 - Too narrow: easy to interfere which may cause injury & lameness
- Lower leg conformation faults:
 - Tied in tendons: weak & poorly developed. Tendons look squeezed in just below knee
 - Long sloping pasterns: weak & easily injured. Contribute to bowed tendon.
 - Short steep pasterns: Poor shock absorption & can contribute to ringbone, sidebone & navicular
- Hoof conformation faults:
 - Feet too small: more concussion & can lead to navicular
 - Contracted heel: Frog pinched & not touch ground. Can lead to navicular.
 - Flat soles: Since weight carried on sole & not wall leads to tender feet. Can result from laminitis.
 - Shelly hooves: brittle walls make feet tender & hard to keep shoes on

TRAVEL SAFETY (P.261)

- Trailer preparation
 - Make sure trailer & vehicle are safe, serviced & properly hitched with an experienced driver
 - Pony trailer to load & unload
 - Have ventilation
- Equipment for horse (trailer no more than 8-12 hours per day; arrange stabling overnight if needed) (also stop & check pony every 2 or 3 hours & check if urinated. If not unload & wait for him to pee. Don't let him graze at roadsides due to possible weed killers, etc)

- Properly fitted halter & tie rope (pony must be able to put head down to balance himself so not too tight)
- Shipping boots or bandages
- Tail guard
- Sheet, blanket, etc. depending on weather
- Head bumper
- Hay net
- Water bucket & water in a carrier
- Equine first aid kit
 - Absorbent cotton
 - Gauze squares
 - 2inch Gauze roll
 - Vet wrap
 - Adhesive tape
 - Pressure pads
 - Bandage scissors
 - Antibiotic ointment
 - Vaseline
 - Vet thermometer
 - Alcohol
 - Liniment
 - Sheet cotton leg wraps
 - Diaper pins & masking tape
 - Notebook & pencil
 - Betadine
 - Saline
- Extra tie rope & chain end lead
- On arrival walk pony out 10-15 minutes
- Other equipment
 - Muck bucket, rake, broom
 - Shavings in trailer to absorb urine