

Bag O' Bones: Why Is This Horse So Skinny?

**Kathleen Crandell, Ph.D.
and Mark Llewellyn**

Four horses share a paddock. Three appear to live on air alone while the fourth is a rack of bones. The three easy keepers get barely a sniff of grain, just enough to encourage them to come to the barn. The resident bag o' bones has been a nightmare to manage; every effort to add a few pounds has been fruitless. Beyond frustration, the owner is now dabbling in voodoo incantations, witchcraft and crystals in an attempt to flesh out bag o' bones.

How could there be such a difference between horses? Is there something wrong with the skinny horse? Nothing is more frustrating than trying to get weight on a horse with no results. Although putting weight on a horse may be remedied simply by feeding more calories, the problem often requires a more thorough probe into what is causing static weight.

This two-part series deals with probable causes and changes in diet or management which will give the skinny horse every opportunity to gain weight. The first part will discuss probable causes which may preclude a horse from gaining weight or which causes a horse to lose weight. The second part, which will appear in the October issue of EQUINEWS will review methods of increasing calories in the diet to achieve weight gain.

Insufficient caloric intake is the primary cause of failure to maintain sufficient body condition in horses. A variety of reasons may account for caloric deficiency. Some are easy to pinpoint and simple to address, such as parasite loads or teeth problems. Others are impossible to diagnose without euthanizing the horse and performing a necropsy. Physical problems of the digestive tract account for many of these problems, but there may be psychological and environmental reasons as well.

Parasites

Internal parasites can be a major contributing factor to weight loss or inability to put on weight, although severe cases of parasitism are not as common as a few years ago because of improved dewormers and deworming programs. The ravages of internal parasites can have disastrous results for several reasons. First, parasites may compete directly for the nutrients inside the digestive tract, robbing nutrients from the horse. There may also be damage to the intestinal lining caused by the parasites which makes it difficult to absorb nutrients. Damage to the intestinal lining can diminish production of enzymes needed to prepare food particles for absorption. Competition for protein by parasites can affect absorption of nutrients because some are dependent on protein to transport them through the intestinal lining. The damage can also cause swelling of the intestinal lining which can draw electrolytes, sugars and amino acids (building blocks of protein) back into the intestines and then out into the manure. In older horses, the wasting of muscle tissue may be a result of the years of damage to the intestines by parasites, making it difficult for protein and other nutrients to be absorbed in adequate quantities. Therefore, the animal becomes protein deficient and starts to break down its own muscle tissue to supply the protein for essential body processes. For this reason, diets formulated

for senior horses typically have higher protein. An effective deworming program should keep parasites from being a reason for weight loss. Examination of fecal samples by a veterinarian will reveal the efficacy of a deworming program. Deworming strategies should be discussed with a veterinarian who is familiar with regional parasite populations.

Teeth

If a horse is not maintaining weight, the first thing that should be checked is the conditions of the teeth. Proper dentition is essential to a horse because of the nature of its diet. Horses evolved eating coarse roughages and plant fibers that require thorough grinding by the molars to break down the particle size of the food. Enzymes and microbes of the gastrointestinal tract readily digest feedstuffs which have been crushed into minute particles. Problems with dentition can have disastrous effects on the body condition of a horse.

Perhaps the most common dental problem is irritation or laceration of the cheek, tongue or gums by sharp edges or points on the teeth. Normal wear and tear induced by chewing can reshape the edges of the teeth, sometimes making them sharp enough to cut into the parts of the mouth they contact. This makes chewing painful. A horse will often reduce the quantity of feed consumed or will eat more slowly than normal. Pain caused by points can be alleviated by floating the teeth, a procedure in which a dental rasp is used to smooth sharp edges.

A dental problem particular to young horses is the presence of caps that will not dislodge appropriately. By the time a horse achieves maturity, it will have had two sets of teeth. Immature horses possess deciduous or milk teeth which are gradually replaced by permanent teeth. As permanent teeth erupt and grow, milk teeth are generally ousted. In some instances, a portion of a milk tooth, a cap, may remain. Caps can make chewing difficult and should be removed if discovered. Young horses that roll feed in their mouths and spill feed from their mouths should have their teeth inspected for the presence of caps.

Infections in gums or teeth, cracked or broken teeth and poor mouth conformation (severe parrot mouth or undershot jaw) can also cause reduced feed intake. In aged horses, loss of molars is a primary concern when discerning a cause for weight loss. As time takes its toll on the horse, dentition can become wavy and teeth can start to fall out. When a horse does not properly grind his food because of molar loss or malalignment, the food enters the digestive tract in particles too large for proper breakdown by digestive enzymes in the small intestine and microbes in the large intestine and cecum. If this is the case, feed is of little energetic benefit to the horse and weight loss will result. Receding incisors, another problem common in aged horses, may cause difficulty in tearing grass when grazing. Inadequate intake of forage will result. Aged horses who have spent a lifetime cribbing may be doubly prone to receding incisors. For these reasons many commercial senior feeds are marketed to provide the complete diet, including forage, in small particle size. These feeds can be softened with water and made into a gruel so they do not require any chewing to be of benefit to the horse.

Careful observation of the eating habits of a horse will likely reveal a dentition problem. Slow eating, reluctance to drink cold water, tilting the head while chewing,

wallowing food around in the mouth before swallowing, and balling up food in the mouth and dropping it all may indicate a tooth problem. However, some horses may not exhibit abnormalities in food intake or mastication but may still be losing weight from a chronic tooth ailment. Most equine veterinarians are knowledgeable in proper dental care and can perform a thorough examination of the mouth. In areas of the country with exceptionally large horse populations, an equine dentist may be available to diagnose and alleviate dental quandaries. If the problems are permanent (as in tooth loss), adjustments to the diet should be made to address the problem.

Digestive tract problems

Any physiological problem that keeps food from getting to the intestines for absorption can cause weight problems. If swallowing is painful or difficult the horse will not want to eat. Things that may cause problems with swallowing could be nerve damage from equine protozoal myelitis (EPM), obstructions from abscesses or strangles, and muscle weakness caused by hyperkalemic periodic paralysis (HYPP) or botulism. Partial esophageal obstruction can occur from abnormal growths, scar tissue from an episode of choking, or a foreign object lodged in the throat. Esophageal obstruction narrows the passageway for food, making it difficult for the horse to swallow. Horses that have chronic choke may have an esophageal obstruction that instigates the problem. The only way to effectively diagnose esophageal narrowing is by endoscopic exam or x-ray. If there is no way to clear the obstruction, special dietary adjustments should be made so that the type of food offered is easily swallowed.

Gastric ulcers can cause reduced appetite in horses because of a painful or uncomfortable stomach. The end result is a horse who is not able to consume enough calories to maintain weight. The incidence of ulcers in horses is surprisingly high. Surveys done on performance horses have found ulcers in about 80% of racehorses in training and as many as 50% in other types of performance horses. Horses that live on pasture most of the day rarely develop ulcers. Gastric ulcers occur in the horse when the acidity of the stomach is too high. The main precipitants for gastric ulcers in horses are a high grain and low forage diet, meal feeding instead of continuous forage availability, overtraining and other stresses of a performance schedule. Signs associated with gastric ulcers are irritability, picky eater, chronic colic, diarrhea, and inability to gain weight. Some horses have all of the signs, some have only one and some do not exhibit any, yet have the problem. Medications have been developed to help heal gastric ulcers and antacids are currently being marketed to prevent gastric acid accumulation in the stomach. Antacids can also be used to prevent ulcers from occurring or reoccurring.

Further along the digestive tract, problems that can occur in the small intestine, large intestine and cecum may influence the horse's ability to absorb nutrients. Chronic diarrhea can contribute directly to weight loss because it is an indication of nutrients moving too quickly through the digestive tract, thereby escaping absorption. There are many causes of diarrhea in the horse. Countless bacteria reside in the equine digestive tract and a delicate balance exists between bacterial types. If the balance of the different types shifts, the whole ecosystem in the hindgut can disintegrate. The inability of the bacteria to function properly may result in the inability of the digesta to be broken down into small enough particle size for absorption. Inadequately digested feed often results in

diarrhea. Viruses can also disrupt the health of the bacterial population of the hindgut and cause detrimental effects. Viral and bacterial pathogens can also cause damage and sloughing of the intestinal lining.

No magic potion is marketed which will return the bacterial population of the hindgut to a state of normalcy, but there are a few products that may help. Probiotics are frequently used to help repopulate the gut with beneficial bacteria. One old-fashioned probiotic recipe called for a bucket of feces from a healthy horse mixed with water. The preparation was then given to the horse through a nasogastric tube. Today, there are neater, but not necessarily more effective, ways to rebalance the microbe population of the hindgut. Endurance enthusiasts have been known to feed yogurt with live cultures to their horses for the probiotic effect. Commercial probiotic pastes or liquids with *Lactobacillus* and/or *Streptococcus faecum* are available, as are bagged products with yeasts and probiotics designed as daily supplements. Probiotics are very useful when a horse has been stressed by trailering, change of home, dewormed or antibiotic treatment. When there is no apparent reason for a horse to have a problem putting on weight, sometimes just the addition of probiotics and yeast supplement to the diet will bring the horse around.

Disease

Chronic and acute disease can interfere with the horse's ability to maintain weight. Many diseases affect the body by disturbing protein use. Without proper amounts of protein, the body cannot rebuild damaged tissues, make transport proteins which carry other nutrients through the blood to target sites, generate clotting factors for blood or perform a host of other physiological functions. When the horse cannot get enough protein from the diet, the body begins to break down the existing protein in the body to use for its most important functions. Muscle is the most abundant storehouse of protein in the body. Muscle wasting is an indicator of protein deficiency, either from dietary inadequacy or disease interfering protein utilization.

Chronic liver disease may result in weight loss due to the decreased ability to handle protein and fat properly. Normally, dietary protein and fat make their way to the liver after being absorbed from the intestines into the blood or lymphatic system. The liver acts as the master coordinator for the nutrients, directing amino acids and fatty acids to fulfill assignments elsewhere in the body. When the liver is not functioning properly, many other systems in the body are also affected with the end result of weight loss. Liver function can be assessed with a simple blood analysis.

Malfunctioning kidneys may also cause weight loss. Acute or chronic kidney disease can result in significant excretion of protein in the urine. Horses with kidney problems will usually drink excessive amounts of water and urinate frequently. Kidney function can also be assessed with a simple blood analysis.

Certain health problems occurring in the body will result in an abnormal increase in the distribution of energy usually necessary for normal body processes. Abscesses within the body cavity will rob large amounts of energy from the horse, resulting in chronic weight loss. Cancer has the same effect on metabolism. Horses with chronic obstructive pulmonary disease (COPD) also burn more calories than horses with normal breathing patterns because of the increased physical effort required to breathe. Pituitary

adenoma (Cushing's syndrome) also can place metabolism in high gear, burning the body's energy stores excessively. Common ailments such as a heart murmur can cause problems because of the disruption of blood flow which carries nutrients throughout the body.

Environment

Horses are like humans in that environment may affect appetite. An uncomfortable or unhappy horse may prefer to indulge in a stable vice such as cribbing, weaving or stall walking, thereby wasting valuable calories. The result is detrimental to the horse's ability to maintain weight. The ideal solution is to find out what the horse does not like about the environment. This is often challenging to find or, if found, impossible to change. The next best approach is to increase the caloric density of the diet.

Herd dynamics may account for poor condition and is frequently the cause in pasture or lot environments. Horses low in the pecking order will be granted only limited access to feed by horses higher in the social hierarchy. Timid horses will waste away rather than fight for a chance at the food if it is hoarded by the more dominant horses in a group. In group feeding situations, generous space should separate hay. If grain is group fed, the grain buckets or feeders should also be spaced accordingly. Providing one or two extra servings of hay or grain to the group may be beneficial because less dominant horses will have more options from which to choose should they be intimidated by another horse.

Chronic pain is often overlooked as a cause of chronic weight loss in horses. The body's response to pain is the release of adrenaline (epinephrine) which puts the body in a state of catabolism. Catabolism causes the breakdown of body energy stores which ultimately results in chronic weight loss. Pain can also dampen the appetite of the horse.

Numerous causes can account for a horse's inability to maintain weight aside from not consuming sufficient calories. Quick and easy solutions cure some problems, but for other problems there may be no solution but to deal with the animal as it is.