

Nutrition for Rehabilitating the Starved Horse

by Carolyn Stull, MS, PhD

The greatness of a nation and its moral progress can be judged by the way its animals are treated. —Mahatma Gandhi

It is difficult to comprehend the long-term neglect and surrounding situation that produce such a devastated, depressed creature as a starved horse. The bones are so prominent that the skeleton appears to belong to a larger horse, the head is disproportionately large compared with the body, and the tail is always low and motionless.

But the low hanging head tells it all. The ears barely move to any sounds in the environment, no extra energy is spent interacting with herd mates. The eyes are dull, without expression, without expectations.

Malnourished and poorly cared for horses can be found even in a country



This beautiful horse named Cowboy was rescued when he was 500 pounds underweight. Through the Sonoma County CHANGE program, he was provided all the medications and supplies, supplemental feed, veterinary services and TLC he needed to bring him back to life as you see him here. Read his story inside.

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of relative wealth such as the United States. In fact, the problem of neglected horses in the U.S. has worsened in recent years and reflects the growing number of horses that are no longer wanted or needed or whose owners are no longer capable of providing care for them, physically or financially. The degree of worsening may be related to both the global recession that has created economic hardship for many horse owners and the simultaneous

closure of equine slaughter facilities in 2007. During the previous decade, these slaughter plants had processed approximately 68,000 horses per year.

It is estimated that approximately 100,000 horses per year in the U.S. are categorized as “unwanted.” Unwanted

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Director's Message



Dr. Claudia Sonder
CEH Assistant Director

Most horse lovers are keenly aware of a horse in need of help. We have been conditioned to appreciate the fat, shiny, jovial horse and it is natural to be troubled by one who appears emaciated or debilitated. Over the last several years, many factors have contributed to the unwanted or neglected horse in this country. The economic downturn has created a situation where 50% of the nation's 2 million horse owners have an average annual income of less than \$50,000. The price of hay continues to rise and most veterinarians are reporting continued stagnation in routine preventative medicine procedures such as dentistry.

In recent years there has been a surge of horse rescue nonprofits. These organizations have had all the right intentions, but the ones that have survived the economic downturn also have had well laid out oversight boards, financial plans, fundraising goals and publicity campaigns. These rescue organizations need support from the communities they serve in the form of supplies, volunteer time and/or monetary donation. Local animal control offices need

It Takes a Village

support as well in the form of education and resources. They need training in learning how to recognize a malnourished horse and in investigating the circumstances surrounding the horse, as well as in horse handling and safety. They need halters and lead ropes, brushes and buckets.

The CHANGE program in Sonoma county (www.sonomachangeprogram.com) provides an excellent example of a working partnership between advocates for the horse and local law enforcement to efficiently identify neglected or abused horses and transport these animals to safety. A good relationship between the veterinarian and the local animal control office fosters the exchange of knowledge and service and can be vital in the success of disaster planning on the larger scale.

What can we do as individuals to be advocates for the horse and our neighbors in our communities? What should we do when we see a horse in trouble? Is seeing ribs on a horse enough to warrant concern? What are the circumstances of the owner? Are there temporary or long-term deficiencies involved? Who do you call for advice?

A goal of this issue of the *Horse Report* is to provide very specific information about the special needs of the starved horse and the education and resources necessary to properly care for these animals. The starvation case studies detail the histories and veterinary management as well as the outcomes of the

patients. The cases reveal the degree of veterinary care, support, and the myriad complications associated with restoring health to these horses. They are included to underscore the fact that no two starvation cases are ever the same and a village approach is often necessary for a successful outcome.

The refeeding research performed at UC Davis continues to save lives, as many of us would "kill with kindness" without this knowledge. Taking the time to educate ourselves about body condition scoring, the potential underlying causes of malnourishment, the timelines and resources associated with rehabilitation, and the recommended course of action when trouble is suspected will make us all more valuable to the horses we love and the communities we reside in. ■



Mindy (the Comeback Kid), pictured here, is featured in one of the case studies in this *Horse Report*.

The Starved Horse

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horses range from being essentially normal, healthy horses of varying ages and breeds, to horses with some type of disability or infirmity, horses that are unattractive, horses that fail to meet their owner's expectations for their intended use (e.g., athletic ability), horses with non-life-threatening diseases, horses with behavioral problems, or horses that are dangerous.

A relatively small number of these horses end up in a rescue or sanctuary facility where they can be rehabilitated and rehomed. As might be expected for horses that are relinquished to nonprofit facilities, poor body condition is apparent in many of the horses, with a number of them considered emaciated, very thin or thin.

In humans suffering from starvation caused by illnesses such as anorexia, cancer, or gastrointestinal obstruction, patients can develop "refeeding" syndrome when they are given concentrated calories, which in turn can lead to heart, respiratory and kidney failure three to five days after the initial meal. This same syndrome has been reported in the literature for horses. Thus, UC Davis researchers have developed a refeeding program for horses that would minimize these effects and enable the horse to gradually return to normal body weight.

What Happens During Starvation

During the starvation process, the horse initially uses any fat and carbohydrate stores in his body to supply energy for metabolism. This is the normal process for any healthy horse: fat and carbohydrates are used for energy, exercise, brain function, circulation, etc., and are then replaced

with nutrients from food. The cycle is constant and never-ending, even during sleep. In a starved animal, once this source of fat and carbohydrate is gone, energy is derived from the breakdown of protein.

While protein is a component of every tissue, there are no inert stores of it in the body such as there are for fat and carbohydrates. Consequently, the starved body uses protein not only from the muscles, but also from vital tissues such as the heart and even gastrointestinal tissues--tissue that is necessary for life. The starved body cannot select which tissue protein will be metabolized for energy. As time goes by, the horse's survival is in a precarious situation. When a horse loses more than 50% of its body weight, the prognosis for survival is extremely poor.

Experimental Diets for Refeeding

In a study on the effects of different types of feed used for refeeding starved horses, we selected three that were very different in nutrient composition: alfalfa hay, oat hay, and a commercially available complete feed consisting of grain, molasses, fat and alfalfa. Alfalfa hay is known to be high in protein (20%) but low in the carbohydrate starch (3%). Oat hay is high in fiber but low in protein (7%). The complete feed represented a feed high in carbohydrate concentration, with 19% starch.

The three types of feed were given to 22 starved horses that were brought to the UC Davis research site as representative of horses rescued by equine organizations. Horses were fed one of the three diets over a 10-day rehabilitation period. The researchers focused on this time period as critical to successfully transitioning the gut from a starved state to a fed state. Even though the diets were different

in composition, they were fed in amounts that were equivalent on a caloric basis, so that horses assigned the oat hay diet, for example, received the largest volume of feed, while the horses on the complete feed received the smallest amount but the same number of calories at each meal.

Which Diet Worked Best?

Our results with the complete feed were very consistent with human studies conducted years earlier using concentrated calories. As the horse ate the high-carbohydrate diet, insulin was released in response to the high level of starch. The job of the hormone insulin is to facilitate carbohydrate uptake from the bloodstream and storage in cells for future energy use, but it also simultaneously draws the electrolytes phosphorus and magnesium from circulation into the cells. Since the starved horse has no stores of electrolytes, this depletion may lead to kidney, heart and respiratory failure. These effects do not occur with the initial meal but can be seen several days to a week later due to the repetition of insulin release following a high-carbohydrate meal and the cumulative depletion of electrolytes.

The oat hay diet was very bulky and caused diarrhea in several horses. Several essential nutrients such as phosphorus and magnesium were low in the oat hay compared with the other diets, so this diet did not support a successful rehabilitation. The alfalfa hay had the best results due to its high composition of quality protein, but also the major electrolytes phosphorus and magnesium. Since alfalfa hay is very low in carbohydrate content, there were minimal effects due to insulin response.

In a subsequent feeding study, we compared a ration of alfalfa hay to

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a ration of alfalfa hay and corn oil. Equine diets usually do not contain much fat, but in the recent decade, the use of corn oil to increase the energy density of a meal has been widely used in nutrition programs for older horses and in horses undergoing intensive training programs. The two diets were fed again on an equal-calorie basis. Although the corn oil had no harmful effects, substituting calories from corn oil for alfalfa decreased the total nutrient content of phosphorus and magnesium in the diet.

Thus, the response to the diet combining corn oil and alfalfa showed a decreasing blood phosphorus level over the 10-day period, which was not advantageous to rehabilitation. Again, the alfalfa diet was the most effective at delivering the necessary nutrients in the correct amounts to the starved horse.

Our research has shown that starved horses had very different responses to several diets. We found that the best approach for initial refeeding of the starved horse consists of frequent small amounts of high-quality alfalfa. High-quality alfalfa has characteristics of leafiness, fine stems, no dust or mold, with a crude protein content of 16 to >20%. This amount should be increased slowly at each meal and the number of feedings decreased gradually over 10 days. After 10 days to 2 weeks, horses can be fed as much as they will eat. The horse will show signs of increased energy after about 2 weeks. Ears, eyes and head movement will be the first noticeable improvements. Some weight gain can be achieved in 1 month, but 3 to 5 months usually are needed to rehabilitate the starved horse back to a normal body weight. Veterinary care and nutritional advice should be sought during the rehabilitation as complications can arise. ■

RECOMMENDATIONS FOR REFEEDING A STARVED HORSE

Note: A scale is essential for weighing the hay in the initial steps of refeeding.

Days 1-3

Feed one pound (approximately 1/6 flake) of high-quality alfalfa every four hours (total of 6 pounds per day in 6 feedings). Contact a veterinarian to evaluate the medical status of the horse.

Days 4-10

Slowly increase the amount of alfalfa and decrease the number of feedings so that by day 6 you are feeding just over 4 pounds of hay every 8 hours (total of 13 pounds per day in 3 feedings).

Day 10 and for several months

Feed as much alfalfa as the horse will eat and decrease feeding to twice a day. Provide access to a salt block. Do NOT feed grain, treats such as apples or carrots, or other supplements until the horse is well along in its recovery. Each feeding of grain, treats or any supplements complicates the return of normal metabolic function and can result in death.



Provide clean, fresh water at all times.

Deworming and correction of dental problems are very beneficial to the horse's recovery.

Other types of hay such as grass may be added following the first 2 weeks of refeeding, but these should be added slowly over time. Alfalfa hay contains adequate amounts of salt for a sedentary horse, so use caution in offering a salt block within the first 4 to 6 weeks.

Henneke Body Condition Scoring System

Body condition, or the measure of fat cover, can be evaluated by visual appraisal and palpation. A scoring system in horses uses six areas of the body to assign scores of 1 (extremely emaciated) to 9 (obese). The six areas are: (A) along the neck, (B) withers, (C) crease down back, (D) tailhead, (E) ribs, and (F) behind the shoulder. Note that a long hair coat or a winter hair coat may "hide" skeletal protrusions or fat deposits. Thus, it is best to evaluate the animal from several different angles and palpate (feel) the appropriate areas of the body to determine the proper body condition score.

A score between 5 and 7 is considered ideal for healthy horses. Horses scoring in the 1 and 2 category should be evaluated further for causes such as medical conditions, dental problems, or the lack of proper nutrition. **Individual body condition scores (1-9) are as follows:**

1— Poor. Animal extremely emaciated; spinous processes, ribs, tailhead, hip joints and lower pelvic bones projecting prominently; bone structure of withers, shoulders and back easily noticeable; no fatty tissue can be felt.

2— Very Thin. Animal emaciated; slight fat covering over base of spinous processes; transverse processes of lumbar vertebrae feel rounded; spinous processes, ribs, tailhead, hip joints and lower pelvic bones prominent; withers, shoulders and back structure faintly discernible.

3— Thin. Fat buildup about halfway on spinous processes; transverse processes cannot be felt; slight fat cover over ribs; spinous processes and ribs easily discernible; tailhead prominent, but individual vertebrae cannot be identified visually; hip joints appear rounded but easily discernible; lower pelvic bones not distinguishable; withers, shoulders and neck accentuated.

4— Moderately Thin. Slight ridge along back; faint outline of ribs discernible; tailhead prominence depends on conformation, fat can be felt around it; hip joints not discernible; withers, shoulders and neck not obviously thin.

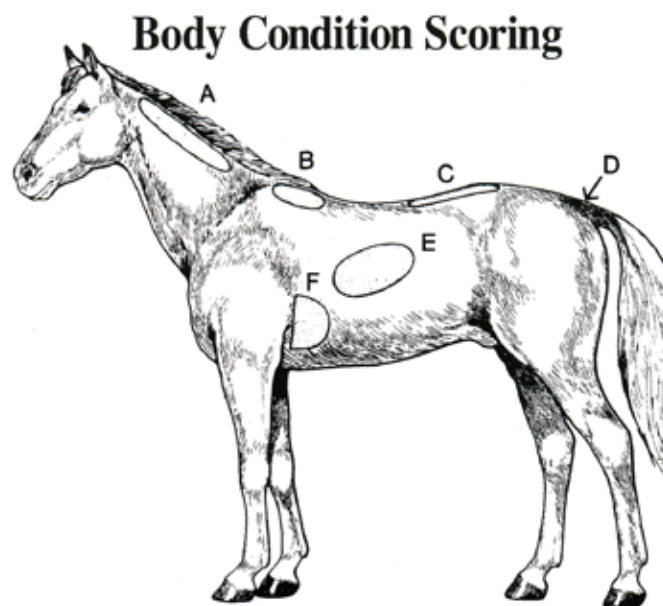
5— Moderate. Back is flat (no crease or ridge); ribs not visually distinguishable but easily felt; fat around tailhead beginning to feel spongy; withers appear rounded over spinous processes; shoulders and neck blend smoothly into body.

6— Moderately Fleshy. May have slight crease down back; fat over ribs spongy; fat around tailhead soft; fat beginning to be deposited along the side of withers, behind shoulders and along sides of neck.

7— Fleshy. May have crease down back; individual ribs can be felt, but noticeable filling between ribs with fat; fat around tailhead soft; fat deposited along withers, behind shoulders and along neck.

8— Fat. Crease down back; difficult to feel ribs; fat around tailhead very soft; area along withers filled with fat; area behind shoulder filled with fat; noticeable thickening of neck; fat deposited along inner thighs.

9— Extremely Fat. Obvious crease down back; patchy fat appearing over ribs; bulging fat around tailhead, along withers, behind shoulders and along neck; fat along inner thighs may rub together; flank filled with fat.



The Underweight Horse: Surveillance and Management Considerations on a Case-by-Case Basis

by Grant Miller, DVM

You are driving on a country road and pass a picturesque scene of several horses grazing in an open field. You notice one horse standing away from the group. Without being able to see much detail, it appears to you that this horse does not look like the others. Its ribs are showing and its hip bones are protruding. Like many concerned citizens, you wonder if the horse is ok, and if someone knows that it is underweight. Is anyone doing anything to address this issue? Should you call someone?

If you have experienced this, you are not alone. Animal control agencies indicate that scenarios like this are reported on a daily basis throughout the United States.

Reports of underweight horses are made to local animal control departments, humane societies, or legal authorities. These agencies will, in most cases, conduct a site visit to investigate complaints. Clearly defined ribs and protruding hip bones seem to be the most common “triggers” that initiate calls to authorities. Other common reports include observations that a horse is not being fed on an ongoing or routine basis, or that there is not enough feed available in the pasture where a horse is housed.

While some reports are credible and warrant investigation and intervention, some are determined to be unfounded. Animal control officers frequently report that



complaints about underweight horses are inaccurate or that further investigation uncovers facts about the case that justify the condition of the animal. In some instances, the horse is under veterinary care, while in others the owners have already taken measures to remedy the situation. It is clear that reports should be

addressed on a case-by-case basis, since circumstances surrounding underweight horses can differ greatly in each instance.

So what should you do if you drive by a horse that appears too thin? The most important thing to not do is to leap to conclusions. Making sure that

you get an accurate look at the horse is crucial to determining if an action should be taken. In many cases, observing the horse from a different angle (and not at a “split second” glance) can end up resolving initial concerns. Do not trespass to get a closer look but do gather relevant facts such as an accurate description of the animal (color, sex, defining marks, etc.) and a specific geographic location (address or description of the area) and report it to the local animal control authorities.

Common Causes of Low Body Weight Condition

There are a variety of causes for low body weight condition in horses, and these are described below. If you are rehabilitating an underweight horse, particularly a severely underweight horse, it is important to have a veterinarian determine the cause of the condition at the outset, because other medical interventions may be needed in addition to an appropriate feeding regimen.

1. Inadequate Caloric Intake

Inadequate caloric intake accounts for the majority of underweight horses. In this scenario, energy (in the form of calories) is taken in by ingestion of nutrients (hay, pellets, grain, etc.) in order to meet the metabolic demands of the body. But if the caloric expenditure put out by the body to meet metabolic demands (such as staying warm during cold weather, pregnancy, lactation, etc.) exceeds caloric intake, the body will turn to body stores for energy. Thus, as body tissues (fat and muscle) are dissolved for energy, the body loses weight.

There are two general scenarios that occur in which a lack of adequate caloric intake is the cause of sub-optimal body condition. In one

scenario, the horse lives for an extended period of time without any ingested feed. Again, it is highly advisable to contact a veterinarian before giving the horse feed because feeding can induce diarrhea and colitis (inflammation of the colon), which can both be life-threatening to horses. Diarrhea can cause irreparable dehydration and electrolyte imbalances. Colitis can lead to endotoxemia and sepsis (blood-borne infection), which can cause nearly instantaneous death. Horses can also become laminitic as a consequence of colitis.

In the second scenario, the horse has feed but its net caloric intake is inadequate. This can occur when a horse is being fed a suboptimal amount of food, is not being fed appropriate feeds, or is only being fed on a sporadic basis. In some situations, the horse is being fed a good amount of food on a regular basis, but the food is inappropriate for that horse (for example, poor quality hay with low nutritive value, pregnant horse that requires extra food, or horse that is missing several teeth and cannot chew hay).

It should be noted that both of the scenarios above can occur if a horse is housed with herd mates that are dominant. In such a scenario, herd dynamics can result in one horse not consuming adequate feed, even when ample feed is provided. Therefore, some horses may need to be isolated from more dominant herd mates during feeding, or be moved to a different location so that they do not have to compete for food.

When inadequate caloric intake is determined to be a cause of low body condition, an appropriate feeding regimen should be formulated for the horse. In general, the following tips may be useful when formulating a

feeding plan to assist an underweight horse in gaining weight:

- Veterinary consultation and oversight is advised early in the rehabilitation process.
- Small, frequent meals on a 24-hour basis can help horses through the more critical stages of rehabilitation (usually during the first 2 to 4 weeks of refeeding).
- High-quality feed sources are beneficial. When possible, low-carbohydrate, calorically-dense feed that is high in digestible energy should be provided.
- A clean, fresh water source in the form of a large bucket is useful because water intake can be monitored.
- Appropriate feedstuffs (i.e., feeds that the horse can chew and digest) are recommended. Examples of recommendations include: pelleted/soaked feeds for horses with dental issues, senior pellets for some cases, low carbohydrate/high digestible energy hay such as alfalfa for other cases.
- Avoid the “one-size-fits-all” approach to refeeding. Each feeding program is dynamic and can require adjustments on an ongoing basis depending on how the horse responds.
- The use of gastroprotectants such as Gastrogard® or Ulcergard® can be beneficial in some cases.
- The use of probiotics with yeast can be useful in some cases, however they may not be warranted in all cases. The use of digestive aids should be carried out with the advice of a veterinarian.

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Avoid other stressors such as a loud environment or an inconsistent feeding schedule.

Use blankets and provide shelter to help the horse keep warm (lower energy expenditure) during inclement weather or cold environments to aid in increasing body weight.

2. Dental Issues

Dental problems in horses can contribute to weight loss, although it is very rare to find a horse that is underweight due solely to dental problems. Usually, dental problems will contribute to low body condition score in combination with inadequate caloric intake. Because equine teeth (hypsodonts) grow throughout the animal's life, chewing over time creates sharp enamel points on the upper outside and lower inside edges of the premolars and molars (cheek teeth). These sharp points can dig into the cheeks and gums, making it painful for a horse to chew.

In addition, missing teeth, fractured teeth, or malocclusion such as parrot mouth can impair a horse's ability to adequately grind food when chewing. Horses with pain from dental problems can drop food ("quid") or only partially chew food before swallowing it. Because chewing is the first step in digestion, food that has not been adequately chewed and ground down into smaller bits will pass through the body whole. If it is not ground down to a size in which the body can digest it for energy use, food can end up being inefficiently utilized. Thus, weight loss can occur because the body must use its own stores to use as fuel to meet metabolic demands.

Addressing dental problems can increase the efficiency by which the body can absorb nutrients and energy from food. It is recommended that the horse have its teeth examined and floated (filed) to correct sharp enamel points and any other occlusion issues. Dental care should be performed by a veterinarian.

3. Infection and Infestation

If a body has to expend extra energy as a result of an ongoing infection or parasite infestation, weight loss can sometimes occur. In some circumstances, horses feel sick as a result of an infection or infestation and thus will not eat even though adequate food may be available. Examples of chronic infection include pneumonia, pyometra (uterine infection in mares), peritonitis, and internal abscesses. If a horse cannot eat enough to meet the metabolic need of the disease in addition to other energy needs (like staying warm, working, etc.), weight loss will result.

A physical exam performed by a veterinarian during the early stages of case management can greatly alter the outcome of a rehabilitation case. The exam can help illuminate signs of chronic infection or parasite infestation. In many cases, blood testing can also help determine if and where an infection is occurring. A fecal McMasters test is an essential test to determine whether or not parasites may be playing a role in poor body condition score. The McMasters test actually quantifies the number of parasite eggs present in a fecal sample. This is important because the mere presence of parasite eggs does not necessarily mean that parasites are contributing to weight loss. In actuality, the number of eggs present helps to determine whether or not they are a factor. Fecal samples must

be fresh in order for results to be accurate.

In each equine case of infection or parasitism, medication and management practices will vary.

4. Other Medical Conditions and Chronic Diseases

Several hundred chronic diseases and conditions exist in horses which can cause weight loss. Cancer, Cushing's disease, gastric ulcers, enterolithiasis, bone fragility syndrome, mandibular fractures, neurologic conditions, mineral toxicosis or deficiency, and organ dysfunction (heart/liver/kidney/thyroid) are but a few examples. Organ failure like heart, liver and kidney can also all result in profound loss of body condition. Each of these diseases has their own mechanism by which they result in an increased metabolic demand, but they all draw on a body's energy stores. In some circumstances, horses feel sick as a result of their disease and thus will not eat, despite having plenty of food available. In other cases, the metabolic demand placed on the body by the disease or condition exceeds the energy intake of the horse, thus creating a negative energy balance and subsequent weight loss.

Each medical condition involves its own diagnosis, testing, medical treatment and management considerations. For these reasons, it is essential that underweight horses be examined by a veterinarian in the early stages of their rehabilitative process. ■

General Observations of Underweight Horses

- Veterinary involvement in cases is instrumental to a successful outcome.
- Cases in which underweight horses have been completely deprived of food for a long period of time (days to weeks) are far more complicated and critical than cases in which the horse has had access to food.
- Diarrhea and colitis that occur during refeeding are serious complicating factors that lower the chance for successful rehabilitation.
- In some cases underweight horses may display abnormal behavior in relation to eating, such as aggression during feeding time or pica (the ingestion of inappropriate feed such as hair, feces, or dirt/sand/gravel). These psychological conditions may not resolve, despite a return to optimum body condition.
- Determining the cause(s) of the poor body condition and adequately addressing them will greatly influence the speed and efficiency of recovery.
- Very rarely will a horse not gain weight or reach optimum body condition, provided that the causes of the low body condition can be adequately addressed. An exception would be horses suffering from end-stage organ failure.
- The ability of a horse to regain weight can vary widely. Some horses may only take a few weeks to reach an optimum body condition, while others may take many months.



COWBOY'S TRIUMPH

A Thoroughbred gelding with the name of Cowboy conjures up a picture of a big, strong, energetic horse, but this description was far from the horse discovered one day in mid-February living in rural Sonoma. Instead, Cowboy was an extremely emaciated horse whose body was hidden underneath a dirty blanket. Alongside Cowboy were three other horses, all noticeably underweight

During the investigation, it was discovered that issues of domestic violence and substance abuse interfered with the quality of care provided to the horses.

The horses were fed sporadically, but the amount of feed given was never enough to maintain four mature horses. As the youngest and now the weakest one of the four horses, Cowboy maintained the lowest position in the small herd's dominance ranking. Thus, he never consumed any of his fair share of the limited amount of feed and he lost weight more rapidly than did any of his herd mates. Once a 1,200 pound horse, Cowboy was found to be about 500 pounds underweight with a body condition score of 1 (see Henneke Body Condition Scoring System, page 5). With this much weight loss due to starvation, Cowboy's prognosis for survival was considered extremely poor.

Cowboy was purchased by a concerned passer-by and taken off the property to a new home. The new owner immediately



Cowboy after 3 months of rehabilitation.

began feeding Cowboy free-choice alfalfa hay and there was a constant supply for him to munch on. However, after three days at his new home, Cowboy became lethargic and stopped eating any feed offered to him. He showed the classic signs of a serious gastrointestinal disturbance (loud sounds coming from his abdomen, gas, cramping, lethargy and poor appetite) and Cowboy broke with severe diarrhea.

Cowboy was evaluated by a veterinarian and immediately started on an intravenous fluid drip. He remained on IV fluid support 24/7 for four days. Potassium was added to the fluids to assist with an electrolyte imbalance caused by the massive loss of fluids with the diarrhea. Antibiotics, anti-inflammatories, and gastrointestinal medications used for treating stomach ulcers (Gastrogard) were administered daily to help his digestive system and body

fight the inflammation, toxins released, and possible pathogens associated with the damage to the colon lining caused by the acute diarrhea.

The diarrhea caused irritation to Cowboy's legs and area surrounding his tail. Daily skin care of his hind limbs included removing fecal material, applying Vaseline and Desitin, and braiding his tail to control fecal scalding. His hind limbs also had to be wrapped because of edema subsequent to hypoalbuminemia (low blood protein because of diarrhea).

On day 17 of rehabilitation, Cowboy developed signs of laminitis on his front feet. He was stood in ice water buckets for 20 minutes three to four times daily and in a deeply bedded stall with Styrofoam pads on his front feet. He remained on anti-

inflammatory/pain (Banamine) and gastric ulcer (Gastrogard) medications for 21 days.

Colitis resolved approximately three weeks into rehabilitation while the edema in the rear legs subsided at approximately four weeks into rehabilitation. The laminitis resolved in approximately one month after the initiation of treatment (approximately 6 weeks into rehabilitation).

Cowboy's teeth had many sharp points, making the grinding surfaces inadequate, especially when chewing long-stemmed hay. Thus, his teeth were power-floated to produce smooth and level grinding surfaces. Cowboy was vaccinated for Tetanus, Eastern and Western Encephalitis, West Nile Virus, Rabies, Rhinopneumonitis, and Influenza approximately two months after he was admitted into foster care.

Because of the severity of the diarrhea along with the sharp

points on his teeth, Cowboy was having a difficult time digesting hay. Thus, hay pellets were initially fed, which are more easily digested than long-stemmed hay. He was fed 3 pounds of 100% pure alfalfa pellets (rabbit pellets) four times daily at 8:00 a.m., 1:00 p.m., 6:00 p.m. and 11:00 p.m. Water was often added to the pellets to form a slurry, which also was helpful in improving his water consumption. Over a period of several weeks, the amount of pellets was increased. At the end of the second month, Cowboy began eating a flake (about 9-12 pounds) of alfalfa hay twice daily in addition to his pellets. Over the course of the third month, he was weaned off the alfalfa pellets and completely fed alfalfa hay.

Cowboy was also fed some supplements to help with his nutritional rehabilitation: 1 cup of wheat bran mash with probiotics (no yeast), Biosponge powder (commercially available adsorbent for intestinal disturbances), 2 tablespoons of electrolytes without sugar, and any needed medications twice daily.

Cowboy amazingly recovered from his emaciated state but the success of his rehabilitation was due to diligent veterinary care and proper nutritional support daily over several months. Cowboy lived up to his name because when things got tough he got back up and kept trying!

Comments on Cowboy's Case

- Because Cowboy had little to no access to food for an extended period of time, his rehabilitation involved several complicating factors.
- Moving Cowboy twice in one week (the second time to a foster care facility) caused stress, which may have been a complicating factor contributing to his colitis.
- The degree of Cowboy's emaciation made his chances for recovery much lower.
- Colitis and subsequent laminitis occurred in the early stages of refeeding.
- Lethargy and weakness persisted for approximately two weeks.
- The horse had to be body clipped to remove dull, scruffy hair.
- The power-float and vaccines were not performed until Cowboy was clinically stable, approximately two months into rehabilitation.
- Cowboy did not leave his stall at the foster home for approximately six weeks.
- Cowboy began ground training approximately three months into rehabilitation. ■



It is hard to imagine that Cowboy was in such a condition, looking at his healthy, recovered state at left.

Mindy the Comeback Kid

Mindy, a 19-year-old chestnut Thoroughbred mare had been receiving full dressage training for many years of her life and received excellent care while living in a high-end show barn. Unfortunately, her owner fell on hard economic times and Mindy was moved to a more economical backyard boarding situation. Her accommodations were no longer a barn or stable, but an overhung shelter without any walls.

That winter brought on cold temperatures, wind and rain causing deep muddy conditions. The owner had reportedly moved and no longer lived near Mindy nor had been to the property to see her for many months. Mindy's diet suffered since she only was sporadically fed alfalfa hay (possibly one to two times per week). Mindy was reported to authorities in the middle of January as living in deplorable conditions without consistent care. She was estimated to have lost 300 pounds of her usual 1,200-pound body during the previous two to three winter months, and her body condition score had dropped to just above a 2 on a 9-point scale.

Mindy was removed from the property and taken to



Mindy, two months after rehabilitation.

a barn with a stall and paddock. Upon arrival, she was examined by a veterinarian. Several medical tests were performed. A complete blood count and serum chemistry evaluations revealed no abnormalities, the Cushing's disease test was negative, and the parasite fecal tests found no detectable parasite eggs—all good results to support a successful rehabilitation program. The only negative finding was that she had sharp enamel points on the edges of her premolars and molars, which may have contributed to a diminished ability to chew feeds properly, especially hay.

Mindy was given a hot bath with medicated shampoo to treat a fulminating fungal infection covering most of her body. She was dried with

towels, covered by a blanket and hand walked until completely dry. Several subsequent baths were required to treat the fungal infection. Large patches of hair loss were ever present until a new healthy hair coat grew in over the next few months. Mindy also had extensive dermatitis on all four limbs due to standing for a long period of time in the deep mud, so a topical medication was applied daily to her legs.

It was discovered upon arrival at her new facility that Mindy had an infected granulating wound on her left hind leg. Treatment included oral antibiotics twice daily for 10 days, and the wound was wrapped until it healed nicely.

Mindy's feet were trimmed and shod during the first two weeks of her rehabilitation. A few weeks later, her teeth were power-floated to remove the sharp points, which drastically improved her grinding surfaces and ability to chew feeds, especially long-stemmed hay. Mindy was also vaccinated during the first month for Tetanus, Eastern/Western Encephalitis, Rabies, Rhinopneumonitis, Influenza, and West Nile Virus.

The nutritional rehabilitation program designed for Mindy took into account that she was chronically underweight rather than in a starved state, her teeth were less than functional due to the very sharp points, and she had been fed alfalfa hay sporadically in inadequate amounts during the previous months. As a result, Mindy was fed very small amounts (3.5 to 5 pounds each) of alfalfa hay four times daily at 7:00 am, 12:00 pm, 6:00 pm and 12:00 am; the amount of alfalfa hay increased over the next month. She also was fed 3 pounds of an alfalfa-based mixed hay pellets (does not contain grain, concentrates or molasses). After one week, she was allowed to graze on green grass for approximately 15 minutes twice daily. Over a period of weeks, she was allowed increased access to grass until she was living in a stall with access to one-half acre of pasture. By the end of her rehabilitation

(60 days) Mindy was being fed 1 flake (about 9-12 pounds) of alfalfa hay twice daily, 1 pound of mixed hay pellets twice daily, and had access to green grass at all times.

This alfalfa-based nutritional program, along with attention to her medical needs, transitioned this underweight mare with a scruffy hair coat into the stylish Mindy with a body score of a 5 (moderate)...just in time for summer grazing!

Comments on Mindy's Case

■ Bathing Mindy freed mud from her hair, allowing it to separate and hold in a heat layer around her body for insulation. Matted hair does insulate horses well, thus causing an increased energy expenditure for warmth due to lack of insulation.

■ In the one month prior to her power-float, Mindy gained a significant amount of weight. This was attributed to the high-energy, high-quality feeding program as well as to housing the mare in a suitable environment and addressing the issue of her matted hair.

■ Mindy was back under saddle by day 45 of her rehabilitation.

■ She had a healthy appetite and no episodes of gastrointestinal disturbance throughout the duration of her rehabilitation. ■



Mindy on Day 1 of her rehabilitation. She was 300 lbs underweight and afflicted with a fungal infection covering most of her body and extensive dermatitis on all four limbs from standing in mud for a long period of time. Can this be the same horse pictured in the left photo?

Sonoma County's CHANGE Program A Template for Change in Your Community

In a county with more than 20,000 horses, Sonoma County Animal Care and Control is stretched thin. It handles the needs of unwanted and stray dogs, cats and other domestic pets, as well as injured wild animals and livestock from the unincorporated areas of Sonoma County, the city of Santa Rosa and the town of Windsor. It also responds to calls about abused, neglected and stray horses and livestock.

Small animals find haven at the county's Santa Rosa shelter but horses do not. Currently, Animal Control does not have facilities for horses, nor the funding, personnel or training to care for them. Despite the best of intentions, the County of Sonoma has never had a solid equine care and control program in place.

That changed in 2007 with the founding of the nonprofit organization, the Sonoma County CHANGE Program, or Coins to Help Abandoned and Neglected Equines. Concerned about Animal Control's limited resources for handling horse cases, a group of community members formed CHANGE as a support network for the Sonoma County Animal Control Department to call on for assistance with horse abuse, abandonment or neglect cases.

CHANGE provides housing, veterinary care, farrier care and adoption services for horses that enter Animal Control's custody. According to veterinarian Dr.

Grant Miller, simply caring for horses who are victims of abuse and neglect without addressing the root of the issue "enables the problem." Miller, who helped found CHANGE after euthanizing an emaciated and severely dehydrated horse left tied to a fence in 100-degree heat, describes a multipronged approach to the challenge of horse neglect in Sonoma County. "It all starts and ends with the law, and if you enforce the law, you pull the situation up by the bootstraps," says Miller.

By offering intensive support and expert witness testimony to Animal Control and the Sonoma County District Attorney's office, CHANGE helps these organizations to more effectively build cases against and prosecute horse abusers. Several criminal cases have already made their way through the legal system, resulting in felony animal cruelty convictions, in part because of the organization's persistence. The Animal Control Department and the Sonoma County District Attorney have been assisted by CHANGE in handling cases effectively.

CHANGE recognizes that prevention of horse abuse and neglect before it occurs is preferable to prosecuting and punishing offenders. Knowing that Animal Control officers are on the front line in horse cases, CHANGE is working to offer education programs for officers in order to give them a better understanding of basic management and handling of horses, standards of care, and body condition scoring. In addition, CHANGE helps officers develop an educated eye that can alert them to abusive



Dr. Grant Miller with Flagstaff

activities such as horse tripping. A component of underground rodeo events, horse tripping involves making a horse run at high speeds and then roping it by the legs to pull it down. Horse tripping is illegal in California.

Future plans for the organization include a program for offenders that offers education on animal cruelty laws and standards of horse care and management in place of a misdemeanor conviction.

It's a tall order for a little organization that subsists solely on volunteer labor and donations from the community, but CHANGE is already showing Sonoma County that big changes can come from small efforts. "We're taking a new approach to an old problem," says Miller. "A journey of a thousand miles begins with one step." ■

Please visit their website at:
www.sonomachangeprogram.com

Henry Bergh: The Great Meddler

by Carolyn Stull, MS, PhD

Mankind differs from the animals only by a little, and most people throw that away.

In the early nineteenth century, Henry Bergh was quite well known in New York City for his concern over the treatment and care of the thousands of horses that pulled wagons, coaches and street cars. Street cars were packed and overloaded with passengers and numbered in the hundreds with many miles of tracks in New York. Horses endured icy, slippery, manure-laden, and salted streets in the winter months.

Henry Bergh was reported to have stopped the overloaded streetcars and refused to allow the horses to continue until excess passengers disembarked. Passengers would refuse to comply, which brought the horse-drawn traffic to a halt. This caused traffic jams during the busiest hours. Bergh was ridiculed in the newspaper as “the Great Meddler” with reports stating, *One is compelled to believe him insane or to conclude that he is a mere seeker after personal notoriety at the expense of public convenience.*

His passion led him to draft the first specific legislation for equines in 1866 for the state of New York to protect horses and mules from abandonment. This language is incorporated into many other states’ abandonment and anti-cruelty legislation, including California, as follows:

Every owner, driver, or possessor of an old, maimed, or diseased horse or mule, turned loose or disabled in any street, lane or place in any city in this state, who shall allow such a horse to lie in any street, lane, or place for more than three hours after knowledge of such a disability shall, on conviction be adjudged guilty of a misdemeanor.



Three days after New York enacted the legislation, Henry Bergh founded the American society for the Prevention of Cruelty of Animals. Today, the ASPCA is well known and respected as a nonprofit organization concerned with overpopulation and adoption of dogs and cats in local communities, but their seal still portrays an angel of mercy protecting a fallen carriage horse.

The public’s perspective on the role of horses in society has evolved from providing draft power and transport to companionship and recreation

much like cats and dogs. However, municipal governments have not responded to funding programs and facilities similar to shelters for dogs and cats to manage unwanted horses in local communities. The estimated current capacity of equine rescue facilities in the U.S. is only 13,700 horses. Unlike dog and cat shelters that limit the time an animal may reside at the shelter, equine rescue facilities invest money, time and volunteer efforts into feeding and rehabilitating horses to health to increase the marketability of the horses to potential adopters. However, for every four horses relinquished to a facility, only three are adopted or sold to new homes.

Similar to the equine welfare issues that faced Henry Bergh in the 1860s, today’s equine nonprofit rescue facilities cannot be expected to provide quality services and care for more than the 13,700 horses (of an estimated 100,000 unwanted horses in the U.S.) without substantial donations and financial sustainability, active trained volunteers, adequate facilities, and successful adoption programs. ■

Please visit Dr. Stull’s website at: www.vetmed.ucdavis.edu/vetext/animalwelfare

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