

The Care and Feeding of the Starved Horse

Dr. Bridgett McIntosh
Dr. Fred Hopkins
Dr. Doyle Meadows
UT Extension

Horse starvation in the U.S. is an emerging issue because many of today's horse owners lack the fundamental basics of equine nutrition and management, and are unaware of the economic investment involved with rehabilitating starved horses. In addition, the recent banning of horse slaughter in the U.S. has intensified the movement to “rescue” and rehabilitate unwanted horses that are often emaciated and in need of proper feeding and care. The care and feeding of undernourished horses can be a difficult process because there is a lack of information on how to safely refeed and care for these animals. Reintroducing feed and forage to the diet of starved horses too quickly can result in death due to a syndrome called *refeeding syndrome*. Up to 20% of starved horses may die in spite of the best of care. Case studies have shown that owner ignorance, economic hardship, indecision, or disagreements are the most common causes of starvation in horses. Starvation in horses is particularly a problem during the winter and early spring months, or at times of drought, when there is a lack of forage accessible to horses. Returning emaciated horses to an appropriate body condition and healthy state requires nutritional management and health care programs that minimize the risks of refeeding syndrome and promote total rehabilitation of the animal's health.

Definition of the Starved Horse

We consider a horse starved and in need of special attention if:

1. The horse is inadequately fed, has a body condition score (BCS) (Table 1) of less than 3 and has no other unassociated health problems.

OR

2. The horse had had nothing at all to eat for at least five days.

OR

3. A horse that has lost more than 15% of its body weight in the previous 60 days or less and has no other unassociated health problems.

Initial Exam of the Starved Horse

Determining the animal's current condition is an important first step in dealing with the starved horse. Some areas of concern include:

The Horse's History:

- What has the horse been fed and what feed appears to be available?
- Does the horse have free choice access to clean water?
- How old is the horse?
- When was the horse last dewormed and with what product?
- How long has the horse been on this farm?
- What other horses has it been housed with?
- Is this horse's behavior typically submissive within the herd?
- Is there shelter available?
- What vaccinations have this horse been given and when?
- When did the horse last receive dental care?
- What sort of health problems has this horse had in the past?
- If this is a mare, might she be pregnant?

The Horse's Current Condition:

- What is the horse's body temperature? Normal is 99 to 101.5° F.
- What is the horse's heart rate or pulse rate? Normal is 25 to 48 beats per minute.
- What is the horse's rate of breathing? Normal is 8 to 20 breaths per minute.
- What is the horse's current body condition score?
- Is this horse depressed or excited?
- Can the horse stand up?
- Does the horse appear weak?
- Is the horse dehydrated? Use the skin pinch test.
- Do the horse's teeth show unusual wear?
- What condition are the horse's feet in? Is farrier care needed?

Veterinary Examination of the Starved Horse

Management programs to rehabilitate a starved horse should be coordinated by a veterinarian at some early point in its care. In addition to the list above, the veterinary exam should also include the examination of mucous membranes and determination of capillary refill time and examination of the horse's abdomen for the presence and nature of gut sounds. A blood sample should be collected for a Coggins test as soon as possible to ensure the horse is negative for Equine Infectious Anemia (EIA), a viral disease for which there is no vaccine or cure. Another blood sample may be collected to test for liver, heart and kidney function, along with a complete blood count. A manure sample should be collected to test for intestinal parasites by performing a fecal egg count. A tetanus shot should be given within the first day or two of acquisition of the animal. Vitamin B injections may also be administered to stimulate the appetite of a horse that will not eat.

Feeding the Starved Horse

Nutritional programs for starved horses should be coordinated with an equine nutritionist, a veterinarian, and your county agricultural agent. Methods to refeed the starved horse will

depend on the horse's appetite, current body condition, and the prevalence of disease. It is essential to reintroduce feed to a starved horse gradually to avoid refeeding syndrome. Refeeding syndrome occurs when large amounts of traditional high starch grains are fed to starved horses too quickly resulting in a surge of insulin secretion from the pancreas which leads to the rapid uptake of high concentrations of glucose by the body's cells. The glucose forces large amounts of minerals, including potassium, phosphorus and magnesium out of the cells and into the bloodstream. The result may be heart, kidney and liver failure, and death may occur within 3 to 10 days. To avoid refeeding syndrome, starved horses must be fed gradually allowing their body chemistry to "catch up". Ration amounts should be gradually introduced by regulating intake and feeding schedules. Initially, the starved horse should be offered small rations in frequent feedings throughout the day. Starved horses can safely gain .5 to 1 pound of body weight per day and it may take up to a year or more for a horse to safely move from a BCS of 1 to a BCS of 5 (Table 1). Although there is limited research on refeeding and management of starved horses, studies have shown that emaciated horses should be gradually fed with roughage based diets. With any feeding program, horses should have free choice access to fresh clean water and salt. When caring for and feeding a starved horse the following recommendations should be followed:

Feeding the Starved Horse Alfalfa Hay

Alfalfa hay is considered the best feed for starved horses because of its high nutrient content and palatability. Alfalfa is typically low in sugar and starch so it produces a lower insulin response than grain diets. However, hay should be sampled and submitted to a forage testing laboratory to determine nutrient content in order to develop an ideal nutritional program. Good quality alfalfa hay should be selected for feeding the undernourished horses (Table 2). The recommended feeding schedule for refeeding starved horses with alfalfa hay is as follows:

- Feed 1 lb (1/4 flake*) of alfalfa hay every 4 hours for the first 3 days.
- Increase the hay to 4 lb (1 flake*) and decrease the frequency of feeding to every 8 hours from day 4 to 7.
- Continue feeding at this rate until day 14.
- Slowly increase the amount and decrease the frequency of feeding until the horse is receiving all the hay it wants in a day.

*Hay should always be weighed because of variation between bales

Feeding the Starved Horse Grass Hay

Sometimes alfalfa hay is not available in sufficient quantities, or is simply too expensive. While grass hay is not the best choice for feeding starved horses, it can be used successfully. You should have your hay tested by a laboratory to determine nutrient content and always feed hay meets the criteria between good and prime condition according to Table 2. Generally, you will have to feed about twice the amount of grass hay compared to alfalfa hay in the early stages of feeding the starved horse. The recommended feeding schedule for refeeding starved horses with grass hay is as follows:

- Feed 2 lb (1/2 flake) every 4 hours for the first 3 days.

- Increase the amount and decrease the frequency of feeding on days 4 through 7 so that the horse is being fed about 8 lb of grass hay three times a day.
- Continue to feed this amount until day 14.
- Slowly increase the amount and decrease the frequency of feeding until the horse is eating all the grass hay it will eat free choice.

Feeding Concentrates to the Starved Horse

Starved horses should not be fed grain or commercial concentrates for at least 2 weeks after refeeding begins. However, even very good grass hay will support only very slow weight gains and a horse being fed alfalfa will regain weight more quickly if fed moderate amounts of concentrates. Commercial horse feeds that are high in fat and fiber are generally the preferred type of concentrate for starved horses. Most brands of horse feed have one or more high fat and fiber feeds in their product line. Many of these feeds incorporate beet pulp, which is highly digestible and has a nutrient profile similar to good quality forage. A highly palatable and easy to chew grain mix or concentrate should be selected since these horses often have teeth problems from a lack of dental care. Senior feeds are a good choice for starved horses because they are manufactured to be highly digestible and easy to chew, and are typically higher in fiber. High fat rice bran and vegetable oils are used to achieve a fat level of 5 to 8%. However, feeding corn oil may result in decreased dietary intake of phosphorous and lower blood phosphorous in starved horses. If grain or concentrates must be fed, a strict feeding schedule should be as follows:

- Never feed concentrates within the first 2 weeks of refeeding a starved horse
- Feed ½ pound of concentrate twice a day beginning after day 14
- Increase grain mix by ½ pound a day every 3 days until the horse is being fed ½ to 1 pound of grain per 100 pounds body weight of feed per day in 2 feedings

The Environment for Caring for the Starved Horse

It is best to house and feed the starved horse alone. They should be placed with other horses only if absolutely necessary and the herd or group is compatible. However, the horse is a herd animal and in order to promote normal behavior and avoid vices, the horse should be housed where it can see and hear other horses. Feed, water, shade and a windbreak should be available. Also, the horse's environment should be well ventilated to reduce the likelihood of respiratory disease. It is usually best that the horse be out of sight of the casual visitor who may feel compelled to feed the horse more than it can handle or file an animal abuse complaint.

Deworming Starved Horses

Most, if not all, starved horses have internal parasites. Deworming programs should be implemented under the direction of a veterinarian to avoid stress, diarrhea, and colic. A veterinarian recommended deworming schedule is as follows:

- On day 14, give ½ dose of one of the paste dewormers containing one of the benzimidazole dewormers. Examples include Safeguard® and Anthelcide®
- Repeat ½ dose in 3 days

- After 3 more days, give double the normal dose of the paste dewormer for 5 consecutive days
- Seven days later, give a normal dose of a dewormer containing pyrantel (Strongid®, Exodus®, others)
- Seven days later give a regular dose of a dewormer containing a macrocyclic lactone and praziquantel. Common brand names include Equimax®, Quest®Plus, ComboCare®

Other Care for the Starved Horse

The starved horse is not likely to build immunity to vaccines during the first 2 weeks of refeeding. However, this horse is also more susceptible to various contagious diseases than others. After day 14 the horse should be examined by an equine veterinarian and given vaccines against Eastern, Western and West Nile Virus Encephalitis. Other vaccines may be indicated depending on the local situation.

Starved horses are often in need of dental care, though teeth floating may be stressful and this process should be delayed until later if the dental problems are not interfering with the horse's recovery. Tranquilization can lower the horse's blood pressure and heavy sedation should be avoided in starved horses. It is often the case that malnourished horses are also in need of hoof care by a farrier. Changes in hoof angles and balance need to be made slowly over several visits so that the horse can adapt to the changes in foot position.

When to Consider Euthanasia

Humane or economic considerations may make euthanasia the best option for the horse in some situations. Euthanasia should be considered when:

- The labor and money for proper care of the horse is unavailable.
- The horse is in body condition score is 1 and shows no improvement in 60 days of refeeding.
- The horse can't stand up or has been down 5 days or more.
- The horse has serious health problems.
- The horse won't eat.
- There is evidence of heart, liver and kidney failure.
- In spite of proper care, the horse does not show improvement within 14 days.

An Emerging Issue

Standardized guidelines for the care and feeding of starved horses is not widely available because of a lack of research and case studies, differences between individual cases, and an array of medical conditions that often accompany malnourished horses. However, it is known that starved horses are extremely sensitive to abrupt changes, therefore refeeding and health care to recover these animals is a long and gradual process. With the banning of slaughter in the U.S., there is concern that the number of starved horses will further increase, which has stimulated an interest in research to develop improved guidelines for the care and feeding of starved horses. Horse starvation is also concern where there is a lack of readily available forages in drought

stricken areas such as the current situation in the southeast. Avoiding starvation through times of both economic and agricultural hardship is possible through utilizing high fiber byproducts and commercial feeds to extend hay sources throughout the year. Increased awareness of the care and feeding management of starved horses will enable these horses to return to a useful and productive life. Returning neglected animals to health can be very rewarding, but it is expensive and requires guidance from equine professionals including an equine veterinarian, an equine nutritionist, and your county extension agent.

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Table 1: Determining Body Condition Scores for Horses.*

Score	Description
1.	Poor: Extremely emaciated; no fatty tissue can be felt. Ribs, spine, withers, hooks and pins projecting prominently. Bony structure of withers, shoulders and neck are easily seen.
2.	Very Thin: Emaciated. Slight amount of fat covering the base of the spine. Transverse process of lumbar vertebrae feels round. Tailhead, hooks, pins, spine and ribs are prominent. Neck, withers and shoulders are faintly discernible.
3.	Thin: Tailhead is prominent but individual vertebrae cannot be visually identified. Hook bones appear rounded, but are visible. Pin bones are not distinguishable. Slight fat cover over ribs, but easily discernible.
4.	Moderately Thin: Negative crease along back. Hook bones are not discernible. Faint outline of ribs is evident. Withers, shoulders and neck are not obviously thin.
5.	Moderate: Fat around tailhead feels spongy. Ribs are not visually distinguishable, but can be felt. Withers appear rounded. Neck and shoulders blend smoothly into body.
6.	Moderately fleshy: Fat around tailhead feels soft. Fat over ribs feels spongy. Fat beginning to be deposited behind the shoulders, on the sides of neck and withers.
7.	Fleshy: Individual ribs can be felt, but noticeable filling of fat between ribs. Fat around the tailhead is soft. Fat is deposited along neck, withers and behind shoulder.
8.	Fat: Tailhead fat is very soft. A positive crease is formed down the back. Difficult to feel ribs. Area behind shoulder is filled in flush with body. Noticeable thickening of the neck. Fat deposited along inner buttocks.
9.	Extremely Fat: Fat deposits around tailhead. Patchy fat appears over ribs. Bulging fat on neck, withers and shoulder. Obvious positive crease down back. Fat along inner buttock may rub together. The flank is filled in flush with body.

*Adapted from: Henneke, D.R., G.D. Potter, J.L. Kreider, and B.F. Yeates. 1983. Relationship between condition score, physical measurements and body fat percentage in mares. *Equine Vet. J.* 15:371-382.

Table 2: Quality Standards for legume, grass, or grass/legume mixed hay. Prime is considered the highest quality; as quality standard number increases, nutrient content decreases*.

Quality Standard	Description	Crude Protein, % (CP)	Acid Detergent Fiber, % (ADF)	Neutral Detergent Fiber, % (NDF)
Prime	Prime	> 19	< 31	< 40
1	Premium	17-19	31-35	40-46
2	Good	14-16	36-40	47-53
3	Fair	11-13	41-42	54-60
4	Poor	8-10	43-45	41-65

*Adapted from: Hay Market Task Force. American Forage and Grassland council. From, Ball, D.M., C.S. Hoveland, and G.D. Lacefield, 1996. Southern Forages. Williams Printng Co. Atlanta, GA.

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