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Feeding the Orphaned and Hand Raised Foal

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Take Home Message

Foals should be fed to maintain a steady growth rate, and any nutritional, management, or other forms of stress minimized. Healthy, properly fed, stress free foals will have a lower incidence of developmental orthopedic disease as compared to those not maintained in this manner.

Introduction

This will be a discussion of hand raising healthy foals during the nursing period, introducing them to solid food, and preparing foals for weaning.¹

Foals are usually hand fed as orphans if their mother dies, has no milk, is unable to care for the foal, or is needed for other purposes (showing, breeding, etc). When hand feeding a foal, attention can be made to minimize stress, feed a high quality milk replacer that is 'mare-milk like', and maximize feeding programs which mimic the natural feeding program of a mare nursing its dam.

Nurse/Foster Mares

Nurse mares or foster mares, when available, will greatly aid in the raising of orphaned foals.²⁻⁴ Foster mares save the owner hours of labor and usually decrease the incidence of the hand raising associated behavioral abnormalities.² One concern when employing a nurse mare is the use of either draft or cross bred mares. These breeds may produce excessive quantities of milk, which maybe associated with increased incidence of DOD.² It is usually possible to introduce (or graft) a foal to a foster mare successfully during the first 10 days of life. The adoption process is facilitated in fractious mares by patience, twitching, and/or tranquilization.^{1,2} The process may be aided by coating the foal with the foster mare's sweat, milk, an aromatic substance (e.g., vaporizing ointment), or feces. The bonding may be aided if the mare's sense of smell can be suppressed with aromatic substances.² Healthy foals will usually nurse up to 7x/hr the 1st week of life, then 3x/hr by the 4th week of life.⁶ Whenever nurse mares are used, the clinician, owner, or caretaker should be very cognizant of the foals health, and continued steady growth. If a foster mare is unavailable, a foal may be taught to nurse a lactating goat. Goat milk appears to be well tolerated by foals.¹⁻⁴ The nurse nanny/doe may also serve as suitable companion for the foal.^{1,4}

Hand Feeding

If a foal is fed from a bottle, bucket, or pan, all equipment should be completely cleaned after each feeding, and allowed to dry prior to it's next use.^{1,2,7,8} Strict attention to sanitation is

mandatory. Lamb and calf nipples have been commonly used for feeding foals.⁹ The author prefers nipples made for human babies.¹

Foals can be easily taught to drink from a pail or bucket, particularly those with wide mouth.^{1,2,7,9} The foal is allowed to nurse the finger wetted with milk while the foal's mouth and the nursed hand is gradually lowered into the pan of milk.^{1,2,7,9} The nursing reflex is triggered by moving the finger against the foals palate.^{1,2} Bucket or pail feeding is preferred as it requires less labor, and is more easily cleaned. Pails or buckets should be hung at the level of the foal's chest.^{1,4}

If mare's milk is unavailable, a commercial mare's milk replacer, goat milk, and/or modified cow milk, may be fed.^{1,7} Good quality commercial milk replaces specifically formulated for foals are available.¹⁰ Mare's milk contains 21% to 23% crude protein and 14.5% crude fat on a dry-matter basis; the milk is a 10.5% to 11% dry-matter solution,^{1,2,10} therefore milk replacers should be ~22% CP, 14-15% fat, and <0.5% CF.^{1,2,7,10} Cow's milk (preferably 2% fat) may be made suitable by the addition of some form of carbohydrate.² Although the addition of dextrose (20g/L) is commonly added to 2% cow's milk without problems,^{1,7,10} others² have suggested that the addition of jelly pectin (20g/L) is more suitable. Cow milk replacer may be adequate if it is 20% crude protein (of milk or animal origin) on a dry-matter basis, 15% fat and should contain less than 0.5% crude fiber.² The clinician or caregiver is cautioned that whenever using a milk replacer, careful attention be made to proper mixing and that all mixing and milk holding equipment be properly cleaned and dried. If foals are fed colostrum and then switched to milk replacer, the change should be gradual over several days.⁷

Foals can consume approximately 15% of their body weight (BW) increasing to 22-23% BW by day 2 and up to 25% by day 7.¹⁰ Multiple small feedings are indicated and more closely mimic natural feedings.^{4,7} Lewis² has recommended dividing the total quantity of milk into 8 feedings daily the first 1-2 wks of life. From the 2nd wk to the 4th wk the total of 25% BW in milk can be divided into 4 feedings daily. The transition from 8 to 4 feeding daily should be made slowly.²

Regardless of the feeding regimen or type of milk fed, the caregiver should monitor the foal's attitude, appetite, hydration, and urine output. If diarrhea or constipation occurs, the frequency of feeding, quantity of feeding, procedures used for mixing replacers, and cleanliness of feeding equipment should be monitored. Many times reducing the quantity of milk fed, with a concurrent increase in feeding frequency alleviates many problems.

Feeding Concentrate

Foals will begin to consume small amounts of dry feed during the first 2 weeks of life.^{2,9} Creep feeding may help reduce the stress associated with weaning, increase nutrient intake, and allow sooner weaning, thus reducing the labor associated with hand feeding the foal. Creep feeding thus is generally begun when foals are two to four weeks of age.¹⁰ The feed made available to foals during the first one to three months of life should be a high-density, low-fiber feed that is 16 to 20% protein, 0.8-1%Ca, and 0.6-0.8% P.¹⁰ Milk replacer pellets might be most suitable initially, with a gradual change to traditional grain based creep feeds. Milk replacer pellets and/or grain mixtures that meet these requirements are available commercially and can be placed in a foal's mouth several times daily until it begins to eat on it's own.^{1,2} When a foal is consuming

two to three pounds of milk replacer pellets daily, grain creep feed should be introduced gradually over a 5 day period.¹ By five to six weeks of age, a foal should be consuming 0.5 to 1.5 pounds of creep feed per 100 pounds of body weight each day.^{1,2} Good-quality forage and water should always be available to foals.^{1,2} An advantage of creep feeding is reducing stress and optimizing growth rate at weaning.^{1,10} Foals have been successfully grown and managed when weaned at one to six months of age.^{1,7,9,10} Most light bred foals can be weaned when they are consuming 0.75 -1lb of a good quality creep feed per month of age per day, consuming grass, and water. Placing a gentle, non lactating companion animal (goat, geriatric horse, etc) with the foal prior to weaning, and leaving them together may aid in reducing the stress of a transition from a milk based to a solid diet. Foals should be vaccinated, dewormed, and any procedure done at least 2 wks prior to weaning. Weaning should occur when it is the only foreseeable stressful event (weather changes, new hay, new feed, farm management changes, etc). Although gradual weaning has been used, the author prefers abrupt, non gradual weaning. All weaned foals should be closely monitored for appetite, signs of diarrhea/constipation, urine output, and general attitude.

Developmental Orthopedic Disease

Developmental Orthopedic Diseases (DOD) is a much studied yet only partially understood disease in the horse. Equine DOD has many causes, which may or may not act in-concert to produce the disease.¹⁰ Genetics, diet, inappropriate diet (energy, protein, macro- trace mineral intake, type of carbohydrate, etc.) mal-positioning in utero, endocrine disturbances, stress, altered growth rate, and combinations are some of the more commonly believed etiologies of this syndrome.^{2,10} The genotype association with DOD is poorly understood. Weight gain is heritable, yet rate of gain might not play as much a role as once thought.¹⁰ Signs and lesions of DOD may be seen early in life, then regress. Further, specific joints appear to have different windows of susceptibility.¹⁰ Irregular growth, which can be caused by diet, weaning, weather, environment, or other types of stress and season appear to be associated with DOD. Creep feeding may help reduce the weaning associated alteration in growth rate.¹⁰

Insuring an adequate dietary intake to meet NRC recommendations may be the only potential cause of this syndrome that the clinician- animal caregiver can influence.^{2,10} The most common dietary nutrient imbalance in horse diets appears to be associated with excess energy (including carbohydrate induced endocrine disorder), either excessive or deficient protein intake (including specific amino acid deficiencies), and Ca – P imbalances.¹⁰ Copper deficiency might not be associated with DOD, and supplementation of the weanling might not be of any benefit in the prevention of DOD;¹⁰ still the author recommends that diets be fed to meet dietary requirements of copper. Supplementation of copper in the pregnant mare's diet does appear to be of benefit in minimizing this syndrome in her foal. A high-energy, non-structural or free sugar based diet may produce maximum growth, but not optimal growth. Foals with unlimited access to high-energy, fermentable carbohydrate, creep feed may exhibit signs of DOD.^{1,2}

Foals should be fed diets that will promote steady, moderate growth rate.² If grass hay is fed, a salt mixture with 12% calcium and 12% phosphorus should be provided.¹ The addition of feed-grade steamed bone meal or dicalcium phosphate to trace mineral salt at a 1:1 ratio may correct most imbalances of calcium and phosphorus.¹ If legume hay is fed, a high-phosphorus salt

should be available. A mixture of 50% trace mineral salt and 50% monosodium phosphate may be of value if it is the only source of salt offered.¹ Voluntary exercise of the foal-weanling appear to help minimize DOD, while lack of exercise or forced excessive exercise are probably detrimental.¹⁰

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