Nutrition for Orphan Foals

by Gordon Rich, Chemical Engineer, BE (Chem) Hons. from Wombaroo Food Products

From time to time breeders are faced with orphaned foals or mares producing limited milk supply. When hand-rearing a foal the aim is to provide nutrition that closely mirrors what would be received from the mother's milk. In many cases it may be possible to foster out an orphan foal to a surrogate mare. If this is not practical then a suitable horse milk replacer should be fed to provide optimum nutrition.

**Colostrum**

Success in hand-rearing foals greatly improves if they receive colostrum at birth. Colostrum is the first milk produced by the mare and is high in immunoglobulins (proteins produced in response to infection by micro-organisms). Foals are born devoid of immunity so must acquire their initial immunoglobulins from colostrum in order to fight infections. Colostrum can only be absorbed for a short time after birth. It is therefore recommended to supply colostrum to young foals within 36 hours from birth, if no mare's colostrum on hand for such emergencies. Otherwise, powdered bovine milk replacer should be used to provide a level of passive immunity to foals.

**Composition of Horse Milk**

After providing colostrum, the mare starts to produce normal milk to nourish the foal. Horse milk is unique in composition, as can be seen by the comparison with cow's milk in the table below.

<table>
<thead>
<tr>
<th>Table 1. Milk composition comparison</th>
<th>Horse</th>
<th>Cow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solids (grams/litre)</td>
<td>109</td>
<td>127</td>
</tr>
<tr>
<td>Energy (kilojoules/litre)</td>
<td>2000</td>
<td>2800</td>
</tr>
<tr>
<td>Carbohydrate %</td>
<td>57</td>
<td>38</td>
</tr>
<tr>
<td>Protein %</td>
<td>20</td>
<td>26</td>
</tr>
<tr>
<td>Fat %</td>
<td>14</td>
<td>30</td>
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Horse milk is relatively dilute, with a low solids and energy content compared to cow's milk. This allows for a controlled growth rate of the foal, without putting excess body weight on too quickly. It is important because normally a foal's height increases faster than bodyweight and therefore proper nutrition is essential during this rapid bone growth phase. For example, at one year of age foals reach about 90% of their adult height but only about 60-75% of their final adult weight, which is why it is essential they receive colostrum within the first 36 hours from birth.

**Feed Volumes**

The amount to feed depends on the energy requirement of the foal, and this is calculated based on the metabolic rate of the animal. It is important to note that energy usage of an animal is not linear with body weight (eg a 100kg foal does not need twice the milk intake of a 50kg foal). Therefore a simple rule of thumb is “feed 10% of body weight per day” does not apply, as this may be insufficient for young foals but excessive for older ones.

| Table 2. Feed Volumes |
| --- | --- | --- | --- |
| Foal Weight | Age (approx) | Feed Volume | % of body weight |
| 50 kg | Birth | 6 litres/day | 12% |
| 100 kg | 32 days | 10 litres/day | 10% |
| 150 kg | 72 days | 13.5 litres/day | 9% |

An excessively rapid weight gain from too high an energy milk may be responsible for an increased incidence of skeletal problems in young foals. Carbohydrate provides the majority of energy in horse milk. The carbohydrate is mainly lactose, which is readily digested by intestinal enzymes in the foal.

Protein supports growth and development of the foal. The protein consists of about 50% whey protein, compared to cow's milk which only has about 20%. Whey protein has a high biological value for growing foals due to its elevated quantities of essential amino acids (particularly lysine & threonine). Cow's milk or similar products (eg Skim Milk Powder) are therefore not an ideal substitute for foals because they do not contain the whey protein profile of natural mare's milk.

Fat is utilised as an energy source, but the quantity is limited, which helps restrict excessive weight gain. Fatty acids are also used for cell wall structure and brain development. The fat content of horse milk is vastly different to that of ruminants such as cows and goats. For example, horse milk is particularly high in the omega-3 & 6 fatty acids (20% alpha-linolenic acid). The fat from cows or goats milk contain much lower levels of these fatty acids and therefore are not ideal for young foals.

**Feed Guidelines**

- **80%** of the above volumes is sufficient for foals under 6 months of age. Over-feeding can cause diarrhoea, so large deviations from the suggested feed volumes are not advised.

When the foal is about 2 months old it should begin to show interest in solid food. Introduce a commercial starter mix into the diet and slowly reduce the volume of milk replacer fed. At this time the foal should be exercised in a paddock and have access to both hay and pasture. Caregivers need to wean foals quickly, but ideally they should not be weaned before 6 months.

In a nutshell:

- Success in hand rearing foals is greatly enhanced if they receive colostrum at birth
- A quality Horse Milk Replacer should closely resemble mare's milk and be high in lactose, with moderate protein levels, & low fat content.
- Proper nutrition is essential during this time as skeletal deformities can occur if bone elongation is interfered with by excessive weight gains.

**Hand Rearing**

Foals should be housed in a clean, draught-free environment and have access to a grazing paddock and fresh drinking water. Milk should be warmed to about 30°C, and fed every two hours for the first week, reducing this to every 4 hours by the end of the second week. After one month reduce feeding frequency to every six hours. Foals may be initially fed from a bottle and teat, however they quickly learn to drink from a bucket.

During the hand-rearing period body weight should increase by about 1.5kg per day. Typical foal growth charts and feed guidelines can be obtained from manufacturers of milk replacer products. Over-feeding can cause diarrhoea, so large deviations from the suggested feed volumes are not advised.

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- A quality Horse Milk Replacer should closely resemble mare’s milk and be high in lactose, with moderate protein levels, & low fat content.
- Horse milk replacers should have a high whey protein fraction, and the fat should contain elevated levels of omega-3 & 6 fatty acids, in particular alpha-linolenic acid.
- Volumes should be fed according to metabolic energy requirements (based on body weight) for optimum weight gain.

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Handling the orphan foal

by Dr Amanda Warren-Smith, NCAS(1G), BAppSci(Eq)Hons, PhD

When raising orphan foals, social development and establishing a sensible relationship with their human carers are as important as great nutrition and physical health. This article reviews relevant scientific findings that should be taken into account when raising orphaned foals.

Orphan foals are best reared by fostering them onto a broodmare that should be as close as possible in size/breed and stage of lactation to the foal’s dam so that milk production is appropriate in amount and schedule. Orphan foals are best reared by fostering them onto a broodmare that should be as close as possible in size/breed and stage of lactation to the foal’s dam so that milk production is appropriate in amount and schedule. Orphan foals are best reared by fostering them onto a broodmare that should be as close as possible in size/breed and stage of lactation to the foal’s dam so that milk production is appropriate in amount and schedule.

The intensive human involvement anywhere, standing, being handled all the time, sucking on their clothing and being handled all the time, is dangerous and can be harmful to the foal. As the foal matures, it is also more likely to seek social company that is very common with orphans. So, if you are faced with having to raise an orphan foal, try and get it fostered with another suitable mare or to live with other foals and train it the same as you would any other foal.

References