



Issue 4 2011

# Talking Breeding

## From the editor...

Thank you to those of you who provided feedback and comments on issue 3 of Talking Breeding. The newsletter is written for owners of one to a few mares, rather than larger commercial stud farms. It is satisfying that so many of you have found the newsletter of practical interest.

In this issue on preparation for foaling, we discuss the management of a mare prior to and on the day of foaling. We also provide a review of the importance of ensuring a newborn foal is able to consume sufficient colostrum during the first 16 hours of its life. Foals, in contrast to human babies, are born with little antibody reserve against diseases in their environment. This is because mares have 5 layers of cells within the placenta or membranes between the maternal blood circulation and the foal's blood, whereas women have 2 layers and longchain antibody proteins are able to be transported through into a baby before birth.

It's now past the winter solstice and day length is increasing. Increasing day length stimulates the ovarian cycles in maiden or dry mares in preparation for the spring breeding season. In the next issue we will discuss breeding cycles and the use of lights to stimulate ovarian activity for early season breeding.

If your mare is expecting a foal, I trust that when it is born, it will be healthy and just what you wished for in her foal.

All the best,

*Dr John Kohnke*  
BVSc, RDA

### In this Issue...

- Preparing for Foaling - Important Aspects
  - Colostrum - the Immune Basis for Early Life
- Plus Handy Hints and lots more...

#### Handy Hint 1

##### Estimating the Day of Foaling

On average a mare carries her foal for 340 days from conception, or 11 months and one week. The expected foaling date can be calculated by adding 12 months to the date of last service, minus 1 month and add 7 days. Signs of foaling near the due date include increased udder development, 'waxing up' of the teats as colostrum milk is produced and the udder fills, drop in the croup and relaxation of the vulva. In most cases, a mare will foal within 24 hours after the disappearance of the small white 'dots' on the sides of the teats. Keep the mare under observation 24/7 during the last week before the expected foaling date. Up to 80% of mares foal at night. Eighty percent of these mares foal between 10pm and 4am, with 60% of these mares between 1-3 am in the morning. Often first foal mares foal up to 7 days early and aged mares up to 4-7 days later than expected.

#### Handy Hint 2

##### Check for Caslick's Sutures Before Foaling

Don't forget to check all mares, especially those bred away from your stud or property, for a Caslick stitch-up of the vulva, to prevent unnecessary damage to the vulva during foaling. Arrange for your vet to remove the Caslick skin seal at least 4-6 weeks before the due foaling date, just in case the mare foals earlier than expected.

#### Handy Hint 3

##### The Normal, Healthy Foal

Most newborn foals stand and drink within 30 minutes to 3 hours after being born. A newborn foal is considered to be abnormal if it does not stand within 60 minutes of birth, fails to seek security and comfort from its mother within 2 hours of birth, or has not attempted to suckle within 3 hours of birth. Other signs of a lack of oxygen during a prolonged birth or twisted umbilical cord include 'dummy' like behaviour, 'chomping' movements of the mouth and aimless wandering if the foal is able to stand. Consult your vet for a full appraisal of the foal's health and brain/neurological function.

#### Handy Hint 4

##### Beware of Uterine Distortion Syndrome

Studies have observed that overweight mares confined to hilly country have a higher incidence of Uterine Distortion Syndrome (UDS) with bent and deviated legs in newly born foals. UDS is thought to be caused by compression of the unborn foal in the womb during the last 2 months before foaling as a fat mare grazes on hilly country. It is important to move the mare to flat ground at least 3 weeks before her due foaling date. This will reduce the risk of the foal being born with 'bent legs'. Also ensure that her diet is supplemented with a bone and joint nutrients, such as Kohnke's Own Cell-Grow if she is grazing succulent pasture without a full 'hard' feed or a commercial mare feed is provided at less than the recommended daily amount in an effort to control her weight gain in a 'good doer' type of mare.

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# Preparing for Foaling- Important Aspects

All mare owners and breeders want their pregnant mare to produce a well-developed, healthy foal with no difficulties during foaling. There are a number of important management practices that should be carried out in the last three months prior to foaling that will help to ensure that the mare remains healthy and able to feed and care for her newborn foal. Careful management will help to minimise foaling problems and assure a healthy start to the young foal's life. It will also help maintain her fertility to enable the mare to be bred again and conceive during the first 4-6 weeks after foaling.

## Feeding During the Last 3 Months

An unborn foal doubles its size during the last 3 months (last trimester) prior to birth. This rapid rate of development increases the demand for energy, protein and trace-minerals for the mare to pass into her unborn foal through the membranes. **During this time of higher demand of late pregnancy, the grazing mare approaching foaling has a reduced gut capacity to carry the bulk of feed required, less energy is available from winter pasture and there is often extra energy drain due to the cold wintery weather in most areas. The mare also has to build up reserves to meet the elevated needs in preparation for milk production and to maintain optimum fertility in the first 2 months of the post foaling period to enable her to breed commercially at 12 month intervals.** A heavily pregnant mare should be provided with a higher energy diet containing more grain or prepared feed concentrate to provide energy, as well as protein, calcium and other essential nutrients to fuel the growth of her unborn foal.

## Avoid Excessive Condition

It is important to try to maintain a pregnant mare in a 'trim' condition, preferably with a 'fleshy covering' and last 2-3 ribs just covered. Heavily conditioned or overweight mares are more likely to have difficulties at foaling. An overweight mare may also produce reduced volumes of lower protein milk after foaling, which may limit the growth rate of her foal to weaning age.

As a working guideline, you should plan to increase the energy and protein levels by 10% per month to meet needs by adding an additional 200g concentrate per 100kg bodyweight (remember the unborn foal adds 15% to the pregnant mare's bodyweight), or roughly 1 kg of concentrate over the 9th and 10th month of pregnancy to maintain a 500kg mare in a 'fleshy' but not overly fat condition. This additional amount of concentrate as mare cubes, pellets or even grain, such as oats or barley, will depend on the seasonal conditions and the available grazing in the paddock.

### Handy Hint 5

#### Paddock Feeding to Reduce Wastage

It is generally inefficient to feed large volumes of chaff as roughage in a 'hard feed' to paddock fed mares, as it is costly and unless it is dampened in the bins, it can blow away as a mare feeds. A well formulated breeder pellet or cube, mixed with 30% oats or rolled barley as a fibrous carrier for the pellet, (they are cheaper per kilogram than chaff) and on smaller studs with some available grazing, a half a biscuit of teased out lucerne hay can be mixed into the bin with the hard feed. The popular and safe tyre feeders are ideal to mix in hay and concentrate as a paddock feed. Lucerne cubes, such as Multicube lucerne cubes, are also an ideal, low waste roughage to mix into pellets or grain mixes. They are similar in price to hay and non-dusty and less is wasted. Mixing in a pelleted supplement, such as **Kohnke's Own Cell-Grow®**, eliminates wastage from blowing away as the mare chews the feed provided in paddock feeders.

## Pre-lactation

Most mares start to 'bag up' and 'wax up' within the last 2-3 weeks before foaling. However, up to 12.4% of mares pre-lactate or 'run their milk' before foaling, depleting the amount of concentrated protective antibodies contained in their first milk to pass on to their foal. If a mare begins to pre-lactate for more than 3-4 days prior to foaling with large volumes of sticky, white colostrum splashed down the insides of her hind limbs, the full reserve of about 750mL for a 500kg mare of highly concentrated initial colostrum milk may be drained away.

A newborn foal born to a 500kg mare needs to take in about 500-750mL of concentrated colostrum milk within the first 6-12 hours after birth to establish protective immunity in its blood. This will ensure adequate immunity against common environmental microbial diseases for the first 12 weeks of life until its own immune system can produce antibodies starting at 4-6 weeks after birth. The low level of immunity in a young foal occurs at between 5-7 weeks after birth when the colostrum immunity is being depleted and its own immune system is immature or slow to respond. *Refer to diagram on page 4.*

It takes about 4 weeks for a mare transferred to a new locality to become sensitised to local microbial populations and environmental 'flora'. It is good practice to bring a mare home from a stud for foaling, or send her to a stud to foal down, about one month before she is due to foal, so that she can pass on antibody immunity to the local 'flora' in her colostrum to her newborn foal.

Check with your vet and arrange a concentrated antibody drench or serum transfusion (at about 20mL per kg birth weight of the foal) during the first 12 hours after foaling if you have a mare which has pre-lactated and is likely to have depleted her colostrum reserves in the few days prior to foaling.

## At the time of Foaling

A healthy, newborn foal is well adapted for survival, but special precautions should be taken to reduce stress and risk of disease by careful foaling and post-natal management. The majority of healthy mares have little difficulty in foaling, although overweight and fat mares, or very old mares are more likely to be less fit and lack muscle tone to ensure a quick and explosive foaling action over a 5 minute period. Obviously, these mares require more careful observation and any difficulties or a delay in the foaling process can increase the stress on the newly dropped foal. If a mare is having difficulty in foaling, it is best to get her to stand up and walk around on a lead for a couple of minutes and call your vet for advice. In most cases, the malpresentation will correct itself, but if a mare is still having difficulty, repeat walking her around until your vet arrives. Do not take a dog near a foaling mare as this may interrupt her foaling process. Keep onlookers to a minimum. If possible have a large stable or covered area prepared in advance and walk the mare carefully to the area up to 50 metres away, so that she is sheltered and warm as she foals. Have a bucket of warm water and clean towels ready for your vet's arrival. Ensure that your torch has strong batteries or arrange for a vehicle to be parked near the mare to enable its headlights to be used (low beam) to provide light for your vet if the foaling is in a paddock at night.

## Check the Foal and Mare at Birth

If you are present at the birth, ensure that the membranes are free from the foal's nose once the foal is born and on the ground. Avoid too much intervention - allow the mare to remain down and resting. Up to one third of the foal's blood volume is transferred from the membranes within 1-2 minutes after foaling - leave the umbilical cord intact until the foal attempts to move away. The foal will normally break the cord itself as it moves or the mare stands up. If a mare remains standing when delivering her foal, carefully support the weight of the foal (it will be slippery and covered in fluids) to avoid it falling to the ground. Hold the mare firmly at the position so that the cord remains intact for 2-3 minutes to allow blood transfer. If it is

raining or very cold, attempt to walk the mare and carry the foal at the level of her nose to a sheltered area or a stable with clean bedding. Always place the foal on a horse rug or an old 'doona' to help keep it clean and off the cold wet floor or ground.

#### Check List:

1. Check the mare for foaling lacerations – seek advice from your vet if necessary.
2. Check that the cord breaks and the foal is vigorous.
3. Check the mare's membranes – they should come away (expelled) within 1-2 hours – check that the full membranes are present by spreading them out. If in doubt – seek advice from your vet.
4. Once the foal is standing, check for any abnormalities.
5. Attend to the Cord -The umbilical stump should be sprayed with 10% iodine solution or cetrimide spray to help dry it up and reduce the risk of infection. If the stump is soft and leaking fluid (urine), seek advice from your vet.

#### Note:

**If the membranes are retained for more than 4 hours - seek advice from your vet. An injection of oxytocin hormone may be necessary to release the membranes attached in the womb. If the membranes are not expelled within 6-8 hours, manual removal by a vet will be necessary.**

**Membranes retained for more than 8 hours, when the cervix closes, are difficult to remove and the mare is likely to develop an infection in the womb, resulting in severe toxicity, with risk of laminitis (founder) and difficulty in getting her back in foal in the same season.**

Birth weight is a critical guide to the vitality and chances of survival as well as the foundation for future growth and development of the newborn foal. Foals weighing less than 35 kg at birth for a 500kg mare virtually have little chance of growing and achieving adequate early growth targets up until 2 years of age.

## Colostrum - the immune basis for early life

At birth, a foal leaves the sterile, warm conditions of its mother's womb that has provided nutrition and protection against disease and injury and enters the "hostile" and highly contaminated paddock environment.

### The Importance of Colostrum

It is important the newly born foal receives colostrum milk as soon as possible to provide energy, protein and water, as well as essential antibody protection against disease. Colostrum (first milk) provides immunoglobulins or antibodies that are concentrated into a mare's milk during the 10-14 days prior to foaling. The transfer of circulating antibodies to the foal direct from the mare's blood is prevented by the numerous layers of the placental barrier during pregnancy. Only low levels of antibodies are present in the foal's blood at birth and intake of colostrum is essential to provide immunity against common diseases during the first few weeks of life.

Failure to either obtain, or to absorb, adequate levels from colostrum within 16 hours after birth will predispose a young foal to a higher risk of bacterial infection. A foal which does not receive adequate colostrum or antibody cover during its first day is more likely to fail to thrive and succumb to infectious disease. Many of these foals develop persistent diarrhoea or are retarded in their growth and development.

It is most important that all newborn foals receive adequate colostrum within 8-12 hours after birth. A healthy, active newborn foal weighing 50-55kg at birth, will suckle between 2-3 litres of colostrum during the first 12 hours of its life.

### Colostrum contains three types of protein immunoglobulins:

- IgG for immunity against infective diseases.
- IgM for general immunity and health.
- IgA, which increases in milk after foaling and remains for up to 3 weeks, is not absorbed into the body and provides local gut protection against bacteria and other germs that commonly cause diarrhoea in a young foal, especially once a 7-10 day old foal starts to nibble pasture or share hard feed with its mother, which can overwhelm its gastrointestinal defence.

} Secreted for  
3 days after  
foaling

### Secretion of Colostrum

Expert management and care of a newborn foal is essential to ensure that it receives adequate immunity via colostrum milk. A mare only produces colostrum for the first 2-3 days of lactation and the level of antibodies is highest during the first 6-12 hours. Surveys have shown that up to 23% of foals tested within the first few weeks of life have low blood levels of antibodies in their blood. A less than optimum uptake of antibodies from colostrum can result from low levels in the mare's milk, or failure of the foal to suckle or to absorb sufficient amounts of colostrum within the first 12-16 hours after birth. After 24 hours the long chain proteins which form the immune antibodies can no longer be absorbed, but local gut immunity is provided in the milk by IgA for up to 3 weeks.

### Handy Hint 6

#### Stimulate a Mare's Immunity Prior to Foaling

Ideally, a pregnant mare needs to be exposed to the environmental contamination and profile of microorganisms, such as bacteria which cause scours, joint-ill and septicaemia, for at least 2 weeks prior to foaling down on a stud. In fact, studies have shown that up to 4 weeks exposure to germs in the paddock or foaling environment, is needed to provide adequate levels of environmental specific antibodies as immunoglobulins in her colostrum milk.

**Up to 12.4% of mares prelactate, or 'run their milk', seen as thick milk dripping from the teats and splashing down the mare's legs, before foaling. If a mare runs her milk for more than 3 days before foaling, she will significantly deplete her colostrum levels of IgG and IgM, for systemic immunity, but usually adequate IgA reserves will remain to provide gut immunity for 2-3 weeks.**

There is no way to prevent pre-lactation in a mare near to foaling.

A single dose of 500mL of colostrum per 50kg bodyweight (an average large breed foal weighs 45-55kg at birth) can be given to the foal by stomach tube. Consult your vet for advice on the amount a foal may need relative to its vigour and nursing behaviour. This should be adequate to establish immune cover in a newborn foal when given during the first 16 hours after birth. See Handy Hint 9 on page 4 for information on supplying colostrum to the foal by bottle feeding stored colostrum.

Aged mares over 20 years of age generally have lower levels of antibodies in their colostrum. A mare which foals earlier than 320 days of pregnancy may not accumulate adequate colostrum reserves to feed her foal. However, foals born early are still able to absorb antibodies provided in colostrum. Most foals that are less than 320 days of pregnancy have a poor rate of survival because their lung fluid and respiratory system is not fully functional.

During the first week of life, a foal suckles up to 105 times each day and stays within 1 metre of its mother for about 85% of the time, rarely moving more than 5 metres away. The frequent intake of colostrum and milk containing IgA antibodies bathes the gut lining with protective antibodies. Frequent nursing also stimulates the mare to produce more milk to feed her foal, with daily volumes of 15-20 litres being produced by the peak of lactation 4-10 weeks after foaling.

Shy maiden mares may resent initial attempts to nurse and deprive their foals of essential colostrum. Foals which are poor suckers, 'dummy foals', or foals which are weak or become separated from their mothers at birth, may also not be able to suckle an adequate volume of colostrum. If you are unsure as to whether a foal has suckled sufficient colostrum, consult your vet for advice. A simple 'on-the-spot' blood test is now available to check IgG levels. Adequate levels are readings above 400mg/dL, with at least 800mg/dL needed to ensure optimum immune protection.

## Absorption of Colostrum

A foal which is born prematurely and survives should be able to absorb antibodies because the special intestinal transport cells are formed early in foetal development. Although a foal's immune system can produce antibodies from 2-3 weeks of age, full scale response is not developed until 10-12 weeks of age. Therefore, the colostrum absorbed during the first 12-16 hours after birth must provide a temporary cover against common diseases over this period. The low point of immune protection in a foals' blood, especially a foal that did not receive adequate colostrum, occurs at about 5-6 weeks of age. A newly foaled mare produces colostrum for only 2-3 days, but the level of antibodies rapidly falls after 12-14 hours, once her foal has suckled and depleted the initial colostrum reserve.

## Sources of Colostrum

Colostrum can be collected from another mare within 12 hours after she foals. The best choice is a good producing mare that is still secreting colostrum after she has fed her own foal. Up to 250mL (1 cupful) of colostrum can be stripped from a newly foaled mare at hourly intervals after each time her own foal has nursed. A newborn foal will only take 50-60mL per drink. Stripping 3 cupsful colostrum immediately after she has fed her own foal (1 cupful at a time) to freeze or feed to another foal, will not significantly drain or lower the antibody levels available for her own foal at its next drink.

Although recipes for artificial colostrum are available using cow's milk fortified with egg protein, these may provide energy and protein, but do not provide protective antibodies. In areas where major horse studs are grouped, frozen colostrum is usually available from a colostrum 'bank' for orphaned or colostrum deficient foals. Some horse breeders routinely collect colostrum from newly foaled mares, and may make sufficient available to you or your vet. Colostrum can be stored frozen for 12 months without deterioration. It must be thawed slowly in warm water - not microwaved or heated excessively as this will damage the structure of the immunoglobulin protein and destroys their protective effect.

Serum collected from a mare or gelding resident for some time on the property can be used to provide immunity at the rate of 20mL per 1kg birth weight of a foal by intravenous drip or nose tube feeding of the young foal. Consult your vet for advice.

**Note:** For more specific information on colostrum and feeding serum to a newborn foal (Fact Sheet G1), contact Gary at [newsletters@kohnkesown.com](mailto:newsletters@kohnkesown.com)

## Handy Hint 10

### Cow Colostrum

Colostrum from a **newly** calved cow can be safely given by nose tube to a newly born foal at 500mL per 50kg bodyweight to provide short term immune protection to an orphan or colostrum deprived foal. Mare colostrum provides more specific and longer lasting antibody levels than cow colostrum.

## Handy Hint 7

### Collect Colostrum Within 6-8 Hours After Birth

Colostrum can be collected from a mare which has had a stillborn foal, or one that has lost her own foal soon after birth. Colostrum must be collected within the first 6-8 hours after the mare has foaled. Once a mare's own foal has suckled and removed 2-3 litres of colostrum, the quality of the subsequent colostrum secreted after 12 hours declines as the antibodies are drained. A test is available to measure the remaining antibody level in a mare's colostrum. Consult your vet for advice. Choose a healthy mare to provide supplementary colostrum - avoid a mare which is in poor condition, one that has pre-lactated for more than 12 hours or an aged mare, as antibody concentration may be lowered. Always wash and dry the udder and teats and practice good hygiene when stripping colostrum.

## Handy Hint 8

### Foals Prefer to Suck from a Flat Teat

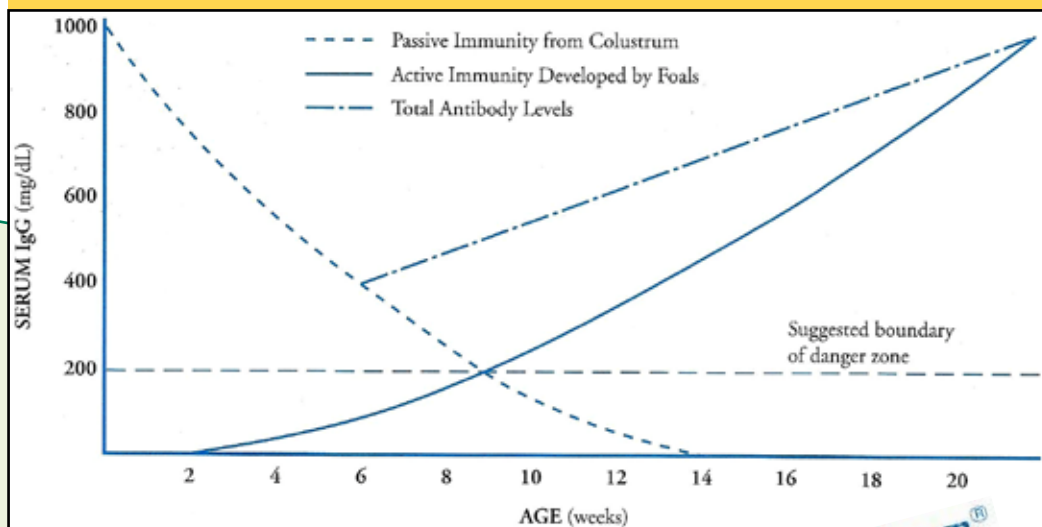
Newborn foals find it easier to grasp a flat teat to suckle. If a mare has an udder full of milk and the teats are large, wash the teats and strip a few mLs of colostrum from the teat to flatten it to facilitate the foal to drink. It is best to strip the opposite side teat to the side on which the foal is seeking a teat as most foals will suckle from that teat. If you are attempting to feed colostrum from a bottle, avoid using a lamb feeding teat. I recommend that you cut a 75mm long end off the index finger of a standard Ansell® rubber washing up glove to act as a flat teat. For feeding colostrum, because it is so thick, a 2-3 mm hole may need to be punctured in the finger tip of the glove 'teat'. Hold the 'teat' firmly on the neck of a plastic 600mL soft drink bottle when feeding the warm colostrum milk.

## Handy Hint 9

### Collect Colostrum if a Mare Pre-lactates

If a mare bags up and starts to drip colostrum for a few days before her due date, then it is best to milk her out two or three times a day as the colostrum accumulates and drips from her teats. Wash the mare's teats and glands thoroughly with warm water and collect the colostrum by stripping the teat into hygienically sterilised (eg boiled) 600mL soft drink bottles. The colostrum can be frozen to prevent it souring, just in case the mare does not foal for 2-3 days. As soon as the mare foals, slowly thaw the bottle(s) of colostrum in lukewarm water. The newborn foal should be provided with colostrum within 1-2 hours after birth at 100mL at hourly intervals by bottle as soon as it attempts to suckle. The foal should receive a total of 500-750mL of colostrum by bottle in the first 16 hours after it is born. If the foal is not able/will not, drink from the bottle, a vet can administer 500mL of colostrum via a stomach tube. Consult your vet for advice.

**Graph: Low point in immunity occurs between 5-7 weeks of age** (Adapted from Blackmore, 1984)



## Product of the Month

## CELL-GROW

*Cell-Grow is a comprehensive vitamin and mineral supplement for optimum body, bone and skeletal development of the growing foetus, the young foal and growing young horse.*

