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# Poor Feed - Poor Fertility

By Dr John Kohnke BVSc RDA

Over recent years, much more research effort has been focused on the nutritional requirements and feeding management of the broodmare. Although large sums of money are often outlaid for the purchase of a breeding farm and stock, stallion services, upgrading facilities and marketing, often relatively little attention is given to ensuring the optimum nutrition of the broodmare.

Although fertility and the conception rate decreases as a mare ages, careful attention to nutrition and a well planned feeding program in preparation for breeding will help to ensure an optimum conception rate for each mare. An adequate energy intake, matched to the mare's needs, is essential to achieve and maintain an optimum body condition for breeding.

Horse breeders often over-feed pregnant mares and growing horses relative to their needs. They often under-feed dry mares ("empty" or non-pregnant) and lactating ("wet") mares when maintained on predominately grazing pasture. Under these conditions, inadequate nutrition can affect a mare's subsequent fertility, conception rate increase the risk of early embryonic abortion, and the development of her foal during late pregnancy.

If the drain of lactation is not compensated for by an increase in the energy and major nutrient intake, a mare's fertility will decline, followed by a reduction in milk production, and finally a loss of body condition.

**Of all the nutritional factors that can influence fertility and maintenance of pregnancy, the adequacy of energy and protein intake is critical to breeding success.**

## Handy Hint

### Feed to Breed

Inadequate nutrition can have a direct influence on the fertility, conception and foaling rate of mares. Poor nutrition is a major factor that can reduce reproductive efficiency, despite good breeding management and veterinary care of otherwise healthy mares. An adequate and well-balanced nutrient intake and feeding management program is paramount to fertility and breeding success.

## Handy Hint

In a lactating mare, the drain of milk production is superimposed on the energy requirement to maintain fertility and conception, especially in a marginally under nourished mare with a foal at foot. This invariably results in less than optimum fertility and a reduced chance of the mares getting back in foal during the peak period of her lactation between 4-10 weeks after foaling to ensure the desired 12 month foaling interval. A survey indicated that 83% of otherwise healthy and 'non-infected' mares which failed to get in foal had low energy intake relative to their daily needs

## Non-Lactating Mares

### Important Considerations

There are a number of dietary management guidelines that must be considered when preparing a mare to be bred to increase her chances of conceiving and establishing a viable pregnancy to full term.

### Condition Scoring

The body condition of a mare at breeding can be evaluated against condition score standards that have been developed to monitor energy stores within the body relative to fat distribution. The concept of condition scoring provides a standard for breeders to evaluate the probability of a mare breeding successfully.

Ideally a mare should be fed to achieve a moderate to good condition prior to breeding.

**As a guideline, a mare in moderate to good condition has a 'fleshy' covering over her ribs and pin bones, with the outline of her ribs just visible.**

**There are a number of relationships between the body condition, energy and protein intake on the fertility of breeding mares that have been established by review of a large number of research studies.**

## Feeding for Fertility

- A poorly fed or thin mare, in below average condition, will have a delayed onset of oestrus and irregular oestrus cycles, in contrast to a well fed mare.
- A thin mare will come into season and cycle, but may fail to ovulate, conceive or maintain her pregnancy. Such a mare should have her feed intake increased, commencing 2-5 weeks before the breeding season, so that she is gaining weight when bred.
- A mare that is thin or below moderate condition at breeding, is still able to foal down a foal of average birth weight at full term 11 months later.
- Unless a mare's body weight is improved after foaling, she will have a higher risk of lower fertility and embryonic loss when she is bred during the peak of her lactation, if she is losing condition due to inadequate energy intake.
- Even without weight loss, studies have shown that a thin mare has longer intervals between foaling and ovulation

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requires more cycles per conception, has an overall lower conception rate and an increased early embryonic death rate than a mare in a moderate to average, or fat condition.

- An inadequate intake of protein in the ration, even with adequate energy, can delay the onset of oestrus and decrease overall fertility, possibly due to failure to ovulate, although a mare may show her normal oestrus behaviour and cycle length.
- A well fed, but not overly fat mare will normally ovulate earlier, with more regular cycles, than a fat or overweight mare fed on a maintenance or weight reduction diet.
- A fat or overweight mare will cycle and conceive successfully if her nutritional intake is maintained during the pre-breeding period, oestrus and conception, and for 90 days after conception so as to avoid any loss of body weight.
- An inadequate intake of energy in a mare during the first 90 days of pregnancy, due to starvation, relocation stress or mare group competition for feed, for a period of 4 days, will greatly increase the risk of early embryonic abortion and loss of pregnancy even before a loss of body weight is evident.
- Any reduction in the feed intake of a fat mare immediately before the breeding season to reduce her body weight will retard the onset of oestrus, and increase the time interval between oestrus cycles.
- It is unwise to start a weight-reducing program on an obese mare within the last 2 months before breeding.
- A lack of feed during the previous lactation period may reduce the fertility of a mare in the following season, even if a mare has gained weight and is in good condition at breeding.

## Maiden Mares

**A maiden mare retired to stud from race training just prior to breeding, or an overly fat mare at pasture, requires individual attention to ensure she does not lose weight when sent to stud.**

When maintained under semi-drought conditions, a maiden mare or an older dry mare will also suffer a shortfall of energy prior to breeding. Up to 46% of young mares that are not fully mature will abort their foals before full term if they are not fed enough to meet their total needs. If a mare is in poor condition, providing supplementary feed to increase her energy and protein intake will help to improve her fertility and chance of conception, and ensure that she is able to maintain her pregnancy during the first 3 months.

A mare's condition should be evaluated at least 4-6 weeks prior to breeding, and adjustments made to the dietary intake to ensure the mare is receiving an adequate ration to reach and maintain an optimum condition score of 2.0 prior to breeding.

Newly introduced mares, or those low in the 'peck order' in a larger group of mares, often suffer nutritional stress when bossed away from feeders. These mares will lose condition and fail to cycle and conceive early in the season. It is best to segregate new and maiden mares away from socialised and older mares, and attempt to provide individual feeding to ensure they are able to maintain a rising plane of nutrition.

**A steadily rising plane of nutrition will help to improve fertility and conception rates for mares that are in light to medium condition. The gradual build-up of the energy intake in the ration should commence at least 4-6 weeks prior to mating. Heavier mares should be maintained at a constant body weight, without allowing them to become obese.**

### Handy Hint

#### Maintain Energy Intake on Retirement from Racing to Stud

The energy density, quality and nutrient balance of the diet is reduced significantly if a mare that was previously maintained on a working horse ration is turned out on less than adequate pasture within 4-6 weeks prior to breeding. If she starts to lose weight, then her fertility and chance of conceiving will be significantly reduced. The fertility of a well fed and cared for maiden mare in good condition may be adversely affected when she is sent to stud in late winter. Loss of condition can lead to a delay in the onset of the mare's oestrus cycles with an elongated period between each cycle.

## Lactating Mares

### Important Considerations

There are a number of dietary management guidelines that should be considered to ensure a lactating mare maintains her milk production and fertility.

- A mare that foals late in the season may be unable to maintain her body weight if she receives a lower nutritional intake once pasture is grazed down or becomes less productive. The combination of consuming a lower energy diet and increasing lactation demand will drain her energy reserves and result in loss of body weight. Ovulation in this case can be suppressed and she may not be able to get back in foal, even when given supplementary feed to increase her energy and protein intake. This often occurs during the early summer period in late foaling mares when pastures dry off, or are grazed down, and energy and protein intake is reduced.
- Although studies have not linked early foaling, or an increased difficulty in foaling, with heavy or obese condition in a mare, many breeders claim that excessive condition can result in a higher incidence of foals born with limb deviations.
- If a mare is in very poor condition, feeding to gain weight during the early lactation period will help to improve fertility, but the rate of conception may be less than optimal. Her milk supply may be lower during the peak period of her lactation from 4-10 weeks after foaling, and the weight of her foal at three months of age less than average.
- An overly fat mare can afford to lose some weight slowly without affecting overall fertility.
- A lack of adequate energy and protein intake during the first two months after foaling usually affects fertility first, and then milk production and finally body condition. It may not be visibly apparent that a large mare, weighting 500-550kg is lower in condition until she has lost 50kg in body weight.

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- An obese mare at foaling that is slightly underfed to meet her needs, will maintain her fertility and ability to conceive, as well as milk production for the growth of her foal. If body fat reserves are lost rapidly on a low energy diet, the mare's fertility and then milk production will be adversely affected.
- If a mare has a consistently lower feed intake than necessary late in the breeding season to meet lactation demand, she will lose condition and is less likely to breed successfully in the time remaining in the breeding season.
- It is a common belief that an obese mare does not produce as much milk due to fat occupying room in her mammary gland. Studies have shown that an obese mare has a similar milk yield to a moderately conditioned mare, but her foal may grow at a slightly lower rate during the first two months.
- Excess energy intake in a lactating mare does not increase the fat or protein content of the mare's milk, but in fact lowers them slightly.
- There is no practical advantage in overfeeding a lactating mare to boost her milk production, except that the subsequent fertility and conception in a very thin mare will be improved by providing more feed so that she can gain weight.

**A thin mare that is put onto higher levels of feed at foaling will have a conception rate similar to a well conditioned mare.**

**The failure of early foaling mares to cycle and conceive is largely due to lack of adequate energy intake in the 2-3 months following foaling.**

## Handy Hint

### Avoid Weight loss after Foaling

It is important to avoid significant weight reduction during the first three months after foaling, as milk production may be reduced and retard the growth rate of the foal. If the mare is bred and becomes pregnant, then she has a high risk of early embryonic abortion if she loses significant weight during the first 90 days after foaling.

## Handy Hint

### Do not Transport Too Late

If you are returning a mare from stud in foal, studies have shown that it is 'safest' to transport her following a 21 day preg. Test or between 24-34 days before her developing foal embryo becomes too large to rely on uterine fluid as a source of energy and nutrients. Transporting mares between 45-60 days can increase the risk of embryo loss.

**During early lactation, as compared to late pregnancy, a mare's requirement for energy increases by 70%, protein by 60%, calcium by 66%, phosphorus by 25% and double the volume of water intake.**

Milk yield in mares is influenced by the mare's genetic ability for milk production, feed intake during the late stage of pregnancy, and by availability of water and intake of energy and protein during lactation.

The growth rate of her foal at foot is relative to the milk yield of the mare.

Mare's milk contains sufficient energy, protein and other major nutrients to meet the needs of the young foal during the first 4 weeks of its life. The growth rate of the foal is dependent on the milk yield of the mare during the first 2 months of life.

Once a mare foals and begins to produce milk to feed her foal, she must be provided with an increased intake of energy, protein, calcium, Vitamin A and other vitamins and minerals to meet her needs. A lactating mare requires more of these nutrients than a racing or performance horse in medium-heavy work.

## Handy Hint

### Simple Energy Equation

The energy and protein drain of lactation in a mare may affect her chances of cycling and conceiving when she has a foal.

A simple way to remember that an adequate **ENERGY** intake is essential for optimum breeding performance is that the letter '**E**' is in the words **OESTRUS, FERTILITY, CONCEPTION, PREGNANCY AND EMBRYONIC HEALTH** and **2 E's** in **SECRETION** of milk. There are also **2 E's** in the word **FEED**.

Any mare in thin condition has less chance of getting back in foal as reserves are drained by the onset and increasing demands of lactation.

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## Nutritional Needs

### Early Lactation - First 3 Months

At the peak of lactation, which occurs between 4-10 weeks after foaling, a 500kg mare can produce a weight of milk equivalent to 3-4% of her body weight, or 15-20 litres of milk per day, consuming up to 3-3.5% of her body weight in dry feed and concentrate mix.