



By Appointment to Her Majesty the Queen,  
Horse Feed Manufacturers,  
Dengie Crops Ltd, Essex

# Dengie

## Gold Product Advisor Course



# Product Advisor Awards



Welcome to the third level of the Dengie Product Advisor course and congratulations on progressing this far. By now you have a good knowledge of the horse's digestive system, nutrients and their functions and the commonly used raw materials in horse feeds which I hope has helped you when advising your customers. The aim of this level of the course is to develop your understanding of specific nutrition related diseases and the particular requirements of different age groups.

To complete this level of the course successfully the nutrition team will be looking for you to show that you understand the special requirements of horses with specific diseases by offering feeding advice as well as management tips. This is so important as very often changing the diet in isolation is not enough.

As always, if you have any queries or questions please don't hesitate to contact the Dengie Feedline on 01621 841188 or email us at [feeds@dengie.com](mailto:feeds@dengie.com). Good luck!

Best wishes

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# Colic & Digestive Upsets



“You are what you eat” is certainly a cliché but it does sum up how important diet is to the overall health and well-being of an individual. For the horse it is not only what you feed that matters but how you feed it and getting either of these elements wrong can result in nutrition related diseases such as laminitis and colic. The aim should always be to feed your horse sympathetically to try and reduce the risk of digestive upsets occurring.

## The fundamental principles of being a herbivore

The basic feeding strategy of an herbivore is to eat fibrous materials that contain low concentrations of nutrients but to eat lots of it to get the required levels of energy and nutrients. This inevitably means that herbivores spend a long time eating and, as the nutritional content of plant material varies according to the season, herbivores' bodyweights will usually fluctuate throughout the year.

As mammals do not possess the digestive enzymes required to break down fibre they rely on populations of micro-organisms to do it for them. As fibre has a complex structure it takes time to break down and so, in order for micro-organisms to digest fibre efficiently, they need as much time as possible to work on it. The more fibrous a fibre source is, the longer it will take to break down.

These principles are where the basic rules of feeding come from which are intended to maintain a healthy digestive tract. The basis to every horse's diet should be to feed plenty of fibre, with workload and condition determining which type of fibre is most suitable.



### Essential Rules of Feeding

1. Ensure clean fresh water is available
2. Feed little and often
3. Feed according to work, temperament and condition
4. Keep to the same feeding hours each day
5. Do not work immediately after feeding
6. Feed adequate roughage
7. Introduce changes to feed gradually
8. Feed clean, good quality forage
9. Feed something succulent daily



## Colic

Colic is the ultimate multi-factorial disease and so it can be very difficult to definitively diagnose the cause. Nutrition related causes are numerous but are commonly linked to an excess of cereal based feed or too little fibre. A lack of water can also cause problems.

Research in the USA has shown that by feeding between 2.5 and 5kgs of cereals a day (that's just 2 to 5 of the large Stubbs scoops), the risk of colic is 4.77 times greater than for horses not receiving cereals. Increase the intake to more than 5kgs per day and the risk ratio increases to 6.33 times greater than when no cereals are fed. If large quantities of starch are fed in one meal it exceeds the absorption capacity of the small intestine and reaches the sensitive hind gut where it is digested by the microbial population. This process creates a very acidic environment which fibre digesting bacteria are unable to tolerate and die off. This can cause colic symptoms as well as laminitis.

Just as for humans, fibre is important for regular bowel movement in horses and it helps to push excess gas out of the digestive system. A lack of fibre can mean that gas accumulates which can result in colic.

Impactions can occur for a number of reasons. An increasingly common cause in older horses and ponies is poor dentition where they are no longer able to chew effectively due to loose or missing teeth and so larger pieces of food are swallowed. For horses and ponies with compromised dentition it is important to provide softer fibre such as short chopped alfalfa and grass or products that combine alfalfa and sugar beet that are fed soaked to provide easy to chew fibre.

In winter, horses are less inclined to drink which may be due to the water being cold. They are also often turned out less and are fed hay as opposed to grass which can mean that their water intake may be considerably reduced. The combination of all these factors means that a much drier material is consumed and so the risk of impactions is increased. Using feeds containing sugar beet and that are fed soaked is a great way of helping to increase water intake.



## Loose droppings

Loose droppings can occur for a number of reasons, some of which are more serious than others. Diarrhoea is clearly more serious than “cow pat” droppings and, if diarrhoea occurs in foals, veterinary attention should be sought immediately as severe dehydration can be fatal. Reasons for loose droppings are as follows:

- **Insufficient fibre** – fibre gives droppings bulk and so too little fibre in the diet can result in loose droppings. Other symptoms of insufficient fibre may include stereotypies (vices) such as wood chewing and coprophagy (eating droppings)
- **Feed intolerance** – where a particular feed material irritates the digestive system. Elimination diets are usually required to identify the cause.
- **Increased water intake** – lush spring pastures or changing to haylage from hay can mean that the horse is consuming more water and less fibre than he was previously which often affects the consistency of droppings. It is a myth that less haylage than hay should be fed and so if using haylage check that you are feeding enough.

## Which fibre?

Not all fibres are the same as they range in digestibility and the levels of other nutrients they contain. One of the least digestible is straw which contains very few other useful nutrients, however this doesn't mean that it isn't a valuable feedstuff for certain horses. For individuals that hold their weight easily, straw is a useful way of providing fibre without many additional calories.

Performance horses are often fed very little fibre due to the concern that it provides too much bulk or “deadweight”. There are types of fibre such as sugar beet and alfalfa that are highly digestible and although they can't be used as the sole fibre source in the diet, they help to increase fibre intake without providing too much bulk.

Allergies can be distressing for both the horse and owner. An allergic reaction may be apparent in a number of forms from coughing to runny noses or even urticaria. It can be particularly tricky to identify the cause of an allergy and therefore devise a suitable management regime. Many horse owners are also attributing changes in their horse's behaviour to allergies to their feed. These situations are far more likely to be due to an intolerance or simply overfeeding rather than an allergy.

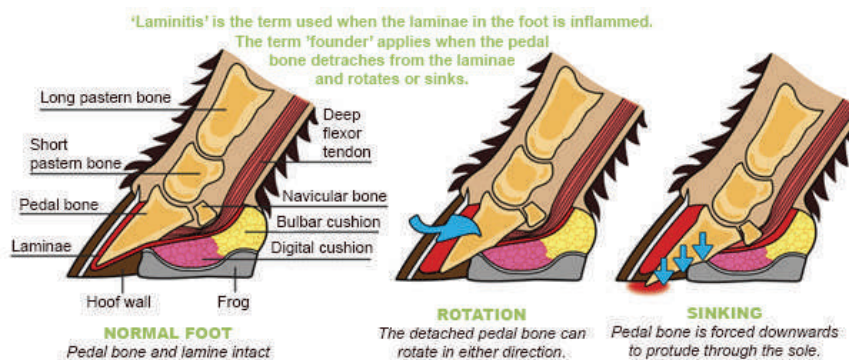
# Laminitis, EMS & PPID



## What is laminitis?

The layer of tissue that bonds the hoof wall to the pedal bone is known as the laminae. Laminitis occurs when the laminae becomes inflamed resulting in severe pain because the hoof wall prevents any expansion to accommodate the swelling. In severe cases the laminae fails, allowing the pedal bone to rotate downward and even push through the sole of the foot.

Laminitis is more commonly seen in the front feet – horses often adopt a classic stance of shifting their weight back on to the hind legs to relieve pressure from the front feet. Other symptoms include a pounding digital pulse, heat in the feet and a reluctance to move.



If your horse has laminitis it is important to identify the underlying cause. Researchers suggest that we should consider laminitis to be the symptom of other diseases such as Equine Metabolic Syndrome (EMS) or Pituitary Pars Intermedia Dysfunction (PPID, formerly known as Cushing's Disease), which need to be diagnosed, treated and managed appropriately.

## What is EMS?

Equine Metabolic Syndrome (EMS) is a metabolic problem characterised by obesity or regional adiposity. Symptoms include fat pads and/or a cresty neck, insulin resistance (high circulating levels of insulin in the blood) and often, repeated incidents of laminitis.

Insulin resistance is an abnormal response to the intake of non-structural carbohydrates (NSC), which are a combination of water soluble carbohydrates (WSC, or 'sugar') and starch in the diet. When NSC is broken down and absorbed it results in a rise in blood glucose levels. Normally, insulin is released by the pancreas to regulate blood glucose levels by stimulating the storage of any excess. In cases of insulin resistance, the cells don't respond as they should and so more and more insulin is released in an effort to restore blood glucose levels to normal. This results in very high levels of insulin in the blood which is believed to disrupt the normal functioning of the vascular system.





Fat stores in the body develop the ability to produce hormones known as adipokines and inflammatory messengers that put the body into an inflammatory state. One of the effects of adipokines is to decrease sensitivity to insulin which is why individuals that are overweight or obese become insulin resistant. The key to reducing the risk of laminitis is therefore to promote weight loss.

## What is PPID?

Pituitary Pars Intermedia Dysfunction (PPID) is a degenerative endocrine disorder that disrupts the control of hormones produced in the pituitary. Equally common in both horses and ponies, PPID can affect any breed and, although it is most commonly seen in older horses over the age of 20, horses as young as 10 years old can be affected too.

PPID is caused by neurons in the hypothalamus gradually degenerating over time. These neurons are responsible for releasing dopamine to inhibit the production and release of hormones from the pars intermedia, which is one of the three lobes of the pituitary gland. In the absence of a signal to stop, the pars intermedia continues to produce hormones, leading to high levels of certain hormones circulating in the body. This results in some of the common signs of PPID including a longer, curly coat that fails to shed, a dipped-back and pot-bellied appearance, excessive drinking and urination and laminitis.

Although not proven yet, there is some suggestion that horses with EMS are more likely to develop PPID later in life.



## Diet and laminitis - the link?

The underlying endocrine problems, EMS and PPID make the horse more vulnerable to laminitis. The trigger that ultimately results in the clinical signs of laminitis is often diet-related and is usually due to excessive consumption of sugar or starch. Grass and grass based forages such as hay, are usually the main source of sugar in most equine diets whereas the greatest source of starch is cereals. It is usually very easy to remove the starch from a horse's ration but it is often much harder to control sugar intake. However, it is vital to make the effort to do so if you want to win the "battle of the bulge" and keep your horse healthy.



## Top weight loss & feeding tips for all horse & pony owners

- Feed according to the work done, not what you plan to do!
- Restrict access to grazing, particularly when it is abundant which is usually the spring and autumn. This can be done via a track grazing system, grazing muzzle or turning out in a well grazed paddock. Research shows that grass intake can be reduced by 75-85% when using a grazing muzzle.
- Exercise your horse or pony – try schooling, lunging, long-reining and hacking for at least 20 minutes a day, all of which will help your horse's waistline!
- Feed highly digestible fibre feeds that are low in sugar and starch, such as alfalfa.
- Try to feed little and often to mimic the horse's natural grazing behaviour and help ensure that any sugars and starch are fully digested in the small intestine.
- Lose the duvets! To help your horse or pony burn off a few extra calories, try not to over-rug, especially if they're not clipped or we're experiencing a mild spell
- Feed a live yeast culture to improve fibre digestion and help create a healthy environment in the gut that will allow friendly bacteria to proliferate.
- Use a low-calorie hay replacer. Replacing the weight of hay with the same quantity of Hi-Fi Lite can help reduce sugar intake by up to 50%.
- Soaking hay will help to reduce the sugar and starch content. Research has shown that 16 hours of soaking at 16°C removed the most sugar but this isn't practical for everyone to do. Soak for at least an hour if you can.
- Use small-holed haynets or try double-netting to help reduced hay/haylage rations last longer
- Regularly use a weigh tape to help monitor your horse or pony's condition.

# Feeding the Veteran



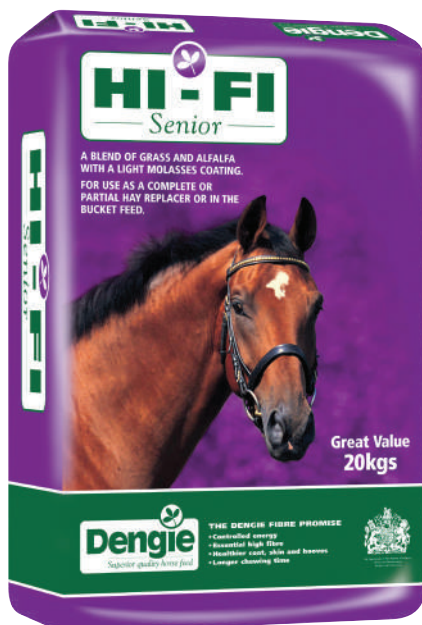
Just like humans, horses are living longer as nutrition, management and veterinary care improves. This means that many are experiencing age-related problems such as PPID (refer to the previous module), arthritis or poor dentition. Caring for an older horse is a significant undertaking as the time and costs involved can be considerable.

## Poor dentition



The horse only has one set of adult teeth and many horses are now outliving the working life of their teeth. Teeth may become worn, loose and even fall out which for an animal that should spend most of its time eating fibrous material can present a big problem. In a Dengie funded study it was found that horses with poor teeth consumed two-thirds less hay than horses with normal teeth in the same time period which illustrates why weight loss is a common problem for older horses. Signs that a horse is unable to chew properly include balls of chewed up hay appearing around the bottom of the haynet, quidding where feed falls out of the mouth as the horse eats and feed refusal. If any of these signs are apparent seek help from a vet or equine dentist.

In addition it is important to offer the horse sources of fibre that it can eat to try and avoid weight loss. Short chopped fibre such as Dengie Hi-Fi Senior can be used as a full or partial hay replacer if the horse can manage it. Just use the same weight of Hi-Fi Senior as you would hay. If this is still too much for the horse to manage the next step is to use a combination of high fibre cubes with soaked Alfa-Beet. This can be soaked up and made into an easy to chew mash. In the same study, horses with poor teeth consumed the same amount of the mash as horses with normal teeth thereby providing them with an essential source of fibre to maintain gut health and body weight.





## Loose droppings

Like other parts of the body the digestive system becomes less efficient as it ages. There is evidence to show that the secretions from the gut that the bacteria feed on reduce with age and so the microbial population is more vulnerable to pathogenic species becoming established which can ultimately result in loose droppings in the horse.

Insufficient fibre intake is another cause of loose droppings. Horses with poor teeth can no longer consume as much fibre which means there is little structural fibre being consumed and passing through into the droppings.

FOS prebiotics have been shown to provide a food source for beneficial bacteria which helps to counter the changes to the digestive system. They are included in Dengie Performance+ Balancer and Dengie Healthy Tummy complete fibre feed.

## Arthritis

Arthritis is a disease commonly associated with ageing and the horse is no exception. Wear and tear on joints causes inflammation and erosion of the cartilage which can result in stiffness, pain and lameness. Injury can also cause arthritis and being overweight can worsen the problem and the symptoms.

Arthritis can't be cured and so a combination of good management and complementary therapies is usually employed. With regard to diet there are several things to try:

- If the horse is overweight promote weight loss.
- Increased exercise will help promote weight loss, strengthen surrounding tissues to ease the joint and may help to reduce inflammation thereby improving mobility of the joint.
- Increase omega 3 intake – in humans omega 3 intake has generally declined and this is thought to be linked to the increase in inflammatory diseases such as arthritis. Although the horse's natural diet is relatively low in oils it is worth trying to increase the level of omega 3 to see if it helps ease the symptoms. Cereals are higher in omega 6 so horses on cereal diets over many years will have received higher levels of omega 6 than they would naturally. The best source of omega 3 fatty acids is fish oil, hence why cod liver oil is taken by many arthritis sufferers. If you prefer not to use fish oil, hemp oil is the best source of non-marine omega 3 followed by linseed.
- Glucosamine and Chondroitin are constituents in joint tissues and are widely supplemented for humans and horses with arthritis. In human studies there is little statistically significant evidence to show beneficial effects from their use.
- Hyaluronic acid is found in a wide range of body tissues including cartilage. It is a component of synovial fluid which helps to lubricate and cushion the joint. In trials it was better than a placebo at reducing knee pain and improving function when injected into the joint. There is some evidence that it can be absorbed via oral and topical administration but efficacy is still to be proven via these routes.

# Feeding Horses with Liver Disease



## What does the liver do?

The liver is a major organ in the body and is involved in energy, protein and fat metabolism as well as storing vitamins including the fat soluble vitamins A, D, E and K. The liver is also responsible for detoxifying the body which is why it is vulnerable to damage when toxic or poisonous substances are consumed. The liver can regenerate to some extent but a severe toxic insult can result in irreversible damage.

## Feeding horses with liver problems

When feeding horses and ponies with liver disease the main priority is to reduce the overall 'stress' on the liver. Given the role the liver has, the main feeding recommendations are:

- Meet but not exceed protein requirements
- Low fat and oil diet
- Use carbohydrates as an energy source
- Feed little and often rather than large meals
- Provide vitamin supplementation
- Include branched chain amino acids in the ration

The aim is not to exclude protein from the diet completely as it is an essential nutrient that is needed to keep the horse healthy and in good condition. If you have been reading around the subject of liver disease you will see that most articles written on the subject state that alfalfa should be avoided due to its high protein content. Alfalfa does have a naturally good level of protein and therefore should be fed in restricted quantities to horses and ponies with liver disease, but the real issue, as with any feed that you may consider using, is also the amount that is actually fed. Unfortunately, even vets often only advise customers on the basis of the level of protein rather than looking at it in conjunction with the amount fed.

A simple way of explaining this is comparing Feed A with 20% protein fed at 500g and Feed B with 10% protein fed at 1kg. If you were to just look at the percentage of protein on the bag it would be easy to automatically assume that Feed B would provide less protein as the percentage is lower. However when you compare the feeding rates you will actually get the same amount of protein from both feeds.

In horses with liver disease the levels of branched chain amino acids (BCAA) are reduced and the levels of aromatic amino acids (AAA) are increased in the blood plasma. Ideally the ratio should be high BCAA and low AAA. High levels of AAA in the blood cause some of the more disturbing effects of liver disease including fits and seizures.

By feeding more BCAA in the diet and meeting, but not exceeding, protein levels the aim is to improve this ratio. Branched chain amino acids are present in good quantities in sugar beet and alfalfa relative to other fibre sources although the latter should be used at low levels due to the total protein content. This makes Dengie Alfa-Beet one of the best products from the Dengie range for horses with liver disease.

Milk Thistle is often recommended for horses with liver problems as it contains silymarin, a potent antioxidant that is said to protect the liver from free radical damage and to aid regeneration.



Over the last decade, research has increased our understanding of Equine Gastric Ulcer Syndrome. More recently two distinct diseases have been identified which affect different areas of the stomach: Equine Squamous Gastric Disease (ESGD) and Equine Glandular Gastric Disease (EGGD). Whilst we know the risk factors for ESGD, less is understood about EGGD.

## Symptoms of gastric ulcers in horses

Symptoms are not always very easy to distinguish from other issues or diseases but some common ones include weight loss, dull coat, biting when being girthed and intermittent colic. However, it is important to understand that good doers and overweight horses can have ulcers too. It is also apparent that there is no link between the severity of ulcers and the symptoms – some horses are clearly very stoic with grade 4 ulcers and no signs of any problems visible on the outside!

## Feeding strategies that increase the risk of horses having ulcers

- Feeding too little fibre – chewing fibre produces more than double the amount of saliva than chewing concentrates
- Feeding 1% of bodyweight as grain resulted in a marked increase in ulcers in non-exercised horses
- Feeding 2g/kg BW starch per day or 1g/kg BW per meal more than doubled the risk of a horse having ulcers

## Feeding horses with ulcers

Feeding horses with ulcers is focussed on reducing risk factors – follow these top tips to keep your horse healthy:

- Feed plenty of forage to increase chew time and therefore saliva production which will naturally regulate the levels of acidity in the stomach. Use low calorie forages for good doers to provide chew time without weight gain.
- Focus on feeding little and often - dividing the total forage ration in to as many small meals as possible helps to keep the time the stomach is empty as short as possible.
- Try to avoid the use of cereal based concentrates as these increase the risk of ulcers. Use more digestible fibre sources like alfalfa with added oil to meet energy requirements. For example Healthy Tummy provides 11.5MJ/kg of slow-release energy which is the equivalent to a medium energy mix. Alfa-A Oil and Performance Fibre provide the same energy level as a conditioning or competition mix. Performance Fibre is ideal if you have a fussy feeder.



- Include alfalfa in the ration as research has shown alfalfa is a better buffer to acidity than other fibre sources due to its protein and calcium content. The Dengie Alfa-A range are all based on pure alfalfa and so provide the most buffering potential – they have a range of energy levels so pick the one that meets your horse's energy requirements
- Feed a small amount of fibre in the time before tacking up to ride so the horse doesn't have an empty stomach when ridden – a handful or two of a chopped fibre is ideal. The exercise intensity may need to be reduced for horses with ulcers to allow time to recover.
- Turn out as much as possible and try to avoid any unnecessary stressful situations.

## For horses with EGGD:

A consensus statement was published by specialists representing the European College of Equine Internal Medicine (ECEIM) about EGGD. It stated that there is no proven link between diet and EGGD but it was recommended to implement the same feeding strategies as for squamous ulcers (outlined above). In addition the following advice was given:

Link - <https://www.eceim.info/eceim-consensus-statement-guidelines>

- Provide a minimum of 2 rest days from work per week if possible or provide regular rest periods
- Turn-out where possible provided the horse does not become stressed by turnout. Some horses that are not accustomed to turn-out may be less stressed in a stable environment
- Minimise management changes and other potential stressors
- Minimise changes in equine companions and human carers



# Exertional Rhabdomyolysis



## What is Exertional Rhabdomyolysis (ER)

Previously known as Azoturia, Setfast or Monday Morning Disease, ER is the name now used to describe muscle pain and cramping usually triggered by exercise. Two clearly defined aetiologies (disease processes) have been identified, Polysaccharide Storage Myopathy (PSSM) and Recurrent Equine Rhabdomyolysis (RER).

### Sporadic ER

Caused by over-training, muscle strain, dietary deficiencies of electrolytes, vitamin E or selenium and exercising when suffering from viral infections

### Chronic ER

An underlying inherited abnormality such as polysaccharide storage myopathy (PSSM) in Quarter Horses, Warmbloods and Draft breeds or recurrent exertional rhabdomyolysis (RER) in Thoroughbreds, Standardbreds and Arabians predisposes the horse to muscle problems. Other contributing factors are usually required to trigger clinical signs.

## How do I Know if my horse has a problem?

The most obvious symptom is the cramping or seizing of muscles causing the horse to find moving difficult. Symptoms can be subtle such as a shortening of the stride or as extreme as a complete inability to move. The frequency of the problem can also vary depending on the cause of the problem. Nearly all occurrences happen during exercise.

If your horse is showing any of these symptoms you should call your Vet. A blood test will usually reveal high muscle enzymes demonstrating that muscles have been damaged. For a definitive diagnosis for PSSM muscle biopsies are usually required.

## Recurrent Equine Rhabdomyolysis (RER)

The second aetiology involves a defect in calcium metabolism within the muscle cell that causes problems with muscle contractions. This is the form that is most often found in Thoroughbreds or part Thoroughbred horses and a number of trigger factors have been identified including high starch diets, restricted turnout or exercise and presence of a viral infection. Excitable or stressy individuals tend to be more likely to succumb to ERS with 2 year old fillies most vulnerable to the problem.



## Management and feeding tips

Researchers at the University of Minnesota suggest that if only the diet is changed about 50% of horses improve. If both diet and exercise are altered, then 90% of horses have no or few problems and so it is important to address both the feeding and management of the horse.

The following tips are important in trying to reduce the risk of ERS occurring:

- Exercise the horse daily to increase glucose utilization
- Feed a high fibre, low sugar and starch diet with supplementary oil if required
- Ensure the diet is balanced with vitamins and minerals
- Turn out as much as possible
- Warm up and cool down thoroughly
- Increase exercise intensity gradually
- Encourage horses to drink by flavouring water
- Use electrolytes to replace those lost in sweat
- If there is any indication of a viral infection on the yard reduce the workload
- Always seek veterinary advice

## Feeding recommendations

The basic principle for both aetiologies is to eliminate starch from the ration altogether and to use fibre and oil as energy sources. Alfalfa is an ideal fibre source to use as it is naturally low in starch and sugars. When combined with oil such as Alfa-A Oil, it is an ideal feed for horses with ERS.

It is important that the diet is balanced and so a broad spectrum vitamin and mineral supplement should be used such as Performance Vits & Mins. Research indicates an increased need for selenium and vitamin E, two important anti-oxidants that are needed to counteract the effects of exercise and muscle damage. The recommendation is that the total diet contains 160iu of vitamin E per kg dry matter fed and 0.2mg of selenium per kg dry matter per day.

Electrolytes are lost in sweat and can contribute to muscle problems as well as the onset of fatigue. Ideally electrolytes should be administered in water to promote efficient absorption and rehydration. If a horse won't drink electrolytes they should be added to a dampened feed.

# Allergy & Intolerance



Allergies can be distressing for both the horse and owner. An allergic reaction may be apparent in a number of forms from coughing to runny noses or even urticaria. It can be particularly tricky to identify the cause of an allergy and therefore devise a suitable management regime. Many horse owners are also attributing changes in their horse's behaviour to allergies to their feed. These situations are far more likely to be due to an intolerance or simply overfeeding rather than an allergy.

## What is an allergy?

An allergy is where the immune system mistakenly believes that a harmless substance is going to be harmful to the body and elicits an immune response. For example, a harmless protein in the saliva of the culicoides midge causes the allergic reaction Sweet Itch. Allergies are almost always caused by a protein. However, it is important to note that this doesn't mean all proteins will trigger an allergic response. For example, a protein in peanuts can cause a severe allergic reaction but the same person can still eat meat which contains protein. It is the type of protein that causes the allergic reaction.

Recurrent Airway Obstruction (RAO) is another form of allergy where the horse is allergic to mould spores that are commonly found in bedding and hay. Management is key to dealing with the allergy by using dust free bedding and choosing forage sources carefully.

## What is food intolerance?

The term food intolerance should only be used to describe reactions that do not involve the immune system. It has been suggested that a better name for food intolerance is non-allergic food hypersensitivity. In humans, food intolerance occurs when the body is unable to deal with a particular food due to a lack of an enzyme or chemical required to digest it. Symptoms include diarrhoea and bloating but are generally not life threatening.

## Managing respiratory allergy

Fibre is an integral part of the diet for digestive health in horses. For those owners with horses suffering from RAO, finding a forage source can cause a real headache as soaking hay is not always effective enough for some horses. Haylage is usually a cleaner, less dusty forage source but contains more energy than hay which can be a problem for owners with overweight horses and ponies.

Dengie offers a flexible approach to feeding forage to RAO horses. All alfalfa produced by Dengie is high temperature dried meaning that a consistently clean forage is produced. Several of the Hi-Fi range can be used as complete or partial hay replacers, the most suitable for horses with RAO being Hi-Fi Senior. Hi-Fi Senior contains a blend of high temperature dried grasses and alfalfa with a light molasses coating and is suitable for all horses and ponies that need a top quality hay substitute. Dengie Pure Grass which contains purely high temperature dried grasses is also suitable.



## Feed related problems

Sweet Itch is sometimes thought to be related to diet but in fact it is an allergic reaction to the saliva of the culicoides midge. The irritation causes horses and ponies to rub the affected areas often to the point where the skin is broken. Barriers such as specially designed rugs are generally the most effective way of trying to stop the problem occurring. Some horse owners feed garlic to try and put the midges off biting.

Very little is understood about food allergies and intolerances in horses. One of the most common symptoms attributed to feed is urticaria also known as nettle rash or protein bumps. It is always important to rule out other causes such as a change of bedding or even the washing powder that saddlecloths or rugs have been cleaned in. Keeping a comprehensive diary can help to identify factors that are contributing to the problem.

When compound feeds are fed, which by their very nature combine a number of different raw materials, it can be difficult to ascertain which ingredient has caused the problem. It is usually necessary to conduct a feed elimination diet to try and isolate which ingredient is responsible. Of the cereals commonly included in compound feeds, barley is the one most commonly linked to urticaria. However, a feed elimination diet should start by going back to a simple diet of hay and water and new feeds introduced back into the diet one at a time.

If cereals are found to be the cause of the problem then it is possible to use alfalfa based feeds to supply the horse's energy and protein requirements. Additional oil can be added if more energy is required and a vitamin and mineral supplement can be used to balance the ration.

# Broodmares & Stallions



It is widely appreciated that nutrition is fundamental to health and well-being. Research in a number of species also suggests that diet can specifically affect fertility and, in technologies such as AI using semen that has been frozen or chilled are employed, there is evidence to suggest that diet becomes even more critical.

## The link between diet and fertility

Relatively little research has been conducted in horses compared to other species but one study using stallions demonstrated that feeding increased levels of omega 3 fatty acids improved sperm motility after semen had been chilled or frozen. The particular form of omega 3 was DHA which is only obtained from fish oils.

Zinc is a mineral that is frequently identified as being important for male fertility. A study using bulls showed that sperm concentration and motility were significantly higher in zinc supplemented individuals. The research also demonstrated that organic forms of zinc resulted in the greatest improvements. Organic forms of trace minerals are usually listed as chelates or bioplexes on ingredients lists.

Female fertility has also received increased attention and, apart from the well known factor of being underweight that reduces fertility, other nutrients have been identified as important. Beta carotene was initially thought to be important as a pre-cursor of vitamin A but it is now believed to be essential in its own right. Studies in dairy cows have produced conflicting results but the general view seems to be that a diet that is deficient in beta carotene may inhibit fertility but feeding in excess of requirements doesn't necessarily improve fertility.

It is probably fair to say that good quality grazing will supply a good proportion of the key nutrients linked to fertility. However, certain geographical areas are known to be deficient in essential minerals such as copper and zinc and many stud horses do not have access to grazing. Stallions combining a competitive career with breeding for example, may be stable kept and in these situations getting the diet right is vital.

## Timing is everything

The production of sperm takes 60 days and so dietary changes need to be implemented at least 2 months before the results need to take effect. Mares are most likely to conceive when nature intended them to as they start to put on weight after the winter months. Implementing a rising plane of nutrition so that your mare is in optimum condition at the time of covering should help to increase the chances of conception.



## Feeding the pregnant mare

The basis to all rations should be a balanced diet. Many mares in the first two trimesters of pregnancy do not require additional energy to maintain condition. However, it is vital that the diet is balanced and so a source of vitamins and minerals is essential; a supplement such as Dengie Performance Vits & Mins would be suitable. For mares that are turned out, a high quality vitamin and mineral lick such as Dengie Field Lick can be a practical way to provide nutrients to complement a forage based diet. Field Licks can also be a useful way of allowing individuals lower down the social hierarchy access to essential vitamins and minerals if they don't manage to consume sufficient levels of feed when being fed as a group.



The last three months of pregnancy is when 60% of foetal development occurs and so the mare's requirements increase in order to support this growth; it is estimated that her energy requirements increase by up to 20% above maintenance at this time. Mares that hold their weight easily can be given Alfa-A Original with a supplement to balance the ration. For mares that require more help to maintain their bodyweight it is possible to use Alfa-A Oil which contains as much energy as a Stud Mix per kg but is cereal free and so is particularly useful if mares are stabled or are prone to laminitis. A supplement should be used to balance the ration.

## Feeding the lactating mare

Mares in early lactation have a greater requirement for dietary energy than at any other time in their reproductive cycle which is due to the huge amounts of milk they produce. Most mares in early lactation produce about 3% of their body weight in milk per day; for a 550kg mare that equates to 16-18kg of milk. Mares would normally foal when there is an abundant supply of grass to help meet the increased energy and protein requirements of milk production. If mares foal very early or very late in the season, less grass is available and so more feed is usually required to meet her requirements.

## Feeding the mare post weaning

Once the foal has been weaned the type of feed the mare requires will be determined by her future vocation and her condition. If she needs to put on weight then conditioning feeds such as Alfa-A Oil or Alfa-Beet can be used. If the mare is pregnant again and in good condition then a supplement alongside Alfa-A Original would be suitable.



## Feeding stallions

The most suitable diet for a stallion is largely determined by the amount of mares he is covering and any other work that he is doing. Dengie Fibre Feeds are ideally suited to working stallions as they provide slow release energy and are cereal free and so are therefore less likely to encourage or exacerbate over-excitability behaviour. For stallions that are working hard or that need to gain weight, Dengie Alfa-A Oil is ideal as it contains as much energy (calories) as a traditional stud mix. A good quality broad spectrum supplement such as Dengie Performance Vits & Mins will provide a balanced diet.

If semen is being collected for chilling or freezing it is worth considering the addition of some omega-3 fatty acids to the diet. The linseed in Dengie Performance+ Balancer contains these as does cod liver oil. Omega-3 fatty acids help to create healthy sperm that are better able to withstand the stresses of freezing and thawing.

For stallions that become very fussy during the covering season, it is often a case of trying different feeds to try and entice them to eat. If possible, turning out on good grazing is usually very effective at stimulating appetite. Using a round pen and moving it regularly can help to reduce the risk of injury.

# Foals & Youngstock



Whether you are aiming to produce a top class performance horse or a reliable all-rounder, getting your youngster's diet right is crucial if they are to fulfil their potential. The diet should provide all the building blocks from which a sound structure can be developed that is capable of supporting the horse throughout its working life.

## The new born foal

Initially the foal is dependent on milk as a source of nutrition due to the presence of milk digesting enzymes in the digestive tract. The most important milk is colostrum as this contains antibodies that provide immunity against disease. Antibodies are absorbed directly into the foal's bloodstream from the digestive tract, a process that only occurs efficiently during the first 36 hours of life.

The quantity of milk produced by the mare peaks at around 2 months after foaling by which time the foal will consume approximately 20-25% of its body weight in milk per day. Once the foal reaches 4 months of age, milk will only be providing approximately 50% of the energy and protein needed and about 30% of calcium and phosphorous requirements. At this stage the foal's digestive tract has developed so that it can start to digest fibre, cereals and other feeds efficiently and so is less dependent on the mare and her milk.

Table 1 - Composition of mare's milk

Component	%
Water	89
Protein	2.7
Lactose	6.1
Fat	1.6
Ash	0.6

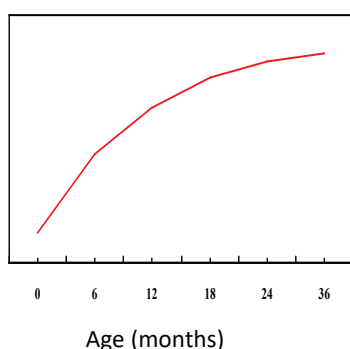
## Creep feeding

The need to use a creep feed for the foal is determined by a number of factors including the foal's growth rate, the mare's milk yield and the foal's future vocation. If the mare is milking poorly and the foal is underweight then a creep feed is likely to be beneficial. As the foal's digestive system is adapted to milk for the first 3 to 4 months of life, any creep feed offered during this time should be milk based. After about 6 months of age the levels of milk digesting enzymes decline and so the foal gradually loses the ability to utilise milk proteins.



## Growth rate

A foal's growth rate is measured in average daily gain (ADG). Growth is most rapid in the first 3 months and the ADG can be in the region of 1.1kgs per day. The rate of daily weight gain usually decreases by 0.1kg per month until about 6 months and from then to 12 months the ADG will be about 0.5 – 0.75kgs per day. Weighing a foal regularly is a valuable way to monitor growth. If the weights are then plotted on a graph (as shown below) a curve is formed which illustrates how rapidly the foal is growing.



This graph shows an example of the normal growth pattern of a foal. Initially the growth is rapid but this will slow as the foal ages. A very flat curve suggests the foal isn't growing which could be due to disease or inadequate nutrition. A steep curve could indicate that the foal is growing very rapidly and may be susceptible to developmental problems if not addressed.

The aim is to maintain an even rate of growth that enables the horse to reach its genetic potential. Putting the horse on a high plane of nutrition will not mean that it exceeds the height that its genetics have determined, but, it does increase the risk of Developmental Orthopaedic Disease (DOD).

### Factors affecting growth rate:

- Weather
- Illness and disease
- Creep feeding
- Mare's milk production

## Developmental Orthopaedic Disease (DOD)

DOD is a term used to encompass a wide range of growth problems such as epiphysitis, contracted tendons and OCD. There are many suggested causes of DOD including:

- Genetics
- Conformation
- Injury
- Nutrition

It is thought that DOD is likely to be multi-factorial as not all horses on the same diet or management regime develop problems.



## Dietary factors

For many years high protein diets have been thought to be the cause of DOD. Recent research suggests that it is more likely that high starch diets are responsible, particularly if combined with trace mineral deficiencies or imbalances. It is therefore important to ensure that the diet is balanced and that starch, which comes from cereals, is kept to a minimum. Fibre and oil can be used to provide alternative sources of energy and, when combined together such as in Dengie Alfa-A Oil, provide as much energy as a traditional stud mix. Feeding a supplement or balancer such as Dengie Performance+ Balancer designed for youngstock alongside will balance the diet.

## Weaning

Weaning is one of the most stressful periods in a horse's life and so good preparation is vital for avoiding a significant drop in the foal's condition. Most foals are weaned from around 6 months of age onwards but occasionally it may be done earlier in order to obtain greater control over the foal's diet. Early weaning should only be done after careful consideration as research suggests that the earlier the foal is weaned the greater the impact it has on the foal's health and well-being.

It is advisable to introduce a bucket feed to foals prior to weaning so that they become confident eating from the bucket by copying their dams. The feed should be introduced gradually and built up slowly so that by the time weaning occurs, the foal is consuming the recommended quantity of feed. A feed that is high in fibre and oil, such as Alfa-A Oil, will be sympathetic to the digestive system and so helps to reduce the risk of digestive upsets whilst providing sufficient energy for growth and development. Dengie Performance+ Balancer will balance the ration and also contains a prebiotic to support gut health.

## Behaviour

Recent studies have shown a link between diet and the behaviour of young foals. It was found that replacing cereals with fibre and oil reduced spontaneous locomotion and reactivity and that foals appeared to be more confident in their environment. High starch diets have also been linked to increased aggressive wood chewing and coprophagy (eating dung).

## Feeding yearlings

As the youngster gets older the growth rate slows and therefore the horse's nutritional requirements decrease. It is still vital that the diet is balanced but the quantities of feed required to support growth are not as great. For yearlings that are destined for the sale or show ring, a balance has to be found between achieving good condition without triggering DOD. Just as for foals, high fibre and oil diets such as Dengie Alfa-A Oil provide safe sources of energy and are sufficient to support growth. They should be fed alongside a suitable vitamin and mineral source such as Performance+ Balancer to provide a balanced diet.

# Dengie

## Gold Product Advisor Course



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