



## UNDERSTANDING ENERGY

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#### 1. UNDERSTANDING ENERGY

Finding the correct balance between controllable energy and too much can be a fine line.

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For all owners, trainers, and riders finding the correct balance between controllable energy and too much or too little can be a fine line.

Understanding what energy is, will ultimately lead to a better balance for the horse.

Although "energy" is often referred to when discussing behaviour and/or performance and "calories" when discussing weight gain or loss, the two are the same.

Therefore, finding a food to provide the horse with more energy without calories (or vice versa) is impossible.

In human nutrition energy is measured in kilocalories, hence the term Calories. However, in horse's energy is measured in Mega Joules (MJ) of energy.

Currently there is no worldwide standard for energy measurement although most companies and researchers will use Digestible Energy (DE). This is the amount

of energy remaining after the energy in the faeces is subtracted from the gross or intake energy. So ultimately it gauges what energy % is available for the horse to actually use.

It should be noted that the equine digestive system is not 100% efficient and so technically DE is an approximate estimate of the energy contained within a feed as not all energy is easily available to the horse.

Not all companies will express such values due to the lack of standardisation. However reputable ones will include the information on DE to allow the client to make an informed choice.

The energy content of a feed refers to the conversion of chemical into kinetic energy as the horse works. Therefore, if it is known how much a horse works then it can be estimated how much needs to be put in. Supplying too much energy can lead to uncontrollable behaviour and/or weight gain, supplying too little can lead to under performance and weight loss.



The below table gives a guideline of workload levels.

Exercise level	Description	Approx energy level of feeds (per kg)
Maintenance	Horses or ponies at rest (not working) or those in very little work (less than 1 hour per week)	No hard food often needed or those providing a low energy, approx. <b>8-10MJ</b>
Light work	1-3hours per week. Leisure/riding school Showing – occasional local level Dressage- occasional prelim/novice Show jumping –occasional up to 1m Endurance up to 30km Pregnant mares up to 10months Growing animals up to 12months (no work) Non breeding stallions	Light energy feeds <b>Typically 10-11MJ</b>
Medium	3-5 hours per week Intense schooling Showing- affiliated Dressage medium + Show jumping 1.10m + Eventing Endurance 80km Racing- training Polo and Polo crosse- one day Pregnant mares from 10months + Breeding stallions Growing Horses 18months in work	Medium energy <b>Typically 11-13MJ</b>
Hard	4-5 hours a week, including gallop, heavy jumping and other skill work Dressage- Grand Prix+ Show jumping- 1.50m + Eventing 3, 4* 3days Endurance 120km + Racing – training middle stages Lactating mares Polo, Polo crosse- multiple days High energy	<b>Typically 13-13.5MJ</b>
Very Hard	1 hour per week speed work, 6-12 hours per week slow work Racing-full work/training Endurance Eventing- International competitions Extreme energy	<b>Typically 13.5- 14MJ</b>



Energy is not an existing nutrient in itself but it is taken from the nutrients the horse receives. There are multiple pathways the horse can use to produce energy. However the overall end product is ATP (Adenosine Triphosphate).

Energy sources available to the horse are fibre, fat, and carbohydrates. Protein is often thought of as an energy source however it is an extremely inefficient process and one the body does not like to use. Generally speaking the body will only revert to using protein for energy if any of the conventional sources are not available and/or protein is hugely oversupplied within the diet.

Excess protein consumption can lead to the horse requiring more water (not ideal for hard working horses that already have significant water requirements) and results in increased urea production. This can not only affect the kidneys but also the respiratory system from ammonia once urine is exposed to the environment.

### **Fibre (Structural carbohydrate)**

Fibre is an important part of the horse's diet for two reasons. Firstly, it provides valuable energy and secondly it aids in a healthy working digestive system. Therefore, it should be the basis of every horse's diet, even those working hard.

Fibre is known as a "slow" release energy as it is broken down in the hindgut, by bacteria population into free fatty acids which are then released into the blood stream to produce ATP. This process takes time and is released slowly into the system.

Fibre contains digestible and indigestible fibres. The indigestible portion known as lignin is what gives the plant its structure and strength as it ages. Therefore, the more lignin a fibre source contains the less useable it is by the horse, and the more you would need to feed to account for this. High lignin sources would be things like straw and late (mature) cut hays.

Fibre sources such as "super fibres, i.e. soya hulls and beet pulp, are wonderful options to add into the diet, especially for harder working horses, as they provide more digestible fibre per kg than traditional hays, meaning they can provide more energy for work, whilst in turn aiding the health of the digestive system by keeping fibre levels up.

### **Fat**

Fat within the equine diet is generally supplied by oils, and although the natural diet of the horse doesn't contain much oil, horses can use it well.

Oil contains a large amount of energy and in fact provides 2.2 times more than carbohydrates.

This makes them ideal for working horses as it allows you to provide small volumes packed with energy. Fats are also a "slow" release energy source, making them ideal for energy while providing a calm temperament.

### **Carbohydrates (Non structural carbohydrates, NSC)**

NSCs are made up of starch and sugar. NSCs are supplied generally by the cereal portion of the horse's diet.

Digestion breaks down the starch into glucose (sugar) which is then absorbed straight into the blood stream in the small intestine. Cereals are therefore known as "Quick" release energy sources.

Cereals often receive a bad rep, as more and more people become conscious of overfeeding and causing digestive upset. However, glucose is the only energy source used by the brain and other organs and so some sugar and starch are essential in the equine diet. At this stage there are no studies into the exact amount needed and so it is always advisable to stay within a range suitable for your horse.

An NSC level of 12% and under- for horses with medical issues such as laminitis, Cushings, Insulin resistance

Low Level -12-20% - ideal for hot horses or those prone to issues such as ulcers, colic and or tying up

Upper -25-30% - acceptable for the average horse in work

High -30% plus- for horses working at much harder levels but should still be fed carefully and in multiple smaller meals.

*(Figures from Kentucky Equine Research)*



# TESTIMONIAL

Dear Equus

I was the lucky winner of the Equus competition where I won 10bags of **Equus** food for my horse.

On receiving my prize, I had a consultation with Helena Basson (from SA Horse Feeds, my local supplier) and together with Hannah and Helen we worked out the best diet for my horse Cheval.

Well Cheval has never looked better and is on top form!

Thank you **Equus** for my incredible prize.

*Kindest Regards  
Antoinette Burger*



The horses' stomach is limited in terms of capacity and is designed to receive food on a "little and often" basis. If large grain meals are fed, undigested starch can be passed from the stomach into the large intestine (hindgut). This can disrupt the vital bacteria population (those that digest fibre) leading to digestive upsets such as colic, tying up, laminitis etc.

To avoid these issues:

Feed small meals often- no larger than 2kg per meal.

Choose products that contain cooked grains- i.e. extruded or micronized grains, as they improve the digestibility of the grain.

Only use concentrate feeds when necessary

Feed for your horse's workload and thus energy needs- be honest and don't over supply

### **How do I know what to choose?**

As we said fibre should always be the base of any diet, and the average horse should have at least 1.5% of body weight in hay per day- this is 7.5kg per 500kg horse per day.

Feeding can be complex, and it is advisable that advice from a qualified nutritional

consultant is sought before deciding on the best diet for the horse.

However as a rule of thumb:

If you want more "fizz" – ensure the base diet of fibre is provided and then look at choosing a feed with slightly more Carbohydrate.

If you want less "fizz"- ensure the base diet of fibre is provided and then look at choosing feed which provides more fat for calmer energy. You can also include extra fibre ingredients such as beet pulp or soya hulls.

### **Need less weight**

If you have a good doer that gains weight easily: ensure the base diet of fibre is provided and then look at using a low-calorie Balancer to provide the daily essentials. If your good doer is working and therefore requires some energy, make sure you choose a product that matches his workload and no more. You could use this alongside a balancer so that minimal levels of feed can be fed.

### **Need more weight?**

Ensure your base diet of fibre is provided and then look to a diet high in fat and fibre. As fat contains more calories per volume than carbohydrates it ensures you can get maximum calories without overloading the digestive system.



*For an absolutely free consultation with no further obligation contact our professional consultants to schedule a visit to your yard.*

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