



energy to work,
energy to **WIN**

The effects of a high fat diet, on energy availability in the racehorses.

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When horses work their bodies are thrown into a frenzy of biochemical activity, releasing energy stores into the blood in order to fuel the muscles as they power the horse along the ground. Complex chemical pathways spring into action to release enough energy to meet the demands of work as quickly as possible.

Energy stores in the horse, are available in two major forms:

1. Muscle and liver Glycogen; a type of sugar which can be quickly released for immediate use as a horse goes from standing to full speed.
2. Fatty Acids; which are stored in adipose or fat tissue within the body and are released a little more slowly as horses get into their stride and work mainly in the aerobic zone.

The difference in size of these two stores of energy is quite immense:

the average 500kg equine stores around 75MJ of energy as glycogen compared to a massive 640MJ as fat. The metabolism, or 'burning' of fat, requires a little glycogen in order to proceed, so if glycogen 'runs out' the horse is no longer able to use the fat stores for energy.

It follows, that once glycogen stores are depleted the horse becomes suddenly very fatigued. Many trainers will be familiar with the situation where after a blistering first half of a race, the horse suddenly 'hits the wall'. The body can no longer keep up the energy demands of the muscles and the horse quickly slows up the pace. This 'wall' of energy depletion and fatigue can mean the difference between running to a strong finish and suddenly falling to the back of the pack with only a few lengths to go.

It makes sense then during an event of medium to long duration aerobic work such as racing, that ideally the horse should be predominantly using its massive stores of fat, rather than 'using up' the limited onboard stores of glycogen to power the work effort.

This is where a high fat diet can help.

Horse's bodies can 'switch' to preferentially using fat rather than glycogen as the major energy source for the muscles, in response to training and in response to diet. During training and conditioning, horses naturally start to use more fat for energy as they get fitter, but the effect can be maximized by feeding a high fat diet.

A high fat diet is described as a diet where a significant proportion of the total calories are provided in the form of fat; either vegetable oil or other high fat supplements such as a stabilized rice bran (Equi-Jewel). A ration including 1-2 cups of vegetable oil or 500g to 1kg per day of Equi-Jewel would be described as a high fat diet.

Horses fed a diet high in fat, begin to burn more fat and use less glycogen during work efforts. The metabolic 'switch' takes about 5 weeks of feeding and working the horse continuously, so a quick squirt of oil the day before the race will not give the desired result!

For the question of which type of fat is best, well there are no definitive answers as to which might maximize

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the glycogen sparing effect. Canola oil appears to be one of the better all round oils, having reasonable omega balance and being readily accepted by most horses. Other vegetable oils such as sunflower or soya oil are also fairly good. Corn oil may not be the best option as research has suggested that corn oil has a poor omega balance. This poor balance can actually raise working heart rates and blood lactate levels, but corn oil is very palatable and so may be useful for fussy eaters.

With the high fat supplements, Equi-Jewel stabilized rice bran has been research proven to reduce working heart rates and lactates, when compared to oil. The other advantage is that it is a palatable dry pellet which is readily accepted by horses adverse to oily feeds. Equi-Jewel also contains Natural Vitamin E and Selenium, to

assist with rapid muscle recovery in hard working horses.

Other high fat supplements include sunflower seeds, soya bean meal and coconut meal. With these supplements, consideration must be given to their high protein content, and so may tip the protein levels in the diet over the scales if used as a fat supplement.

Remember that fat contributes a significant number of calories to the diet so you need to reduce the amount of grain fed if you don't want your horse to get too fat. A rule of thumb is that 1 cup of oil or 500g or high fat supplement is equivalent in calories to about a kilo of whole oats, and slightly less of steam flaked corn or barley.

You will need to feed as least 1 cup per day of oil or 500g per day of a high fat

supplement. Continue daily with high fat feeds for at least 5 weeks to get the full benefit of glycogen sparing. If you want to maximize your horse's energy metabolism, and want to prevent that heartbreaking fatigue setting in at the most crucial time in the race, then start adding a little fat to your horse's diet. As a bonus you'll get a nice shiny coat, and who knows, maybe even a couple of placings as your horse powers home with all the energy that he had at the start of the race.

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Equi-Jewel developed by KER is a high fat stabilised rice bran supplement with added calcium, selenium and vitamin E.

Equi-Jewel is a high fat product, which increases the energy density of a ration and reduces the amount of grain required to meet the daily energy requirements of the horse. Being a source of unsaturated fat Equi-Jewel also enhances skin and coat condition.

*Please note that Equi-Jewel is not a complete feed.

When to use Equi-Jewel

- Sale and show horses - Equi-Jewel can be supplemented to horses of all ages to achieve superior coat condition due to its high fat content.
- Performance horses - Adding Equi-Jewel to the diet allows the horse to consume additional calories without having to eat much greater volumes of feed.
- Horses that tie up - High carbohydrate diets should be avoided with horses susceptible to tying up, Equi-Jewel provides a suitable energy supplement and has the antioxidant properties of vitamin E and selenium.

Equi-Jewel

High fat stabilised rice bran supplement.

Feeding Recommendations

Average recommended intake is 500grams of Equi-Jewel daily. Intakes can be increased to up to 2kg per day if required, however no more than 1 kg of Equi-Jewel should be fed per feed.

Analysis (approximate in DM basis.)

Crude Protein:	Min 14.0%
Crude Fat:	Min 20.0%
Crude Fibre:	Max 15.0%
Calcium	Min 2.50%
Phosphorus:	Min 1.70%
Vitamin E:	Min 735IU/kg
Selenium:	Min 1.14mg/kg
Energy:	Min 16.5 MJ/kg

