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THE GOOD OIL[©]

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With much information around on new ‘magic’ products to improve performance, it’s important to keep up with the research on feeding competition horses - before turning to supplements.

If horses are properly conditioned and have the fuel and nutrients they need, there is good evidence they will willingly and voluntarily run faster, jump higher, stop harder, move more consistently and perform at a higher level. Recent research in performance Quarterhorses indicates that muscle fuel supply can be altered and performance improved by specific feeds. A finely tuned supply of nutrients, when combined with specific feeding management practices, can improve performance. This is particularly applicable to energy.

The primary nutrient of concern in performance horses is energy – and needs differ according to workload and type of work. Workloads for western pleasure and equitation horses are generally ‘light’ – in that they are not exhaustive, energy needs can be met by oxygen from breathing (aerobic work) and heart rate does not usually reach 150 beats per minute (the rate at which oxygen cannot meet energy demands = anaerobic work). Timed-events and most cattle-working events are broadly classified as ‘moderate’ work and cutting horses, some cow horses, reining and polo ponies perform ‘heavy’ work.

With aerobic work, energy is supplied by oxygen and the fat and fibre in the diet. Horses that perform short-duration, high-velocity exercise must have enough carbohydrates (sugar, starch = grains) in the diet and stored in the muscles to meet the sudden demands of

anaerobic work. Hay and roughage do not provide enough energy for horses that perform at intense levels of activity and grains are often needed. However, heavy reliance on grains for energy can increase risks of acidosis, sub-clinical laminitis and colic. Grain grains should be processed so the starches in them can be digested more easily in the small intestine, more glucose can be absorbed and the risk of hind-gut acidosis is minimised.

High-performance horses, such as cutting horses, reining horses and other athletes, routinely perform both aerobic and anaerobic work while competing. Recent research indicates that the performance of such horses can be improved by adding oil to the diet. With proper time for adaptation, oil supplementation can influence the amount of stored muscle energy (= muscle glycogen), the fuel supply for anaerobic work. Adding oil to their diets can reduce reliance on high grain diets – and oil also supports lower intensity, aerobic practice/training work.

Horses doing high heartrate, anaerobic work rely on blood glucose and then muscle and liver glycogen for fuel. When cutting, working a cow or running a barrel race, horses rely significantly on anaerobic energy production. Once blood glucose levels begin to fall and muscle glycogen stores become depleted, fatigue ensues. Proper training combined with correct dietary support builds muscle and liver glycogen stores and



delays the fall in blood glucose that heralds fatigue. Fortunately, research shows that adding fat to diets of performance horses gives them a more concentrated supply of energy; enables them to produce and store more muscle glycogen and ‘spares’ blood glucose. Arena horses especially perform at their best when on an oil-enriched high energy diet.

Let’s firstly have a look at the advantages of oil for working horses, and then at the benefits of oil for all horses. Oils provide around 3 times as much energy as grains – so 330ml of oil provides the same amount of energy as 1kg of oats – but without the risk of ‘hot’ behaviour and hind-gut acidosis (**Table 1**). In fact, adding oil to the diet provides benefits for all horses in terms of acidosis, arthritis, behaviour, fertility, inflammation, immunity, PSSM, temperament and tying up.

TABLE 1.

Amount of feeds that can be replaced with 1 cup (250ml) of oil	
Oats	700g
Barley	600g
Corn	600g
Commercial grain mix	630g
Rice bran	450g
Flaxseed	600g

The addition of 500-1000ml of oil to the diets of performance horses (including endurance, futurity, cutting, racing, eventing) reduces heat production, weight handicap (from gut fill) and working heart rates and can delay the onset of fatigue.

Horses fed oil-supplemented diets have increased resting muscle glycogen concentrations. Oil provides a cool and steady supply of energy - allowing the horse to preserve blood glucose levels. The ‘glucose-sparing’ effect of oils delays the onset of fatigue, so that although horses cannot increase their maximum effort, they can maintain it for longer.

Approximately 75% of the energy utilized by the muscles is lost as heat – giving the working horse an efficiency of around 25%. As exercise time increases and heat load rises, a tug-of-war for blood flow develops between the skin and muscles. The horse diverts more and more blood away from the working muscles and sends it to the skin for sweating/cooling. The tug-of-war for blood flow between skin and muscle decreases if the total heat load is reduced.. In addition, horses exercising in hot conditions expend up to 20% more energy, so it is even more critical to select feeds that minimise heat production and energy wastage. Oils offer significant and unparalleled advantages here, with one report showing total body heat production decreased by 14% when horses were fed an oil-



enriched diet. This reduces the amount of sweat produced and hence fluid and electrolyte loss – especially important for horses training and competing in hot/humid climates.

Heart rates are a useful indicator of how hard a horse is working. A lower heart rate at the same absolute exercise level indicates that a horse is experiencing a lower relative workload and therefore, a lower level of stress. A recent study of 3 and 4-year old Quarter horses showed that on reining and cutting exercise days, their heart rates and cortisol (= stress) levels were lower and they recovered faster than horses without oil added to their feed. In addition, calmness, as measured by spontaneous activity and reactivity (spook tests), was lower when diets were fortified with oil. Prolonged periods of stress can be detrimental to young horses due to suppression of the immune system. The intricacy of manoeuvres and intensity of performance required by young horses also increases stress and it's critical to find ways to keep these horses sound and healthy. Stress, training and grain all increase the risk of gastric ulceration and oils may offer some protection. Just 45ml of corn oil each day is sufficient to reduce gastric acid secretion.

Oils can also have a calming effect on excitable horses – including weanlings and those prone to tying-up. Reactions to loud noise and visual stimuli are reduced in horses on

10% oil diets; weanlings take less time to learn handling and working horses had lower salivary cortisol levels and less startle reactions when 11% of dietary energy was provided by oils. And, oils also offer owners another tool to maintain body condition in horses that lose appetite when under the stress of training, competition and travelling.

Reductions in stress and inflammation benefit all horses – and this is where certain oils can help. The healthful benefits of increased omega-3 fatty acids in human diets are widely accepted and human athletes on Omega 3 supplements report less muscle soreness and shortened recovery after athletic events. Studies in horses have found advantages in feeding diets rich in omega 3 polyunsaturated fatty acids (PUFAs), including: lowered heart rates, lowered joint inflammation and increased immune response and disease resistance. Omega-3 fatty acids have also received attention for their role in maintaining cell membrane fluidity (including red blood cells) and are thought to reduce exercise-induced pulmonary haemorrhage – ‘bleeding’.

So, which oils to choose? Most diets are based on cereal grains, which are rich in omega 6 oils. The natural, grazing, browsing horse has a diet based largely on grass and browsing forage which contain a much higher proportion of omega 3 oils. The

PUFAs in corn, sunflower, safflower, soy and rice bran oil are mainly Omega 6, which tend to aggravate inflammation. Oils with a high level of Omega 3 fatty acids don't intensify inflammatory processes – in fact, they reduce them. Vegetable oils with higher concentrations of omega 3 fatty acids include linseed, flaxseed and fish oil (Table 2).

TABLE 2.
Omega 6 and Omega 3 levels in common feedstuffs

Feedstuff	Omega 6 (Linoleic acid)	Omega 3 (Linolenic acid)
Grass (cold season C3)	3.8	8.2
Grass (warm season C4)	3.6	4.6
Lucerne hay	3.9	7.9
Canola meal	12.1	3.5
Barley	10	1
Flax seed	59	226
Linseed meal	2.1	7.3
Oats	23	1
Rice bran	71	3
Soy meal	5.9	1
Sunflower seeds	230	0.6
Canola oil	186	91
Coconut oil	18	0
Corn	532	12
Fish (salmon) oil	17	10
Linseed oil	127	533
Olive oil	98	7.6
Peanut oil	320	0
Rice bran oil	334	16
Soy oil	504	68
Sunflower oil	289	0.4

Several factors need to be considered when supplementing oil:

- horses need up to 4 weeks for their gut to adapt to added oil
- start with total daily addition of 50ml and increase by 10-20ml per day
- muscles need 6 to 11 weeks to adapt - begin well before a strenuous event.

How much oil?

The ideal amount of oil varies with workload, body condition and how much grain you want to replace. Horses can tolerate up to 20% of the diet as oil - 750-1000ml of oil per day. Vitamin E intake needs to increase to 1mg (or International Unit i.u.) per ml of added oil (200-250 i.u. of vitamin E per cup of oil) and because oils contain no protein, minerals or vitamins, these nutrients will also need to be balanced – especially in young growing horses and pregnant and lactating mares.

There is considerable evidence that omega 3 oils reduce inflammatory reactions in joint disease in humans. Recent international equine research indicates that similar responses may be expected in horses.



Omega 3 oils are a critical part of the balance of antioxidants, vitamins and minerals needed in correct amounts for resistance to disease and control of inflammatory/allergic reactions. Vitamin E, selenium, copper and zinc, are other big players here and if these are deficient, results from Omega 3 supplementation will be limited. Jenquine all-4-feet® can be added to any diet or oil-enriched diet to meet protein, vitamin, mineral, anti-oxidant and biotin requirements.

While the benefits of many so-called ‘ergogenic aids’ remain to be confirmed in horses, the advantages of oils and especially omega-rich oils are real. For both ourselves and for hard-working horses, it is important to ensure an adequate daily intake of oils – especially omega 3 oils.

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