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### NUTRITION BASICS



## The science behind feeding fat

There has been a great deal of research investigating the potential benefits of adding fat (in the form of oil or high fat feed sources) to the equine diet.

Higher fat diets are reported to increase the energy density of the diet, moderate the glycaemic response, reduce excitable behaviour, alter the metabolic response to favour fat utilisation and reduce heat load. More recent research has also focused on anti-inflammatory and immune responses to fat supplementation (particularly omega-3 fatty acids).

**While we still have much to learn, current research demonstrates that fat supplementation has the potential to promote performance, reduce disease and improve the health of horses.**

### RACING RESEARCH



## Fat for athletic performance?

Horses adapted to a high fat diet undergo metabolic changes that favour fat as an energy source. This is likely to be beneficial in horses involved in low to moderate intensity exercise, but is it useful for racehorses that might have a greater reliance on carbohydrate during intensive exercise?

Some studies have reported an increased time to fatigue and faster times when performing repeated sprints when horses were supplemented with high levels of fat in the diet (*refer Geor et al., 2013*). Increased stamina, glycogen-sparing, improved power-to-weight ratio and a reduction in acidemia and heat generated during exercise are all proposed mechanisms for improved performance however studies are inconsistent.

It is our experience that fat is beneficial in racehorse rations however...

**The key to adding fat to the diet is to make sure it is there all the time and most importantly, introduced early in a horse's preparation (i.e. during pre-training). Fat adaptation can occur after about 3 weeks, however effects are transient and dependent on the continued inclusion of fat in the diet.**



## Better behaviour on oil?

Anecdotally, horse owners often comment that dietary fat alters behaviour, making their horses “cooler” and easier to handle. This comment has been supported in the literature with studies reporting reduced reactivity to pressure, loud noise and visual stimuli in fat supplemented horses (*Holland et al., 1996*).

Horses in dressage training were found to have lower resting cortisol levels and a reduction in the intensity of their responses to a startle reaction test when fed a fat-added diet compared to an isocaloric diet higher in starch (*Redondo et al., 2009*).


The most important thing to remember is that oil is VERY energy-dense. One cup of oil supplies about the same calories as  $\frac{3}{4}$  of a dipper of oats, however unlike oats, is void of starch.

**Unless weight gain is the objective, it is likely your horse's diet will need to be modified to incorporate oil into the ration. Horses can tolerate oil well, but it is best introduced gradually to avoid digestive upset and kept in a cool place.**



### Equine Consulting Services Pty Ltd

**P** PO Box 3361 Dural NSW 2158  
**M** 0418 488 718  
**E** caroline@equineconsultingservices.com.au  
**W** www.equineconsultingservices.com.au

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 dr\_caroline\_foote

 @CaroFoote



## Omega-3 for mares and stallions

Studies have shown that feeding pregnant mares a diet rich in starch alters the glucose metabolism of foals and potentially increases the risk of osteochondrosis lesions. In situations where supplementary feed is required, fortifying the diet with fat may be a good way of increasing the energy in the diet without increasing starch.

Some studies have also investigated the involvement of fatty acids in fertility and inflammation, and subsequently the development of the embryo and foetus.

Supplementing the diet with fat sources rich in omega-3 (algae source) has been shown to:

- Alter the uterine environment and potentially improve the reproductive health of mares (*Jacobs et al., 2017*);
- Increase the total omega-3 transfer from dam to foetus at birth, with some studies reporting improved social behaviour of foals before weaning and memory and learning ability at 2 years of age (*Adkin et al., 2013, 2015*).

In breeding stallions, supplementation with omega-3 rich in DHA and EPA has been shown to increase the quality of cooled and frozen semen.

**Research into omega-3 supplementation in mares and stallions is encouraging, however we still have much to learn about its effect on foal development and long-term health.**



## Contact Us

### Dr Caroline Foote

B.Sc.Agr(Hons) M.App.Sc. Ph.D.

CONSULTANT NUTRITIONIST