

## Trail Riding, Horse Health and Environmental Responsibility

The attraction of trail riding is to ride through remote and natural landscape, which in most cases in National Parks and State Forests.

In most cases, there is insufficient herbage along the trails to provide the nutrients required to maintain bodyweight, and allow the horse to perform the work required. Therefore, it is necessary to pack in supplementary feed, or have feed drops.

Key issues for selecting suitable feeds include

### 1. Energy density

Feeds contain different amounts of water, energy and come in various pack sizes. The nutrients are only contained in the dry matter, and so high moisture feeds are unsuitable, as are feeds in large pack sizes. Hay, grain and non-grain feeds are compared in the table below. Even though the pack weight is the same, grain and non-grain feeds such as CoolStance copra provide at least 6 times more energy per unit volume compared with hay. Hay therefore is not a good option, unless there is shortage of herbage along the trail, or the horses cannot be grazed,

	Pack size (kg)	Dry matter( %)	Digestible energy (MJ/kg DM)	DE/m <sup>3</sup>
Hay	20	75	10	940
Grain	20	90	12	5100
CoolStance copra	20	90	15	6400

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## **2. Viable seeds.**

One of the major concerns with feeding trail horses is the risk of spreading plant seeds into the environment. Some seeds are resistant to digestion in the horse's intestinal tract, and will germinate in the manure. This means that some feeds fed at home can contain seeds that will pass out in the manure along the trail. Hay and grain based feeds can contain seeds, and can be spread from the areas where the horses are fed along the trail. There are non-grain feeds such as CoolStance copra that provide high levels of energy, are easy to transport, and do not contain seeds of any form.

## **3. Feed storage.**

Feeds that have a long shelf life are best for trail rides. Feeds with moisture more than 12%, and sugar and starch levels above 20% can be prone to molding, and insect infestation.

## **4. Safe energy**

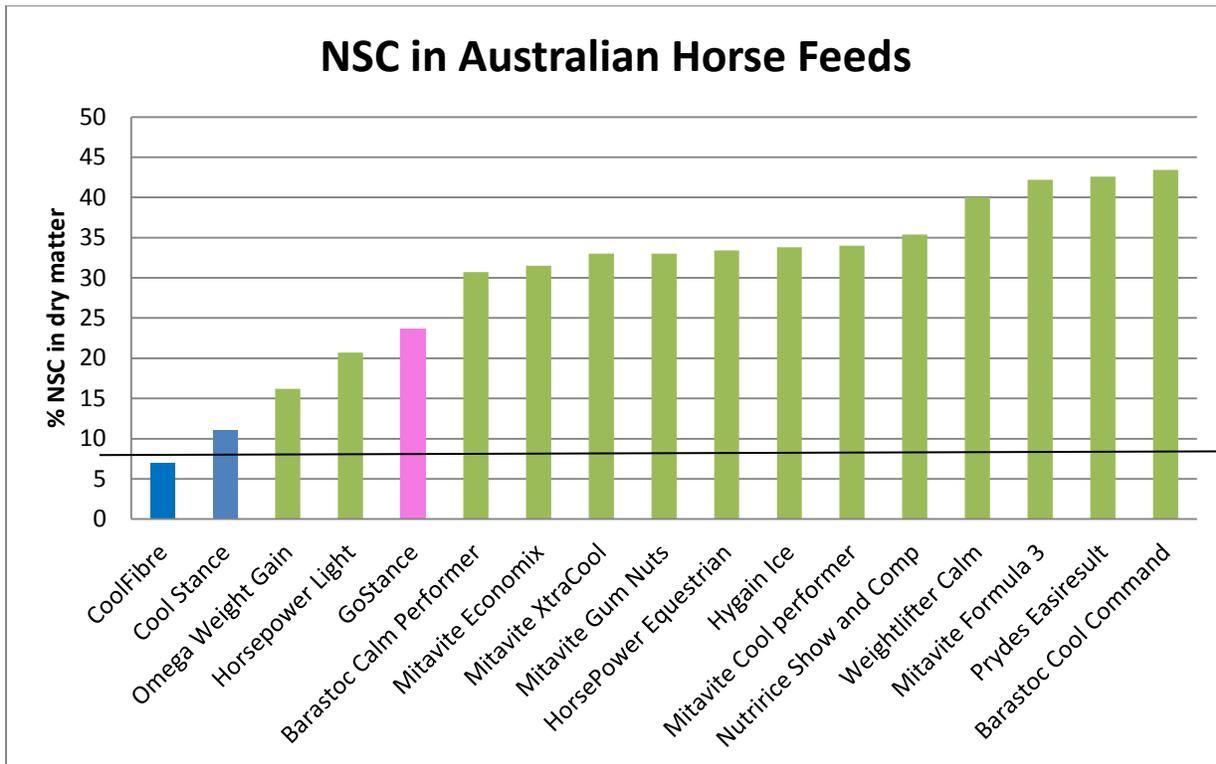
Energy is provided by sugar and starch (termed NSC or non-structural carbohydrates), fiber, oil, and protein in the feed. Feeds contain different amounts of these energy sources, and in most feeds, the energy is supplied from the NSC, i.e. from the sugar and starch grain. There is now a lot of research that shows that high NSC diets cause many of the metabolic disorders including lameness, laminitis, colic, ulcers, tying up, Equine metabolic Syndrome (EMS), and insulin resistance in horses.

## **5. NSC. Non-structural carbohydrates**

NSC is the term to describe the readily available energy supplied from sugar and starch. The level of NSC in horse feeds vary considerably from less than 10 to 70% in grain (see attached figure). This graph shows that as the work level increases, so the NSC intake should also increase. Most horses are overfed and underworked, and it is widely accepted that feeds containing less than 12% NSC should be selected to maintain the horse's health. Most feeds can only attain low

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NSC by diluting with low energy fillers, which dilutes the energy content of the feed. The dilemma for trail horses therefore is to select a feed that provides sufficient energy, and yet contains a low level of NSC.



Hay is not a good option because of the low energy density, the large bulk, and the potential for containing weed seeds. By comparison, grain contains more energy, is denser, and so provides more energy per unit volume. Grain feeds however can contain seeds. Other products such as CoolStance copra contain high levels of energy, are energy dense, and do not contain energy dense feeds are packed in, or placed in feed drops. By necessity, most energy

The challenge of feeding trail riding horses is twofold, to provide energy that is a suitable form to allow the horse to perform its work, and yet not to contain viable seeds that could contaminate the environment.

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**5. NSC related disorders.** High NSC diets have been associated with the following

**5.1 Stomach.** High NSC can cause fermentation of the sugars in the stomach, acid formation and ulceration of the non-glandular part of the stomach.

**5.2 Intestines.** High sugars flowing into the intestines can cause proliferation of naturally occurring microorganisms, which in turn can colonize the intestinal lining and create “holes” in the epithelium. This is called leaky gut or dysbiosis. Large molecules including glucose pass into the blood, raising blood sugar levels, which can cause reduced ability of the cells to take up the glucose, causing insulin resistance and increased cortisol production. This in turn causes lameness, EMS and Cushings in some horses. The high levels of sugars can be stored in abnormal places, for instance in some breeds, the glucose is stored in the muscle cells as a polysaccharide causing PSSM or tying up. Recent research has also shown that excess sugar is stored as a proteoglycan between the collagen fibers in connective tissue, causing suspensory ligament damage, and lameness.

**5.3 Hind gut.** The passage of starch into the hindgut can cause acidosis, similar to that occurring in cattle. This in turn can cause lameness and laminitis.

**6. Selecting suitable feeds.**

CoolStance copra is an ideal feed for trail riding. It provides the following benefits

- High energy density and easily packed and stored
- No seeds
- Low NSC (<12%)
- Long shelf life

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- Can be fed to all horses
- Contains MCT from coconut oil to maintain gut health
- Avoids the metabolic disorders associated with high NSC feeds

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