

**Growing Together**



# **A guide to reading a hay test**



**BOWRAL**  
EST. CO-OP 1926



**Hay analysis helps you better understand what you're feeding your horse. This is especially important if your horse has nutrition issues.**

**Here we explain the terms you will come across in a typical hay test and outline some key figures to help you interpret hay test results.**

### **Moisture %**

The moisture % refers to the amount of moisture in the sample when it was received by the laboratory.

### **Crude protein % (CP)**

CP is an estimation of the total protein content of the hay. The acceptable range of CP for maintenance of an average horse is more than 8% and less than 14%, with an ideal range of 11% to 13%.

### **Digestible energy Mcal/kg (DE)**

Digestible energy is a measurement of the energy value of the feed, expressed as Mcal/kg. A horse in light work typically needs about 20 Mcal of DE daily.

### **Acid detergent fibre (ADF)**

ADF is a measure of cellulose and lignin, and other As lignin content increases, digestibility of cellulose decreases, which lowers the amount of energy potentially available to the horse.

Hays with an ADF value between 25–35 percent are considered higher quality, while hays that have an ADF between 35–45 percent are considered to be of lower relative quality. ADF can be a useful gauge to help determine the general digestibility of hay.

### **Neutral detergent fibre % (NDF)**

NDF measures all the cell wall components – cellulose, hemicellulose, and lignin. NDF values can be used to estimate forage intake potential. The higher the NDF concentration, the less hay is likely to be consumed by a horse.

When the concentration of NDF increases above 55 %, the hay may not provide adequate digestible nutrients, and a horse may need to be fed a higher volume of hay or may need to be supplemented with more energy dense feed.

### **Water soluble carbohydrates (WSC) %**

WSC is a measure of simple sugars and more complex carbohydrates (fructan's). Research has demonstrated that fructan s may cause health issues for for metabolically challenged horses. The acceptable range of WSC is less than 10% for a metabolically challenged hose, or less than 134% otherwise.

### **Ethanol Soluble carbohydrate (ESC)**

ESC is a measure of simple sugars; those that are broken down in the small intestine. Since ESC does not include fructan, it can give a better estimate of a glycemic response from a hay than WSC.

### **Starch %**

Starch is a complex carbohydrate made up of glucose sugars. For insulin resistant horses, glucose causes insulin to rise, and this may trigger the chain of steps resulting in laminitis. Ideally ESC + starch should be below 10% for the overall diet.

### **Non structural carbohydrate (NSC)**

NSC is the sum of WSC % + Starch %. It is commonly used to determine whether the hay is safe to feed a metabolically challenged or laminitic horse. The acceptable range of NSC is than 11% for metabolically challenged horse, or 14% otherwise.

### **Calcium to phosphorus ratio**

There needs to be more calcium than phosphorus in hay. The ideal ratio is 2:1, but the level of calcium can be even higher and still be considered safe. Phosphorus concentration should not be higher than the calcium level.

### **Calcium to magnesium ratio**

Ideally, calcium content should not be more than twice that of magnesium.



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