



Facts about fibre

Fibre is an essential ingredient in the diets of ruminant animals such as cattle.

Fibre is the structural carbohydrate component of plants – it keeps plants upright. Fibre is found in the plant cell wall. There are three main parts – hemicellulose, cellulose and lignin.

A key role of fibre in cattle is to promote chewing, so feeds with fibre length greater than 1.5 cm, but not longer than the width of the mouth, are preferable – they take longer to chew.

Lush, actively growing pasture is high in sugars. More leaf than stem means less fibre.

Grain is plant seed material and not structural plant material – it has high levels of starch, not fibre.

Do you know your fibre facts?

Neutral detergent fibre: evaluating fibre

Neutral Detergent Fibre (NDF) is a chemical laboratory estimate of the amounts of hemicellulose, cellulose, lignin and ash in plant material – the digestible and indigestible fibre.

Acid Detergent Fibre (ADF) estimates cellulose, lignin and ash only. NDF is expressed as a percentage of dry matter – the percentages allow feed to be compared. Deciding between fibre products is easier if you know the NDF percentage values.

Key messages

Fibre is an essential ingredient in diets of ruminants

Fibre length should be greater than 1.5 cm

Neutral detergent fibre intake should be approximately 40% of total dry matter intake

Feed a long fibre source as soon as possible after grain/concentrate feeding to help reduce the rumen pH drop

Acidosis – do you really understand fibre? Not sure? Ask your adviser.

Fibre in the total diet: are your cows getting enough?

Fibre supplies energy.

NDF intake should ideally be about 40per cent of total daily dry matter intake, with 75per cent of the fibre sources having a fibre length greater than 1.5 cm, i.e. you need to work out the fibre percentage of the kilograms of dry matter your cows are eating.

Cows filling up on grain/concentrate in the dairy or on other low fibre feeds like lush pasture may not eat poor quality fibre like straw offered in the paddock.

Heifers or less-dominant cows may not have equal access to fibre fed in the paddock – these animals may be more at risk of acidosis than others.

Fibre and saliva

Are your cows ruminating enough?

Not enough long or 'effective' fibre = not enough chewing = not enough saliva = drop in ruminal pH = increased risk of acidosis.

Cows fed diets with adequate long fibre produce more than 180 litres of saliva per day.

Feeds with no long fibre like grain do not promote much chewing during eating and ruminating, and less saliva is produced.

Chewing for about 27 to 36 minutes per kg of dry matter is normal.

Saliva has a pH of around 8.0 (alkaline) and contains bicarbonate and other naturally occurring buffers.

Saliva and ruminal pH

Do you know how to keep ruminal pH within the optimal range?

More than 2.5 kg of bicarbonate produced each day in saliva helps maintain the cow's average daily ruminal pH in the optimal range for growth of rumen microbes – 6.2–6.6.

In a healthy cow, ruminal pH fluctuates over a 24 hour period. It can drop to 5.5 or lower for several hours after eating large amounts of highly digestible feeds such as grain/ concentrate, silage or lush pasture, before recovering again.

Feeding a slower fermenting long fibre source such as hay as soon as possible after grain/concentrate or replacing lush pasture with some hay or straw, can help reduce the pH drop.

Ruminal pH and acidosis

Can you recognise the signs of sub-clinical acidosis?

If animals consume sufficient amounts of highly digestible feeds, ruminal pH drops, leading to reduced growth of fibre-utilising bacteria and increased growth of acid producing bacteria such as *Strep. bovis*, which continue to acidify the rumen.

If the rumen's natural buffering capacity is overwhelmed, a downward spiral can occur until the rumen shuts down.

Animals with 'sub-clinical acidosis', where the rumen pH is in the range 5.2–5.6, may not appear sick, although feed intake and production are reduced.

Animals with a ruminal pH below 5.2 will be noticeably sick. They will be off their feed, down in their milk, and scouring. This may then progress to 'downer cow' syndrome and death.

Disclaimer

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