

# FeedRight Information Sheet

## Do lactating cows on pasture require additional fibre (e.g. straw/hay)?

There is no benefit of feeding additional fibre (i.e. straw or hay) to cows when pasture makes up more than 60 % of the diet

### Additional fibre

- will lower the overall ME value of the diet, as the lower ME feeds (straw/ hay) replace higher ME feeds and reduce the energy available for MS production
- will not change rumen pH, 'correct' the rumen, prevent laminitis or lameness, or increase MS production.

In high-input systems, dietary fibre should be greater than 35 %.

There is adequate fibre in spring pasture (also adequate effective fibre) for the rumen to function properly. The myth that "soft" pasture or the appearance of loose dung indicates rumen upsets or acidosis is associated with total mixed ration (TMR) or high-input systems and does not relate to cows, where grazed grass contributes at least 60 % of their diet. The DM % of the pasture is lower during spring and therefore extra water passes through the rumen, and is not absorbed in the other stomachs (omasum and abomasum), which results in loose dung. This is not a concern, unless the system is high input, in which case the fibre content of the diet should be checked.

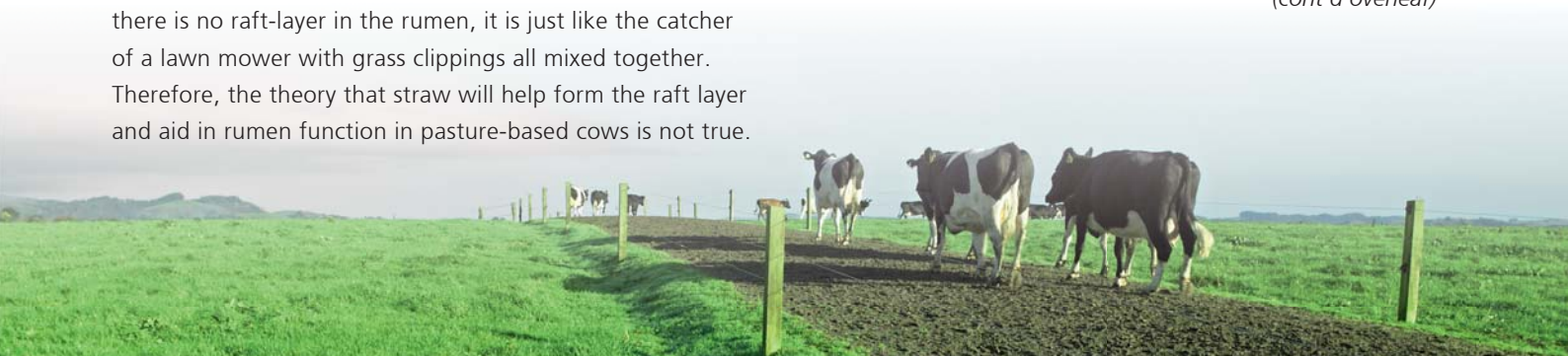
TMR diets were used in research to describe the role of fibre in maintaining an effective rumen environment. From this work some ideas have been introduced to New Zealand pasture-based cows. However, the rumen environment of a cow fed a TMR is very different to that of a pasture-based cow (see table). In cows that are fed a pasture-based diet there is no raft-layer in the rumen, it is just like the catcher of a lawn mower with grass clippings all mixed together. Therefore, the theory that straw will help form the raft layer and aid in rumen function in pasture-based cows is not true.

### What are the key differences between the rumen of a total mixed ration (TMR) cow and the rumen of a pasture based cow?

Variable	Pasture-based	TMR
Inside the rumen	No layering, like barrow loads of lawnmower clippings all mixed up.	Fluid layer, floating raft and gas cap
Water throughput	High water loads eaten (high quality pasture) up to 140 L water in spring	Low water loads, less water in feed (~ 20 – 40 L water)
Passage rate	Faster (up to 30%)	Slower (10%)
pH	Stronger daily variation – when present low pH is associated with high 'normal' acid loads. Acidosis is never a feature.	Less daily variation, when present low pH is associated with lactic acidosis.

In a pasture-based system, research from Australia showed that feeding straw (from 0 to 2 kg DM/cow per day) to cows that were grazing a very low NDF diet (predominantly white clover and 4 kg DM/d of barley/wheat concentrate) did not improve rumen pH or salivation, and in fact decreased milk production. When straw is fed to grazing cows it just mixes in with the grass clippings, virtually replacing a 12 MJ ME feed with a 6 MJ ME feed. Additionally, straw will stay in the rumen for longer. So, if feeding 1 kg DM straw/day, there will be 3 kg straw in the rumen after three days, therefore replacing 36 MJ ME with 18 MJ ME. There are no benefits of feeding straw to pasture-based cows on rumen function (i.e. minimum pH, salivation); if anything, the slower passage rate of straw reduces rumen fill and reduces rumination.

*(cont'd overleaf)*



In addition, the predominant acid produced in the rumen of grazing cows is acetic acid (i.e. vinegar) and not lactic acid (as with cows fed a TMR or high levels of cereal grains). This means, grazing cows can have a much lower rumen pH than deemed optimal for TMR-fed or high-input cows with no detrimental effects, i.e. no incidence of acidosis or SARA (sub-acute rumen acidosis). Jim Gibbs, Lincoln University, has verified this in a number of studies. All the pasture based data (and there is a lot of this) suggests no benefit of adding straw/hay to the diet. As highlighted above, it can, in fact, have negative consequences, as a high quality feed is substituted with a poor quality feed.

#### References:

- DairyNZ Facts and Figures. "Nutritional guidelines for all pasture, pasture + supplement, and total mixed ration (TMR) diets - Fibre". Page 14.
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- Wales, W. J. and P.T. Doyle (2003). Effect of grain and straw supplementation on marginal milk-production responses and rumen fermentation of cows grazing highly digestible subterranean clover pasture. Aust. J. Exp. Agric. 43:467-474.

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*This resource is designed to provide general guidance on particular topics in a timely manner. This DairyNZ information is prepared with due care and based on research to date*

