

UNDERSTANDING RUMEN FUNCTION



THE COW'S DIET CAN AFFECT RUMEN FUNCTION

The primary functions of the rumen are to break down fibre and synthesize microbial protein. Both functions are essential, as much of the energy and protein utilized by the cow comes from the rumen.

Good rumen function will ensure optimal feed intake and digestion, while poor rumen function can negatively impact intake and overall cow performance.

Proper ration formulation and understanding how the individual ingredients in the ration work together can help keep the rumen, and your cows, functioning properly.



Dairy nutrition is the art of feeding bugs

Using the unique Alltech® IFM system allows troubleshooting of potential problems. Strategies can be developed that are tailored to optimise feed efficiency and profitability for individual customers.

For more information, please call the office on **0800 ALLTECH**

or email newzealand@alltech.com



IFM

IN VITRO
FERMENTATION
MODEL

Alltech®

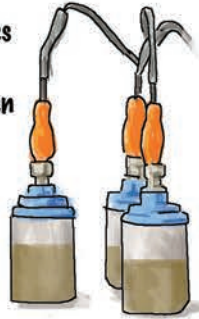
The In Vitro Fermentation Model

IFM helps evaluate ration balance by showing us how carbohydrates (CHO) and protein are fermented. Using IFM we can identify barriers to diet fermentation, formulate rations based on nutrient availability and reduce energy losses

IFM BASICS

1. PRODUCTS OF FERMENTATION ARE MEASURED

Ration samples incubated in buffered rumen fluid for 48h



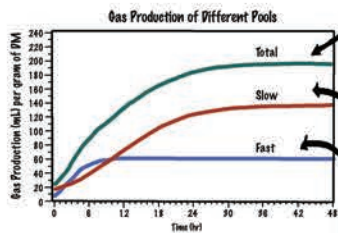
- VFAs
- MICROBIAL BIOMASS
- GASES: CO₂ & CH₄

DM remaining: used to calculate digestibilities

Volatile fatty acids and microbial biomass are NUTRIENT SOURCES for the cow

Carbon dioxide & methane are waste products removed by eructation. (In general, we want as much C as possible to stay in the cow since these gases represent lost energy and contribute to CARBON FOOTPRINT of cattle.)

2. GAS PRODUCTION PROFILES DEGRADATION OF FAST & SLOW-FERMENTING CHO POOLS



Total gas production reflects digestibility

SLOW POOL CHO: fiber/NDF

FAST POOL CHO: sugars, starch, pectins

Rations differ in gas production profiles

- Pool degradation RATES differ
- Time to maximum gas production
- Volume and composition differ

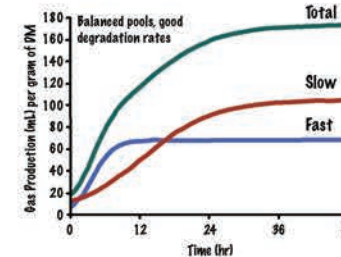
All affect ration nutrient value



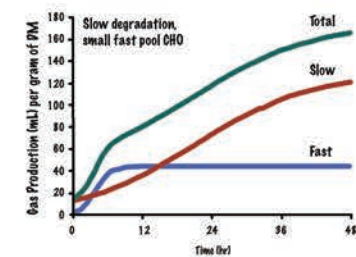
IFM USES

1. RATION TROUBLE-SHOOTING

Good profile:



Problem fermentation:

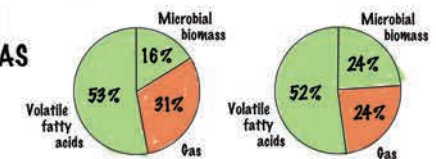


- Digestion rates and profiles reveal barriers to rumen fermentation and suggest solutions
- Monitor nitrogen and CHO synchronization

2. IMPROVE EFFICIENCY, REDUCE CARBON HOOFPRINT

- Though both diets have the same 'digestibility', diet B is more efficient as it produced MORE VFAs & BIOMASS and LESS GAS
- Identify high CH₄/CO₂-producing diets
- Use IFM in on-farm audits

Partitioning of byproducts of ruminal digestion of feeds that are similar in digestibility



3. TEST SOLUTIONS

- Strategies to solve fermentation problems can be tested quickly and easily

4. PRODUCT DEVELOPMENT

- Screen new compounds, diet formulations that maximize rumen microbiology efficiency

