



## UNDERSTANDING THE MECHANISMS BEHIND



**Code 6965**

### Effects on driving dry matter intake

The goal of most dairy producers is to maximize milk production in a cost-effective manner. Feed costs may represent up to 50% of the total costs linked to milk production. Economically, it is important to maximize feed intake, improve efficiency of feed raw materials, and lower feed costs. In most herds, nutrient intake in early lactation is one of the main limitations to high production and good reproductive performance. Inadequate dry matter intake (DMI) will limit peak production and, if body condition loss is excessive, first ovulation can be delayed. In this technical piece, its effects on driving feed intake feeding efficiency and rumen metabolism will be presented.

#### Mechanisms driving dry matter intake

One of two mechanisms that regulate feed intake is physical fill of the rumen (Waldo, 1986). Several in vitro and in vivo studies have shown that **XTRACT™** in dairy diets leads to increase dry matter digestibility of certain fibrous raw materials, i.e. alfalfa hay (Table 1).

*Table 1. Comparison of the addition of XTRACT™ to alfalfa hay on the digestibility of dry matter (DMd), neutral detergent fibre (NDFd), and acid detergent fibre (ADFd) in batch culture over 72 hours.*

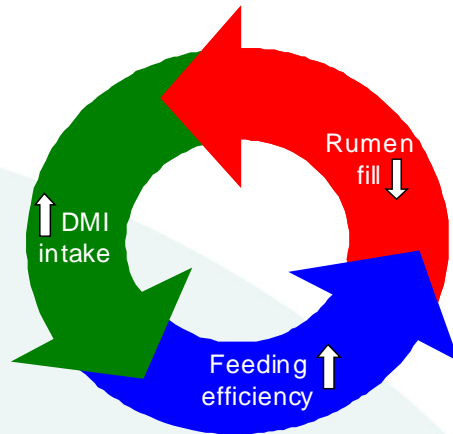
Parameter	Alfalfa hay	Alfalfa hay + XTRACT	SEM
DMd (%)	37.77a	40.46b	2.30
NDFd(%)	5.60a	10.08b	5.12
ADFd(%)	9.03a	11.47b	5.09

University of Buenos Aires, Argentina, 2003.

a,b: p≤ 0.05

The improved digestibility of fibrous feedstuffs not only allows for a better utilisation of nutrients, but plays a role in driving dry matter intake in the lactating animal. Better feed efficiency leads to a decrease in rumen fill which in turn drives the animal to consume more dry matter. This cycle (shown schematically in Figure 1), allows for the animal to take in enough feedstuffs to satisfy its maintenance and production needs. This is particularly necessary for periods where the animal finds itself in negative energy balance such as at the beginning of lactation, and stops the animal from “milking off its back,” by using its body stores when feed nutrients are not of a sufficient level to maintain milk production.

Figure 1. Schematic representation of the mechanism by which **XTRACT™** drives dry matter intake as supported by *in vitro* and *in vivo* studies.



Dose-titration feeding trials have shown the benefits of **XTRACT™** driving dry matter intake as a function of its feeding level. This is particularly evident in forage-based diets such as the one based on fresh ryegrass below (Figure 2).

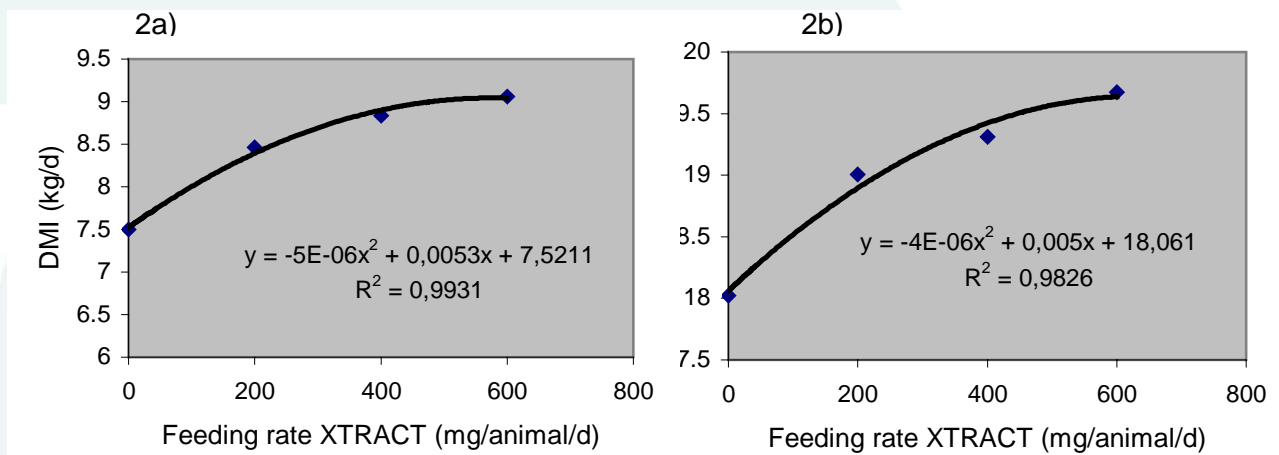
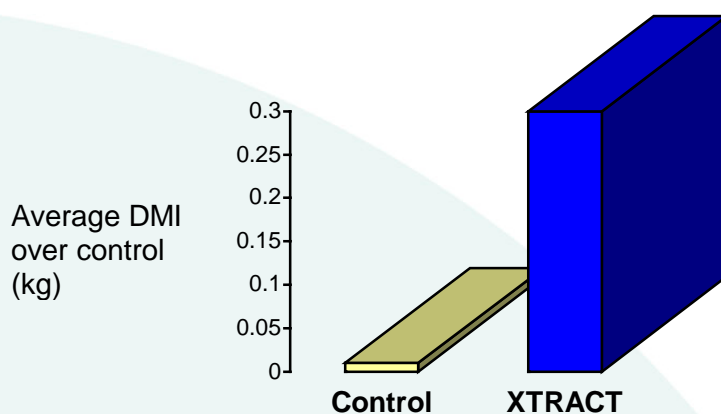


Figure 2. Intake of fresh grass strips (2a) and total dry matter (2b) of lactating dairy cows over 14 weeks at increasing feeding rates of **XTRACT™**.

In this trial, the inclusion of **XTRACT™** in forage-based diets at increasing feeding levels correlated strongly with grass ( $r=0.99$ ) and total dry matter intake ( $r=0.99$ ). Furthermore, the effects of **XTRACT™** on dry matter intake has been confirmed in over 14 trials with either TMR or grass diets. On average, the inclusion of **XTRACT™** at approximately 500 mg/animal/day led to an average daily increase of over 300 grams dry matter/animal/day (Figure 3). This increase played a role in the milk yield benefits of 1.5 liters on average observed in those trials.

Figure 3. Average dry matter intake (DMI) over control of feeding trials conducted from June 2003 to December 2004 in lactating dairy cattle (average of 13 trials conducted in early lactation, days in milk < 120 days).



The major influence of **XTRACT™** is not an issue of palatability. Instead, by improving the digestibility of fibrous feedstuffs, **XTRACT™** appears to drive rumen fermentation so that rumen fill does not reach a maximum level which could compromise intake. The benefit of driving intakes as well as its actions on energy metabolism gives **XTRACT™** potential benefits in the post-calving period.

*References are available upon request.*

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