In a previous issue of At a Glance, we discussed in general terms the concepts and reasons for using rumen modifiers. Anyone who feeds cows is aware of the large number of additives and the claims of improved animal performance, but it is often difficult to determine whether the additive is having the desired effect, or more importantly, if it is cost effective.

Before including a rumen modifier in the NEWTON feed program a number of steps are taken by the Shur-Gain research team to ensure that dairy producers are getting value for their money. Initially a lot of time is spent on the mode of action of the product and a review of the relevant literature. Next the effect on the animal is examined using the Shur-Gain research facilities in Burford, Ontario. The additive is finally incorporated in NEWTON as a rumen modifier, allowing us to decide whether the inclusion of the additive is cost effective.

To demonstrate these steps and to provide more information on an important rumen modifier we have chosen Rumensin premix as an example. A large number of studies have been conducted with Rumensin on dairy cows over the past 20 years.

SO HOW DOES RUMENSIN WORK?
Volatile fatty acids (VFA) provide a significant (~70%) portion of the energy requirements of cattle. VFA are produced in the rumen by fermentation of carbohydrates by bacteria. The primary VFA produced in the rumen are acetic, butyric, and propionic acid.

Rumensin works by changing the bacterial populations, reducing those that produce acetic and butyric acid and allowing for a higher proportion of propionic acid producing bacteria. The benefit from this is that more energy is available for milk production when carbohydrate is fermented to propionic acid compared to acetic or butyric acid.

Rumensin allows for more energy from any ration, freeing up space in the ration for more forage, which translates into healthier rations. Not only does Rumensin improve the energy in a dairy cow’s diet, it also has the benefit of reducing the production of methane.

Environment Canada has provided (accredited) Rumensin with an Environmental Technology Verification (ETV) claim for reducing methane emission and fecal nitrogen levels by 20% each. Not only does Rumensin provide more energy out of the feed, it is also having a positive effect on the environment.
Recently a quantitative summary of the research results (meta-analysis) for Rumensin was conducted by Dr. Todd Duffield. The results from this meta-analysis support previous findings and provide some new insight into Rumensin’s effects on production and health. Here’s an excerpt of the findings.

Using Rumensin in Lactating Dairy Cows:
How to maximize the benefit for your dairy herd?
By Todd Duffield, D.M.V., D.V.Sc
Associate Professor, Population Medicine
University of Guelph

Rumensin use in lactating dairy cattle and its effect on metabolism, health, and performance was recently evaluated. A total of 59 publications from around the world were summarized for this meta-analysis.

Metabolic Findings
Rumensin was found to significantly decrease ketones (acetoacetate and beta-hydroxybutyrate) and non-esterified fatty acids (NEFA – a form of mobilized fat). Rumensin increased blood glucose. These findings strongly support a beneficial effect of Rumensin on energy metabolism of the cow.

Milk Production Findings
Rumensin decreased dry matter intake (DMI) and increased milk yield and milk protein yield, which supports a milk protein production efficiency claim. Overall there was no significant effect of Rumensin on milk fat yield. However, there was variation in milk fat yield response from trial to trial. This variation is most likely caused by differences in diet. This supports other studies that have identified dietary interactions such as adequacy of particle size that may interact with Rumensin to effect milk fat. Thus diets high in PUFA (polyunsaturated fatty acids) and low in effective fibre are likely to intensify a reduction in milk fat when Rumensin is included. However, little effect on milk fat yield with Rumensin is to be expected with these dietary ingredients properly controlled in the diet.

Summary of Production Outcomes-Amounts

<table>
<thead>
<tr>
<th>Variable</th>
<th>Weighted mean difference</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk yield</td>
<td>+0.7 kg/cow/day</td>
<td>+2%</td>
</tr>
<tr>
<td>DMI</td>
<td>-0.3 kg/cow/day</td>
<td>-2%</td>
</tr>
<tr>
<td>Milk production efficiency</td>
<td>+2.04%</td>
<td>+2%</td>
</tr>
<tr>
<td>Milk fat yield</td>
<td>-0.002 kg/cow/day</td>
<td>-0.02%</td>
</tr>
<tr>
<td>Milk protein yield</td>
<td>+0.01 kg/cow/day</td>
<td>+1%</td>
</tr>
<tr>
<td>BCS</td>
<td>+0.07</td>
<td>+2%</td>
</tr>
<tr>
<td>BW change</td>
<td>+6.3 kg</td>
<td>+1%</td>
</tr>
</tbody>
</table>
CONCLUSIONS

The findings from the meta-analysis give strong support for the use of Rumensin during the transition period (for the energy and health benefits) and throughout lactation for the efficiency benefit. NEWTON accounts for the energy benefit of Rumensin within the program. In doing so, the overall ration cost of producing the same amount of milk is reduced since the cost of the rumen modifier and benefits to the cow have been taken into account.

In summary, when you choose a rumen modifier such as Rumensin, you can be sure of the following:

1. The product has been thoroughly researched and proven;
2. There are no negative effects on the animal;
3. It is cost effective.

READ ABOUT HOW NEWTON AND RUMENSIN HAVE WORKED FOR THESE PRODUCERS

Here are examples of how the NEWTON program accounts for the energy value of Rumensin and the savings it can provide on your farm.

### Table 1. Effects on costs of including rumen modifiers in formulated diets

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Good Quality Forages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk Yield, kg</td>
<td>35</td>
</tr>
<tr>
<td>Days in Milk</td>
<td>150</td>
</tr>
<tr>
<td>Milk Fat content, %</td>
<td>3.80</td>
</tr>
<tr>
<td>Milk protein content, %</td>
<td>3.40</td>
</tr>
<tr>
<td>Liveweight, kg</td>
<td>675</td>
</tr>
<tr>
<td>Dry matter intake, kg/day</td>
<td>22.0</td>
</tr>
</tbody>
</table>

Control

- Concentrate cost, $: 4.247
- PCON: 53.3

RM

- Concentrate cost, $: 3.997
- PCON: 53.3

2nd RM

- Concentrate cost, $: 3.597
- PCON: 53.3

3rd RM

- Concentrate cost, $: 3.725
- PCON: 53.0

NEWTON is a unique and powerful tool for making an objective assessment of whether or not an additive should be used. Based on the situation of your herd, it can determine which additive is most profitable for you to use on your farm. It’s up to you to take advantage of the benefits provided by NEWTON.