



Research has shown...

- Increased Milk Production
- No Loss in Milk Components

Encapsulation- Protected Plant Extracts

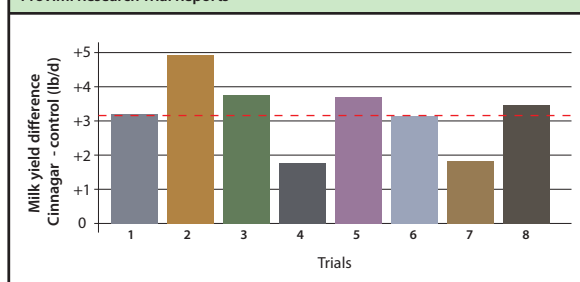
CINNAGAR is a unique blend of plant extracts designed to provide lasting benefits when fed to ruminant animals. **CINNAGAR** is manufactured in a patented process where the plant extract is encapsulated within a fat matrix. This protects the extract from evaporation during the feed manufacturing process. In addition it allows for a slow release of the extract into the rumen providing for effects that last throughout the feeding period (Table 1).

Table 1. Effect of microencapsulation on recovery of Cinnamaldehyde and Garlic oil after steam pelleting. (CaroTech technical bulletin TB08NXT019)

	Percentage Recovery	
	C+G	CINNAGAR
Cinnamaldehyde	80.2	98.5
Garlic oil	69.9	95.8

CINNAGAR™ in Practice

Cinnagar increases milk production +3.1 lb/hd/d
Provimi Research Trial Reports



Provimi North America has conducted field trials to measure the benefits of using **CINNAGAR**. In these trials milk yield of cows fed **CINNAGAR** was increased an average of 3.1 lb over controls with no change in milk components.

Benefits of Garlic Oil

In vitro rumen fermentation studies has shown that **CINNAGAR** inhibits growth of methane producing bacteria. Lower methane production leads to a shift in the VFA profile increasing production of the energetically favorable propionate (Table 2).

Benefits of Cinnamaldehyde

Cinnamaldehyde slows the breakdown of peptides in the rumen. This leads to reduced rumen ammonia concentrations and increased efficiency of microbial protein synthesis (Table 3).

Feeding Rates

Cinnagar is available in 2 concentrations.

Thoroughly mix CINNAGAR into the ration at the rate of :

CINNAGAR- 30	CINNAGAR- 3
0.01 lb/hd/d	0.10 lb/hd/d

Table 2. Effects of Garlic Oil on the Molar Proportion of Acetate, Propionate and Butyrate. (Busquet et al, 2005a) J. Dairy Sci. 88:4393

	Treatments	
	Control	Garlic Oil
Total VFA, mM	123.1	124.9
Acetate, mol/100 mol	65.3 ^a	62.9 ^b
Propionate, mol/100 mol	17.3 ^a	18.3 ^b
Butyrate, mol/100 mol	13.1 ^a	14.3 ^b

^{ab} means within a row with different superscript differ (P < 0.05)

Table 3. Effect of Cinnamaldehyde on rumen ammonia concentration and efficiency of microbial protein synthesis. (Busquet et al, 2005b) J. Dairy Sci. 88:2508

	Treatments	
	Control	Cinnamaldehyde
Ammonia N, mg/100 ml	21.5	18.5
EMPS	27.6	30.6

EMPS = Efficiency of microbial protein synthesis (g/kg true organic matter digestibility)

Available from: