

# NUTRITION GUIDE

## CALCIUM SALTS Size matters !

Fat is the highest energy ingredient available in dairy diets, but the rumen can only cope with small amounts of fat before fibre digestibility is reduced.

Individual fatty acids, the building blocks of fats, must be supplied in rumen-protected form to prevent changes in the rumen.

### Why do we make calcium salts of fatty acids ?

Volac Wilmar manufacture Megalac, a calcium salt, as a high-energy rumen-protected supplement for adding to diets.

Key benefits of calcium salts are :

1. Enables diet fat to be increased without risk of reducing fibre digestibility
2. Enables unsaturated fatty acids such as oleic acid (C18:1) to be delivered through the rumen for absorption in the small intestine

### Effect of granule size

Calcium salt supplements have a range of granule sizes, but Megalac, produced by Volac Wilmar, has larger granules and less fine dusty material than other products.

A study was conducted at the National University of Singapore to determine the effect of particle size, ranging from less than 0.5 mm to 3-4 mm, on stability.



<0.5mm

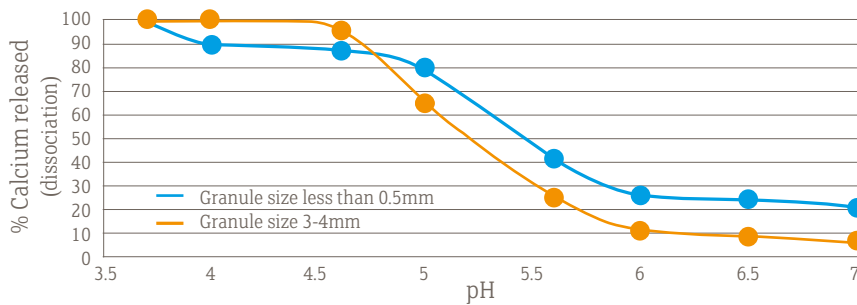


3-4mm

# The research

Breakdown (dissociation) of calcium salts, assessed by release of free calcium, was evaluated for different granule sizes, pH values (acid vs alkali) and time periods to represent conditions in the rumen and intestine.

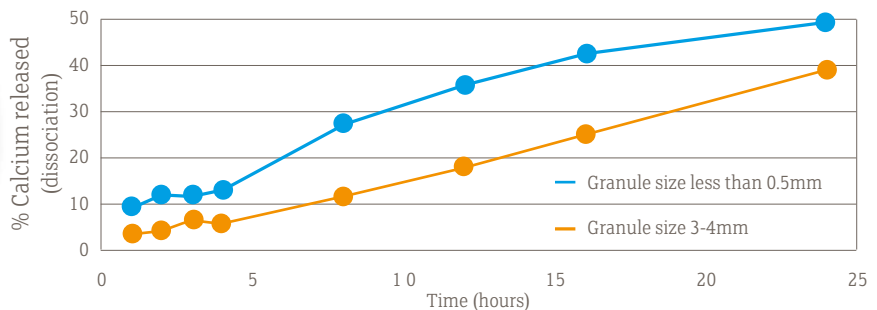
### Breakdown of calcium salts after 16 hours at different pH values



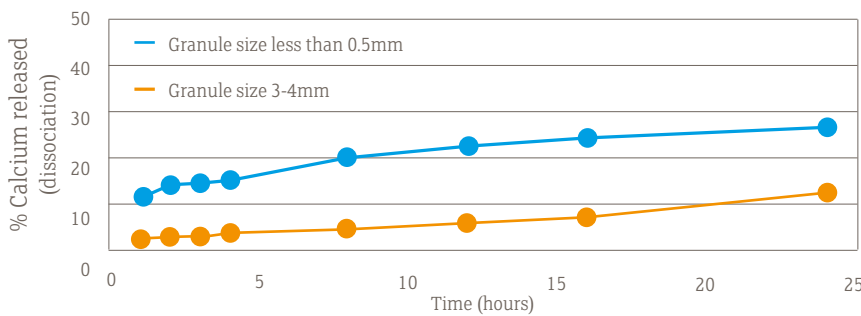
Consistently higher dissociation in small granules at all rumen pH

Small granules break down more extensively in acid rumens than large particles

### Breakdown of calcium salts at pH 5.6 (acidic rumen)



### Breakdown of calcium salts at pH 6.5 (ideal rumen)



Large granules in ideal rumen conditions are highly stable

Fatty acids released in the rumen lose their rumen-protection and can lead to reduced fibre digestibility and lower milk fat. Unsaturated fatty acids such as oleic acid (C18:1) must pass through the rumen intact to maintain their biological effectiveness for improving digestibility and fertility.

## THE CONCLUSION

To maximise rumen protection of fatty acids for maximum benefit, use a supplement with larger granules



**MEGALAC**<sup>®</sup>  
More milk, better fertility