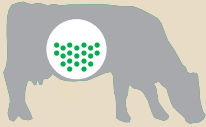
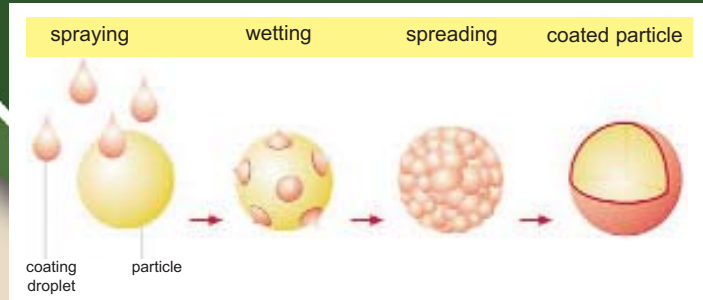


Fact Sheet Micro-encapsulation



Levucell[®] SC
Rumen Specific Yeast



Introduction:

Levucell SC is an Active Dry Yeast, which has been proven to have a beneficial “probiotic” effect on ruminal fermentation. This specific strain of live yeast (*Saccharomyces cerevisiae* 1077) has been identified for its ability to enhance rumen efficiency, stabilize ruminal pH and ultimately increase animal performance.

In order to have this beneficial effect, the product must be viable when fed. *Saccharomyces cerevisiae* is a hardy organism, therefore viability is not an issue in mineral premixes and “top dress” products.

However, when pelleting feed, there are a number of manufacturing processes that reduce the viability of unprotected active dry yeasts. The resulting viability will be a function of

temperature, pressure and time involved in the pelleting process.

Micro - encapsulation:

To ensure Levucell SC viability through the pelleting process Lallemand has developed a patented system of micro-encapsulation that protects the yeast against the high temperatures and pressures of pelleting. The micro-encapsulation process involves coating the dried yeast prills with a specific fatty acid mixture that solubilizes in the rumen environment.

Micro-encapsulated

*Levucell SC rumen specific yeast
maintains viability through
the pelleting process*

Micro-encapsulation Process

The coating is heated and sprayed into the micro-encapsulator as air and yeast prills are circulated from the bottom. As the temperature lowers, the fatty acid solidifies creating coated particles which contain thousands of viable yeast cells.



Micro-encapsulation: the Coating with Fatty Acids



Levucell SC 20
(uncoated)

Fatty Acid



Levucell SC



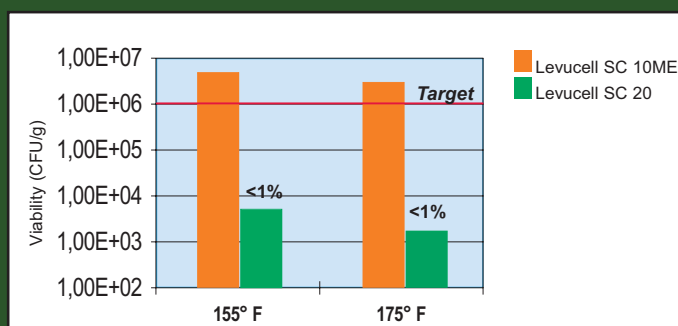
Levucell SC 10ME
(coated)

Results:

In a pelleting trial with Levucell SC 20 (uncoated) and Levucell SC 10ME (encapsulated) it showed that at 155°F and at 175°F the micro-encapsulated yeast allowed the target viability (1×10^6 /g) to be attained.

When the uncoated yeast was used, there was over a 100-fold reduction in viability at the higher temperature. This highlights the importance of using a micro-encapsulated active dry yeast in the pelleting process.

In a number of other trials at five US ruminant feed mills in 2006, the Levucell SC 10ME viability ranged from 90% - 117%.



Conclusion

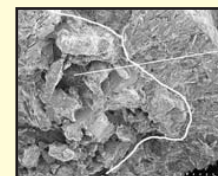
Advances in both biological technology and industrial processing have enabled Lallemand to make Levucell SC available to a wide range of feed suppliers and manufacturers.

Characteristics of Protection

► **Hydrophobic:** the coating protects live yeast from humidity and steam during meal conditioning and pelleting process.

► **Thermal insulator:** The ME coating decreases thermal induction and limits overall humidity inside the particles.

► **Coating:** limits particle damage and maintains integrity.



Magnified Beadlet