

Only Lallemand Offers You the Flexibility to Match Your Direct-Fed Microbial Program to Your Feedlot Operation

Different diets and production stages call for different direct fed microbial solutions. Lallemand has developed several products designed to work in different production scenarios. The Micro-Cell line of products offers three products that can be used to design a custom direct-fed microbial system that will work for you.



MICRO-CELL LA

Bacterial Content - 500 million CFUs of *Lactobacillus acidophilus* BT-1386 per 50 mg (0.05 g) dose

Mode of Action - Thrives in the intestinal environment and colonizes the hind gut. Excludes "bad" pathogenic bacteria such as *E. coli*, *salmonella*...

Applications - Newly received cattle, high-stress/high-risk cattle, reduction of pathogen shedding from cattle

MICRO-CELL PB

Bacterial Content - 1 billion CFUs of *Propionibacterium freudenreichii* P-63 per 50 mg (0.05 g) dose

Mode of Action - Converts lactate to propionate, reducing lactic acidosis and increasing the energy content of the end products of rumen fermentation

Applications - Cattle fed high-grain diets

DFM PROGRAMS FOR FEEDLOT RECEIVING AND DIET ADAPTATION

During feedlot receiving and diet adaptation, cattle are exposed to several stressors that leave them susceptible to infection by pathogenic bacteria.

◆ Micro-Cell LA (*L. acidophilus* BT1386) has been shown to inhibit pathogenic bacteria in cattle and increase feed efficiency during the early part of the finishing period.

◆ Feeding *P. freudenreichii* interferes with diet adaptation and actually reduces performance if it is fed during this time. See Table 1.

Table 1: Effects of Different Bacteria Species on Performance During Transition to a High-Grain Diet

	Control	Micro-Cell LA	<i>P. freudenreichii</i>
Feed:Gain	6.94	6.65	7.22
Comparison to Control		4.3% Improvement	4.0% Reduction

Adapted from Huck et al., 2000 Kansas Sate University Cattlemen's Day Report

MATCHING BACTERIA TO PRODUCTION PHASE IS BETTER

Once cattle are up on full feed, they are under less stress. Because of the high amount of starch in the diet, acidosis becomes the main concern while they are on the final finishing ration.

◆ Micro-Cell PB (*P. freudenreichii* P63) utilizes lactate in the rumen, thereby stabilizing rumen pH and limiting acidosis.

◆ Micro-Cell PB also produces propionate, increasing the energy available to cattle from the fermentation end products.

◆ Trials have shown that matching the right bacteria to the right production phase increases animal performance and improves the return on investment for your operation. See Table 2.

Table 2: Effects of Phase Feeding vs. Feeding the Same Bacteria Throughout the Feeding Period

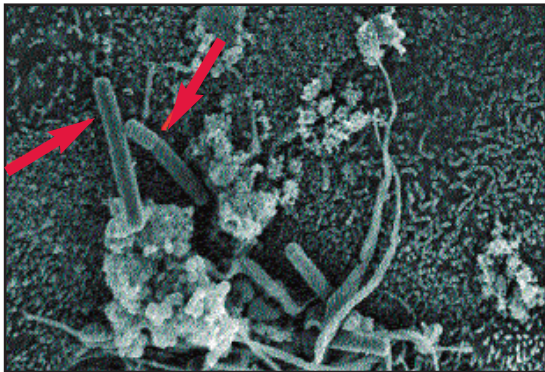
	Control	Phase Feeding	Program X	Program Y
Step-Up Diet Treatment	None	Micro-Cell LA	<i>L. acidophilus</i>	<i>P. freudenreichii</i>
Finishing Diet Treatment	None	Micro-Cell PB	<i>L. acidophilus</i>	<i>P. freudenreichii</i>
Feed:Gain	7.04	6.67	6.94	7.09
P value (vs. Control)	-	0.06	0.64	0.81

Adapted from Huck et al., 2000 Kansas Sate University Cattlemen's Day Report



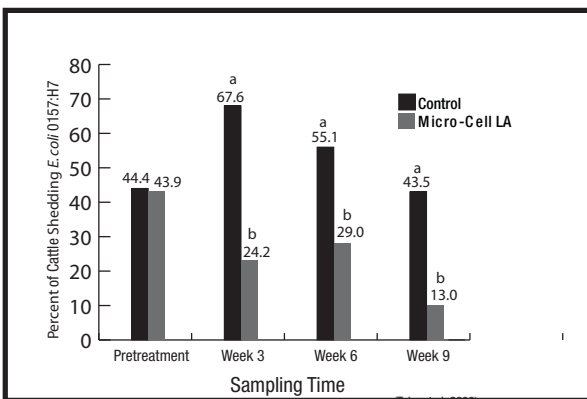
MICRO-CELL LA MODE OF ACTION EXPLAINED

MICRO-CELL LA was first isolated in the 1980s by North Carolina State University as a probiotic for its inhibitory effects on a number of detrimental organisms including *E. coli*, *S. aureus*, *Salmonella*, *S. typhimurium* and *Pseudomonas*. Recent independent studies have shown that fewer cattle fed Micro-Cell LA test positive for the presence of *E. coli* O157:H7 in the feces compared to Control.



Scanning electron micrograph of *L. acidophilus* adhering to epithelial cells in culture. Arrows point to *L. acidophilus* attached to cell surface.

Figure 1. MICRO-CELL LA Reduces the Number of Cattle Testing Positive for *E. coli* O157:H7



Adapted from Taber et al. 2008. J. Food Prot. 71:539-544. Aab Means within week lacking common superscript differ ($P \leq 0.01$).

MICRO-CELL LA Specifications

Package Size	Dose	Doses per Package	Shipping Unit	Bacterial Strain	CFUs per Dose
500 grams	50 mg (0.05g)	10,000	10 Packages	<i>L. acidophilus</i> BT-1386	500 million

MICRO-CELL PB Specifications

Package Size	Dose	Doses per Package	Shipping Unit	Bacterial Strain	CFUs per Dose
500 grams	50 mg (0.05g)	10,000	10 Packages	<i>P. freudenreichii</i> P-63	1 billion

MICRO-CELL PB MODE OF ACTION EXPLAINED

Independent studies have demonstrated the ability of **Micro-Cell PB** to efficiently utilize lactate and produce propionate in rumen fluid cultures at pH levels relevant to finishing cattle diets.

Figure 2. Lactate utilization by Micro-Cell PB in rumen cultures (Nagaraja et al., Kansas State University)

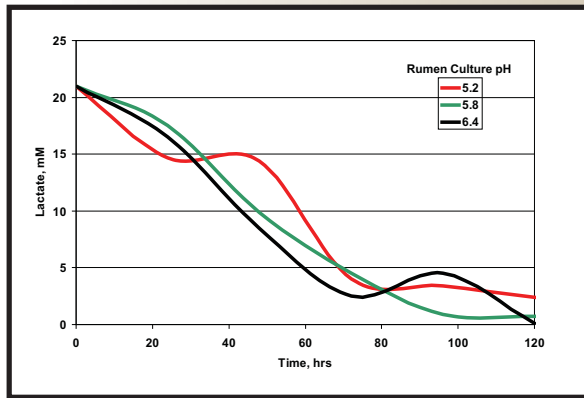
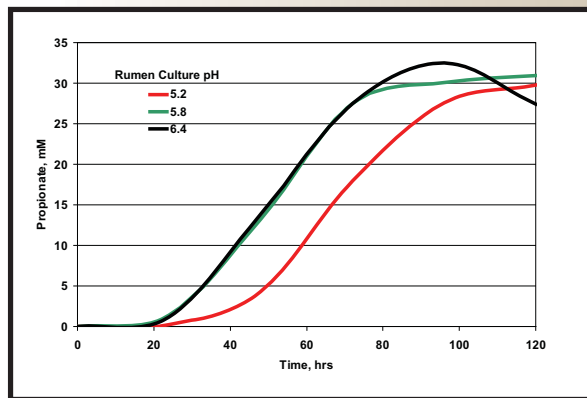


Figure 3. Propionate production by Micro-Cell PB in rumen cultures (Nagaraja et al., Kansas State University)



Product Handling

Store below 4° C (40° F) preferably in a freezer. Keep all application equipment clean and well maintained.