PAC FACTS

# What you need to know about probiotics.

Probiotics are live microorganisms that benefit the animal when consumed. Common probiotics used in ruminant diets include live yeast and live bacteria.

## How do live yeast work?

Live yeast improve rumen health and efficiency in three main ways:

OPTIMIZE

### Rumen Environment

- Take up excess oxygen so rumen is more hospitable
- Stabilize rumen pH to help reduce acidosis

ENHANCE

### Rumen Microbiome

- Establish microbiome earlier
- Shift microbial populations towards fiber digesters and lactic acid utilizers

BOOST

### Rumen Activity

- Source of micronutrients
- Increase microbial growth which increases protein and VFA production

## How do live bacteria work?

Live bacteria have several modes of action that impact gastrointestinal health and immune system function:

FORTIFY

### The Microbiome

- Modify microbial population in gut towards good bacteria
- Increase nutrient digestion and absorption

FIGHT

### Against Pathogens

- Produce antimicrobial substances and alter gene expression of pathogens
- Outcompete pathogenic bacteria

SUPPORT

### Overall Health

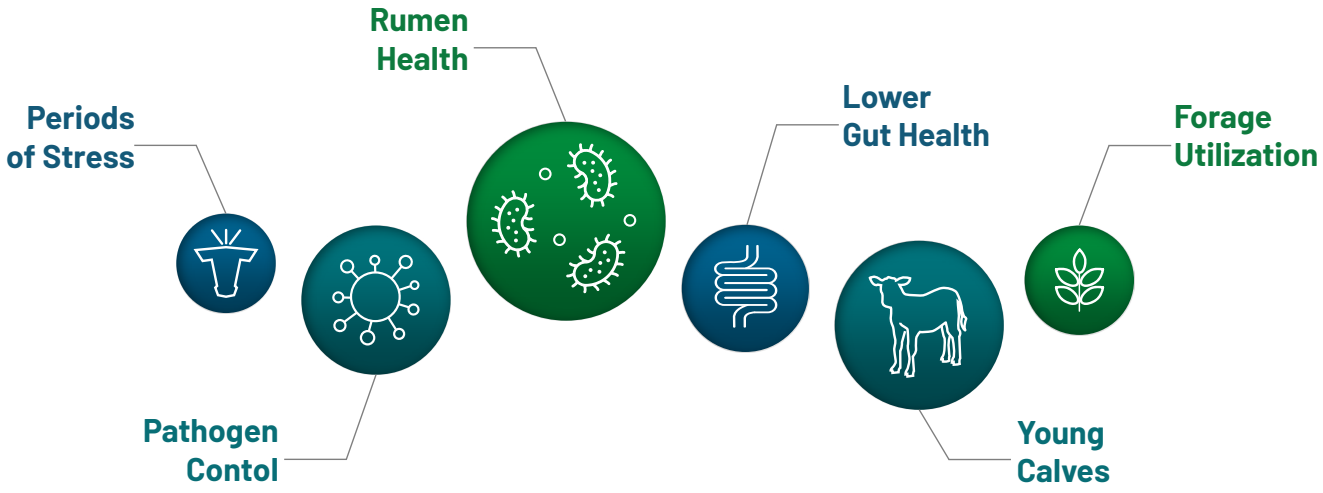
- Modify the immune system to make it more effective
- Reduce leaky gut by supporting gut barrier integrity

Papillon™ Feed Efficiently

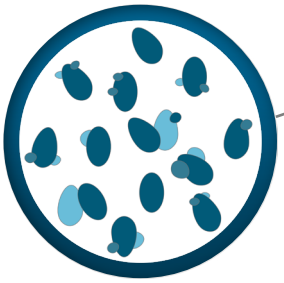
*Learn more at Papillon-Ag.com.*

**WHERE THERE'S A SHIELD, THERE'S A WAY.**

## When should probiotics be used?

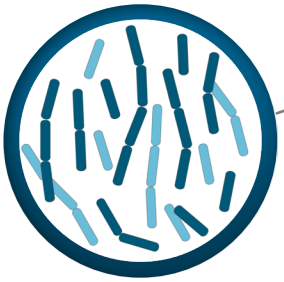



## What are typical responses?



### Live Yeast

- Improved dry matter intake
- Improved milk yield
- Improved milk fat



### Live Bacteria

- Improved milk yield and components
- Improved dry matter intake
- Improved feed efficiency
- Disease reduction

## How do you select a probiotic?

1. Review bacterial strains and colony forming units (CFU). Strains can have different modes of action in the animal.
2. Understand the probiotic selection process. A company should have a comprehensive strain selection process.
3. Look for data on probiotic mode of action. A good probiotic will support the animal in a variety of ways.
4. Look for data in animals facing stressors. They should cope more effectively than those not fed a probiotic.