CLOSTRIDIA...
IT’S WHAT YOU CAN’T SEE.
Clostridia are gram-positive, anaerobic, spore-forming bacteria commonly found in the environment and in the gastrointestinal tract of dairy cows. The species most responsible for enteric diseases in cows is Clostridium perfringens. Under favorable conditions, all types of C. perfringens produce potent toxins resulting in cows off feed, decreased production efficiency, and digestive disorders.
THE CLOSTRIDIA CHALLENGE

DRAGS ON MILK PRODUCTION, DIGESTIVE UPSETS, COWS OFF FEED …

*Clostridium* induced digestive disorders pose a challenge to every dairy. Onset in high producing cows is often sudden and acute with little response to treatment. While preventative vaccines and boosters are effectively used to combat *C. perfringens* type C & D, those formulated for *C. perfringens* type A may not cover the diversity of the strains found on many farms. Overpopulation of *C. perfringens* type A may cause:

- Hemorrhagic Bowl Syndrome (HBS)
- Abomasal ulcers and tympany
- Gas gangrene
- Sudden death

FORTUNATELY THERE’S BACIFLEX™
BaciFlex is a regionally customized direct-fed microbial that uses cutting-edge Bacillus technology to defend against Clostridia. Its multiple strains of Bacillus subtilis produce bacteriocins that naturally inhibit toxigenic and non-toxigenic Clostridium and reduce the frequency of digestive disorders on dairies.

**THE BACIFLEX ADVANTAGE**

- Targets *C. perfringens* type A
- Fewer cows off feed
- Reduces digestive upsets and death losses
- Enhances production efficiency
- Stable in finished feeds and pre-mixes

*The Bacillus strains utilized in BaciFlex are Generally Recognized As Safe (GRAS) and are exempt from the Veterinary Feed Directive (VFD).*
THE PHILOSOPHY BEHIND BACIFLEX

While no two dairies are identical, all deserve a comprehensive, more natural solution to the Clostridial challenges they face. How does BaciFlex address this need while accounting for regional diversity?

HARNESSING THE POWER OF MICROBIAL TERROIR™

The microbial terroir concept considers the total community of microorganisms in the gastrointestinal tract of a cow (microbiota) in addition to environmental elements that impact those organisms (terroir). Microbial terroir characteristics vary from one region to another, indicating the need for regional formulations of BaciFlex.
The science behind Baciflex

As detailed below, the microbial terroir program uses advanced molecular biological techniques to characterize regional microbial terroirs, screen Clostridia inhibiting *Bacillus* candidates, and formulate Baciflex.

1. Commodity ingredients, silage, TMR and cow/calf fecal samples are collected from farms across the US.

2. Clostridial DNA is isolated from the samples.

3. Isolates are analyzed to determine if they are toxigenic.

4. Toxigenic *Clostridium* are grouped into families.

5. Isolates from each family of Clostridia are grown as ‘indicator’ strains.
BaciFlex formulations utilize *Bacillus* combinations that inhibit the broadest range of toxigenic and non-toxigenic Clostridia in their respective region. Continuous monitoring and on-farm validation ensure BaciFlex is responsive to Clostridial population changes.

**TARGETED DEFENSE**

1. Proprietary *Bacillus* strains are grown and beneficial bacteriocins are isolated.
2. Clostridial strains and *Bacillus* bacteriocins are combined in culture plates.
3. After incubation, the percent inhibition of the Clostridia is calculated.
4. The *Bacillus* combination that inhibits the broadest range of toxigenic Clostridia is identified.
5. Regional BaciFlex formulations are produced using the most effective *Bacillus* combinations.
Research shows BaciFlex enhances immune function and reduces the frequency of digestive upsets and death losses on dairies. This translates to substantial savings at the farm level.

**FEEDING BACIFLEX REDUCES DIGESTIVE DEATH FREQUENCY**
THAT’S THE BACIFLEX ADVANTAGE

Feeding BaciFlex provides nutritional benefits that increase production efficiency and improve your bottom line.

ENERGY CORRECTED MILK INCREASE IN 5 HERDS FED BACIFLEX

<table>
<thead>
<tr>
<th>Herd</th>
<th>ECM Increase, lbs</th>
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<tbody>
<tr>
<td>Herd 1</td>
<td>2.8</td>
</tr>
<tr>
<td>Herd 2</td>
<td>1.2</td>
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<tr>
<td>Herd 3</td>
<td>2.1</td>
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<tr>
<td>Herd 4</td>
<td>2.6</td>
</tr>
<tr>
<td>Herd 5</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Herd: 185 hd, 264 hd, 317 hd, 806 hd, 940 hd Weighted Ave
PROTECTION, PREDICTABILITY, PROFIT.... THAT’S THE BACIFLEX ADVANTAGE

BaciFlex is Papillon’s most advanced direct-fed microbial to date. Learn how its Bacillus technology can optimize immune function in your herd, enhance ruminal efficiency, and improve your bottom line today!