

# PhibroPen®

## PRODUCT GUIDELINES

PhibroPen® is a superior antimicrobial product containing Benzylpenicillin potassium, more commonly known as Penicillin G. *PhibroPen* is differentiated from other penicillin products in the market, as it contains a highly concentrated inclusion (100 percent activity strength) of Penicillin G. *PhibroPen* is fast acting and is effective immediately upon addition to treat Gram-positive bacteria. *PhibroPen* disrupts the formation of the bacteria cell wall, which makes the bacteria absorb water and literally split apart (cell lysis).

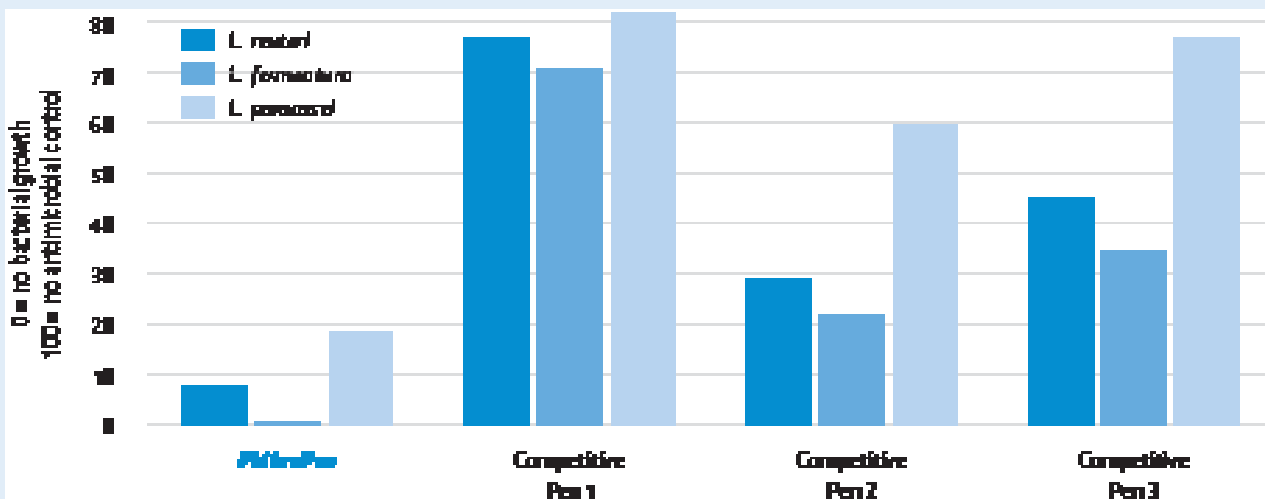
### Demonstration of Performance

Bacterial strains were isolated from mash, which was collected from various ethanol plants. These bacterial strains were inoculated in growth media and exposed to industry-specific penicillin products.

- The antibiotic addition rate represented is 0.25 ppm product dosage.
- Performance was measured by the bacteria’s ability to grow in the presence of an antibiotic. The scale below shows that a reading of 0 equates to no bacterial growth; 100 represents no antimicrobial control.
- *PhibroPen* showed superior performance in controlling growth of bacteria compared to competitive penicillin products at an equivalent dose rate.

### Lactobacillus sp. Isolated from Fuel Ethanol Plants

Antimicrobial dosed at 0.25 ppm



## What is PhibroPen?

*PhibroPen* is an antimicrobial agent for fuel ethanol production. *PhibroPen* consists of Benzylpenicillin Potassium, more commonly known as Penicillin G. Penicillin is part of the  $\beta$ -lactam class of antibiotics.

## How does PhibroPen work?

Penicillin acts by inhibiting a key enzyme (transpeptidase), which is responsible for catalyzing the final step in cell wall biosynthesis (the cross-linking of peptidoglycan). As a result, the bacteria can no longer cross-link components of its cell wall as it grows. This is important because an intact cell wall is essential for bacterial survival – it serves to maintain cellular integrity. Without this rigid envelope, the bacteria will absorb water from its surrounding environment until it literally splits apart (cell lysis).

## Dosage and Direction for Use

*PhibroPen* is typically added to the yeast propagator and/or fermenter prior to or during fermentation for Gram-positive bacterial control. Normal recommended dosage rates are between 0.25 ppm to 2.0 ppm, dependent upon the level of bacteria present. Dosages as high as 3 ppm can be used in extreme contamination situations. The concentration is calculated using the ratio of 1 ppm equals 1 pound in 108,000 gallons of mash.

## Regulatory

*PhibroPen* is Generally Recognized As Safe (GRAS) and therefore suitable for use under the Food Safety Modernization Act (FSMA).



## Packaging

*PhibroPen* is available in 50-pound (22.7 kg) drums and 1/2- or 1-pound (227 or 454 g) water-soluble bags.

## Shelf Life

The product has a shelf life of three years and must be stored dry and at room temperature.

## Appearance

A white to off-white solid crystalline powder

## Kosher Status

Certified Kosher Pareve.

## Manufactured by

Phibro Animal Nutrition for Phibro Ethanol Performance Group, 299 Radio Road, Quincy, IL 62305

## Solubility

Soluble in water

## Safety and Handling

### Hazard Statements

- May cause allergy or asthma symptoms or breathing difficulties if inhaled
- May cause an allergic skin reaction

### Precautionary Statements – Prevention

- Refer to safety data sheet and product label

### Precautionary Statements – Response

- Refer to safety data sheet and product label

Call your Phibro representative today to see if *PhibroPen*<sup>®</sup> is right for you.



Antimicrobials • Process Aids  
Cleaning Products • Yeast

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