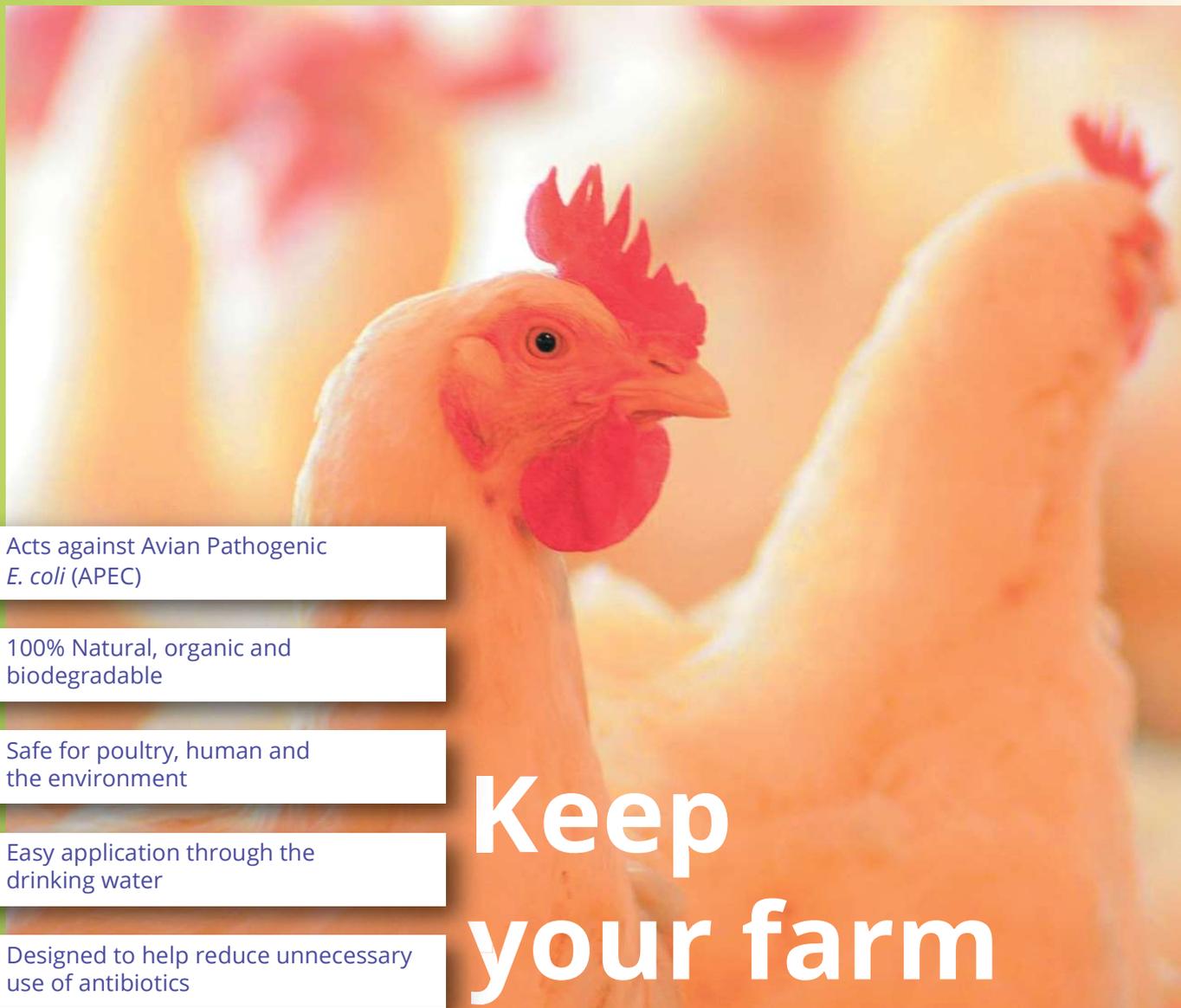


# BAFACOL

An innovative solution  
to control  
Avian Pathogenic *E.coli*  
in poultry



Acts against Avian Pathogenic  
*E. coli* (APEC)

100% Natural, organic and  
biodegradable

Safe for poultry, human and  
the environment

Easy application through the  
drinking water

Designed to help reduce unnecessary  
use of antibiotics

Keep  
your farm  
*E.coli* free

Manufactured by

Proteon   
Pharmaceuticals

Tylna 3a, 90-264 LODZ, Poland

Marketed by

AVON   
poultry

Uttara Dhaka 1230 Bangladesh

## WHAT IS COLIBACILLOSIS

Colibacillosis is an infectious disease caused by the bacterium **Avian Pathogenic Escherichia coli (APEC)**.

The APEC infection is one of the leading causes of morbidity & mortality in poultry flocks. The strains cause a wide range of localized and systemic infections.

The birds get affected by ingestion, inhalation or secondary to fecal contamination of eggs hatched in an incubator.

## TYPICAL SYMPTOMS OF COLIBACILLOSIS

- |                   |                 |                  |               |
|-------------------|-----------------|------------------|---------------|
| 1. Air sacculitis | 2. Pericarditis | 3. Perihepatitis | 4. Septicemia |
| 5. Salpingitis    | 6. Peritonitis  | 7. Omphalitis    | 8. Arthritis  |

## IMPACT OF APEC ON FLOCKS



High mortality



Lower egg production



Decreased hatching rates

## 3 SIMPLE STEPS TO AVOID APEC INFECTION IN YOUR FLOCKS



Implement biosecurity practices.



Focus on preventing, rather than just on curing—once the bacteria has spread, it is very difficult to control.



Use high quality and tested products.

## Causing huge financial loss on the farm

## WHAT ARE BACTERIOPHAGES (PHAGES)

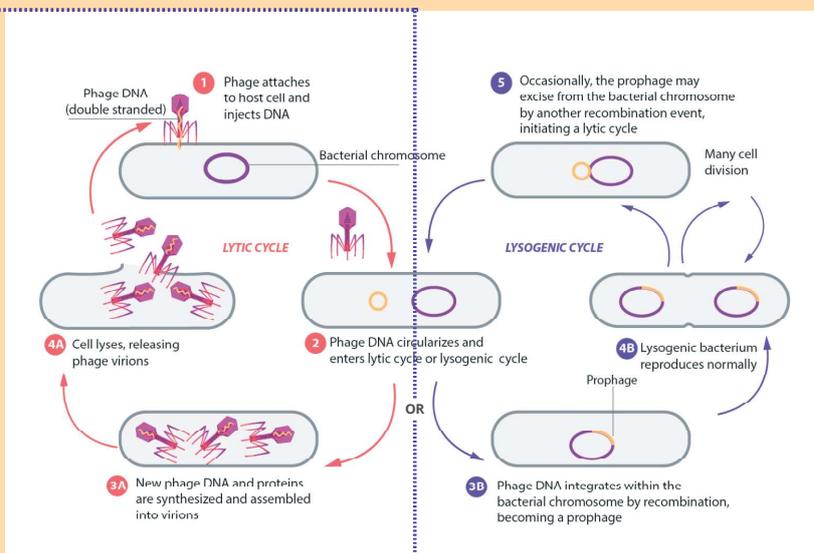
Bacteriophages are naturally occurring viruses that only kill selected bacteria. We might call them the good viruses (similar to the concept of good bacteria in probiotics).

-  Phages eliminate only their selected bacteria.
-  Phages are all around us: on our hands, our eyelids, animal intestines, in the soil, but they don't harm us.
-  Phages are safe because they are only able to infect bacterial cells, not human or animal cells.
-  Phages do not damage the beneficial microbiome balance in gut.

## BACTERIOPHAGES: HOW THEY WORK



**Proteon's Phages are Lytic**  
(eliminate targeted bacteria)



## INTRODUCING BAFACOL

BAFACOL™ is an innovative feed additive consisting of a cocktail of 5 lytic bacteriophages which support the prevention of high mortality and productivity losses with no negative impact on the microbiome, hence improves growth, productivity and performance.

- Highly effective against Avian Pathogenic *E. coli* (APEC)
- Does not cause side effects.
- Natural, non-GMO and biodegradable.
- Easy application through the water supply system.
- Designed to help reduce uses of unnecessary antibiotics.

## COMPOSITION OF BAFACOL

This product contains a mixture of 5 lytic bacteriophages at a concentration of  $1 \times 10^8$  PFU. The product does not contain bacteria

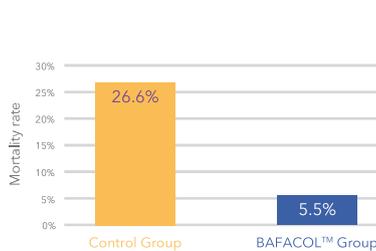
## BENEFITS OF BAFACOL

- Helps to reduce mortality.
- Helps to reduce the unnecessary use of antibiotics on the farm.
- Support birds health and improves production performance and FCR.
- Highly effective in controlling multiple strains of Avian Pathogenic *E. coli* include AMR strains.
- Safe for humans, animals and the environment.
- Helps to improve gut health & immunity.
- Does not create antibiotic resistance.
- Can be used for packaged and processed meat & egg production.
- Suitable for all poultry species.

## BAFACOL™ IMPROVES MORTALITY, BODYWEIGHT AND FCR

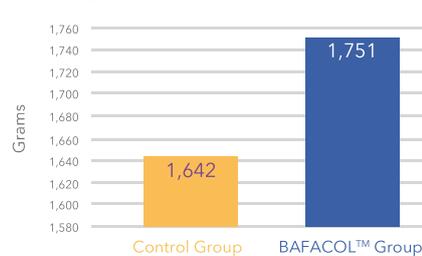
4.9x lower mortality in the **BAFACOL™ Group** vs. in the Control Group

Mortality



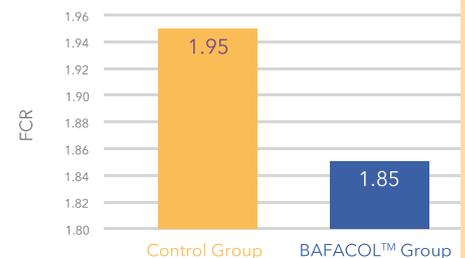
6.6% higher Body Weight in **BAFACOL™ Group** vs. in the Control Group

Body weight



5.4% better FCR in the **BAFACOL™ Group** vs. in the Control Group

Feed Conversion Ratio



## BAFACOL - HOW TO USE

Simply add appropriate dose of BAFACOL™ to water that will be consumed by the birds within 4 to 6 hours. Apply at least 4 hours apart from acidifiers.

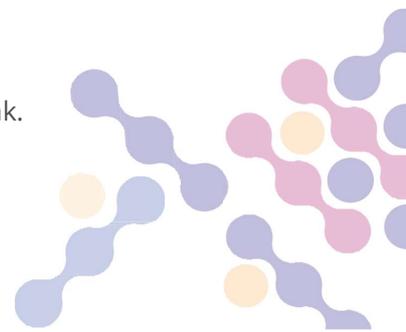
BAFACOL™ can be dosed together with vitamins, antibiotics, inactivated (killed) vaccines or coccidiostats.

BAFACOL™ can not be use together with disinfectant but chlorinated water is compatible.

Withhold BAFACOL™ for 3 days prior and 7 days after live *E. coli* vaccine administration.

## BAFACOL - Dosage

- Use 10 ml of BAFACOL™ for 1,000 birds.
- Broilers apply every other day for 2-6 weeks or throughout the bird life cycle.
- Breeders, Layers or Sonali apply every other day for 3 weeks, followed by 3 weeks break. Repeat the schedule throughout the bird life cycle.



## BAFACOL - Pack Size

100 ml amber color bottle

## BAFACOL - Storage

Store BAFACOL in 2 - 10°C

Once the bottle is opened use it within 96 hours

## BACTERIOPHAGES - COMPETITIVE ASSESMENT

	Antibiotics	Acidifiers	Probiotics	Prebiotics	PROTEON'S phage products
High efficacy towards <i>Salmonella</i> bacteria, including antibiotic resistant strains	✓	✗	✗	✗	✓
No side effects	✗	✓	✓	✓	✓
Natural ingredients	✗	✗	✓	✓	✓
Ability to use long term (sustainability of use)	✗	✓	✓	✓	✓
No negative impact on gut microbiome	✗	✓	✓	✓	✓

In comparison to estimated efficacy of available anti - *E. coli* solutions, BAFACOL™ shows a significant advantage.

## BAFACOL - SAFETY

BAFACOL™ Tolerance Tests:

In vivo BAFACOL™ safety tests\* conducted on chickens throughout a 35-day cycle with 10x the recommended dose proved full safety for poultry.

No side effects were observed.

No changes in the health or zoonotic parameters.

No changes in the blood morphology and biochemistry.

## BAFACOL - Why so safe?

Because the lytic Phages in Proteon's products are only able to infect selected pathogenic bacterial cells and are completely unable to interact with any other cells in animals, humans or plants, they are harmless to anything except their targeted bacteria.

## Proteon Pharmaceuticals

Proteon Pharmaceuticals is an innovative biotechnology company and a leader in the bacteriophage technology for animal farming purposes.

**PROTEON has introduced to the market the first bacteriophage product for animal farming created with the use of precision biology.**

## PROTEON AN ADVANCED TECHNOLOGICAL PLATFORM



Proteon Pharmaceuticals has developed a precision biology PLATFORM for delivering Phage-based antibacterial products



Proteon has a committed team of over 40 research scientists engaged in precision engineering of bacteriophages for industry use.



Proteon use genomics, advanced microbiological selection tools and bioinformatics to develop products.



Proteon have one of the first Good Laboratory Practices certified laboratories for bacteriophages worldwide.



Proteon team has multiple patents for development of phages and engineering solutions for phage delivery.



Proteon Pharmaceuticals has won multiple awards and European innovation grants to support its research