When BioProtect™ Poultry House Treatment is applied to the litter, the lipid peptides alter the environment by suppressing other micro-organisms. Many of which cause odour, including but not limited to those that produce hydrogen sulphide and ammonia. These lipid peptides disrupt the cell membrane of other micro-organisms and organic material causing the cells to rupture, allowing the Bacillus subtilis to come out of spore and break down or consume organic material readily.

BioProtect™ Poultry House Treatment is a litter amendment that inhibits the growth of problem bacteria while helping to control environmental odour, fungi and pathogenic bacteria.

It is a combination of the natural bacterium, Bacillus subtilis, and the lipid peptides that it produces, negating the use of traditional chemical based disinfectants such as formaldehyde.

Safe: Blended as an extremely safe, pourable liquid product, non-toxic and considered non-pathogenic. No Personal Protective Equipment (PPE) required for application.

Natural: An environmentally friendly and powerful probiotic bacterium, Bacillus subtilis is found protecting plant roots around the world.

Bacillus subtilis is considered a safe, benign organism. Both the American Society of Microbiology and US-FDA classify BioProtect™ Poultry House Treatment as a Generally Regarded As Safe; “GRAS” organism. This means it can be safely handled by employees and customers without concern for their health or the environment.
Product Benefits

- Biodegradable, non-toxic, and non-corrosive.
- Controls or reduces ammonia production due to inhibition of urease enzymes in the poultry litter.
- Controls or reduces pathogenic bacteria such as *Salmonella enterica*, *Campyllobacter jejuni*, *Staphylococcus aureus*, *Escherichia coli* (E. coli) and *Clostridium perfringens* in the poultry litter.
- Controls poultry litter pests, such as darkling beetles, and is especially effective against larvae, and flies.
- The improvement of the poultry house environment increases feeding, weight gain and other measures of productivity, such as reduced mortality rate.

- Prevents or reduces pododermatitis resulting from the control or reduction of *Staphylococcus aureus* microorganisms in the poultry litter.
- Improves the quality and value of the chicken manure by encapsulating/trapping nitrogen from entering the atmosphere.
- Reduces the use of toxic and carcinogenic chemicals. These chemicals have the potential to find their way into the human food chain.
- The reduction in ammonia emissions and control of pathogens makes for a safer working environment.

Control of Bacteria

Control of bacteria in poultry litter is of major importance, not only for the control of ammonia emissions, but for the protection of birds and humans from bacteria such as *E. coli*, *Salmonella enterica* and *Campylobacter Jejuni*, to name a few.

Several million tons of poultry litter or manure are generated annually by poultry farms. A substantial portion of the litter or manure is estimated to be disposed of by spreading on croplands. *Salmonella enterica* and *E. coli* have been recovered from litter or manure for up to 120 days after the removal of poultry flocks that were raised on the litter, or produced the manure.

*Salmonella enterica* and *E. coli* have also been shown to survive in litter or manure-treated soils for up to two months.

BioProtect™ Poultry House Treatment has proved very effective at controlling bacteria in poultry litter over an extended period of time. Testing has been completed against some of the most common bacteria:

- *Salmonella enterica*
- *E. coli*
- *Campylobacter jejuni*

The active ingredients in Poultry House Treatment have also been tested against many other strains of bacteria with excellent success in the control of pathogens.

Application Protocol

Layers & Broilers

Treat the poultry litter on a monthly basis and prior to placement of new flocks at a ratio of 1 litre per 100 square meters of litter.*

- Product can be diluted on application to achieve coverage dependant on moisture content of litter.
- Litter condition, seasonal weather conditions, or higher moisture may require additional product.

Toxicology Testing

- Safe for Customers and Employees
  - Acute Dermal Toxicity Study OECD 402
  - Acute Inhalation Study OECD 403
  - Acute Dermal Irritation/Corrosion Study OECD 404
  - Acute Eye Irritation/Corrosion Study OECD 405
  - Acute Skin Sensitization Study OECD 406
  - Acute Oral Toxicity Study OECD 425

- Safe for the Environment
  - Fresh Water Alga Cyanobacteria Growth Inhibition Study OECD 201
  - 48 Hour Acute Toxicity to Daphnia Magna OECD 202
  - 96 Hour Acute Toxicity to Danio Rerio OECD 203

- Toxicology and Efficacy Test Data Available on Request

Product Testing

Broiler Shed Test

Four 2044m² broiler sheds were used with 22,300 birds in each. Two were treated with BioProtect™ Poultry House Treatment and the others with a competitor's product.

Results Demonstrated

- Feed conversion ratio was improved by 1-2% per cycle.
- Reduction in ammonia levels over 39 plus days with reduced need for ventilation fans.
- Bird mortality rates reduced by 0.5%.
- A 5% increase in bird weight was achieved.
- Reduction in unwanted odour in and around the sheds.
- The birds exhibited no feet or breast burns and were all graded at the highest level.
- Reduction in power usage due to reduced fan usage.