

# **Pelican Solutions & Global Future Solutions Mitigating Ammonia Emissions From Poultry Facilities**



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Rich Riddle & Mike Bralkowski**

# Pelican Solutions & Global Future Solutions

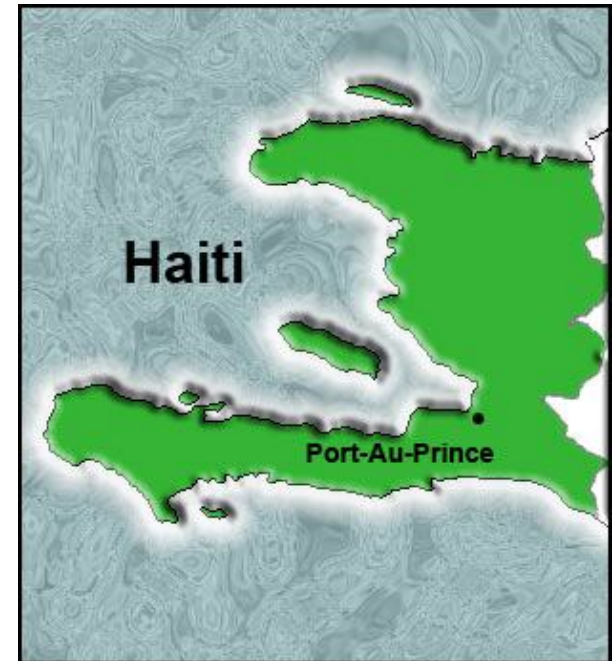
- Pelican Solutions, LLC was founded in 2010 with the objective of being an industry leader in eco-friendly environmental and revolutionary infection prevention technology.
- Pelican Solutions product and research support are delivered through a global partnership with Global Future Solutions (GFS). GFS is an Australian Company working in the field of biotechnology to develop environmentally sustainable solutions to reduce the spread of disease and address major environmental issues.
- Pelican's business initially focused on Healthcare, Sports & Leisure, Schools/Universities, Hospitality and Textiles. The more we worked with the products and interfaced with the chemists, we realized that the existing products, the products in development provided solutions to major problems in the food, poultry, leisure and livestock industries. After almost three years of research and development, Pelican Solutions is introducing revolutionary eco-friendly products that will dramatically impact how our partners do business.



# Pelican Solutions & Global Future Solutions

- GFS visited Haiti after the Earthquake in January 2010. GFS tested the area for bacteria and results showed extreme risks of infection. The dining areas and hospitals areas came back with the highest readings of bacteria. GFS fogged the tested sites with GFS Surface Spray Disinfectant, Hospital Grade and in all cases the bacterial count dropped by more than 90% leaving the areas safe from infection. GFS then supplied the camps with the GFS B antimicrobial product range and have significantly reduced the cross contamination of communicable diseases, especially Cholera.

GFS has also been working in Haiti to remove the odor from the latrine pits with the GFS enzyme range products. Initial results have shown a significant decline in odor within 1-2 days and a decline in the volume of solids.



**This exhibits the research and development power supporting Pelican Solutions.**

# Pelican Solutions & Global Future Solutions

- The poultry industry experiences a variety of problems such as: Ammonia Odor, Pollution, Waste Water, Disease, etc. Diseases are easily spread because of the proximity of the farmer, employees, animals and vegetation. Agricultural waste water is also a problem because it contains dirt, manure and chemicals used to clean the poultry house. Pelican-Solutions and GFS worked together over the past 3 years to develop an environmentally friendly microbial product, **XPEL™ Plus** that provides a range of solutions for the poultry industry, **XPEL™ Plus** can address: Ammonia Odor, Viruses, Sanitation, Pollution, and more in an environmentally sustainable way that is safe for all of the individuals and the poultry on the farm.
- **XPEL™ Plus** is safe for use in Poultry Operations. As a non-toxic all natural microbial sanitizer, **XPEL™ Plus** contains a unique combination of enzymes that:
  - Disinfects and deodorizes the poultry operations
  - Is 100 % Biodegradable and 100% Non-Toxic
  - Controls Salmonella and we have completed a white paper on salmonella



# We Are a Solutions Company

- We know the capability of our products, the farmer knows their business
- We visit each partner so that we can understand their business
  - Broilers
  - Egg Laying
  - Organic
  - Free Range
- In the poultry industry our products works in every facet of the operation, but the application process is unique, not only for each category but also within the category.
  - Scratch Areas
  - Seepage Pits
  - Built litter
  - Condominiums
- With the farmers input we create cost effective solutions for their problems



# What if there was one product that....

- Reduced ammonia below 20ppm and maintain those number for over 39 days with reduced ventilation
- Controlled Salmonella for extended periods
- Reduced Foot Pad Dermatitis
- Increased weight gain by feed efficiency
- Decreased morbidity rate
- Is safe to use while chickens are in the barn
- Is safe for use by employees & farmer's family
- Lowered PH to reduce pathogen activity
- Odorless
- Non-Toxic
- Non-Corrosive



# XPEL™ Plus from Pelican Solutions

- **XPEL™ Plus** is a safe all natural microbial product for poultry operations. **XPEL™ Plus** contains a unique combination of naturally occurring microorganisms, enzymes and surfactants that are safe for the employees and the poultry in the poultry house by reducing ammonia levels in the poultry house. XPEL™ Plus is readily biodegradable, 100% non-toxic , non-corrosive & controls salmonella



# XPEL™ Plus

## Trials Results, Eastern United States

- XPEL™ Plus Case Study: Recent trials were conducted on a Broiler Farm in a 20,000 Sq. Ft. House with 22,000 broilers per house. Four houses were utilized. We tested XPEL™ Plus in two of the four houses and a leading competitor was used in the other two. During and after the trials the following results were noted:
- XPEL™ Plus reduced the ammonia level to less than 20 PPM within 48 hours after application and continued to **reduce ammonia for 39+ days** while the competition stopped working after 5 days. **Prior to increasing the fan speed** the XPEL™ Plus ammonia reading was **12 PPM**. The fan's speed was increased due to the extreme temperatures in the Southeast.
- XPEL™ Plus houses had **Energy Savings** as they were able to run the fans at level one (1) versus level three (3) for the competition.



# XPEL™ Plus

## Trials Results Eastern United States

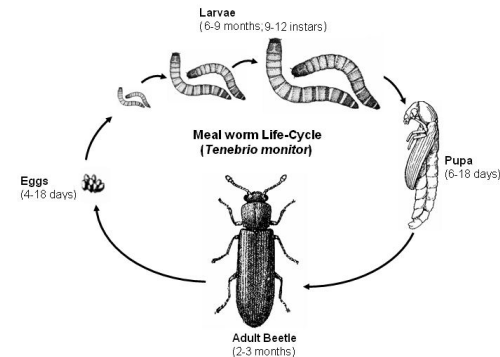
- The General Health of the flock in the XPEL™ Plus houses was better than the competitors houses.  
**Decreased Morbidity Rate** (we had 217 fewer deaths in our houses), XPEL™ Plus Poultry had a **Greater Weight Gain** over the Same Time Period and XPEL™ Plus lowers PH to Reduce Pathogen Activity,
- The poultry in the XPEL™ Plus houses were 15-20 points (1/4 #) greater in size than the chickens in the competitors houses after 35 days. The result is that the 44,000 chickens in **XPEL™ Plus houses added 11,000 pounds of meat in the 35 days** versus the competition.



# XPEL™ Plus

## Trials Observations, Eastern United States

- The chickens in houses 1 & 2 (XPEL™ Plus) exhibited improved health over houses 3 & 4. Houses 1 & 2 had zero blisters and burns on their paws, while houses 3 & 4 exhibited typical paw levels. Feed efficiency in houses 1 & 2 was improved over their normal operations.
- We observed that the Darkling Beetle population in houses 1 & 2 dramatically reduced versus houses 3 & 4. Noticeable impact on eggs, larvae and pupa population. We are interested in talking with a university on doing a white paper on XPEL™ Plus's impact on Darkling Beetles



# XPEL™ Plus Effectiveness on Salmonella Enterica

## Marble Laboratories

Detailed lab test results  
available upon request.

### Methodology Summary

The initial step was to acquire the chicken manure and sterilize to ensure that there are no competing organisms located in the sample. This sample was received from a chicken operation in Ohio. After autoclaving, the sample showed no growth following plating. The sterilized sample was inoculated with a known sample of Salmonella Enterica, mixed and plated; growth of salmonella was observed and supported by TSI test. The product, XPEL™ was applied and testing was performed as per the protocol to evaluate growth of salmonella.

### Results:

There was no Salmonella Enterica observed in the samples from the earliest test sample at 3 hours through the last sample at 96 hours. After an additional 24 hours, the mixture was re-inoculated with Salmonella Enterica. Once again no growth of Salmonella Enterica was observed from the 3 hour to the 96 hours sampling.

### Observations:

From the testing that was performed, XPEL™ has demonstrated to be very effective against Salmonella Enterica. The treatment is effective, relatively immediate (within 3 hours), and appears to have a lasting effect over a period of 9 days.



# Operating Solutions For the Farmer

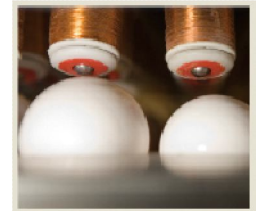
- XPEL™ Plus is not acid base so it does not corrode equipment over time.
- Because XPEL™ Plus reduced ammonia levels over 30 days less ventilation / power was used resulting in reduced energy costs
- Provide alternate uses of the chicken Litter that have been treated with XPEL™ Plus
  - **Manure:** Fertilizer that is nitrogen enhanced therefore more valuable for the farmer. XPEL™ Plus will improve the value of the chicken litter by encapsulating / trapping the nitrogen from entering the atmosphere.
  - **Alternative Energy – Power Plants:** If we have excess chicken litter then it can be used to fuel alternative energy power plants. We are in the process of building the first gasification power plant in Cincinnati, Ohio and chicken litter is an excellent source of BTU's. Also The Gasification Process is an Oxygen starved closed loop process that does not pollute the Environment.



# XPEL™ Plus

## One Solution for Egg laying Operations

- Apply XPEL™ Plus to all of the conveyor belts when they are being cleaned or serviced. The moisture from the water will keep the bacteria active & alive until the chicken litter starts to appear on the belts. The chicken litter is the XPEL™ Plus bacteria's food supply.
- Apply a mister where the chicken litter comes out of the egg laying house to the storage area. The XPEL™ Plus will knock down the ammonia level and the other odors while being transported to the storage facility.
- The XPEL™ Plus Bacteria will double in size every 20 minutes under ideal conditions: Temperature of 70+ degrees, Humidity, Moisture & Unlimited Food Supply (Chicken Litter).



# XPEL™ Plus

## A Solution for Broiler Operations

- XPEL™ Plus Recommends a two (2) year Preventive Maintenance Program. We recommend that the house be cleaned out after 2 years.

Flock	XPEL™ Plus	Water Quantity
1	25 Gallons	400 Gallons
2	25 Gallons	400 Gallons
3	20 Gallons	400 Gallons
4	20 Gallons	400 Gallons
5	20 Gallons	400 Gallons
6	18 Gallons	400 Gallons
7	18 Gallons	400 Gallons
8	18 Gallons	400 Gallons
9	15 Gallons	400 Gallons
10	15 Gallons	400 Gallons
11	15 Gallons	400 Gallons



1 Gallon of XPEL™ Plus + 16 Gallons of water will treat 800 Sq Ft

Since XPEL™ Plus is a living microbial (Bacillus Subtillis) it is reproducing during the two years that it is in the chicken litter therefore the XPEL™ Plus quantity is reduced over the two year time period and reducing cost to the farmer .

# Ongoing Research

- OSU is going to write the white paper on XPEL™ Plus and OSU will use New Day Farms (Ohio) as the commercial operator for the test. Pelican Solutions will meet with Key Executives of New Day Farms and develop the test protocol for controlling ammonia in a belt operation



The Ohio Agricultural Research  
and Development Center



# XPEL™ Plus from Pelican Solutions

## **Mission Statement**

We will continue to be an industry leader in eco-friendly and revolutionary infection prevention technology. Our charge is to develop environmentally sound solutions using the most advanced research and microbial and antimicrobial products. We pledge to our customers that we will listen, provide solutions that positively impact their business and provide unsurpassed customer service.

## **For More Information About XPEL™ Plus Contact**

**Rich Riddle 614-432-6905  
jrr@pelican-solutions.com  
5101 Forest Drive, Suite C  
New Albany, Oh 43054**

