



ELIMINATE

Ammonia, Methane, Pathogens & Odours

with



protection

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Ammonia in farms

Ammonia (NH₃) is a caustic, toxic, irritating and dangerous gas that results from the breakdown of nitrogen present in animal droppings. This gas easily accumulates on farms and reduces the quality of the air that is breathed in them, contributing to the aggressiveness of the animals and decreasing their well-being. In high concentrations, such as those found on farms, it can cause serious lung problems in both workers and animals.

The current conditions of intensive farming production, which include a high density of animals per m², the use of diets rich in protein and often, the lack of adequate ventilation, cause the accumulation of ammonia in concentrations much higher than those recommended.

The United States Occupational Safety and Health Administration (OSHA) has limited exposure to ammonia at a concentration of 35 ppm in ambient air to a maximum of 15 minutes and 8 hours at a concentration of 25 ppm.

Human smell only detects ammonia when it reaches levels of 25-30 ppm, that is, when it is already very dangerous. However, it is already harmful and annoying for people and animals below this concentration, which are common on farms.

At levels above 20 ppm, ammonia in the air dissolves in fluids covering exposed mucous membranes, such as those of the eyes and respiratory tract, producing ammonium hydroxyl, a highly irritating compound.

What is the effect of ammonia on animals?

Why is it important to reduce the concentration of ammonia on the farm?

- **Ammonia is a gas with an irritating effect on the digestive, respiratory, and ocular mucous membranes, and it also affects the animal's skin.** It also influences the development of the animal's immune system, its behavior and well-being.
- The severity of injuries caused by ammonia will depend on the concentration and the time of exposure to the gas. The higher the ammonia levels are and the longer the exposure over time, the more serious the injuries are.
- Farm animals are continuously exposed to ammonia, while farm workers are exposed during their workday.
- Tail biting due to stress and environmental discomfort.



***Photocatalytic technology designed to enhance farms.
Less disease, lower fatalities, removal of antibiotics.
Enhanced animal welfare - eradication of ammonia and methane.***

Health conditions in swine

Due to these exposures, the most frequent health conditions in pigs are:

- Respiratory affections due to irritation of the mucous membranes that cause paralysis and destruction of the respiratory cilia and epithelial cells.
- Inability to eliminate mucus.
- Increased exposure to other pathogens.
- Disorders of the digestive mucosa.
- Growth retardation in pigs.
- Eye condition due to irritation (conjunctivitis).
- Irritations on the skin (pododermatitis).



Health conditions in poultry

In poultry farms the most important health conditions are:

- Impairs the action of the mucosa.
- Deterioration of the cilia of the trachea.
- Pulmonary congestion, edema and haemorrhages.
- Increased susceptibility to diseases such as Newcastle.
- Alterations in the lung structure.
- Conjunctivitis.
- Footpad dermatitis.
- Paw injuries.
- Under weight.



We can conclude that in addition to all these effects, ammonia increases the susceptibility of animals to more serious respiratory disorders, such as pneumonia, and makes them more vulnerable to all kinds of viruses, bacteria, and fungi. In summary, it is important to reduce ammonia levels in the facility, as high ammonia concentrations can have adverse effects on animal welfare, health and performance

Dairy Farms

Dairy farms can be challenged by numerous pathogens including Mastitis-Causing Bacteria, Salmonella, Listeria monocytogenes, Escherichia coli, Mycobacterium avium subsp. paratuberculosis (MAP): Campylobacter, Cryptosporidium, etc. These pathogens can have significant economic impacts on dairy farms due to decreased milk production, treatment costs, and potential loss of markets due to food safety concerns.



HygieniaTouch protection can be considered beneficial for intensive dairy farms due to their potential to control pathogens and improve overall hygiene in the production environment.

Here's why they might be advantageous: Pathogen Control, Cross-Infection Prevention, Improved Food Safety and more sustainable farming via Reduced Chemical Usage.

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Health conditions in dairy farms

In barns, dairy cows may encounter various health issues due to the indoor environment and proximity to other animals. Some of the specific health issues and pathogens commonly associated with barns include:

- **Respiratory Diseases:** Barns with poor ventilation can lead to respiratory issues in dairy cows. Ammonia buildup from urine and manure releases harmful gases that irritate the respiratory tract, making cows more susceptible to respiratory diseases such as pneumonia.

Bacteria such as *Mannheimia haemolytica* and *Pasteurella multocida* are often implicated in respiratory infections in cattle housed indoors.

- **Mastitis:** Mastitis, an inflammation of the udder tissue, is a significant concern in dairy farming and can be exacerbated by barn conditions.

Bacterial pathogens such as *Staphylococcus aureus*, *Streptococcus agalactiae*, and *Escherichia coli* can enter the udder through teat openings, leading to infections. Factors such as poor hygiene, contaminated bedding, and overcrowding can increase the risk of mastitis in barns.

- **Foot Health Issues:** Cows housed in barns may experience foot health problems such as lameness, which can be caused by factors like hard flooring, inadequate hoof care, and standing on wet or dirty surfaces for prolonged periods.

Lameness can be exacerbated by bacterial infections such as digital dermatitis (caused by *Treponema* species) and foot rot (caused by *Fusobacterium necrophorum*).

- **Parasitic Infections:** Barns can serve as a conducive environment for the transmission of parasitic infections in dairy cows. Internal parasites such as gastrointestinal worms (e.g., *Ostertagia ostertagi*, *Haemonchus contortus*) and external parasites like lice and mites can negatively impact cow health and productivity if not properly managed through deworming and parasite control measures.



What's the situation in farms?

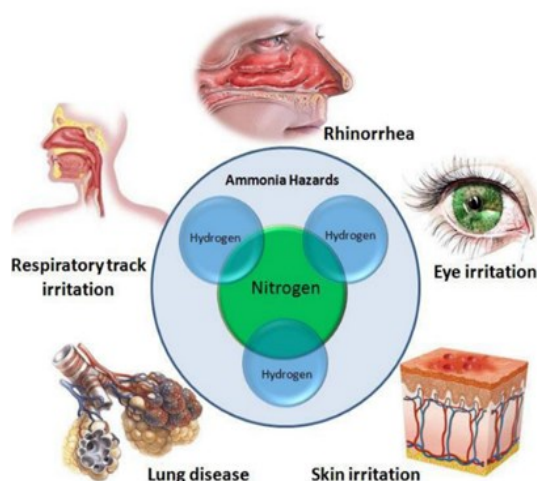
The farms must carry out an exhaustive control so as not to exceed the maximum levels of ammonia established (20 ppm).

At concentrations higher than 24-50 ppm, just a 10-minute exposure causes considerable irritation to the nose and neck.

With concentrations of 100 ppm and above causes much more severe nasal and neck irritation and our body begins to develop resistance in the nasal airways.

These are the most common conditions produced by contact with ammonia in humans:

- 10ppm--> injuries on the lung surface.
- 20ppm--> increased susceptibility to respiratory diseases (humans can detect odor).
- 50 ppm--> 5% of growth retardation.
- 100ppm-> respiratory and eye problems.
- 15% growth retardation.

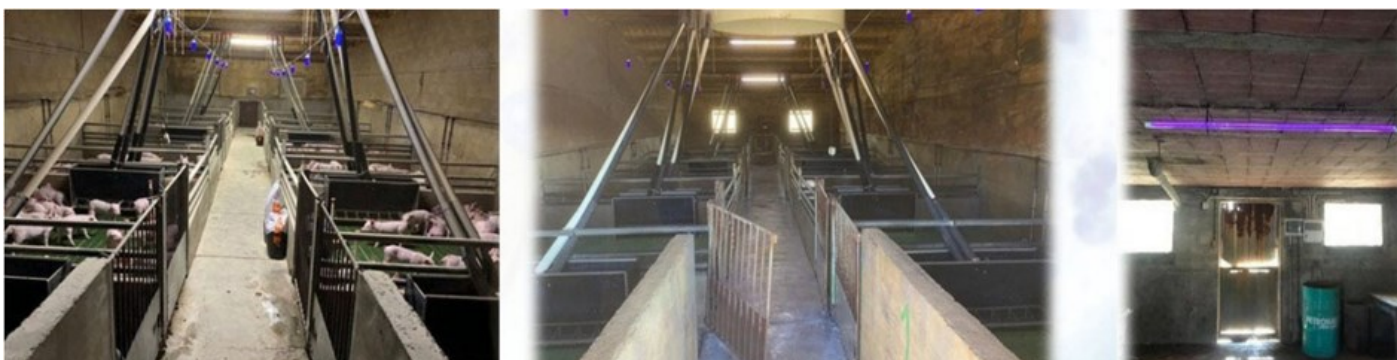


How can HygieniaTouch help?

The **HygieniaTouch** protection System can reduce the concentration of ammonia up to 85%.

Our technology is effective, innovative and easy to apply. Its operation is based on the photooxidation of ammonia (NH₃), through the application of a nano-coating, **HygieniaTouch**, based on mineral semiconductors, combined with the action of our **HygieniaTouch** LED lights.

The **HygieniaTouch** protection System is a revolutionary innovation that improves biosecurity and animal welfare in intensive poultry and pig farms, currently being the BEST AVAILABLE TECHNIQUE on the market (BAT). The perfect solution for compromised and highly vulnerable environments.



How does it work?

Our technology uses the same principles as solar panels (photovoltaic panels). **HygieniaTouch** only needs light energy to activate and start continuously generating small amounts of peroxide radicals and hydroxyl radicals that can destroy polluting gases such as ammonia, as well as viruses, bacteria and fungi that affect the health of farm animals and workers. Just one application a year can keep ammonia levels in check on the farm.

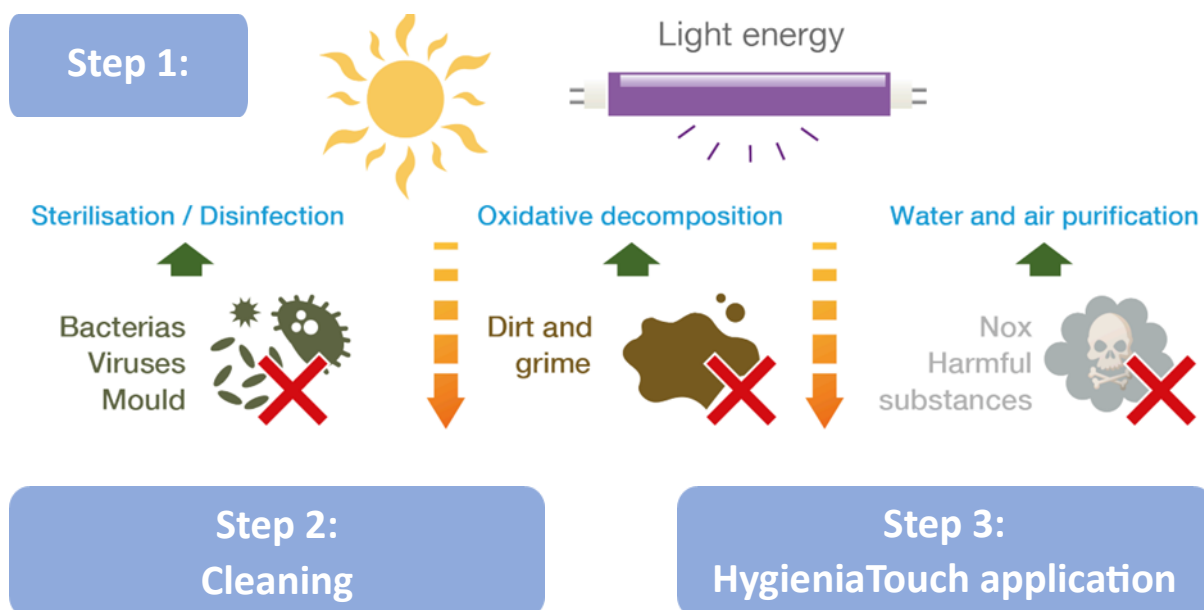
Unique properties of our product:

- Destroys ammonia, and kills viruses, bacteria and fungi on farm surfaces and air.
- It is a totally non-toxic mineral product for people and animals. The main component is used as an ingredient in medicines and as an additive in food.
- It is a natural process and reproduces the effect of the sun and plants.
- Helps to destroy odors that accumulate on farms since they deconstruct the gases that generate bad odors.
- Contributes to the health and well-being of animals and farm workers.

Just one application a year can keep
ammonia levels in check on the farm

Performance HygieniaTouch[®]

CLEANING - DISINFECTION - ENVIRONMENTAL PURIFICATION



THE PROBLEM

The ongoing occurrences of avian influenza, commonly known as "bird flu," have resulted in widespread damage to animal populations, affecting poultry, wild birds, and certain mammals. Additionally, they have had adverse effects on farmers' livelihoods and the food trade.

The cost of pathogens and bird flu in poultry farms can be significant and multifaceted. The financial impact is influenced by various factors, including the scale of the outbreak, the type of pathogens involved, and the specific measures taken to control and mitigate the situation. Here are some key cost considerations:

1. **Mortality and Loss of Livestock:** The most direct cost is the loss of poultry due to mortality resulting from the disease outbreak. Infected birds may die, and there may be a need for culling to prevent the spread of the disease.
2. **Treatment and Vaccination Costs:** Farms may incur expenses for treating infected birds or vaccinating the entire flock. Medications, vaccines, and veterinary services contribute to the overall cost.
3. **Biosecurity Measures:** Implementing strict biosecurity measures to contain the spread of the disease can be costly. This may include investing in secure infrastructure, sanitation protocols, and personnel training.
4. **Disposal of Infected Material:** Proper disposal of infected carcasses, litter, and other materials is essential to prevent further contamination. This process incurs additional costs.
5. **Production Downtime:** Disease outbreaks often lead to a decrease in production efficiency and, consequently, a reduction in overall productivity. The longer the farm is affected, the greater the impact on income.
6. **Trade Restrictions:** Bird flu outbreaks can lead to trade restrictions, affecting the export and import of poultry products. This can result in economic losses for the affected region or country.
7. **Reputation Damage:** If a farm is associated with a disease outbreak, there may be long-term consequences in terms of reputation. Rebuilding trust with consumers and stakeholders can be challenging and may have indirect financial implications.
8. **Increased Monitoring and Testing Costs:** Farms may need to invest in increased monitoring, surveillance, and testing to detect and control the spread of pathogens. This involves additional expenses for diagnostic services and testing kits.

It's important to note that the costs can vary widely based on the severity of the outbreak, the effectiveness of response measures and the overall biosecurity practices in place. Prevention and early detection play crucial roles in minimising the economic impact of pathogens and bird flu in poultry farms.

Decomposes organic and pathogenic substances in the air

• When pathogens encounter treated walls and ceilings they are converted into completely harmless substances

Treats all types of surfaces eviscerating microbes before they spread

• Used in hospitals, health care, transport, businesses, homes, vehicles, buildings, lifts and many more

Authorised by ministry of health Groups PT2,3 & 4

• Certified VIRUCIDAL and BACTERICIDAL efficacy according ISO 27447: 2009 standard

THE SOLUTION

We have developed a unique and simple solution using photocatalysis to better protect livestock both inside and outside farms and bio-security logistics between farms.

In simple terms, photocatalytic coatings with TiO₂ (titanium dioxide) and LED lights can be like superheroes for farms. Imagine them as shields that protect animals from diseases, particularly in the face of the worrying bird flu crisis.



These coatings, when exposed to light, help break down harmful viruses and bacteria, including substances like ammonia, creating a cleaner and healthier environment for the farm. Now, why is this so important? Well, when farms are cleaner and have fewer germs, the animals stay healthier.

This is especially crucial now with the bird flu crisis threatening. By maintaining a clean environment, farmers may not need to use as many antibiotics to keep the animals well. Using fewer antibiotics is great because it helps prevent antibiotic resistance, ensuring that when animals or people really need antibiotics, they still work effectively.

In a nutshell, these special coatings and lights act like a protective team, making farms safer and healthier, especially amid the current bird flu crisis. It's like having a powerful defense against diseases, reducing the need for antibiotics and ultimately leading to fewer animal health problems and less loss of life on the farm.

Other advantages of our system

- The **HygieniaTouch** system contributes decisively to improving farm conditions and maintaining an environment where animals are less likely to contract infections. It eliminates viruses and bacteria
- Most farms have seen an increase in productivity, either by having fewer sick animals, saving on medication and making better use of the animals.
- Destroys the particles that generate odorous compounds.
- It works under any circumstance.
- We have the **TP2** (surface disinfectant), **TP3** (veterinarian disinfectant) and **TP4** (disinfectant for food industry).
- Tested under the ISO Standards.

The Cost of HygieniaTouch photocatalytics

Depending on the type of animal, your situation and premises, on average, over a period of three years the cost per animal can vary. For poultry, for example, the cost per chick over a period of three years is between € 0.08 and € 0,12 using **HygieniaTouch** photocatalytics.

It will save a significant amount, when one considers overall cost savings and welfare benefits including veterinary fees. Contact us to get an in-depth understanding of your typical situation, so we can make you a customised proposal.

STEP 1: Small UV-LED lamps are installed

HygeniaTouch-protection is activated by UV light, either from the sun or UV lamps. The HT-light-lamps emit the same light as a small fluorescent lamp but are based on LED technology and have a lifespan of 50,000 hours. It is safe for eyes and skin, and not the same as UV light in hospital de-contamination units.

The **HygeniaTouch**-protection and the lighting work together to achieve the desired results. When activated by light in the presence of ambient humidity and oxygen from the air, the surfaces continuously and safely produce natural radicals that, in turn, can eliminate microorganisms and toxic gases that cause odors.



With our technology, surfaces are active 24 hours a day, preventing the development of viruses or colonies of bacteria that could cause diseases.

UV Lamps with 24V LED lights that are easily installed and adapt to different environments and types of farms.

STEP 2: Treatment with HygeniaTouch-protection

The invisible, water-based, and completely non-toxic **HygeniaTouch**-protection is applied once per year and its activity is permanent if it receives daylight. 1 liter of **HygeniaTouch**-protection will cover 8-10 sq meter and can be applied by a low-pressure gardening sprayer.

From a sustainability perspective, cleaning is also made much easier once our protective surface treatment is



applied. The unique hydrophobic, hydrophilic nature of the treatment means that dirt and grime cannot bond to the substrate, thus significantly reducing cleaning times, water usage, chemicals and effort.

The outside premises will also be better protected against the influence of UV and will help remove methane and negative climate pollutants from the air. The efficacy of this product is firmly based on numerous physicochemical studies.

Check out our
animation video on
YouTube or [click here](#)



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