

# DAIRYPOWER EQUIPMENT

## SLURRY MANAGEMENT SYSTEMS

SINCE 1973

Slurry Management Specialists for Dairy, Beef & Pig

# SMART SLURRY

## AERATION SYSTEMS



Safer - Smarter



[www.dairypower.com](http://www.dairypower.com)



The Dairypower Smart Slurry Aeration System is established as being the most cost-effective and environmentally friendly method of keeping slurry in a homogeneous pumpable state in the dairy, beef and pig industries.

The system introduced to the Irish market in 1998 is now a market-leader with over 3,500 systems in operation throughout the world.

Each system is custom designed to the specific size and shape of your storage facility. Regardless of the slurry density, the Smart Slurry Aeration System is configured to ensure you get optimum performance, leading to complete consistency of the slurry and the even distribution of nutrients.

The system works on a low-pressure, high-volume basis, with our robust, energy-efficient pump and drive unit supplying air via the Dairypower patented rotary valves to outlet branches fixed to the base of the storage facility. Each outlet branch sequentially releases the air for a set period of time, with the rising air bubbles mixing and aerating the slurry to create a vastly beneficial aerobic environment with no need for further agitation.

### WHAT YOU GET

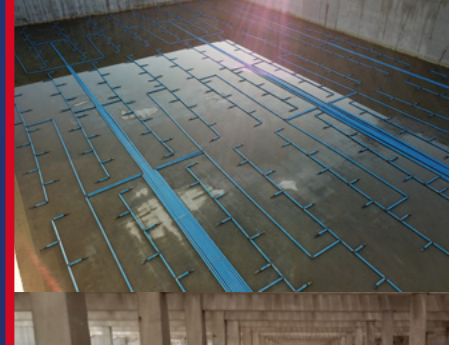
A long-life, fully automated and efficient slurry management system

- Easy-to-use electronic control box
- Quiet, Energy efficient pump and drive unit
- Non degrading pipework - with 10 year limited warranty
- Patented rotary valves
- Dairypower's extensive knowledge and experience of slurry aeration
- High-quality support and service
- Return on Investment - on average 4-6 years
- Peace of mind - No planning... No dangers... trouble free slurry



### MAIN BENEFITS

- Can be retro-fitted into any tank, regardless of size and structure :
  - ✓ Standard concrete storage
  - ✓ Under-slat storage
  - ✓ Round tanks
  - ✓ Lined lagoons
- Built to last :
  - ✓ Non-degrading uPVC pipework
  - ✓ Stainless steel casing and fixings
  - ✓ Highest-quality manufacturing
  - ✓ Systems in operation for over 25 years!
- Low-operating cost & minimal maintenance
- Fully automated system - set the digital control box to run the desired number of sequences for your slurry and you never need to intervene again
- Lowers emissions, reduces odours and carbon footprint



With having 6 months slurry storage and on a fully slatted robotic system with cows living in 365 days a year, aggitating our slurry would almost be impossible. We are now so happy! Having installed a Dairypower Aeration System, we have seen savings in labour and fertiliser cost. The quality of our slurry is the same all year round, which means we can pump it any time we wish. Without the Dairypower Aeration System in place we could not run this unit efficiently... I would recommend the Dairypower Smart Slurry Aeration to any farmer...

Mark Davies - Wales

It's time saving, fuel saving, with no agitation, you just drop the pump and go! The slurry consistency and quality we get is big, your not hauling just water or just solids... when we first spread it on our field it was on a saturday and by the monday morning the crop was already 3 inches tall! Now that was an eye-opener! Out of everything we've done here with our new build and 140ft round tank, the Dairypower system is the product i'm most excited about... I'm 100% satisfied... it's a great system!

Dave Vandembraak - Ontario, Canada





## CONVENIENCE

Slurry, ready when you are...

- Never agitate your slurry tank again!
- No pre-planning - your slurry is always ready to go
- Hassle free – take whatever you need... whenever!
- Homogeneous pumpable state 365 days a year
- No blockages – completely consistent slurry

## HEALTH & SAFETY / ENVIRONMENTAL

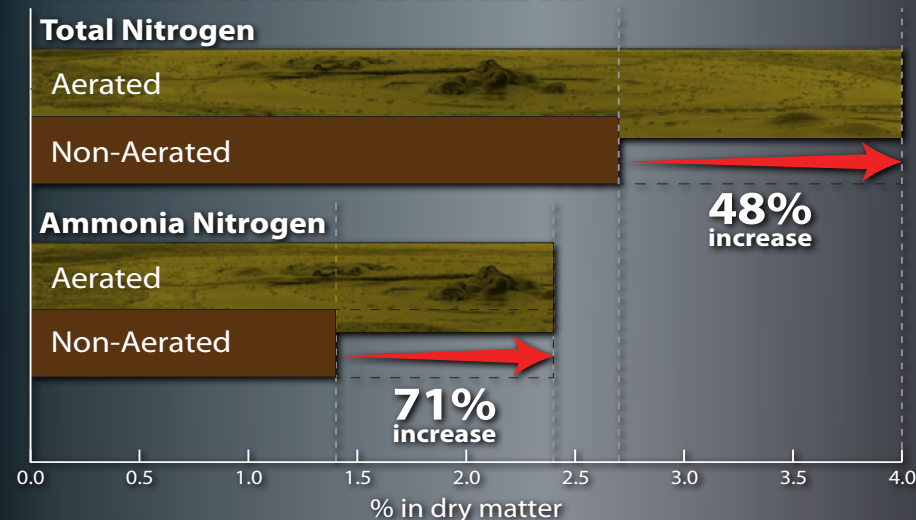
Safer for the farmer, livestock and the environment

- Eliminates build-up of dangerous gases like hydrogen sulphide ( $H_2S$ ) and methane ( $CH_4$ )
- Better air quality - Reduced odour, even when spreading
- Reduces methane emissions and ammonia ( $NH_3$ ) concentrations
- No more diesel emissions or mechanical dangers from running tractors and agitators
- Reduces carbon footprint

## NUTRIENT IMPROVEMENT

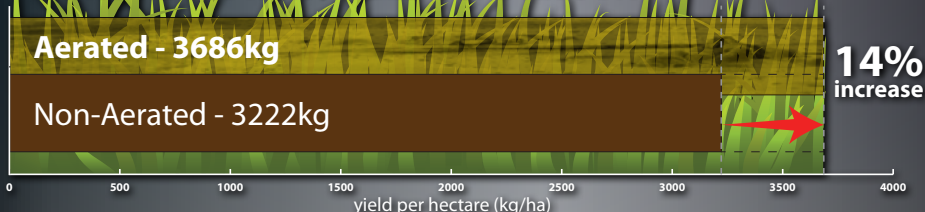
- Increase Ammonia Nitrogen by 70%
- Increase Total Nitrogen and Potassium by 48%

### NITROGEN CONTENT COMPARISON



- Consistent nutrients throughout the entire tank
- Reduce fertiliser and fuel costs
- Increased grass/crop yields

### GRASS REGROWTH / YIELD COMPARISON



With the Dairypower Aeration System there's no more work in agitating slurry! It's fantastic to have the option to take out two or three loads of slurry at any time. It makes looking after our smaller paddocks an ease. My system was installed in 2007 and it has worked faultlessly... I wouldn't and couldn't be without it!

Mark Drohan - Ireland

"We built a new beef barn for 500 Cattle in 2019, and with the tank being fully suspended, agitation was a real worry. We decided to install the Dairypower Aeration System... We can't get over the quality of our manure! The first litre is like the last litre when applying to the land... and that's with no form of tractor agitation. For safety and efficiency I would highly recommend this system!"

Carl Vaughan - Wales





## Reduce Methane Emissions

Methane (CH<sub>4</sub>) is a potent greenhouse gas (GHG) that is 25 times more harmful to the atmosphere than carbon dioxide (CO<sub>2</sub>) and is constantly produced by cattle and pig slurry, due to the anaerobic breakdown of the waste material.

With the introduction of oxygen (O<sub>2</sub>) to the slurry via the Smart Slurry Aeration System, the environment of the slurry changes to an aerobic one, vastly reducing the production of methane (in some cases up to 99%\*), making it far better for the environment.

Not only that, the Smart Slurry Aeration System eliminates diesel emissions due to the redundancy of tractor agitators, producing a vastly smaller carbon-footprint and can even be run by green-electricity sources. With a safer, non-volatile atmosphere from aerating the slurry, farmers and slurry contractors benefit from not needing to remove the animals from the barn and are free from the dangers of explosions, fires and poisoning which are associated with the build-up of gases like methane and hydrogen sulphide.

Reduction in CH<sub>4</sub> emission (by 57%),  
with a decrease in  
total GHG emissions (by 43%)  
with aeration of cattle slurry. <sup>3</sup>

57%  
Reduction  
CH<sub>4</sub>

42%  
Reduction  
GHG

70% to  
99%  
Reduction  
CH<sub>4</sub>

Reductions in CH<sub>4</sub> emissions of  
70% to 99% after aeration of pig slurry. <sup>5</sup>

CH<sub>4</sub> emissions were 40% lower in the aerated tanks (2.04 vs. 3.39 g m<sup>3</sup>).  
The differences in CH<sub>4</sub> emissions remained after the  
aeration phase had finished.  
No effect was detected for CO<sub>2</sub>, and no relevant  
N<sub>2</sub>O emissions were detected during the experiment. <sup>1</sup>

40%  
Reduction  
CH<sub>4</sub>

42%  
Reduction  
CH<sub>4</sub>

Slurry aeration reduced GHG emissions to 53.3 kg CO<sub>2</sub> eq. m<sup>3</sup>  
compared to untreated dairy slurry (92.4 kg CO<sub>2</sub> eq. m<sup>3</sup>).  
The equivalent of 42% less. <sup>2</sup>

In the case of aeration with an interval of 1 hour  
of a total of 14.4 m<sup>3</sup> air per m<sup>3</sup> per day.  
Nitrous oxide and methane emissions decrease by  
14% and 56% respectively. <sup>4</sup>

56%  
Reduction  
CH<sub>4</sub>

1. Research Paper: Low frequency aeration of pig slurry affects slurry characteristics and emissions of greenhouse gases and ammonia  
Author: Salvador Calveta, John Hunt, Tom H. Misselbrook
2. Methane, nitrous oxide and ammonia emissions during storage and after application of dairy cattle slurry and influence of slurry treatment  
Author: B.Amona, V.Kryvoruchko, T.Amona S.Zechmeister-Boltenstern
3. Amon et al. (2006) 4. Kresse (2009) 5. \* Martinez et al. (2003)

## Slurry Aeration Increases the Value of your Slurry

In every form of livestock production, the question of slurry management arises at some point. It is important to decide up front, when planning a new facility, where and how to store the slurry and how to keep the nutrient content of that slurry, since it determines the fertilising and overall value of the slurry.

A very important nutrient to look at in the regards of the nutrient cycle is nitrogen. Cows consume, depending on their diet, a large amount of nitrogen every day with their feed. But only 25-35% of the consumed nitrogen is excreted into the milk of a dairy cow and about 75-65% is excreted through the urine.

Ideally, we would like to catch all the nitrogen excreted by the cow, store it and distribute it to our farm lands, where it stays in the soil until the crop plants are ready to absorb it again. Even when the slurry leaves the farm and is sold, the value of the slurry will be determined by the content of fertilising nutrients, mostly nitrogen. But, there are a lot of factors along the way where we lose valuable nitrogen, mostly in the form of volatile ammonia gases. It begins in the slurry tank when faeces and urine are stored together. The bacteria from the faeces will degrade the urine urea to ammonia (NH<sub>3</sub>). Ammonia is a volatile gas and will leave the tank and emit into the atmosphere. This process lessens the amount of valuable nitrogen inside the slurry.

Bacteria that grow with plenty of oxygen available (under aerobic conditions) generate less ammonia than in anaerobic conditions. In an aerated tank that provides aerobic conditions the nitrogen consuming bacteria will be able to utilise the urea and retain it inside their bodies as organic nitrogen and in the form of soluble nitrate (NO<sub>3</sub>) and ammonium (NH<sub>4</sub>). Nitrogen converted to ammonium will be mineralised as nitrate too. These forms of nitrogen are staying in the slurry tank and therefore available as crop fertiliser once the slurry is administered to the farms soil.

Organic nitrogen is also ready for plants to be absorbed, that means aerated slurry contains a higher concentration of plant-available nitrogen (PAN). Contrary to that, nitrate and ammonium are very mobile and can be washed off in surface run offs or leach into the ground water, where they contaminate the environment and are no longer available as fertiliser for your crops. That is why PAN is an important parameter for determining the slurry's fertilisation value.

In conclusion slurry aeration helps improve slurry quality and value with two important mechanisms. At first, the aeration will introduce plenty of oxygen into the tank, creating an aerobic condition for the microorganisms in the tank to create less nitrogen loss through ammonia emissions. And secondly, the aerobic conditions inside the tank lead to more generation of plant-available nitrogen that stays longer available in the soil and helps prevent loss through washing off more mobile nitrogen forms like nitrate and ammonium.

These two factors increase the overall value of the waste product slurry and helps towards making a dairy facility more profitable.

**Nele Schermeier, Doctor of Veterinary Medicine**

### Sources

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Swine Slurry as a Fertilizer Source – North Carolina State Univ.  
<https://content.ces.ncsu.edu/swine-slurry-as-a-fertilizer-source>

Value of Slurry Nutrients – Iowa State University  
<https://www.extension.iastate.edu/agdm/livestock/html/b1-65.html#:~:text=A%20typical%20hog%20finishing%20slurry,units%20of%20nitrogen%20per%20acre>

Summary Report: Analysis of Aerated and Non-aerated Cattle Slurry Samples. Author: FBA Laboratories, June 2015

*"We can't get over the consistency of our slurry!  
We have extracted several times with zero issues.  
For me, anybody farming on slats should have the Dairypower Aeration System"*

*Ross Towers - UK*

*"We are very happy with the purchase of our Dairypower Aeration system.  
Our slurry now spreads like liquid gold.  
The consistency pumps great. Really consistent coverage"*

*Carter Cann - Ontario, Canada*





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**SMART SLURRY**

AERATION SYSTEMS

**PRO-CLEAN RATCHET**

SCRAPER SYSTEMS

**ECO-CLEAN ROPE**

SCRAPER SYSTEMS

**EASY-FLO GATE**

SCRAPER SYSTEMS

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