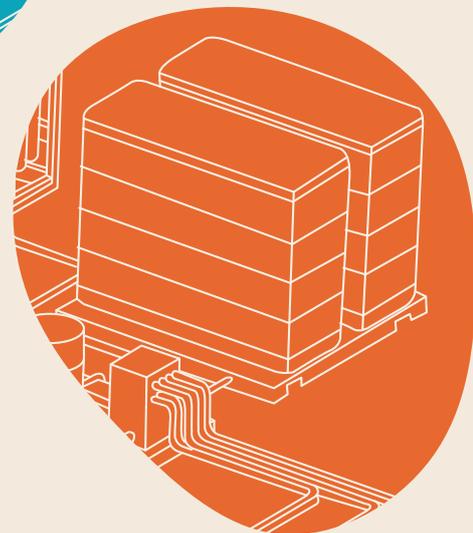
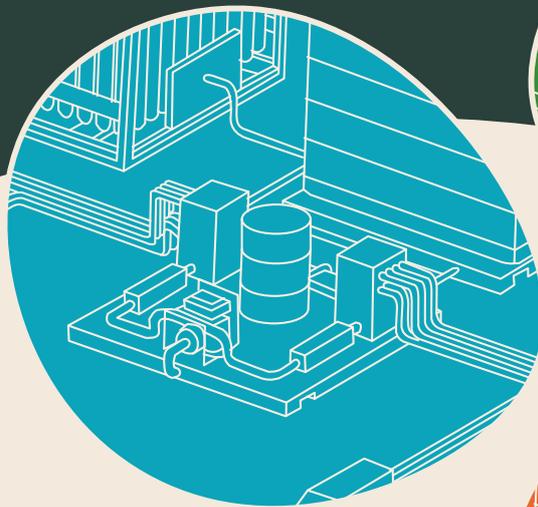


# Nitrogen Foam Delivery System

A high capacity on-farm depopulation solution for improved disease control.



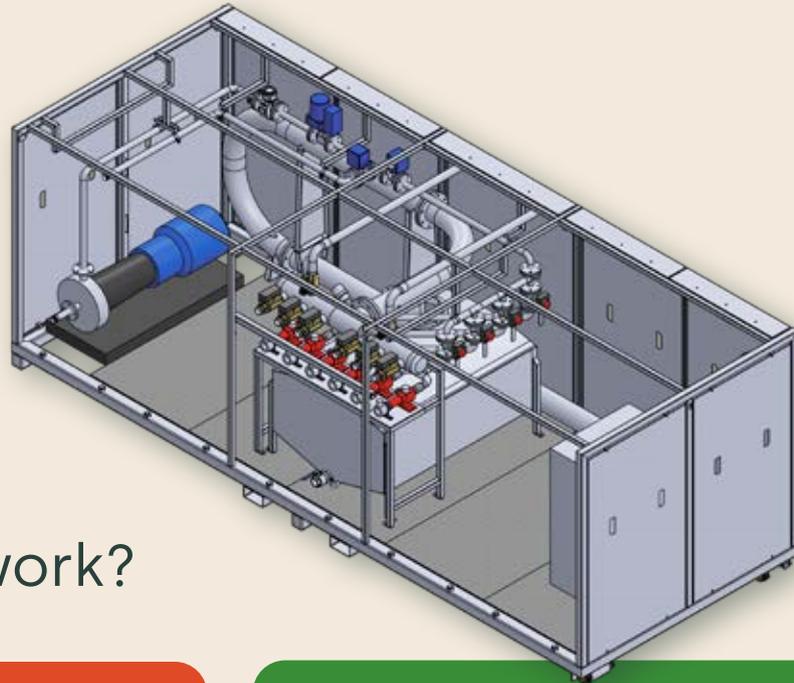
## What is the NFDS?

**The Nitrogen Foam Delivery System (NFDS) is an alternative to whole-house gassing with carbon dioxide.**

The NFDS releases high expansion nitrogen filled foam that rapidly stuns within one minute of immersion, where the body or brain completely loses its oxygen supply. This method minimises pain and stress, reduces handling and ensures there is no tracheal occlusion.



# Nitrogen Foam Delivery Systems (NFDS)



## How does the Livetec NFDS work?

### The problem

Hypoxia is a condition that occurs when the blood doesn't carry enough oxygen to the tissues.

Despite hypoxia being deemed as an acceptable depletion and depopulation method for pigs and poultry worldwide using inert gases like nitrogen and argon, it has not been used for whole-house gassing.

This is due to the lack of ability to seal a house or shed and adequately eliminate the oxygen.

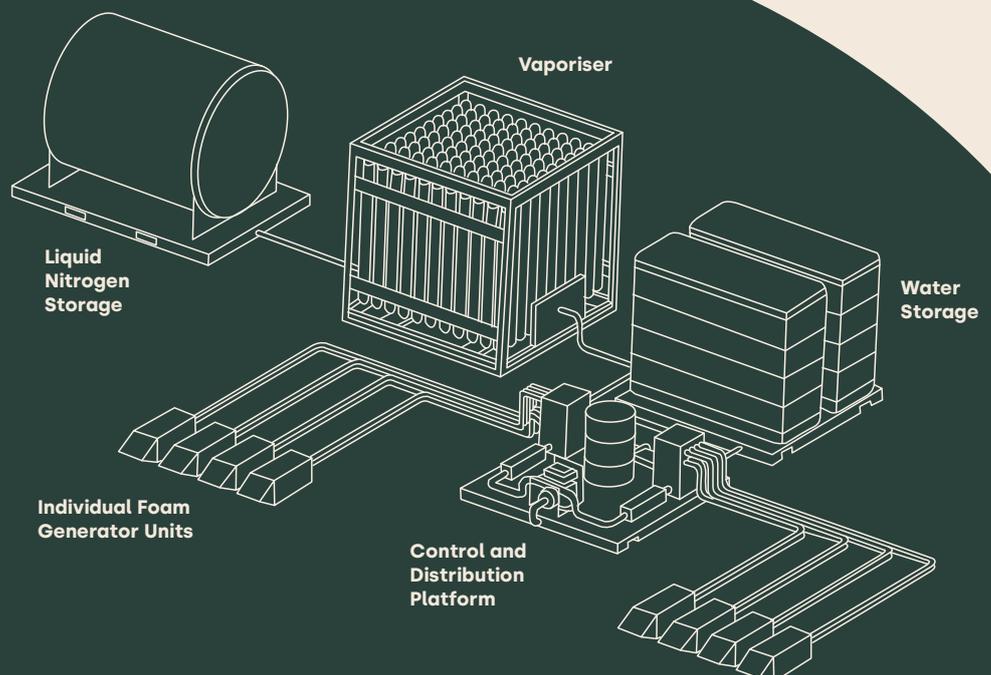
### The solution

**The NFDS has been designed to resolve this issue.**

Using nitrogen, the NFDS delivers high expansion gas-filled foam that entirely surrounds the animal. This method effectively eliminates the oxygen, allowing groups of animals to be rapidly exposed to anoxia without the need to seal the house or shed.

Due to the speed at which the animal breathes in the nitrogen, they very quickly lose consciousness allowing a stress, harm and pain free way of culling.

**The NFDS is made using modular units, which hold 5 key components.**



# Nitrogen Foam Delivery Systems (NFDS)

## Why use the Livetec NFDS?

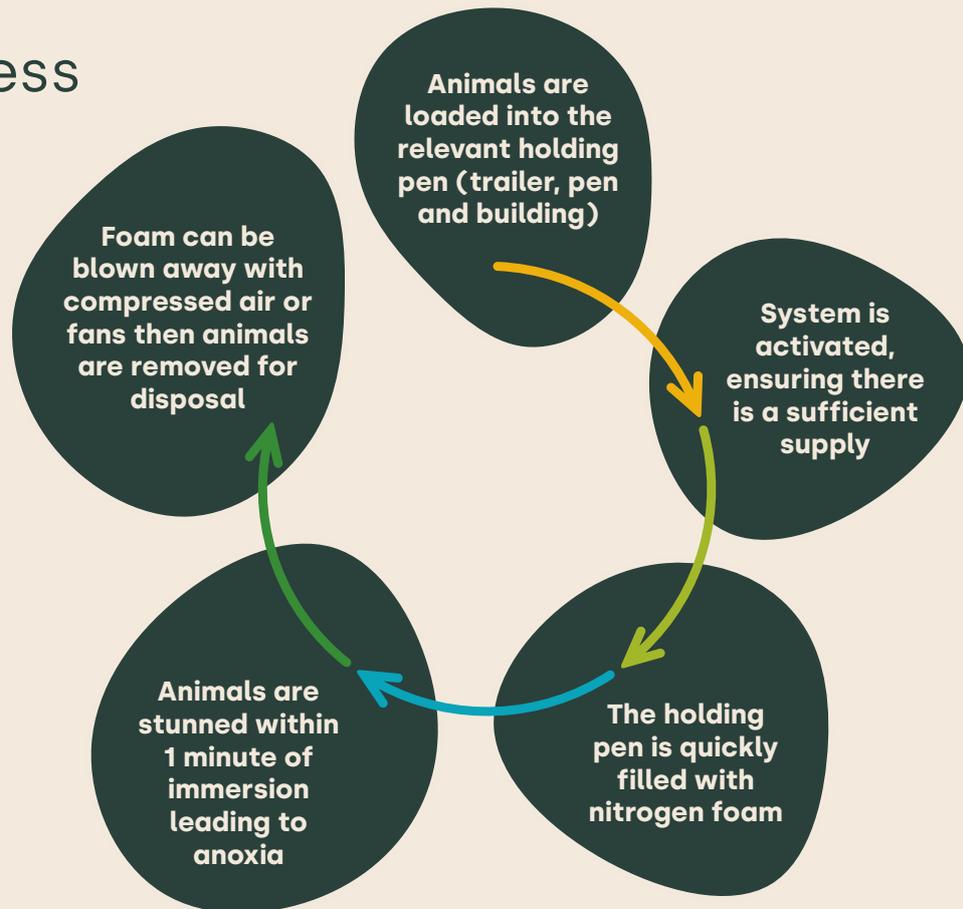
- ✓ **Multi species:** An effective solution for use with all species of poultry (the NFDS is currently being evaluated for additional species too)
- ✓ **Scalable:** The NFDS can be quickly ramped up for increased throughput, allowing for high volume of animals to be processed
- ✓ **Increases throughput:** Higher volume throughput per shift than any other technology being used worldwide.
- ✓ **Rapid deployment:** The modular, trailer mounted setup of the NFDS allows the unit to be quickly moved to anywhere in the state or country
- ✓ **Easy to use:** With the ability to be safely run by minimal staff, the NFDS can free up essential resources
- ✓ **Improves welfare:** The NFDS has been designed to minimise distress and pain to animals, with minimal handling
- ✓ **Reduces stress:** The system also eliminates Caring-Killing paradox by reducing stress on livestock producers and handlers
- ✓ **Flexible:** The NFDS can be used in various scenarios, like outbreak depopulation through to processing
- ✓ **Easy to clean and disinfect:** Maintains the highest level of biosecurity and allows for rapid redeployment
- ✓ **Less water use:** In comparison to normal firefighting foam, the NFDS uses a considerable amount less water

To find out more visit

[www.livetecsystems.co.uk](http://www.livetecsystems.co.uk)

# Nitrogen Foam Delivery Systems (NFDS)

## The Process



## Livetec Systems Foam Generators

Using our extensive research and development projects, we have been able to evolve the design and further develop our foam generators, improving our efficiency to the highest standard.

Our latest generator, when supplied with the correct pressure and flow rates of gas and foam solution can generate up to 50m<sup>3</sup> (1765 CU ft) of high expansion nitrogen foam per minute.



# Nitrogen Foam Delivery Systems (NFDS)

## The NFDS Unit

### Technical Specification

<b>Dimensions</b>	<b>NFDS unit (including water tank)</b> 7m x 2.4m x 2.4m
<b>Gas type &amp; source</b>	<b>Liquid nitrogen vaporized through a variety of commercially available systems.</b> <b>Contact Livetec for your source solution.</b>
<b>Electrical power supply</b>	<b>NFDS System:</b> <b>3 phase, 415 - 480 Volts AC, maximum 65Amps</b>
<b>Foam generators</b>	<b>The system can run 2 foam generators at any one time,</b> <b>up to six can be connected and used in pairs sequentially</b>
<b>NFDS nitrogen foam expansion rate</b>	<b>350:1</b>
<b>Daily capacity (based on poultry)</b>	<b>On farm: 2-3 sheds per day</b>
<b>Usage type</b>	<b>Trailer, pen and building</b>
<b>Set up</b>	<b>On farm or centralised station</b>
<b>Total finished foam produced by NFDS system running 2 foam generators</b>	<b>6,000m<sup>3</sup>/hour</b> <b>100m<sup>3</sup>/min</b>
<b>Water consumption</b>	<b>20,000 litres/hour</b> <b>330 litres/min</b>
<b>Foam concentrate consumption</b>	<b>598 litres/hour</b> <b>10 litres/min</b>
<b>Nitrogen gas consumption</b>	<b>6,600m<sup>3</sup>/hour</b>
<b>Liquid nitrogen consumption</b>	<b>9,475 litres/hour</b> <b>159 litres/hour</b>

\*Data based on running 2 foam generators at the same time



► Suitable for rapid and humane depopulation by anoxia for both pigs and poultry.

# Nitrogen Foam Delivery Systems (NFDS)

## Creating the NFDS

Since our inception, we have been involved in the research and development of high expansion gas-filled foam systems and are the current leaders in the field.

Our original work was a joint project funded by the UK Government in collaboration with the University of Glasgow Veterinary School and the Royal Veterinary College, London.

Through our projects, also supported by livestock Industry grant funding, we established that the exposure of animals to inert gas in high-expansion water-based foam had the potential to be deemed as a highly effective and humane method of euthanasia.

Livetec established that using this method, the cause of death was anoxia as opposed to occlusion of the airway, which happens with medium expansion air filled foam. This was corroborated by post-mortem examinations in which no evidence of tracheal occlusion with foam was found.



# Nitrogen Foam Delivery Systems (NFDS)

## About Livetec Systems

**We are continually exploring new ways to improve the future of farming. We want to give farmers the peace of mind that they're doing everything they can to protect their animals and efficiently operate their business in the very best way.**

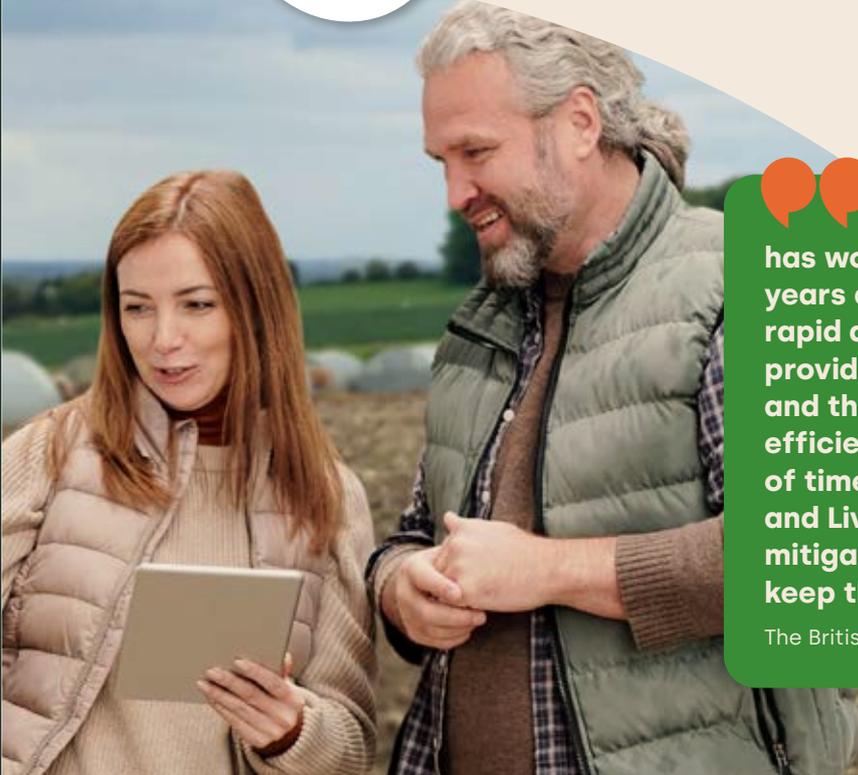
Our clients trust us to protect their reputation, livestock and livelihoods by working in compliance with UK and EU legislation. We act as a partner to help make the necessary changes to facilitate a strong, resilient farming strategy.



**Some of the renowned organisations we work with include:**



**To find out more email  
[info@livetecsystems.co.uk](mailto:info@livetecsystems.co.uk)**



**The British Poultry Council has worked with Livetec for six years and highly values their rapid and reliable service. Livetec provides our member businesses and their farmers with the most efficient service during the worst of times. Industry, Government and Livetec all work together to mitigate the risk of disaster and keep the food supply chain going"**

The British Poultry Council

Livetec is the leading provider of livestock protection - the go-to partner for all biosecurity issues across the industry.

We provide an extensive range of innovative solutions for our clients:

