



Presentation of MT Højgaard

- Concepts for livestock housing units
- Environment technologies

Greening agriculture, 24 April 2013

Agromek Award 2009 and 2012

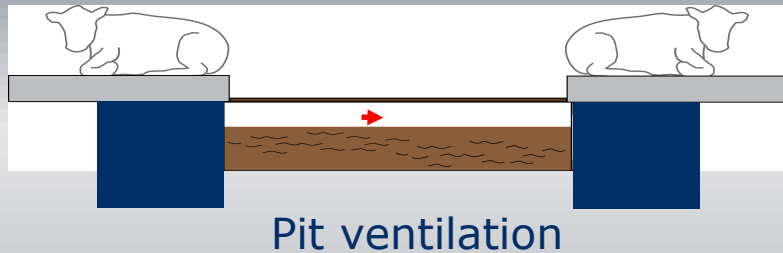


- ★★★ EUR MT Højgaard SmartFarm® central control system ver.01
- ★★★ EUR MT Højgaard's Integrated Air Exchange System© for air purification
- Award winner 2009



- ★★★ EUR MT Højgaard Intellifarm concept slaughter pigs ver.01
- Award winner 2012

MT Højgaard technology wins
EU environmental award 2012



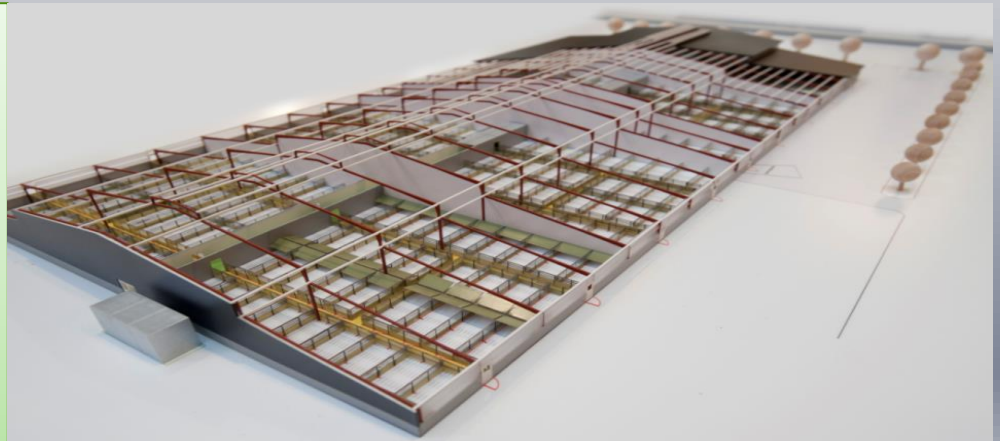
MT Højgaard wins an award for developing a unique technology for air purification and air change in open livestock housing units.

Building design and environment technology

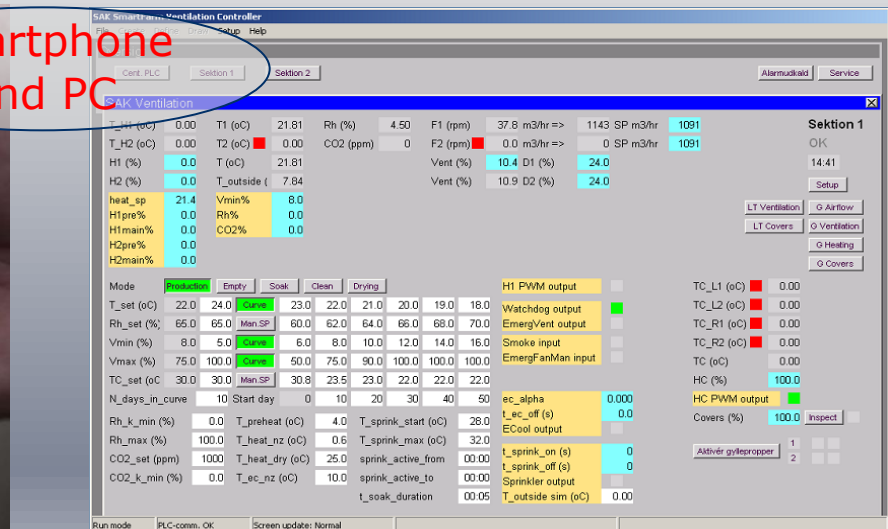
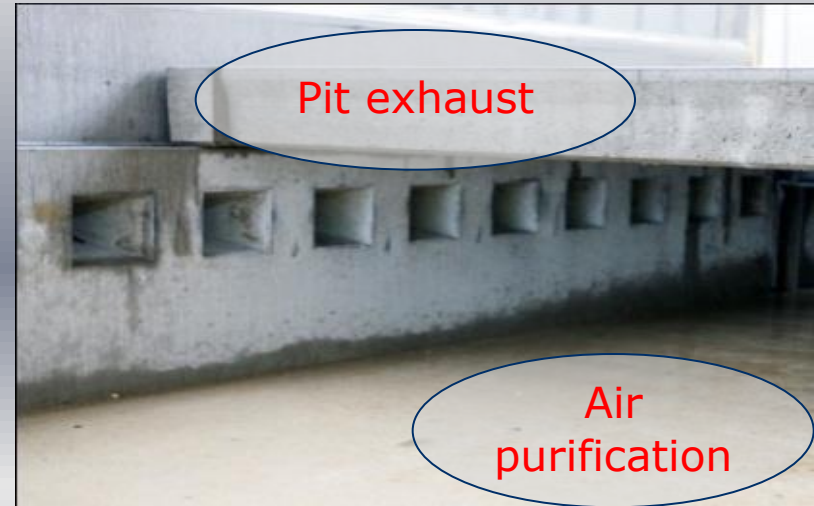


- **Concept for milk production**
- Wide buildings, 75m
- Hybrid ventilation
- Collection of NH₃ and odorous gas
- Air purification
- Improved indoor climate

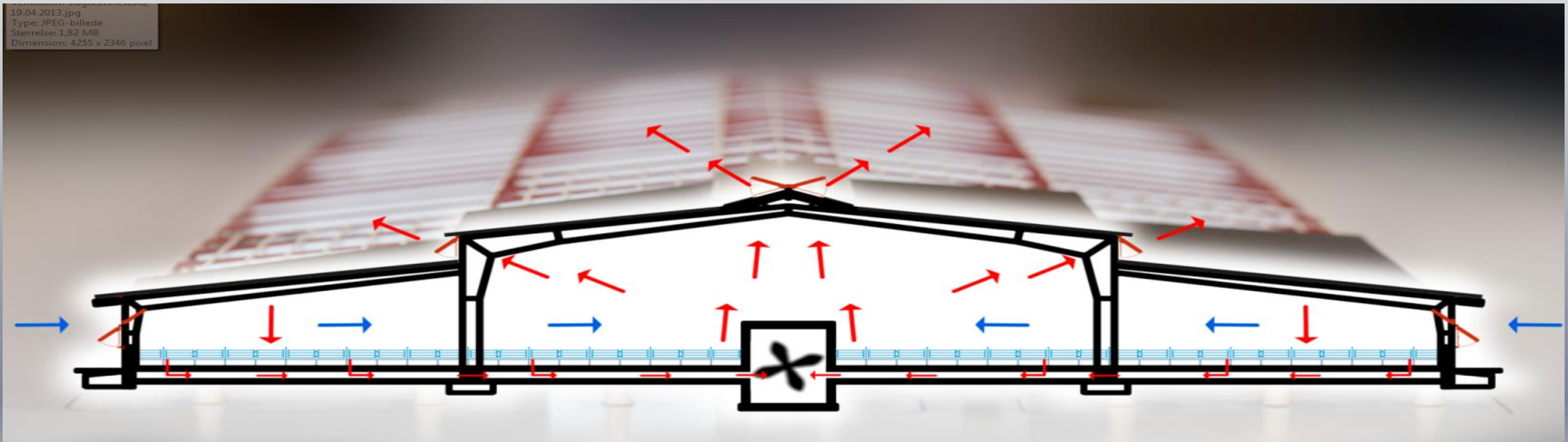
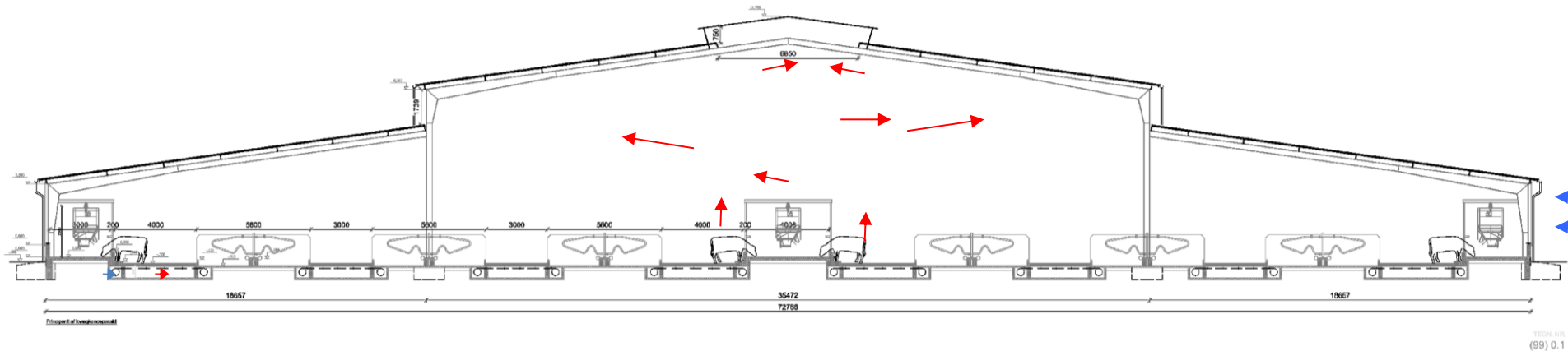
- **Concept for finisher pigs**
- Wide buildings, 60m
- Hybrid ventilation
- Reduction in energy costs(60%)
- Collection of NH₃ and odorous gas
- Air purification
- Improved indoor climate



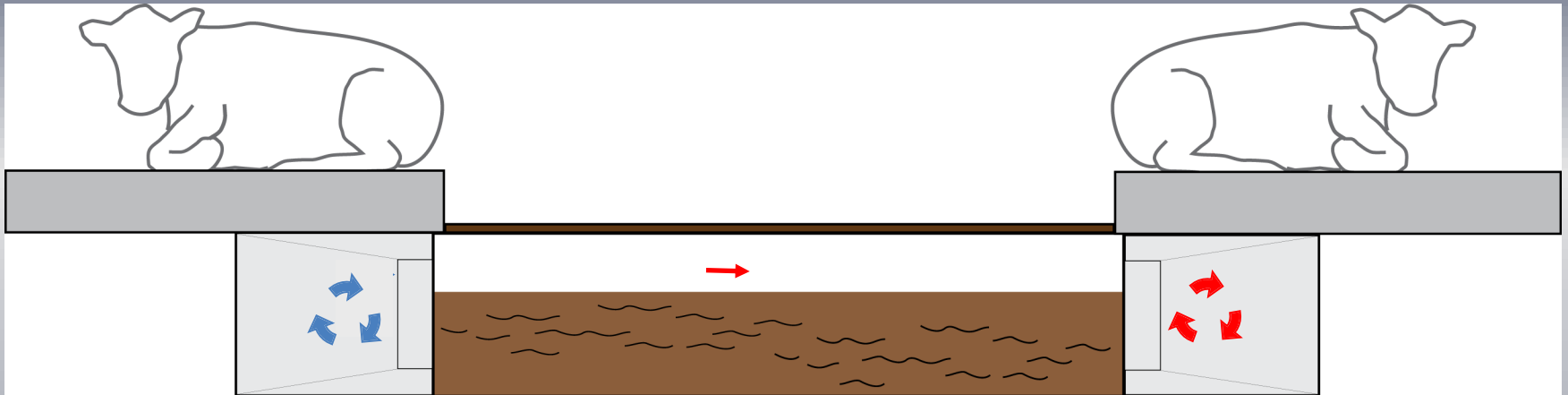
Hybrid Ventilation and SmartFarm Control system for cattle and pig housing units



Hybrid ventilation



Pit ventilation



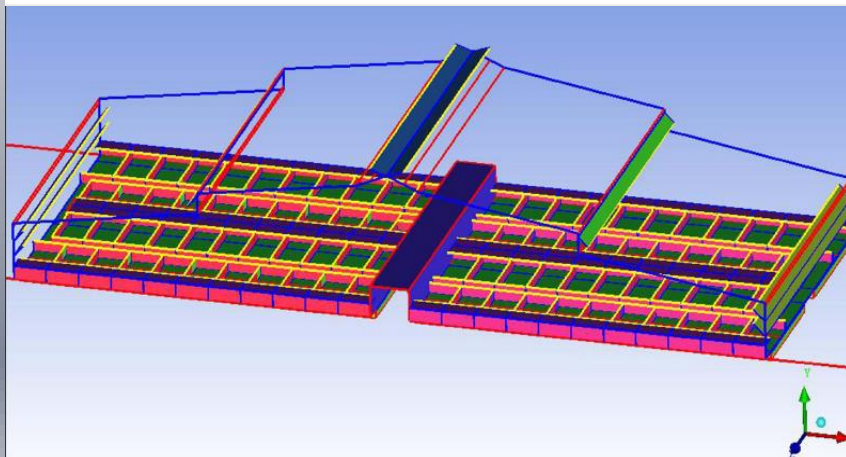
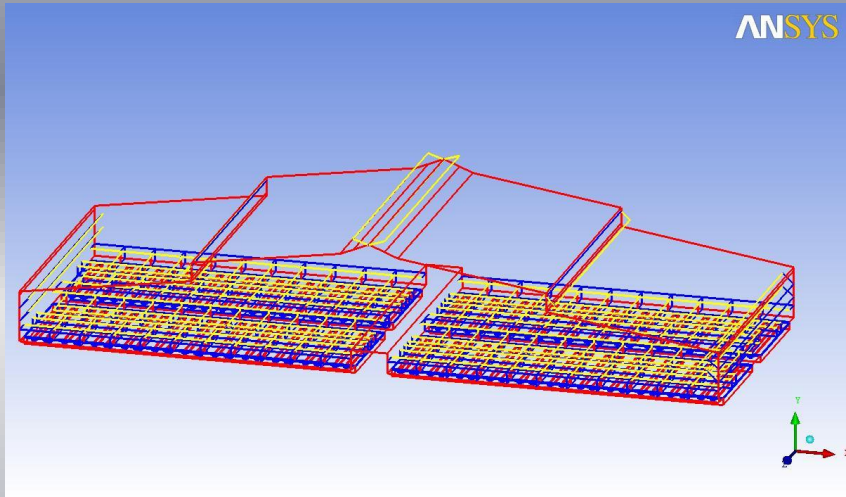
Collection of ammonia and odour gases directly at the source – with potential for reduction of climate gases.

Hybrid ventilation



- Controlled natural ventilation in a regulated combination with mechanical pit exhaust
 - 70-90% natural ventilation
 - 10-30% mechanical ventilation
- Low energy consumption
 - No/fewer ventilation fans
 - Adjustable piglet shelters
 - Heat recovery to heat the floor
- Reduction of emissions, perfect indoor climate
 - Less ammonia – min. 75% reduction
 - Less odour gas – min. 50% reduction
 - Less dust – improved welfare of animals and personnel

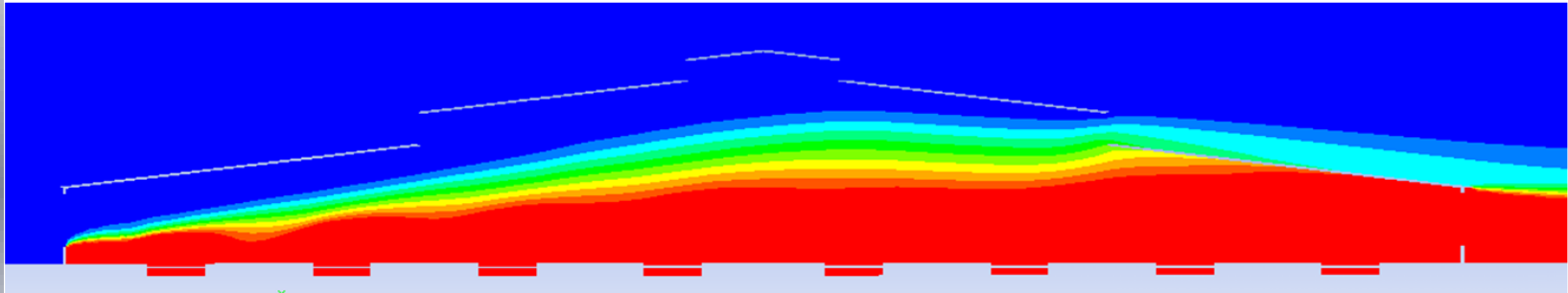
Hybrid ventilation Documentation



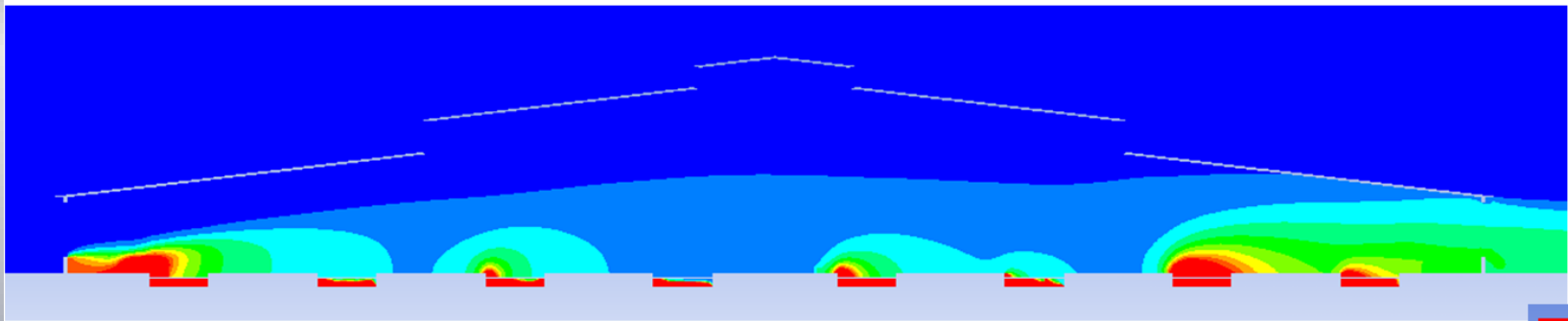
- CFD modulation - Computational fluid dynamics
- Parameters simulated:
 - Ventilation rate, airflow, temperature and air quality
 - Approved method
- Cooperation with Aarhus University and
- The Danish National Advanced Technology Foundation. Ministry for Research and Innovation
 - [Film](#)
 - [Billed](#)

Wind speed: 5 m/s, Ammonia concentration distribution, ppm

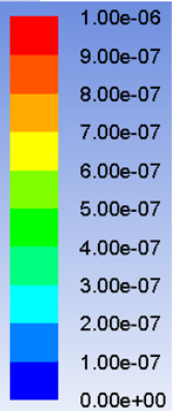
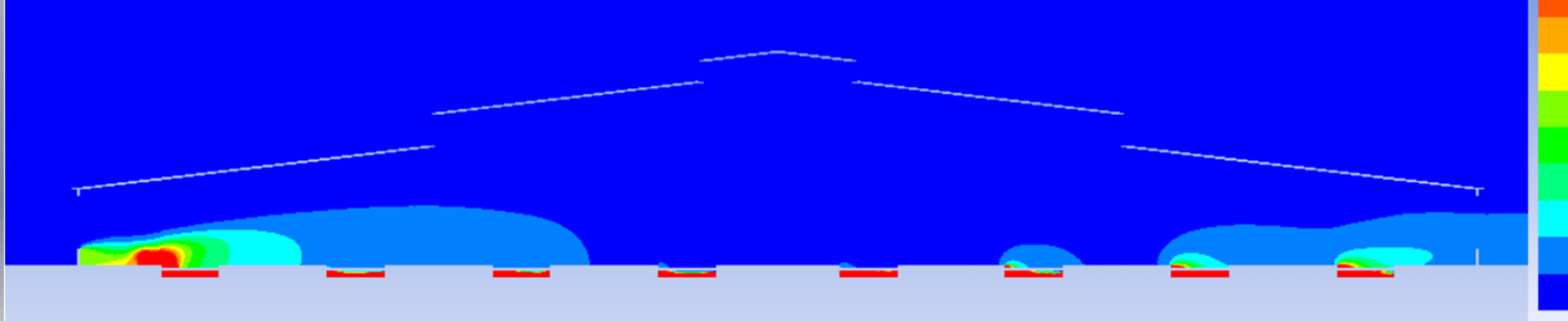
No pit ventilation



Pit exhaust

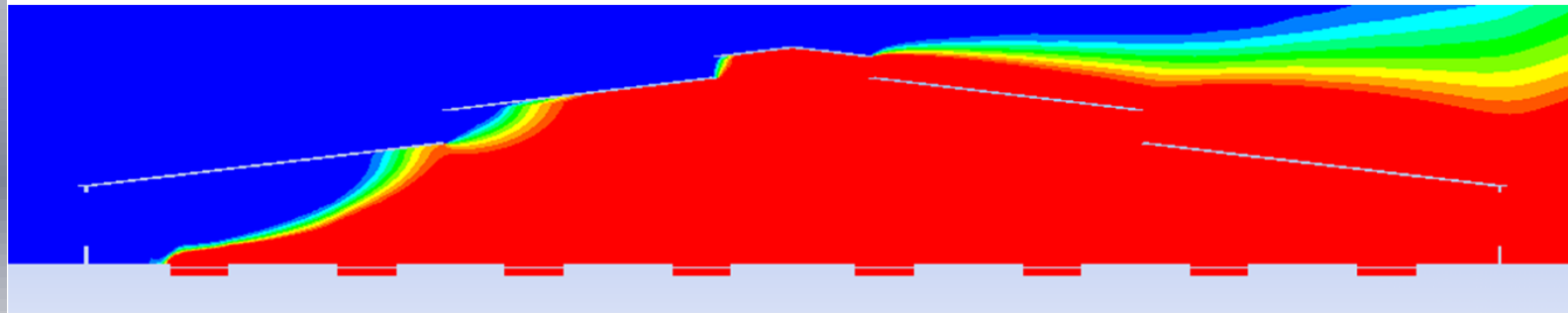


Pit exhaust and pit inlet

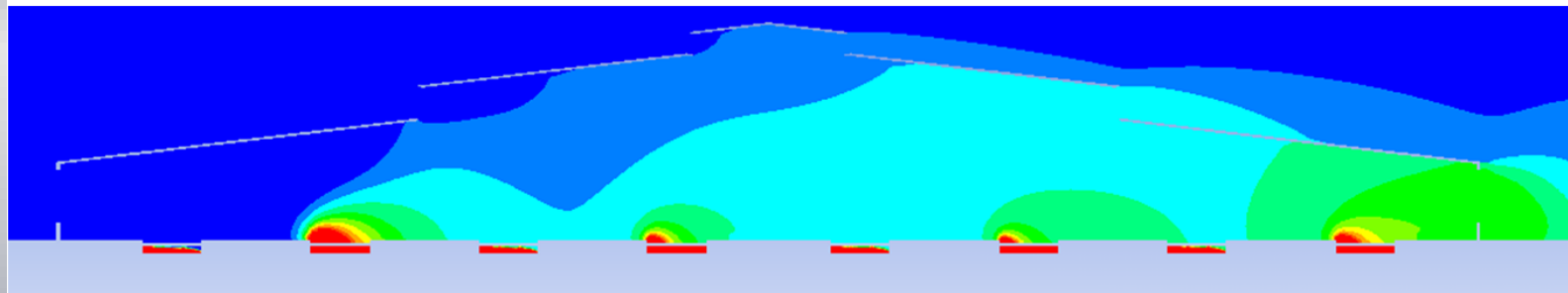


Wind speed: 1 m/s, Ammonia concentration distribution, ppm

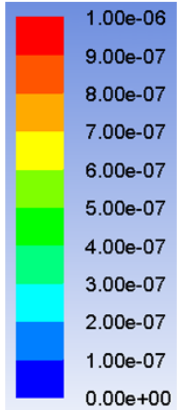
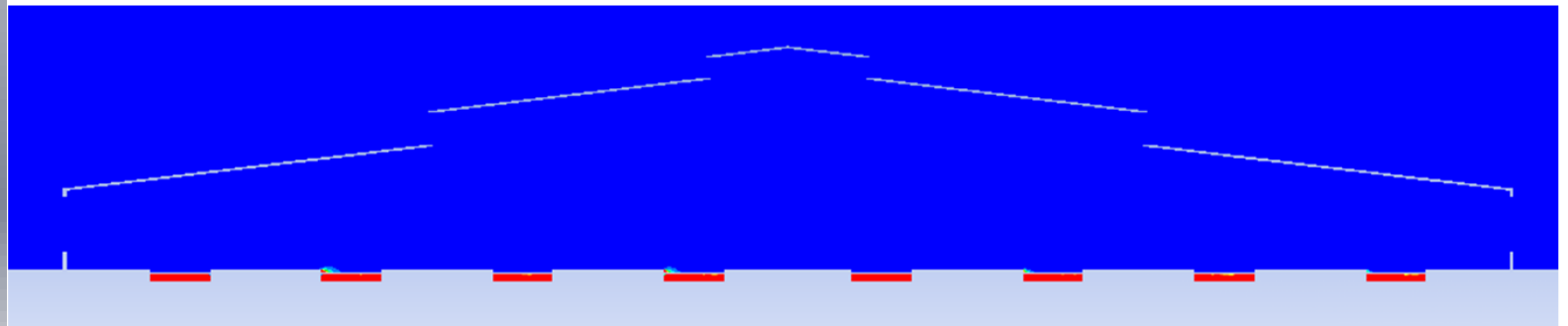
No pit ventilation



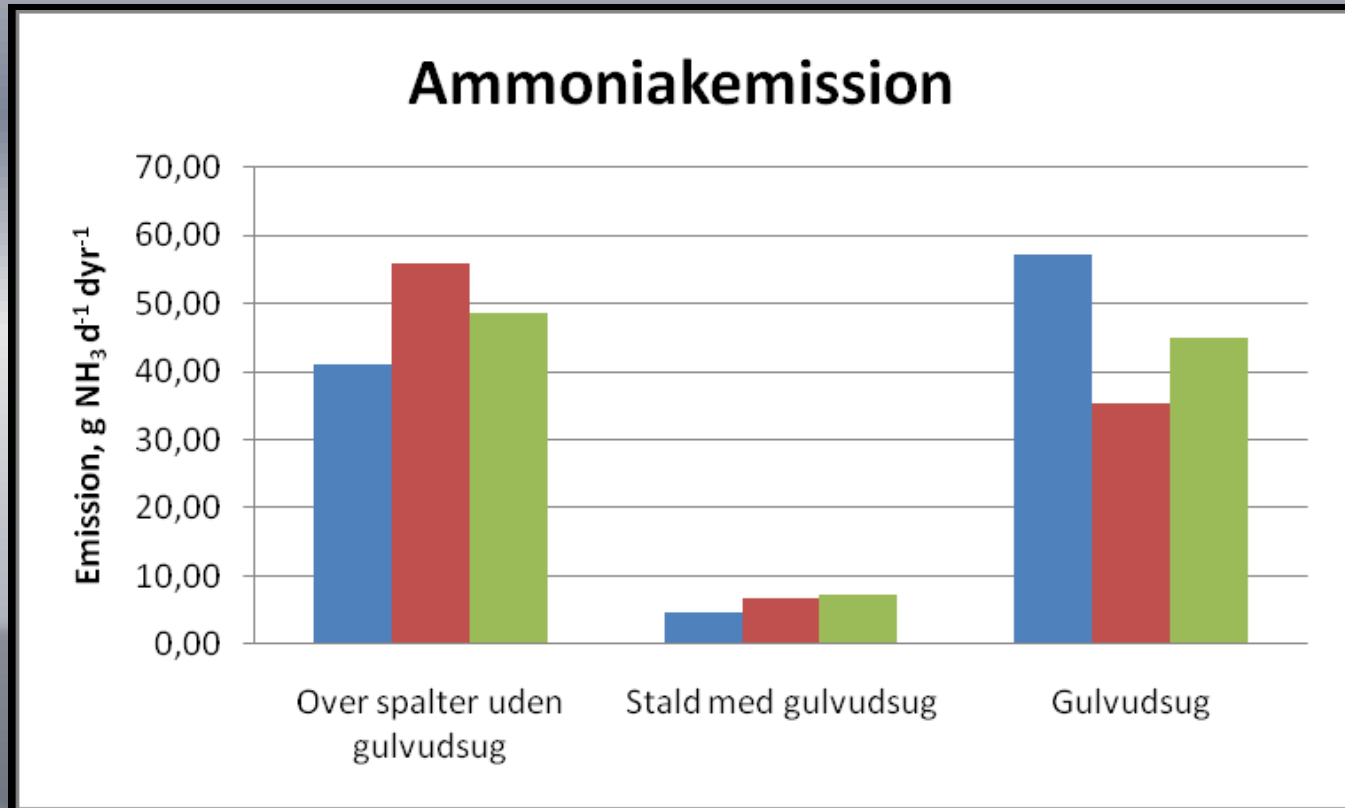
Pit exhaust



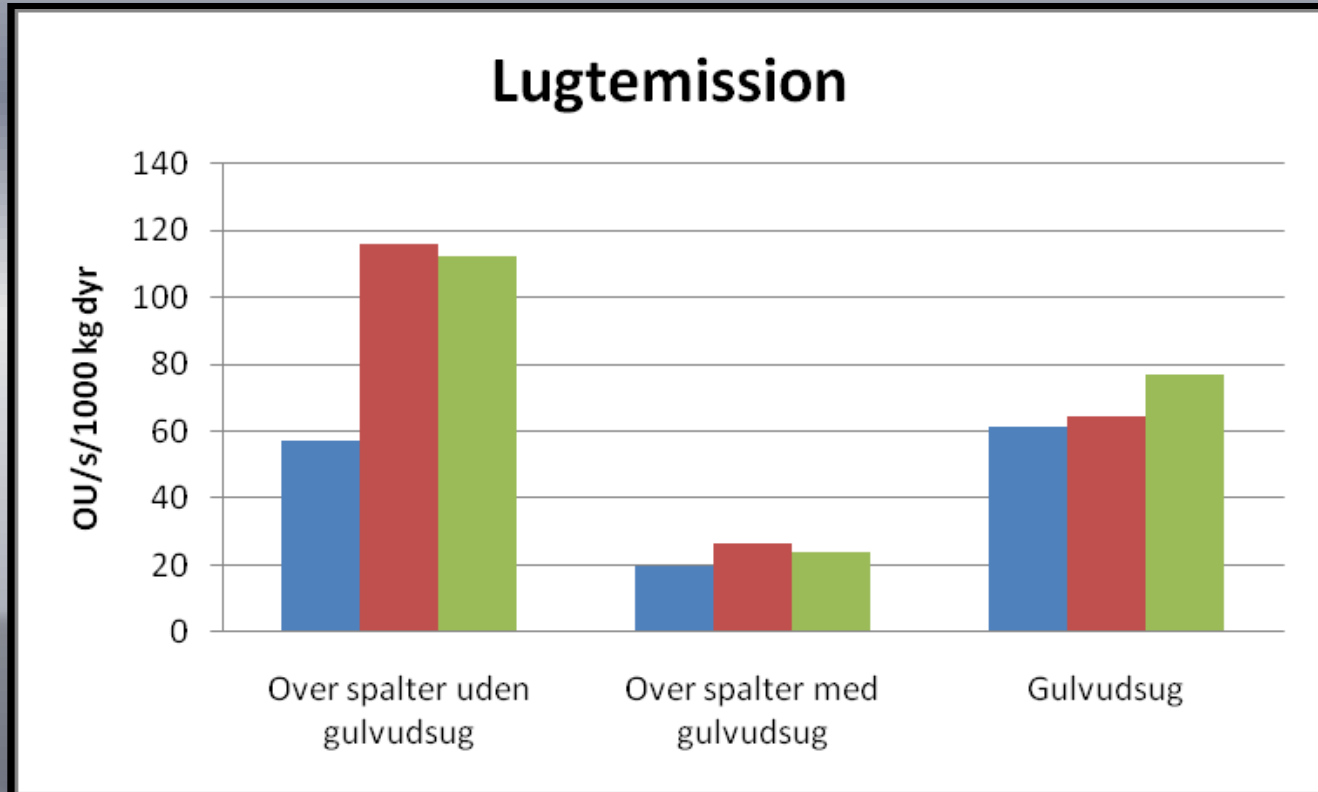
Pit exhaust and pit inlet



MT Højgaard Integrated air change system©, NH₃ emission in a ventilated housing unit



MT Højgaard integrated air change system©, Odour emission in a ventilated housing unit



A cattle housing unit with hybrid ventilation built in 2012

A year of intensive testing has shown results in accordance with the previous CFD simulations:

- Reduction in NH₃ emission of up to 85%
- High reduction in indoor odour emission
- Stable indoor climate with favourable temperature and air quality for animals and personnel
- Fully automatic operation of the hybrid ventilation system without the assistance of the farmer.



Thank you for your time!
For further information, please visit
www.mth.com/agri



Erling Friis Pedersen
Section manager, Agri Division

Mobile: +45 2558 6223
E-mail: efp@mth.dk