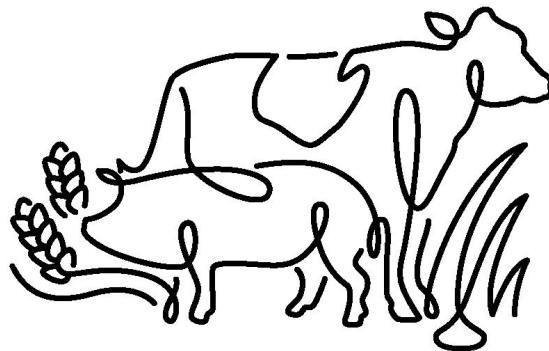


# Health and safety issues

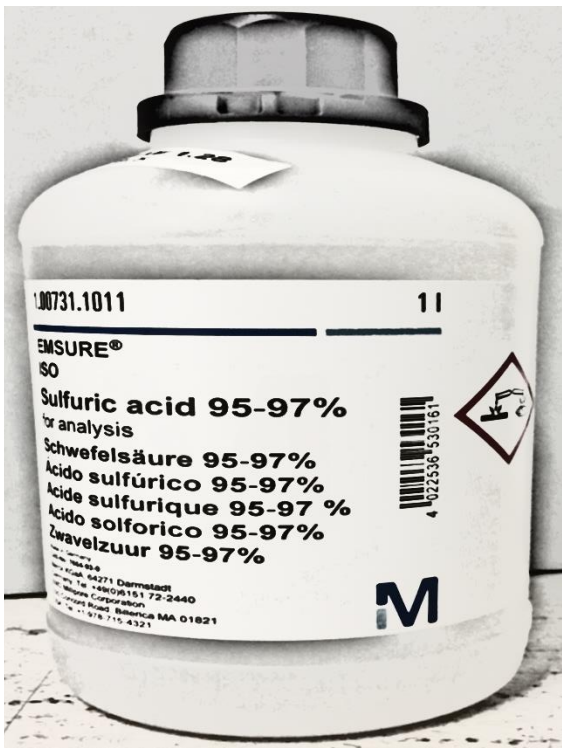
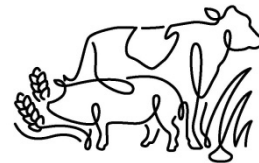


HS – The Rural Economy and Agricultural Society, Kikki Forss & Hanna Bannbers

RISE – Agrifood and Bioscience, Lena Rodhe & Erik Sindhøj, Sweden

ITP – Witold Wardol, Poland

GERMANY, LITHUANIA, LATVIA, ESTONIA, FINLAND



The acid used in SATs is  
95 – 97 % sulfuric acid.





## Signal words

**Danger**

## Hazard class

Skin corrosion, Category 1A - H314

Dangerous to the aquatic environment, acute,  
Category 1 - H400



## Hazard statements

H314 – Causes severe skin burns and eye damage

H400 – Very toxic to aquatic life



## Challenges in working with sulfuric acid



- Extremely corrosive to human tissue
- Reacts violently with small amounts of water
- Diluted concentrations are very aggressive towards metal and other materials

## Personal safety equipment

- Goggles
- Acid-resistant gloves
- Chemical suit
- Acid-resistant boots
- Face shield
- Filter mask (for acid fumes)



Riga, 11-12 October, 2017





## Personal safety equipment

- There has to be an emergency shower near the In-house slurry acidification construction.





## EU legislation of chemicals

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- REACH Regulation – registration, evaluation, authorization, restrictions of chemical
- CLP Regulation – labelling and packaging
- Council directive 98/24/EC – Health and safety of workers from chemical risks at work  
Exposure limits, protective measures
- Council Directive 89/686/EEC – Personal protective equipment
- Directive 2004/35/CE – Prevention and remedying of environmental damage
- Directive 2008/98/EC – On waste handling
- ADR – European regulations for transport of dangerous goods by road.



Fixed tank systems



## Different systems - different safety issues

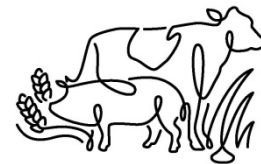


Mobile systems



Riga, 11-12 October, 2017



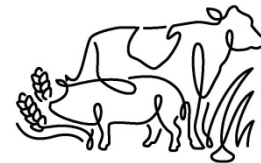


# Scenarios for relevant health and safety issues

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Basic conditions and general precautionary measures relevant to all scenarios

- Scenario 1 – Farm installing in-house SAT
- Scenario 2 – Farm/contractor using Harsø in-storage SAT
- Scenario 3 – Farm/contractor using Ørum in-storage SAT
- Scenario 4 – Farm/contractor using Biocover in-field SAT
- Scenario 5 – Farm/contractor using Kyndestoft in-field SAT



## Record of slurry acidification related acid accidents in Denmark

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- Denmark has been using SATs for two decades
- There are 140 In-house systems, 75 In-storage systems and 110 In-field spreading systems in DK (2016 figures)
- There has been **0\*** reported accidents.

\*) Personal communication with Karin Peters, Danish Ministry of Environment