



SCHAUER Agrotronic Webinar



Eurotier digital 2021 expert talk!

Emissions reduction in (animal welfare) pig stalls:

Experiences from Austria and Germany including showcase
and video from SALUT project

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Participants in the digital expert talk:



CHRISTIAN AUINGER, Senior R&D manager animal housing systems, **SCHAUER Agrotronic GmbH**

Long lasting experience in technical systems as well as deep understanding of animal needs led into continuously development of pig housing systems. He led Schauer's development to its leading position for animal welfare pig stables in Europe. Mr. Christian Auinger is well connected to innovators all over Europa concerning animal welfare and emission control in housing systems.



EDUARD ZENTNER, Head of the Animal Housing Systems, Technology and Emissions department at **HBLFA Raumberg Gumpenstein**

Mr. Zentner has years of experience with administrative permission issues and is therefore particularly familiar with this topic. His expertise on ventilation and stable climate issues is even in demand far beyond Austria's borders, e.g. in the preparation of the VDI guideline 3894 „Emissions - and immissions from livestock facilities“ and therefore knows the situation in Germany very well.



HELMUT DÖHLER, from **DöhlerAgrar management consultancy**

Döhler has been known for decades as an expert in the field of farm manure, as well as emissions in animal husbandry and agriculture in general through many articles in books and magazines. Among other things, he works on developments for the treatment and processing of liquid manure and digestate, and currently also on ways to reduce emissions in stables

Summary – introduction:

The tribute of global warming to achieve an improvement in the environmental situation in all areas has been manifested in various UN agreements, EU directives and national laws. The EU NEC directive stipulates a somewhat drastic reduction in ammonia emission levels by 2030. These targets can only be achieved through cuts and reasonable changes in livestock production. At the same time, society is demanding for more animal welfare, more space for the animals and consequently an increase of the emitting surfaces. This results in an almost insoluble trade off. Nevertheless, there are now partly scientifically acknowledged and also practically tested approaches, mainly through the separation of faeces and urine, in order to still achieve both targets simultaneously. In running pilot projects, attempts are being made to further stabilization of the urine to block the urease activity and thus receive further reduction of ammonia emissions.

In addition, it will be essential in the future in new housing systems that ALL current issues such as NECDir, animal welfare, tail docking, usage of straw, environmental stimuli, stable cooling, etc. are to be integrated as well as possible cumulatively in new systems. For example, the EIP project SaLuT in Austria is an absolutely trend-setting project, also for future approaches in other uses such as cattle or poultry.

Summary results from Expert Talk

The research projects EmiMin of the KTBL in Germany and the EIP project Salut in Austria examine the reduction potentials of various measures, i.e. not end of the pipe but maximum reduction at the source such as:

- Protein-adapted feeding
- Faeces / urination separation
- Reduction of the emitting area
- Supply air cooling
- Fully insulated and covered outdoor area

For a better understanding I would like to show you a video about the EIP project Salut!



WATCH THE FULL VIDEO NOW!

Videotext 2:31 – 2:51:

Better animal welfare and fewer emissions do not have to be a contradiction in terms. With the SALUT clean air project in animal husbandry, HBLFA Gumpenstein is researching, among other things, the effects of faecal-urine separation on air quality.

Videotext 3:02 – 3:46:

The project stable is located in southern Styria. Here Josef Neuhold processes and markets meat from around 2,700 slaughter pigs per anno. The new animal welfare stable is intended to meet the constantly growing demands of its customers:

Josef Neuhold: “At first we had planned another stable project and then had objections from animal rights activists and neighbours and then we weren't able to implement it. Then we came to this NatureLine stable project through the Schauer company, which we are very happy about because, as direct marketers, we need something like that. Today the consumer wants to know where the meat comes from, what the animals get to eat and the main focus is on how the animals are kept. Exactly this will be achieved with the housing system.”

Videotext 3:46 – 4:02:

The stable was built according to the NatureLine concept. The pigs can use 3 functional areas. The core is the separation of faeces and urine. In this way,

the release of ammonia should be avoided and exhaust air cleaning systems should not be necessary.

Videotext 4:02 – 4:38:

Eduard Zentner: “We are currently measuring zero ppm ammonia at low temperatures in the animal area. The same also in the so-called outside movement and faeces area. We assume that it will increase slightly towards the summer months because the ammonia emissions increase the warmer it is”. Under the slatted floor there is a concrete surface with a slope towards the centre. The urine runs down into a urinary drain pipe, and is collected in a urine tank. The manure remains on the concrete floor and is pushed out by scraper into a container.

Videotext 4:38 – 5:05:

Eduard Zentner: “So far, the biggest challenge has been to combine animal welfare systems with fewer emissions. Previous outside climate systems were negatively affected in the discussion and were much more difficult to get through with building permit-procedures. This new system, which is being investigated and an attempt is being made to establish easier, includes all measures that are currently known in literature and science with regard to emission reduction,,

Videotext 5:05 – 5:29:

The activity area connects to the faeces area. The pigs can eat here. In addition to conventional feed, Neuhold offers its pigs herbal pellets. Inside there are paved lying areas with floor heating. This is regularly littered with straw. The pigs clearly enjoy that.

Videotext 5:29 – 5:51:

To reduce dust pollution, the straw is first dedusted and shredded. In addition, a high-pressure cooling system will be installed for the purpose of even further dust reduction. In order to avoid the problem of dirty lying areas, primarily a cool pad was installed that cools the air in summer. This cold air flows through a channel under the inspection aisle into the lying area.

Videotext 5:51 – 6:25:

Eduard Zentner: „So in terms of emissions, it is about the odour pollution. But further questions are about especially about the harmful gases like ammonia, what is the CO2 content in the air, what about the fine dust, what is about the noise out of this stable, and how is the management, which is associated with it. So, EVERYTHING important is included and it should also be ground-breaking, in the future for new barn systems, if the farmers decide to build something like this. So that administrative authorities will have soon all the important facts and values available, which will be important for the permission and the construction process”.

Videotext 6:25 – 6:37:

The animal welfare stable with 850 fattening places costed around 2 million euros including VAT from opening to completion. Neuhold wants to absorb the additional costs through direct marketing of his products.

Videotext 6:37 – 6:48:

Josef Neuhold: “We are very happy that we have implemented and finished the stable it this way, because the consumer wants it and animal welfare will be in the foreground in the future “.

Additional Information to the prices:

After asking farmer Josef Neuhold about the details of the costs of the stable construction, the costs were broken down more precisely. The gross investment amount of 2.1 million euros also includes: - the development costs for electricity, water, sewage and access road suitable for trucks. The stable is about 600 meters from the main road and about 2 kilometres from the main farm. - The costs for the 11-year construction delay, procedural costs, legal fees - Additional costs for additional silo and slurry storage space for the existing stables. The final and comparable stable-costs per fattening place were therefore 1,150 euros net.



INTERVIEW WITH MR. ZENTNER:

- *What is being examined in detail in the Salut project, which institutions are involved in this project?*

E. Zentner: The project SALUT is financially supported by EIP and includes all possible technologies to reduce the Ammonia emissions in the welfare pig stable. Partners of the project are DLG (measuring emissions inside the

stable) BLF Bayern (measuring emissions outside the stable), Human Medical University Graz (investigating germs). Another partner is the Styrian government, dep. environment and TÜV Austria (odour), FfTT Austria (certification of new housing systems), HBLFA Gumpenstein -agricultural research centre (housing ventilation, cooling, fine dust and noise). From the result of the project there are expectations to get key facts for future permission of animal welfare stables and a strong input for future advice to farmers.

- *When can be expected to get results?*

E. Zentner: The first research activities started a few months ago, the start up of the stable was 3 weeks ago. It is expected that the full research trial can be started in April. Then it will last for one year. So, the first results will be available including the full report at the end of 2022.

- *Do you think these results will then be accepted by the approval authorities.*

E. Zentner: The results should lead into new permission administration for such stables.

- *Which reduction potential of emissions you expect to receive from the new stable system?*

E. Zentner: Ambitious but realistic target could be up 80 to 90% of Ammonia and odour emission. This would be on the level of an air-cleaning system and therfor being able to replace it completely.



INTERVIEW WITH MR. DÖHLER:

- *An essential part of reducing ammonia emissions is the segregation of faeces and urine. There is a lot of talk about this, what in detail has to be considered to prevent urease activity?*

H. Döhler: The segregation has to be as complete as possible, for this the urine has to pass immediately with a slope of at least 3 % towards the center of the scraper channel, where the urin drain is installed. The surface of the scraper channel has to be very smooth. The scraper must remove the feces with almost no residue. otherwise the enzyme UREASE, which is excreted with the feces gets in touch with urine will produce ammonia if both fractions are not properly separated.

- *What are the options for further processing of the solid fractions?*

H. Döhler: : The feces may be used for as substrate for biogas plants, according to our recent tests, two tons of pig feces may replace one ton of maize silage. Composting is an option as well, or the production of biochar via pyrolytic combustion.

- *You are currently working on a project for urine stabilization, what are the latest findings?*

H. Döhler: Further stabilization of urine can be achieved by adding alkaline or acidic additives. This could ultimately block the UREASE process in the swine house, but also downstream during storage and spreading in the field. This might have an important impact on the overall reduction of ammonia from animal production. Hydrated lime could play an important role in this process. There is already a good understanding for the implementation in practical technologies within a short period of time.

- *When do you think the first barn will be equipped with the technology?*

H. Döhler: The laboratory tests are almost completed and we are currently working on the technical implementation; in the near future, two houses will be equipped with the technique in order to conduct the stabilization process. A prototype is already under construction. I expect to be able to start field trials in a few months. The prototype will be implemented in a container unit for flexible use on various farms.

It will be essential for the future of animal husbandry to exhaust all possibilities of emission reduction!

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SCHAUER Agrotronic GmbH

AT-4731 Prambachkirchen,
Passauer Str. 1
Tel. +43 / 72 77 / 23 26-0
Fax +43 / 72 77 / 23 26-22
office@schauer-agrotronic.com
www.schauer-agrotronic.com

SCHAUER Maschinenfabrik GmbH Vertriebsgesellschaft

DE-94060 Pocking, Gewerbering 19
Tel. +49 / 85 31 / 82 72
Fax: +49 / 85 31 / 82 71
germany@schauer-agrotronic.com
www.schauer-agrotronic.com



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