



Targeted reduction of emissions in fattening pigs

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Introduction

Livestock husbandry is in focus when it comes to "the polluters" and the required **reductions of airborne emissions**. Ammonia is emitted almost exclusively (around 95%) from agricultural sectors – a reduction, as required by the EU NEC Directive, can therefore only start here.

There are various ways to influence ammonia emissions from fattening pigs – for example **protein-adapted feeding** and the **addition of tested additives** in feed production. In cooperation with **Jadis Additiva**, two fattening periods were carried out to investigate the **influences** of two different **2-phase experimental feeds** on fattening performance and on the **release of ammonia in pig fattening**.

Pig Research Stable

The trials were carried out in 2021 in the **pig research stable of HBLFA Raumberg-Gumpenstein**, Austria. The forcibly ventilated fattening barn has three structurally completely separate compartments for the keeping of 138 fattening pigs each in 6 pens; the exhaust air is discharged via downstream exhaust air purification systems



Abb. 1: Pig Research Stable HBLFA Raumberg-Gumpenstein with air purification equipment on the right side of the building.

Feeding

2-phase feeding with two different experimental groups and a control group was examined; the compartment allocation changed in the mast passages to detect influences by the test compartments. The natural feed additive **Yucca Plus (Yucca Schidigera)**, in the concentration of 200g per 1000 kg compound feed, was added to **the trial feeds I and II**. The trial feed II also had a lower crude protein content. Feeding system Schauer Spot Mix.

Tab. 1: Trial feed II, Starter and Finisher diet

Feed	DM %	ME in MJ	CP %	Lysine %
Trial II Starter	88,47	13,14	15,08	1,11
Trial II Finisher	88,53	12,98	13,66	0,98

Tab. 2: Feed, Control group Starter and Finisher diet

Feed	DM %	ME in MJ	CP %	Lysine %
Control Starter	88,36	13,16	16,50	1,11
Control Finisher	88,42	12,97	15,04	0,97

Ammonia emissions

During fattening period, there was seen a **continuous reduction of the ammonia concentration** in the **compartment**, whose animals were fed with **experimental feed II**. Over an entire fattening period, the average **ammonia content** in the **test** compartment was **5.8 ppm** in the **control compartment** was an average concentration of **7.6 ppm**.

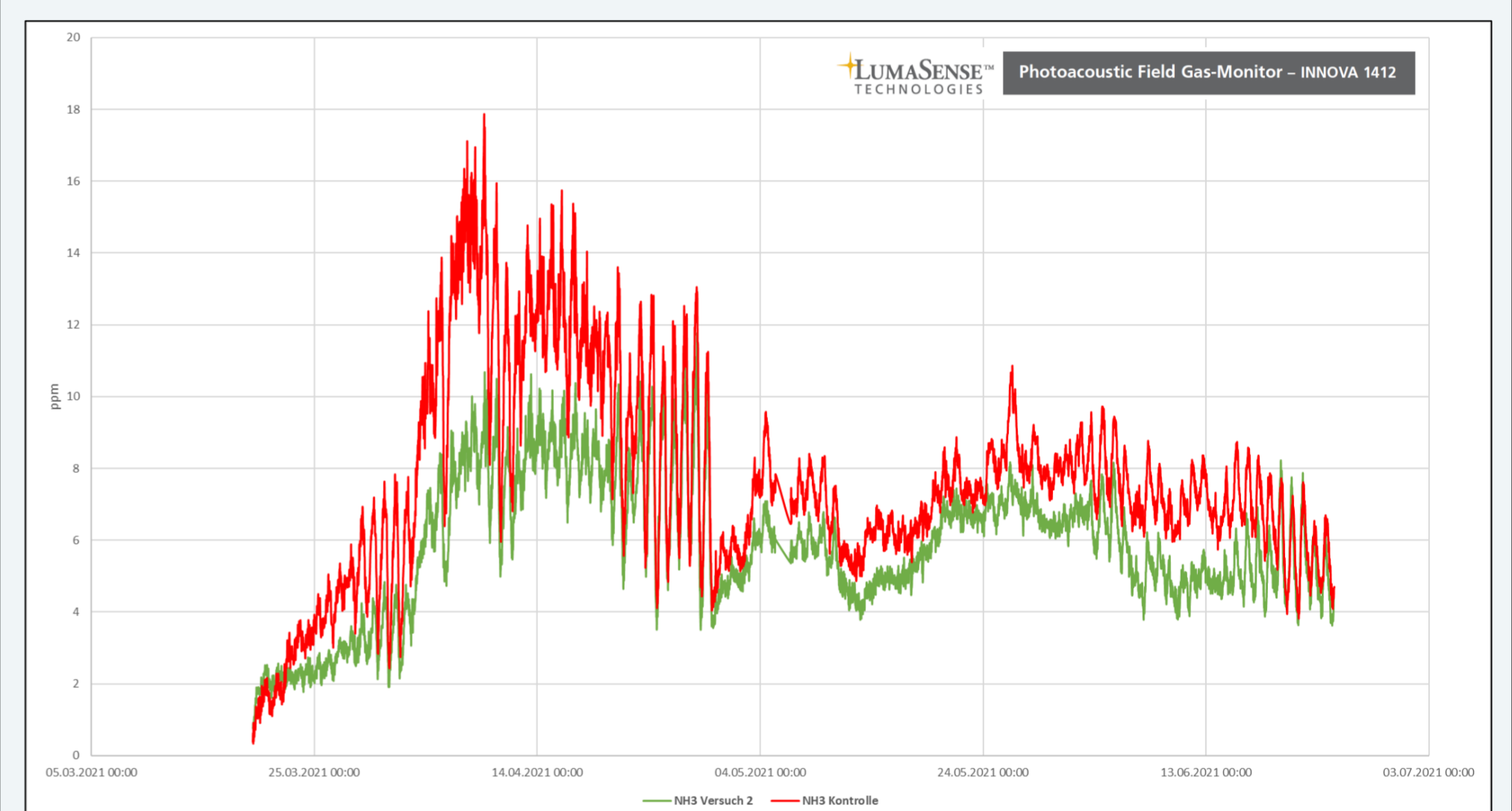


Abb. 2: Concentration curve Ammonia in total fattening period, Comparison Trial group II vs. Control

The corresponding ammonia **emission factor** for dispersion calculations is **2.2 kg ammonia/animal place/year** in **experimental group II** – **2.7** in the control group₂

Performance

Important for the evaluation of an experimental feed is the **comparison** with the control feed on parameters **weight gain, feed consumption, feed conversion** and **classification of pig carcasses**.

Trial II		Control	
Av total gain	kg/week	Av total gain	kg/week
83,9	6,3	84,9	6,3
	g/day gain		g/day gain
	895		904

Tab. 3: Weight gain, average weekly and daily weight gain per animal

Feed / animal trial group II in kg	466,5	Av FCR Trial II	2,73
Feed/ animal control in kg	482,5	Av FCR control	2,77

Tab. 4: average feed intake per animal (FCR)

Class	Trial group II		Control	
	Number animals	%	Number animals	%
Sum S	127	47,4	170	65,6
Sum E	133	49,6	88	34,0
Sum U	6	2,2	1	0,4
Sum []	2	0,7	0	0,0

Tab. 5: Classification lean meat content carcass, absolute numbers animals and percent

Discussion

Both **test feed I** (results not shown here, available on request) and **test feed II** lead to **lower ammonia emissions** during fattening as well as **better FCR**. The mean **total increases** over the fattening period and the mean daily weight gains are somewhat **below control** (not significant) in experimental group II; this **also applies to the classification of pig carcasses** in the highest category S.

In a **detailed economic analysis**, it must be clarified whether **fattening with feed of experimental group II** (lower protein content, lower ammonia emissions, very good feed conversion and reduced total feed requirement) is **more economical and sustainable** and thus **compensates** for any disadvantages in the classification of pig carcasses and daily weight gains.