

BIOAKTIV FarEast

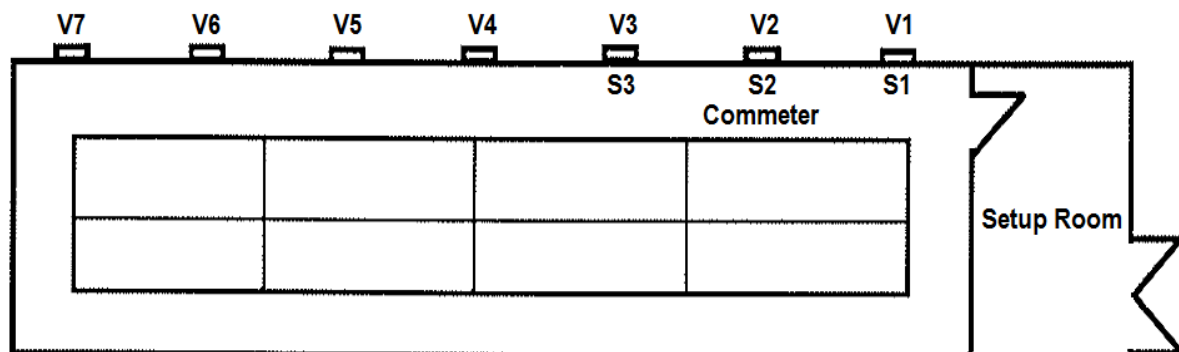
Czech Republic: BioAktiv for Animal Feed Reduces Ammonia Emissions



[BioAktiv CZ](#) of Czech Republic commissioned [VÚZT](#) – Výzkumný ústav zemědělské techniky (Agricultural Technology Research Institute) – to conduct a study on using BioAktiv for Animal Feed to reduce ammonia emissions in a pig house. The institute carried out the study at two identical pig houses at Lety Piggery of AGPI a.s. in the municipality of Písek. The two houses were house 6 and house 11. The study team fed pigs in house 6 with BioAktiv for Animal Feed, while pigs in house 11 received no BioAktiv product. The pigs both houses kept were as follows:

House	Size (L × W × H)	Number of pigs	Type	Age	Average weight
6	5m×8.5m×2.5m	460	Fattening pigs	138 days	74 kg
11	5m×8.5m×2.5m	464	Fattening pigs	145 days	79 kg

The house was a masonry structure with partly slatted concrete floor. It used ad lid dry feeding with automatic refilling troughs. Its longer sidewall had seven exhaust fans, each installed on a 45cm × 45cm opening. The fans sucked in the outside air through slots in the ceiling arranged on the opposite side of the building. Ammonia emissions produced by the pigs gradually accumulated in the air in the house.

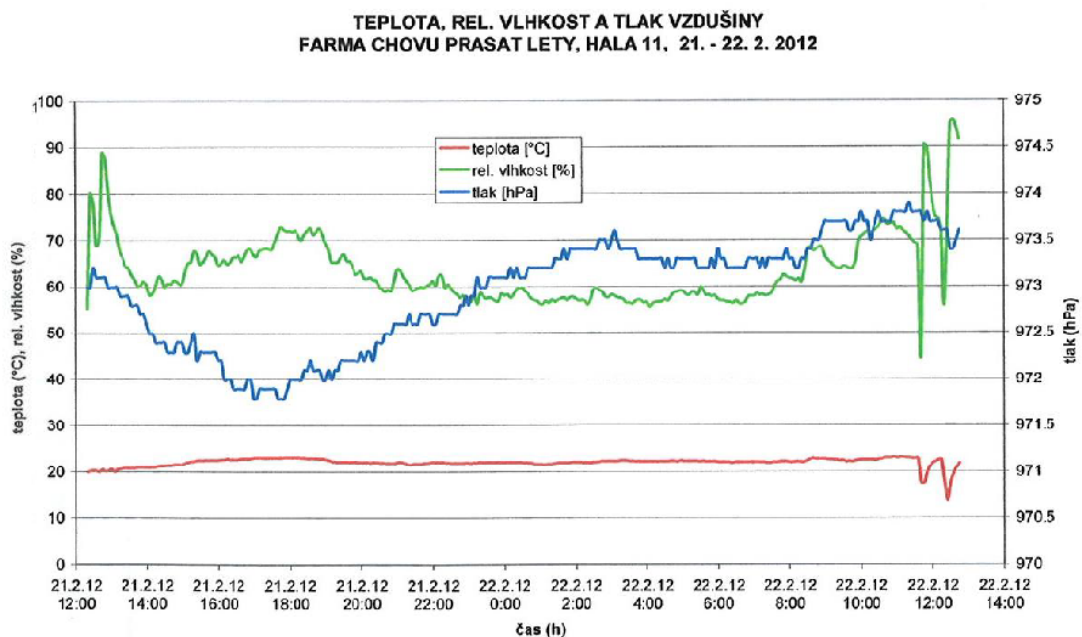
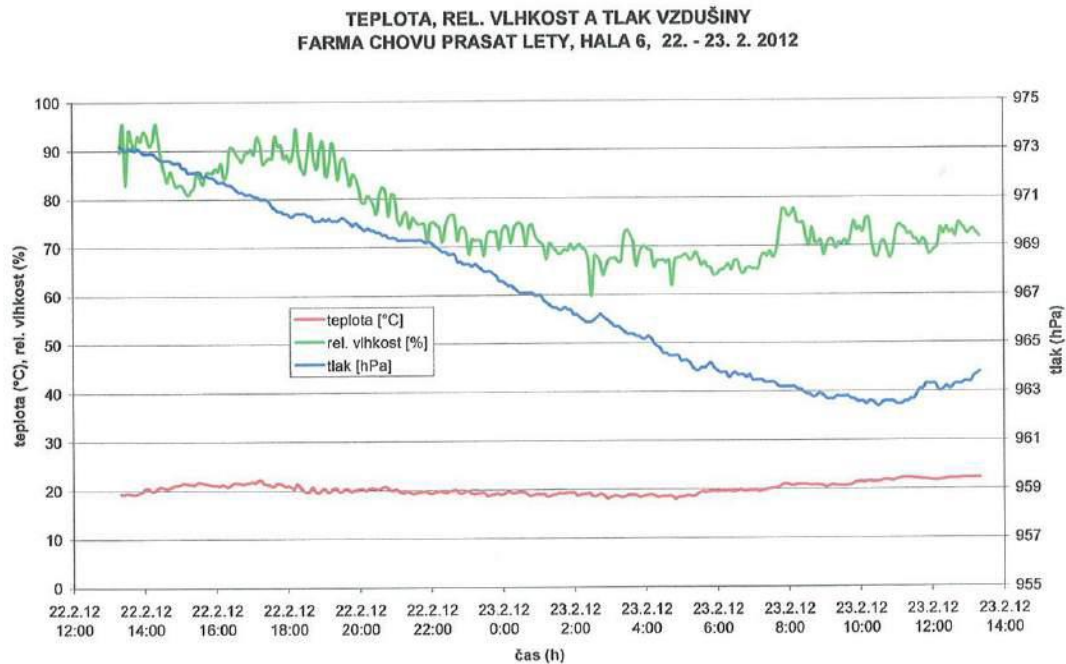


On 21 February 2012, the study team operated the ventilation system of house 11 manually with only V1, V2 and V3 fans (see above) running at 60% capacity. They installed a sampling probe at the upstream of each running fan to measure and record ammonia concentration (at 0°C and 103.3 hPa) by an Innova system at four-minute intervals for 24 hours starting from 12:40H. They also installed near fan V2 the sensor for temperature and relative humidity of a Commeter system which also measured air pressure. They used a Testo anemometer to measure airflow speed at the exhaust fan.

A day later after the data recording in house 11 had finished, the study team did the same process in house 6 and the 24-hour data recording started at 13:20H on 22 February 2012.

As the weather during the 48 hours permitted, the six fans were running at constant speeds. Their airflow rates were as below:

Parameter	House 6 – BioAktiv			House 11 – control		
	V1	V2	V3	V1	V2	V3
Exhaust fan	V1	V2	V3	V1	V2	V3
Probe	S1	S2	S3	S1	S2	S3
Air duct cross section (m ²)	0.20	0.20	0.20	0.20	0.20	0.20
Average airflow speed (m/s)	1.20	2.37	0.50	1.74	1.96	1.38
Airflow rate (m ³ /s) ¹	0.24	0.48	0.10	0.35	0.40	0.28

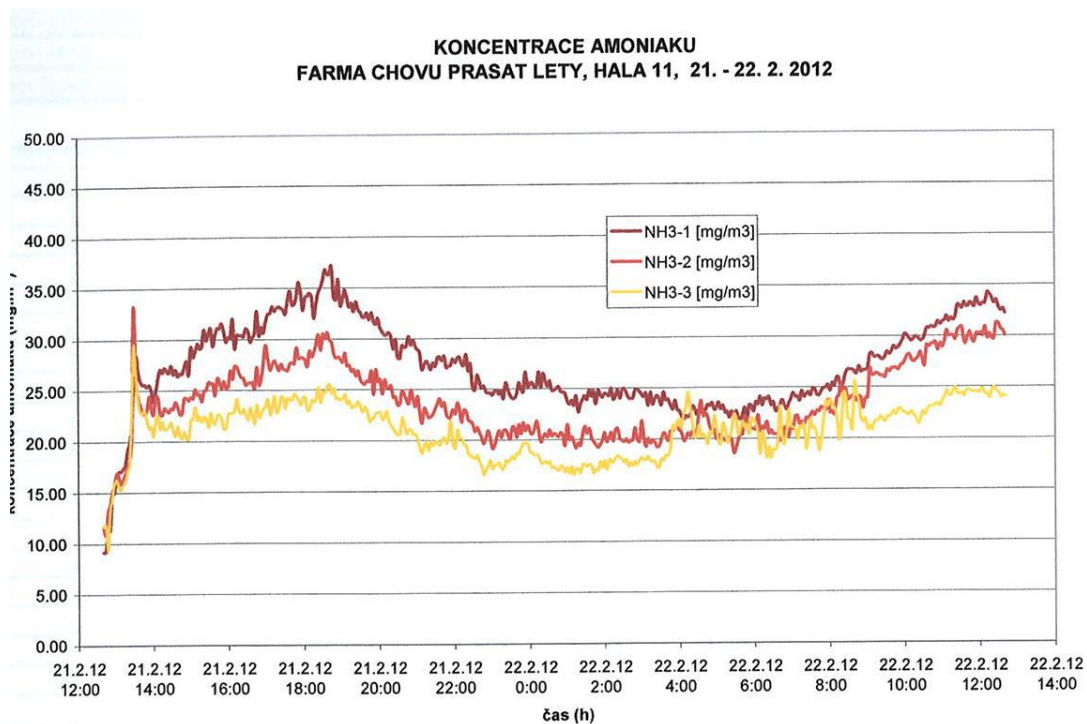
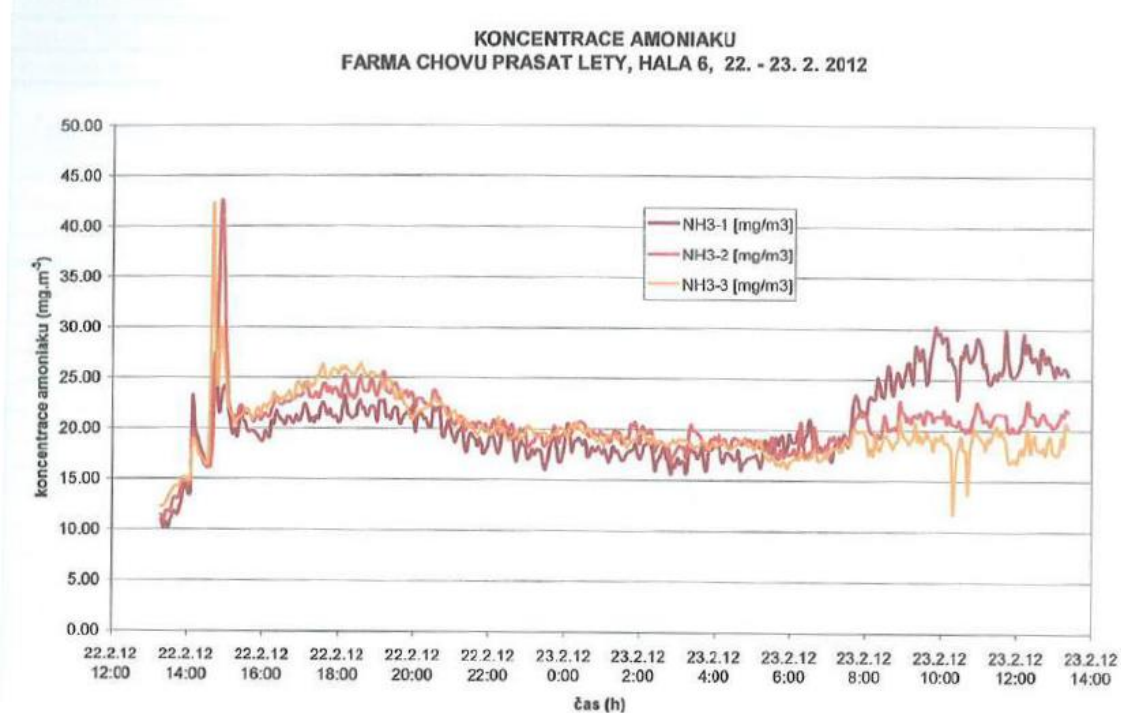


The charts above show the air temperature (green), relative humidity (blue) and air pressure (red) in house 6 (top) and house 11 over the 24-hour measurement period.

¹ Airflow rate = Air duct cross section × Average airflow speed

The table below shows the ranges and averages of the weather data during the measurement period.

House	Temperature (°C)			Relative Humidity (%)			Air Pressure (hPa)		
	High	Low	Average	High	Low	Average	High	Low	Average
6	9.2	22.1	19.7	60	95	78.2	964	973	968.7
11	20.0	23.2	22.1	55	89	62.4	972	974	972.7



The charts above show the ammonia concentration measurements from the three probes of house 6 (top) and house 11. The ammonia concentration in house 6 fluctuated between 10.20 and 42.64 mg/m³, while that of house 11 fluctuated between 9.18 and 37.15 mg/m³. None of the reading from both houses was above 50 mg/m³. The average airflow rate out of house 6 and house 11 were 2,967

and 3,698 m³/h respectively. From the data of ammonia concentration collected, the study team calculated the average ammonia concentration through each fan outlet and the amount of ammonia emissions produced by a pig in a year.

Parameter	House 6 – BioAktiv			House 11 – control		
	V1/S1	V2/S2	V3/S3	V1/S1	V2/S2	V3/S3
Fan/probe						
Airflow rate (m ³ /s)	0.24	0.48	0.10	0.35	0.40	0.28
Average NH ₄ concentration (mg/m ³)	20.65	20.55	20.02	26.95	23.38	20.83
Ammonia emission flow (mg/s)	5.02	9.86	2.03	9.50	9.26	5.80
Total ammonia emission flow (mg/s)	16.91 ± 0.423			24.56 ± 0.491		
Specific production of NH ₄ emissions ²	1.1593 ± 0.029 kg/pig/year			1.6693 ± 0.034 kg/pig/year		

Original documents for [house 6](#) and [house 11](#).

² From the results, BioAktiv-treated pig produced 30.6% lesser ammonia emissions.