61st Annual Meeting of European Association for Animal Production August 23rd-27th, 2010 – Heraklion, Crete Island, Greece

# GREENHOUSE GASES AND AMMONIA EMISSIONS FROM INTENSIVE PIG FARM

**Mihina, Š.[1,2], Palkovičová, Z.[2], Knížatová, M.[2], Brouček[2], J., Hanus, A[2].**

[1]Slovak University of Agriculture, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia (Slovak Republic); [2]Animal Production Research Centre, Hlohovecká 2, 951 41 Lužianky, Slovakia (Slovak Republic)

## OBJECTIVES

Ammonia ($NH_3$) and greenhouse gases ($CH_4$, $N_2O$, $CO_2$, $H_2O$) concentrations and emissions on intensive pig farm were monitored and evaluated.

## MATERIAL AND METHODS

Two fattening periods in the same housing hall for fattening pigs were monitored:
in summer 348 fattening pigs during 105 days
in winter 352 fattening pigs during 121 days.
The same starting and finishing weights were in both groups.
The hall was mechanically ventilated by under-pressure system with three vacuum ceiling ventilators and inlet flaps.
Animals were housed on slats.
Slurry was stored in pit under the slats.
Gases concentration was measured by 1312 Photoacoustic Multi-Gas Monitor with multi-channel sampling and dosing gas analyzer Multipoint Sampler 1309 (Innova Air Tech Instruments).
Air flow rate was measured by measuring ventilators.
Temperature was recorded by thermocouple probes connected with central computer unit by the transmitter ADAM.
Data were collected at an interval of 12 min (gases) and three times per hour (temperature, air flow rate).

**Fig. 1: Housing hall with measuring ventilators**

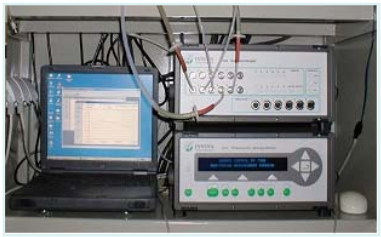
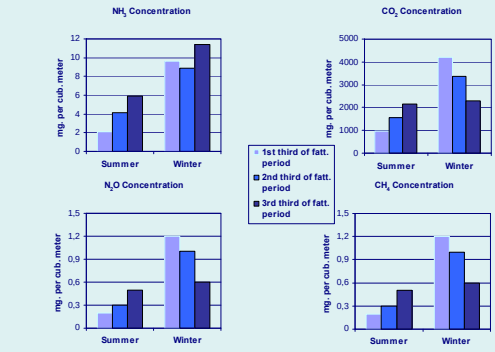
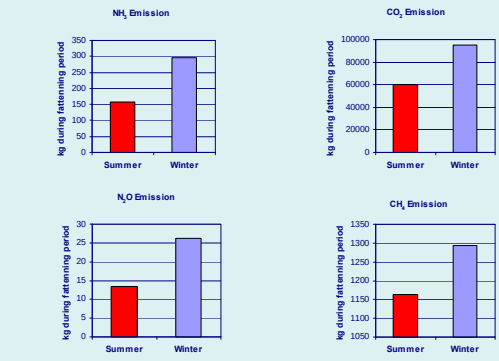
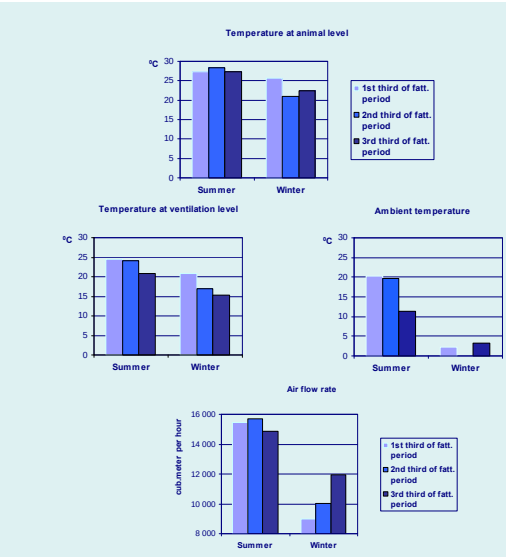


**Fig. 2: Gas monitor with sampler and PC unit**

## RESULTS




## CONCLUSION:

From the measurements on intensive pig farm, in mechanically ventilated (under-pressure system) hall for fattening pigs with slatted floor above slurry pit, following conclusion could be drawn:

- All green house gases concentrations have risen during fattening periods in summer and have dropped during fattening periods in winter. Ammonia concentration has risen during fattening period also in winter.
- Values of emissions of all greenhouse gases and ammonia as well were larger in winter than in summer.
- Temperature in the height of animal heads was lower during winter, however average values were above 20 $^0$C during the whole fattening period. As expected, at the ventilation level was the temperature lower and it had a tendency to drop towards the end of fattening periods both in summer and in winter.
- Air flow rate in summer was almost of stable value with mild drop in the last third of fattening period. In winter was the ventilation rate lower than in summer to keep temperature at the requested level; however it has risen towards the end of fattening periods in dependence of animal weight growth.

**Contacts: Stefan.Mihina@uniag.sk**, palkovicova@cvzv.sk