I prefer:

POSTER presentation

**Continuous monitoring of ammonia in the turkey barn**

**–what values do the animals experience?**

N. Volkmann1, D. Werner2; S. Dennier3; A. Nauber²; N. Kemper1\*, B. Spindler1

\* presenting author:

1nicole.kemper@tiho-hannover.de, Institute for Animal Hygiene, Animal Welfare and Farm Animal Behaviour (ITTN), University of Veterinary Medicine Hannover, Foundation, Germany

2Drägerwerk AG & Co. KGaA, Germany

3Chamber of Agriculture of North Rhine-Westphalia, Germany

**Abstract:**

**Background/Objective:** In Germany, the concentration of harmful gases, especially ammonia, in the air of poultry barns should be kept within a range that is harmless to the birds. For fattening turkeys, a maximum ammonia content of 20 ppm must not be exceeded and should be permanently below 10 ppm.

**Methods:** This study investigated whether these requirements are possible to meet under practical conditions and furthermore evaluated ammonia concentrations at different measurement heights. For this purpose, two identical barns on a turkey fattening farm were equipped with continuous ammonia-measuring systems; each device with a temperature, humidity and air pressure sensor additionally. These systems were installed at two measuring locations in the barn (front/rear area), positioning one device at animal height (30 cm) and one at a height of 170 cm representing human eye level, respectively working height. The measurements were taken continuously, with the highest value transmitted every 5 minutes. The average hourly values were analysed from animals’ 3rd to 12th week of life.

**Results:** The results showed that the average hourly mean value of the ammonia concentration was 8.15 ppm and thus below the specified limit value of 20 ppm. Comparing the measurement heights, only slight differences were found between the mean values at animal and working height (30 cm: 8.0 ppm vs. 170 cm: 8.3ppm). However, during the period of 10 weeks analysed, average hourly values above the limit value were measured at both heights on 34 days. Considering maximum extends reached, a value of 40.3 ppm was recorded at working height and even 46.1 ppm at animal height.

**Conclusion:** These first results showed that the exposure to harmful gases might be a problem in turkey housing. Further analyses are needed to identify the risk of ammonia peaks - for example when the ventilation rate is reduced or when litter is milled.

**Keywords:** ammonia, harmfull gases, climate measurement, fattening turkey

**Acknowledgments:** This work (Model- and Demonstration Project for Animal Welfare #Pute@Praxis) was financially supported by the Federal Ministry of Food and Agriculture (BMEL) based on a decision of the Parliament of the Federal Republic of Germany, granted by the Federal Office for Agriculture and Food (BLE); grant number «FKZ 2817MDT611». Furthermore, we thank Drägerwerk AG & Co. KGaA for their support.