



EAAP Annual Meeting 2015



Effects of physical water treatment on microbiological water quality and performance of turkeys

R. Boussarhane¹, Dr. R. Guenther¹, Prof. Dr. N. Kemper², Dr. J. Schulz²

¹Heidemark GmbH Veterinärlabor

²Institute for Animal Hygiene, Animal Welfare and Farm Animal Behaviour

Warsaw, 31.08.2015

Introduction



⇒ **drinking water quality essential for health, welfare and performance**



⇒ **risk of pathogens and biofilms**



⇒ **adverse effects on vaccinations and drug treatments**

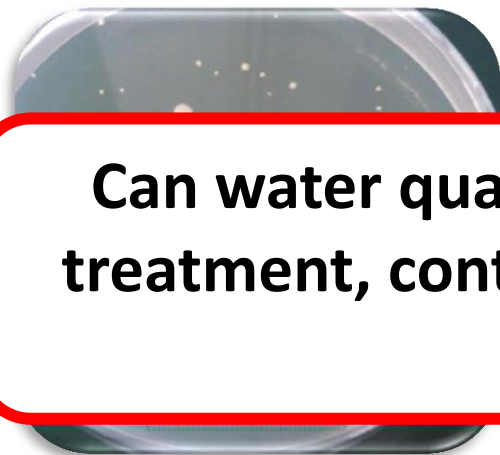
- ⇒ **turkeys drink up to 1 l/day**
- ⇒ **no legal regulations on quality of water used for farm animals in Germany**
- ⇒ **but recommendations**



Recommendations on the microbiological water quality (BMELV 2007)

Water taken into the system should be

- ⇒ free from *Salmonella* and *Campylobacter* (0 in 100 ml)
- ⇒ mostly free from *Escherichia coli* (0 in 10 ml)
- ⇒ aerobe total colony counts < 1.000 CFU/ml at 37° C
< 10.000 CFU/ml at 20° C



Can water quality be improved by physical water treatment, contributing to improved animal health and performance?

Study on turkey fattening farm

⇒ 2 groups with 1,900 animals with separated drinking systems



B8	B7	B6	B5	B4	B3	B2	B1	V	B	V K	B34	B33	B32	B31	B30	B29	B28	B27	B26
test group											control group								
B9	B10	B11	B12	B13	B14	B15	B16	E			B17	B18	B19	B20	B21	B22	B23	B24	B25

Study on turkey fattening farm

⇒ 2 consecutive fattening periods

⇒ test group: physical water treatment



Drinking water is treated by an varied-frequency magnetic field. This field changes crystalline structures (e.g. calcite to aragonite) and should reduce deposits in pipes.

Water quality: parameters on three measuring points (well water, beginning and end of water pipes)

⇒ **total bacteria count by pour plate technique with blood-basis-agar**

⇒ **analyses on the occurrence of *Enterobacteriaceae* and *Campylobacter* spp.**

⇒ **endotoxins by Limulus-lysate-test**

Statistics:

⇒ **SAS 9.3.**



Animal performance and health

- ⇒ slaughter weight in kg
- ⇒ daily gains in g
- ⇒ feed conversion

- ⇒ footpad health
- ⇒ animal losses
- ⇒ water consumption

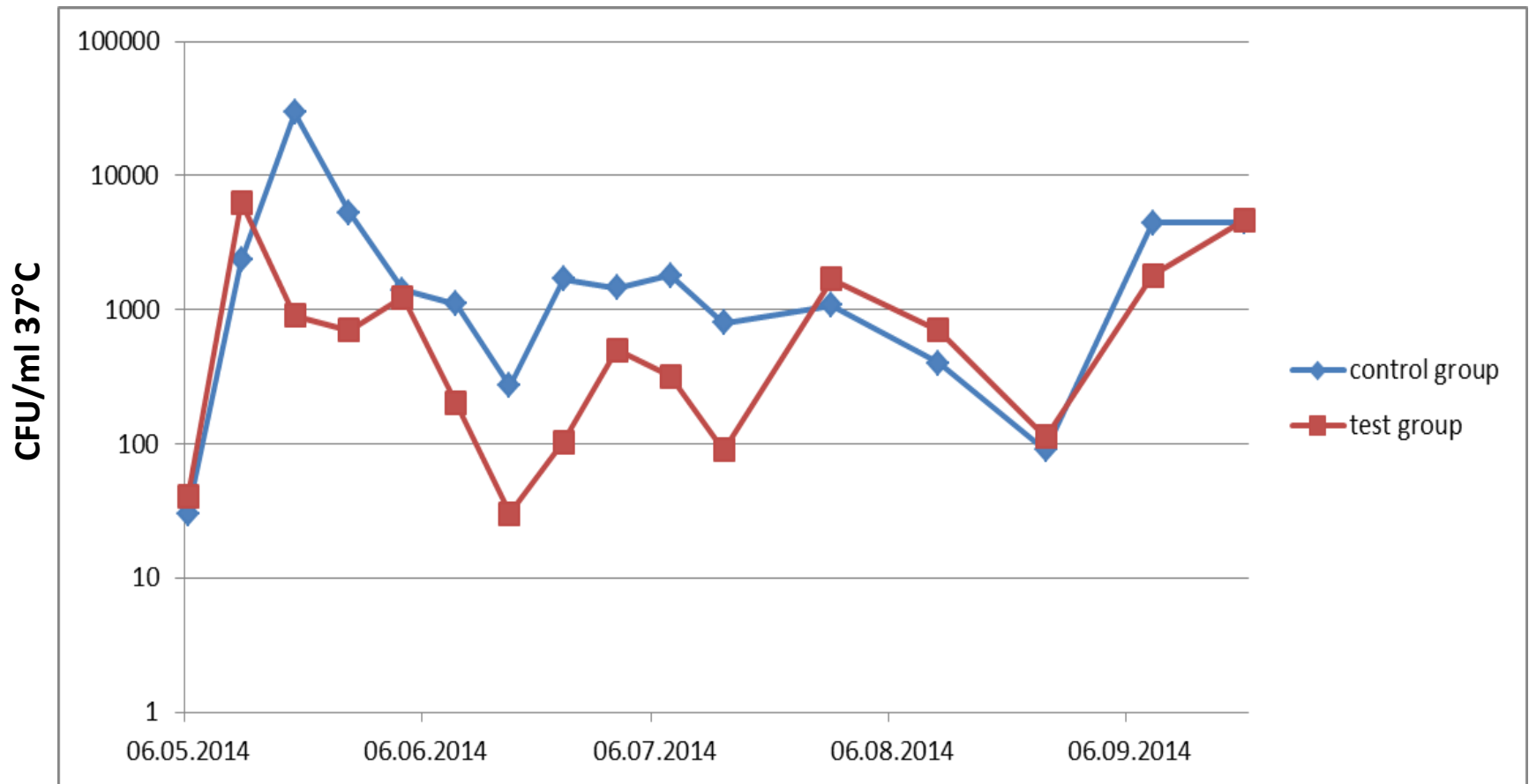


Water quality

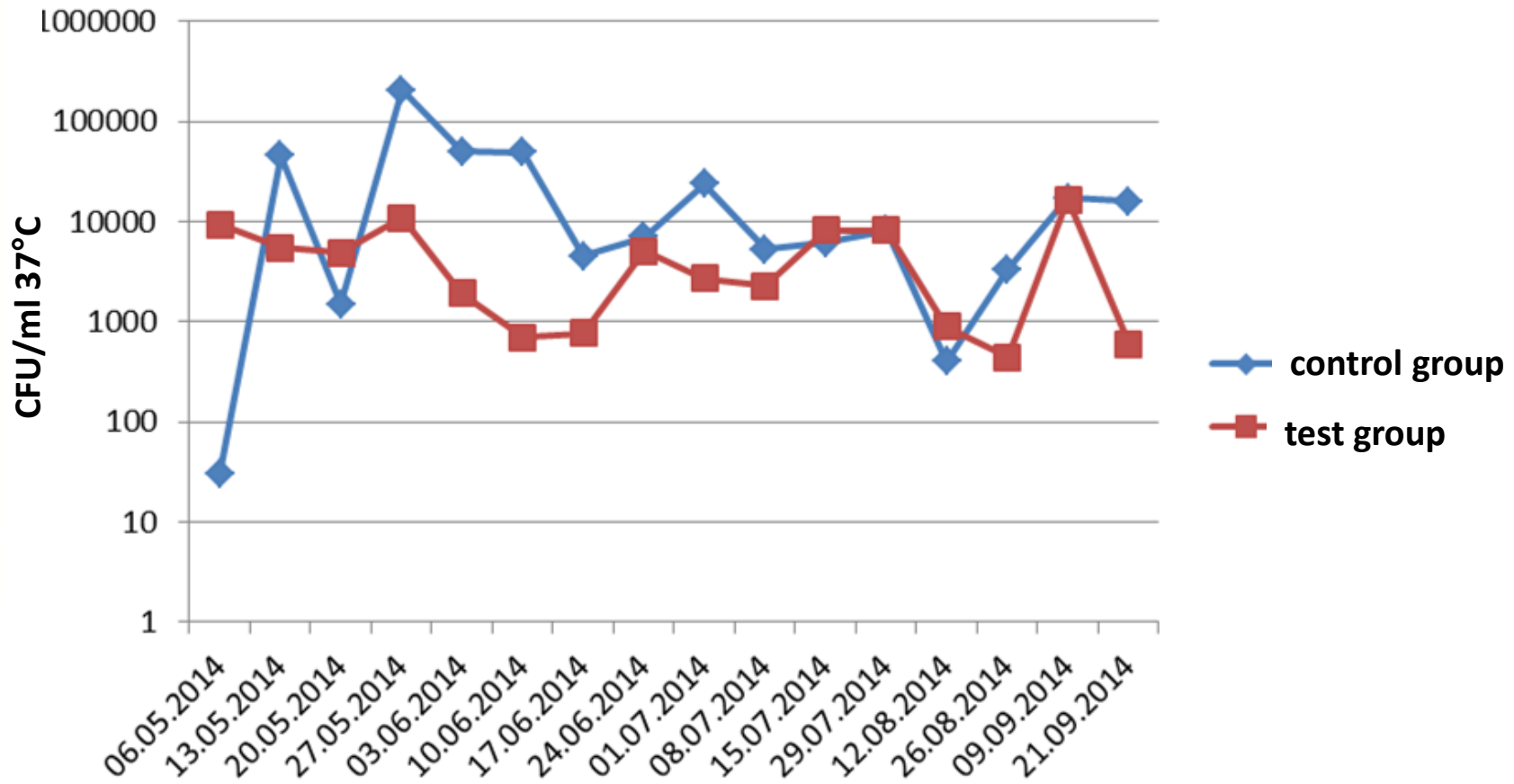
- ⇒ well water with low bacteria loads
- ⇒ high bacteria loads in the water system, increasing from pipe beginning to pipe end
- ⇒ a trend of reduction was observed for total bacterial counts (partly significant) in treated water



Total bacteria counts, beginning of water line, 2nd period



Total bacteria counts, end of water line, 2nd period



Signed rank test by means of differences between total bacteria counts

Fattening period	Sampling point	p-value
1	beginning of pipe	0.01
1	end of pipe	0.60
2	beginning of pipe	0.08
2	end of pipe	0.03

Animal health and performance

⇒ no significant effects of physical water treatment



Conclusion

⇒ electromagnetic treatment of water may reduce the number of total bacteria in drinking water

⇒ the system failed to reach the recommended water quality for farm animals

Stiftung Tierärztliche Hochschule Hannover
University of Veterinary Medicine Hannover, Foundation



Thanks for your attention!

