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MICROBIOLOGICAL AIR CONTAMINATION IN INTENSIVE POULTRY BREEDING

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Introduction

Today supplying of human population with chicken meat is mostly realized with intensive poultry fattening. That form of fattenig include housing of big aglomeration with density of 15-20 chicken in 1 m^2 of closed space (poultry farm). Fattening lasts between 6 and 8 weeks. During the fattening period, one day old chicken achive average body weight of approximatively 2 kg (Supic et al., 2000.). For one kilogram growth chicken eat between 1.7 to 1.9 kg of mixture.

This intensive production can be achived by useing selection obtained hybrids, good feeding and housing in optimal conditions (Nemanic and Beric, 1995.).

Demanding conditions of housing in poultry fattening are ensured by sophisticated equipment and devices.

Conditions evaluation in fattenig poultry practice is argumented by numerous factors, on of them being air quality in chichen housing. In this particular case air quality is described with regard to the appearance of bacteria and moulds in microclimatic complex of chichen housing.

Material and methods

Basic microclimatic complex indicators of bacteria and moulds in air of fattening poultry housing were analized according to standard way in the zoohygienic practice. The following was included in the process:

parameters	**method**
air temperature (tz° C) relative air humidity (rv %) air velocity at biozone (w m/s)	Testo 400 (Testo GmbH &Co. Lenzkirch, Germany)
content of CO_2 in air (vol %) content of NH_3 in air (ppm).	Multivarn II Dräger (Drägerwerk Ag Lübeck, Germany)
content of bacteria in air (n/m^3). content of moulds in air (n/m^3)	Merck Mas 100 (Merck,KgaA,Darmstdat, Germany,

Grown bacteria and moulds were counted by optical counter, subsequently obtained results were correcled by the enclosed table and mathematical equation (Anonimous, 1998.).

The most frequently represented colonies were inoculated on a selective medium, afterwards they were identificated by Gram colouring and with API method (Analytical Profile Indeks). Moulds were identificated by native preparation.

Ross 308 hybrid line chichen were housing on sawdust litter floor with dencity of 20 chicken on 1m^2 . Food, customary for fattenig category, was supplied by hanging feeders, and water by automatic watering throughs. Space was warmed by «artificial clucking hen» during the first few days, and later by termogens. Lightening was natural and artificial, during the first few days, 3,0 W/m^2 and at the end of fattening 1,0 W/m^2.

Results

Table 1. Microclimate complex parameters in fattening poultry housing

parameters	first week of fattening				third week of fattening				fifth week of fattening			
	x	SD	min.	max.	x	SD	min.	max.	x	SD	Min.	max.
tz (°C)	25.5	0.4	25.0	26.0	22.0	0.36	21.4	22.5	20.9	0.27	20.6	21.3
rv (%)	39.9	5.0	35.2	46.2	40.8	1.91	39.0	44.0	57.0	3.88	53.4	64.4
w (m/s)	0.04	0.02	0.01	0.07	0.05	0.02	0.02	0.09	0.08	0.06	0.01	0.18
CO_2 (vol %)	0.17	0.02	0.15	0.19	0.13	0.03	0.10	0.18	0.13	0.01	0.13	0.16
NH_3 (ppm)	0	0	0	0	8.2	4.1	3	13	12.9	1.77	11	15
UBB (n*/m^3)	2998.3	66.9	2905	3047	2713.7	75.4	2628	2770	5401.3	133.7	5256	5533
UBP (n*/m^3)	98	32.9	65	142	39.5	19.2	20	65	300.5	15.9	280	318

(n* = x 1000)
UBB – total number of bacteria
UBP – total number of moulds

Discussion and conclusion

Air of poultry house is burdened with different particles, bioaerosol and volatile organic compounds. Sources of these pollutants are animals themselves, food, whereas in poultry specialy significance is flaces on litter quality and material used for litter.

Bacteria and moulds presence in the chicken housing air is natural phenomenon and their concentracion in the first place points at hygienic status of the housing, its technical character and infrastructure menagement, as wele as its equipment for microclimate condition. As it can by seen from te table, during the first fatteningin week it was determined 2998,3 CFU/m^3 air, with dominating bacteria being of the genus *Serratia (Serratia ficaria, Serratia odorifera, Serratia plymuthica, Serratia amarcescens*), also were determined *Pseudomonas sp., Pantoea sp.* and *Micrococcus sp.* Number of fungus and moulds was 98 CFU/m^3, with dominating yeasts and *Mucor sp.* In the thiard fattening week in the air was 2713,7 CFU/m^3 air, with dominating were *E. coli, Pseudomonas sp., Klebsiella sp., Micrococcus sp.* and *Serratia plymuthica.* Number of fungus and moulds was 39 CFU/m^3, with dominating *Aspergillus flaviceps* and *Rhizopus sp.* In the fifth fattening week it was determined 5401,3 CFU/m^3 of air and the following genera were found *E. coli, Pantoea sp., Serratia plymuthica, Serratia amarcescens.* Number of fungus was 300,5 CFU/m^3, and only yeasts were determined. Air contaminationhas been increased simultaneously with fattennig duration which corresponds to researches (Clark and Rilander, 1983., Mc Quitty et al., 1985., Seedorf et al., 1998.).

Other microclimatic parameters were mostly in allowed limits except relative air humidity and air velocity which were below allowed limit.

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