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THE EFFECT OF AN MAGNETIC FIELD ON THE CHICKEN HATCHING

Ladislav VETERÁNY, Jaroslav JEDLIČKA
Slovak University of Agriculture, Nitra, Slovak Republik

Summary

In the work the influence of magnetic field with the intensity 0,04 T on hatching of ROSS 208 chicken was observed. In the eggs were influenced by magnetic field during their incubation. The hatchability in experimental groups decreased to 78,34 ± 1,88 % and 81,82 ± 2,06 %. The difference was relevant (P< 0,01). The negative influence of magnetic field was manifested by lower weight of the hatched eggs in experimental groups (36,67 ± 0,91 g and 38,89 ± 1,51 g).

Keywords: chickens, hatching, magnetic field

Introduction

Magnetic field is a permanent component of the living enviroment of animals. It can be divided into a permanent magnetic field and a temporary one (Bearly, 1992). Every animal cell consist of molecules. When a cell is placed into a magnetic field, all molecules get magnetised (Tanokura and Suzuki, 1999). According to some sources, live organisms respond to a magnetic field because they contain the magnesite as a specific form of the iron (Mack et al., 2000). Stocker and van Gunsteren (2000) claim that animal cells create changing electric fields as part of their living processes, which then influence the creation of a temporary magnetic field of the cells. Neher (1982) proved that the application of a magnetic field to the animal cells results in the changes of permeability of cell membranes, the increase of thrombotisation and to on. The aim of our work is to determine the influence of a temporary magnetic field on the chicken hatching of hybrid ROSS 208.

Material andmethods

In the experiment, the egg set of 480 eggs of the ROSS 208 meat hybrid aged 45 – 60 weeks was used. The eggs were divided according to their weight into two groups. In the first control and experimental groups the eggs weighing 56 – 60 g were included, while in the second control and experimental groups, the eggs weighing 61 – 65 g. The eggs included into control groups were not exposed to any magnetic field with the induction of 0,04 T during incubation.
In the work we were trying to determine the influence of a magnetic field on the chicken hatching during incubation. The eggs were hatched in the BIOS MONO 06 hatcheries. The magnetic field was applied to the chicken embryos 10 minutes daily during their whole incubation time. The following indicators were monitored during the incubation: the beginning of beakclapping, the beakclapping time, the hatching time, hatchability and the weight of the hatched chickens.
The results are based on the four consecutive experiments. They served as a basis for the calculation of the basic variance statistical indicators. The arrived at differences were tested by the Student T-test.

Results and discussion

The evaluation of the monitored indicators (beginning of beakclapping, beakclapping time and hatching time) showing the influence of a temporary magnetic field applied to the eggs during their incubation did not reveal any greater differences between control and experimental groups. These results do not correspond with the findings of Veterány et al. (1998). In the experimental groups which chicken embryos exposed to a temporary magnetic field, a higher embryonic mortality was recorded and, as a consequence of this also a decrease in hatchability (78,34 ± 1,88 % or 81,82 ± 2,06 %). In comparison with the hatchability in control groups (89,83 ± 2,03 % and 92,18 ± 3,61 % respectively), the differences can evaluated as evident (P<0,01). Pan (1996) achieved similar results also. The application of an ultrasound during the incubation of chicken embryos also significantly decreased their hatchability (Veterány et al., 2000). More over, we think that the magnetic field slows down, among other things, the blood flow. This was also confirmed by Holan et al. (1982). The slowing down of blood flow belongs to the rheological factors causing the origin of the thrombosis (Vašků et al. 1984). According to Ganong (1993) the slowing down of the blood flow in the veins can cause the concentration of blood clots, which are not washed off fast enough and consequently, may result in the formation of the thrombosis. In our experiment we recorded an increase in the occurrence of thromboses in the heart of almost all fallen chickens. This could be related with the embolism of a great blood circulation (Boda, Surynek et al., 1990). Neher (1982) arrived at similar conclusions. The chickens hatched in the experimental groups had lower weight (36,67 ± 0,91 g and 38,89 ± 1,51 g respectively), the chickens hatched in the control groups had higher weight (41,31 ± 1,03 g and 43,14 ± 1,97 g respectively). Garcia Perez et al. (1999) claim that magnetic field makes possible the transfer of the electric charge in the organism and thus influence the metabolism. Our conclusions correspond with the conclusions of Varga and Oblyvač (1979), who prove that the decrease in body weight is one of the effects on a live organism which have been throughly discused.

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DETECTION OF ENTEROTOXIGENIC *STAPHYLOCOCCUS AUREUS* BY IMMUNOCHEMICAL METHODS AND BY THE POLYMERASE CHAIN REACTION

Beáta HOLEĆKOVÁ, [1]Emil HOLODA, Marián FOTTA, Viera KALINÁĆOVÁ, Július GONDOĽ, [2] Jana FEDERIČOVÁ [1], Sandra ANDRAŠKOVÁ

Research Institute of Veterinary Medicine, Hlinkova 1/A, 040 01 Košice, Slovak republic
[1]University of Veterinary Medicine, Komenského 73, 040 01 Košice, Slovak republic
[2]State Veterinary Institute, Hlinkova 1/B, 040 01 Košice, Slovak republic

Staphylococcus aureus, staphylococcal enterotoxin, immunoprecipitation, Western blot, RIA, PCR, *sea, seb*

Summary

Staphylococcus aureus has been one of the most important microorganisms responsible for food borne disease. Food-associated intoxications are commonly mediated by heat-stable staphylococcal enterotoxins (SEs).The production of staphylococcal enterotoxin A (SEA) and B (SEB) in reference strains of *S. aureus* and in 40 *S. aureus* isolates was examined by immunochemical methods such as Ouchterlony immunoprecipitation, Western blot and RIA method. The presence of *sea* and *seb* genes have been tested by polymerase chain reaction. Minimal detection limit was established as 50 pg/50µl of reaction mixture to detect *sea* and *seb* genes by PCR. In reference *S. aureus* strains, PCR results were identical with SEs production. In *S. aureus* isolates, *sea* gene was detected in 8 (20%) out of 40 ones. In this 8 *S. aureus* isolates SEA production was proved either alone or with SEB. Gene *seb* was confirmed in 17 (42,5%) *S. aureus* isolates producing SEB or combination of SEB with SEA

Introduction

Staphylococcal enterotoxins (SEs) (MW 27 900-29 600) are exotoxins of *Staphylococcus aureus* and of some other types of staphylococci. Along with toxic shock syndrome toxin (TSST-1), exfoliative toxins (ETs), hemolysins and other extracellular proteins, SEs contribute to pathogenicity and virulence of the above microorganisms. SEs cause foodborne diseases (food poisoning) - i.e. afebrile alimentary enterotoxicoses with short incubation time (2-6h) and concomitant symptoms which include nausea, emesis and diarrhoea. It has been proved that SEs may participate in the toxic shock syndrome (TSS) cases (Munson et al., 1998) and play an important role in the pathogenesis of a number of infectious, inflammatory and autoimmune diseases in humans (nonfoodborne diseases) and animals. In animals mastitis in cattle and sheep are of the great importance.
The aim of the present study was to examine the production of staphylococcal enterotoxin A and B in 40 *S. aureus* field isolates by three diffeent immunochemical methods
and to detect *sea* and *seb* genes by PCR.