SHORT COMMUNICATION

THE UTILIZATION OF AN ELECTRONIC SOUND GENERATOR WITH VARIED PLACEMENT OF LOUDSPEAKERS IN A HATCHERY ON THE SHAVER STARCROSS 288 HYBRID HATCHING STIMULATION*

L. Veterány[1], S. Hluchý[2], J. Weis[2]

[1] *Slovak University of Agriculture, Faculty of Economics and Management, Nitra, Slovak Republic*

[2] *Slovak University of Agriculture, Faculty of Agronomy, Nitra, Slovak Republic*

This work deals with the influence of an artificial sound stimulation on the Shaver Starcross 288 hybrid chicken embryo by an electronic sound generator. In the experiments, the loudspeakers with amplitude of power 1250 mV and time 380 ms were placed into hatcheries on the 19th day of incubation. The set eggs of weight 58.00 ± 0.50 g were incubated there. In the first hatchery (the control group) no loudspeaker was used. In the second hatchery (the first experimental group) a loudspeaker was placed asymmetrically at the side of a hatchery. In the third hatchery (the second experimental group) a loudspeaker was placed symmetrically in the centre of a hatchery. Using the sound stimulation on chicken embryo, the best results were obtained in the first experimental group: the beginning of beakclapping was 489.10 ± 6.49 hours, the whole group beakclapping time was 10.70 ± 1.63 hours and the whole group hatching time was 499.60 ± 7.47 hours. In the experimental groups the beginning of beakclapping and the whole group beakclapping time showing thus significant difference of results ($P \leq 0.05$), when compared with the control group in which the results were as follows: beginning of beakclapping in 500.00 ± 1.30 hours and the whole group beakclapping time was 14.00 ± 0.89 hours.

hatching; sound stimulation; chicken

* These investigations were financially supported by the grant Vega no. 1/5128/98/09.

INTRODUCTION

The question of the utilization of a sound stimulation on birds hatching was discussed by several authors (Glazev, 1990; Impekoven, 1971; Vince, Toosey, 1980; Veterány, Hluchý, 1997; Veterány et al., 1998). While most authors used for a sound stimulation a tape recorder with recorded sound of a hen or chicken in their experiments, we stimulated hatching by an artificial sound from an electronic sound generator produced on request to suit our demands by Belančík Company.

MATERIAL AND METHOD

In the experiments the Shaver Starcross 288 hybrid set eggs from the parental breed aged 37–45 weeks were used. The average weight of the set eggs was 58.00 ± 0.50 g. The set eggs were hatched in three hatcheries of BIOS MONO 06 type. In the first hatchery (the control group) the set eggs were not sound stimulated. To the other two hatcheries loudspeakers producing sound of an acoustic transducer with amplitude of power 1250 mV and time 380 ms were placed on the 19th day of incubation. In the second hatchery (the first experimental group) a loudspeaker was placed asymmetrically at the side of the hatchery; in the third hatchery (the second experimental group) a loudspeaker was symmetrically in the centre of the hatchery. During hatching, the following traits were observed in 30-minute intervals: the beginning of beakclapping, the whole group beakclapping time, the whole group hatching time, and embryonic mortality (after the 19th day of incubation). The final results, showed in Tab. I, were arrived at in five successive experiments from which the basic variation statistic traits were calculated. The results were tested by two-factor diffusion analysis, *F*-test and Sheffe's test.

RESULTS AND DISCUSSION

Chicken began to beakclap first in 489.10 ± 6.49 hour of incubation in the first experimental group, it means in the hatchery with a sound source placed asymmetrically. The similar whole group beakclapping time was observed in the second experimental group (10.80 ± 0.51 hours), and in the first experimental group (10.70 ± 1.63 hours). The results gained for the beginning of beakclapping and the whole group beakclapping time were statistically significant ($P \leq 0.05$) in comparison with the same traits in the control group. Unequivocally, the best whole group hatching time was obtained in the group with an asymmetrically placed loudspeaker in the hatchery: chicken were hatched after 499.60 ± 7.47 hours of incubation (Tab. I). The longest time of

I. Summarized results of the trial

Indicators	Units	Control group	1st experimental group	2nd experimental group
		$\bar{x} \pm s$	$\bar{x} \pm s$	$\bar{x} \pm s$
Amount of incubated eggs	pieces	19.80 ± 1.83	19.80 ± 1.83	19.80 ± 1.83
Beginning of beakclapping	hours	500.00 ± 1.30	489.10 ± 6.49	495.10 ± 1.53
Whole group beakclapping time	hours	14.00 ± 0.89	10.70 ± 1.63	10.80 ± 0.51
Hatching time	hours	512.00 ± 5.09	499.60 ± 7.47	505.90 ± 1.62
Embryonic mortability	%	1.33 ± 2.67	1.11 ± 2.22	1.11 ± 2.22

$P \leq 0.05$

beginning of beakclapping (500.00 ± 1.30 hours), the longest whole group beakclapping time (14.00 ± 0.89 hours) and the longest whole group hatching time (512.00 ± 5.09 hours) were observed in the control group which was not stimulated by a sound. From the results of the experiments follows that an artificial sound stimulation did not have any significant influence on the hatching of insufficiently developed chicken. Comparing varied placement of loudspeakers in a hatchery, better results were obtained when a loudspeaker was placed asymmetrically at the side of a hatchery which is confirmed also by findings of Veterány, Hluchý (1997) and Veterány et al. (1998).

REFERENCES

GLAZEV, A.: Akustičeskaja stimuljacija rozvitija embryonov kur. Pticevodstvo, *9*, 1990: 11–13.

IMPEKOVEN, M.: Prenatal experience of parental oalls and pecking in the lauging gull. Anim. Behaviour, *19*, 1971: 475–480.

VINCE, M. A. – TOOSEY, F. M.: Posthatching effects of repeated prehatching stimulation with an alien sound. Behaviour, *72*, 1980: 65–76.

VETERÁNY, L. – HLUCHÝ, S.: Vplyv umelej zvukovej stimulácie na liahnutie kurčiat z násadových vajec s rôznou hmotnosťou /amplitúda 625 mV, frekvencia 176 ms/ (The influence of artificial sound stimulation on hatching of chickens from hatching eggs of various weight /amplitude 625 mV, frequency 176 ms/). In: Zbor. z vedeckého seminára k aktuálnym problémom riešeným v poľnohospodárstve, Nitra, 1997: 78–81.

VETERÁNY, L. – HLUCHÝ, S. – WEIS, J.: Vplyv umelej zvukovej stimulácie na liahnutie kurčiat (The influence effect of artificial sound stimulation on chicken hatching). Czech J. Anim. Sci., *43*, 1998: 177–179.

Received for publication on June 18, 1998

VETERÁNY, L. – HLUCHÝ, S. – WEIS, J. (Slovenská poľnohospodárska univerzita, Nitra, Slovenská republika):

Využitie elektronického generátora zvuku s rôznym umiestnením reproduktorov v liahni na stimuláciu liahnutia kurčiat hybrida Shaver Starcross 288.

Scientia Agric. Bohem., 29, 1998: 157–160.

Sledovali sme vplyv umelej zvukovej stimulácie z elektronického generátora zvuku na liahnutie embryí kurčiat plemena Shaver Starcross 288. V pokuse boli reproduktory s amplitúdou výkonu 1 250 mV a časom 380 ms umiestnené na 19. deň inkubácie do liahní, kde boli liahnuté násadové vajcia s priemernou hmotnosťou 58,00 ± 0,50 g. V prvej liahni (kontrolná skupina) sme nepoužili zvukovú stimuláciu. V druhej liahni (prvá pokusná skupina) bol reproduktor umiestnený asymetricky pri okraji liahne. V tretej liahni (druhá pokusná skupina) bol reproduktor umiestnený symetricky v jej strede. Pri použití umelej zvukovej stimulácie sme najlepšie výsledky pozorovali pri prvej pokusnej skupine, kde sa kurčatá začali kľuvať po 489,10 ± 6,49 hodinách inkubácie, vykľuvanie celej skupiny kurčiat trvalo 10,70 ± 1,63 hodín a celá skupina kurčiat sa vyliahla za 499,60 ± 7,47 hodín inkubácie. V pokusných skupinách boli začiatok kľuvania a čas vykľuvania celej skupiny kurčiat preukazne ($P \leq 0,05$) rozdielne oproti kontrolnej skupine, kde bol začiatok kľuvania po 500,00 ± 1,30 hodinách inkubácie a vykľuvanie celej skupiny kurčiat trvalo 14,00 ± 0,89 hodín.

liahnutie; zvuková stimulácia; kurča

Contact Address:

Ing. Ladislav Veteráný, PhD., Slovenská poľnohospodárska univerzita, Katedra pedagogiky a psychológie, Akademická 2, 949 01 Nitra, Slovenská republika, tel.: 087/367 49