EGG PRODUCTION AND HATCHEBILITY OF GEESE KEPT UNDER WARM AND TEMPERATE CONDITIONS

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Introduction

The traditional goose-breeding was established in Europe and the pedigree stocks of tropical countries came from European countries. The great problem of these countries is to assure the appropriate egg production and fertility of the goose eggs.

The tropical environment has negative effect on the egg production, fertility and other egg parameters. The documented effects of heat stress on the performance of some kinds of domesticated birds are decreases in number of eggs (Miller and Sunde, 1975; Petersen et al., 1976), egg weight (Kohne and Jones, 1975.), shell thickness (de Andrade et al.,1977; Voght, 1981.) and shell fragility (Mongin, 1968; Voght, 1981.). From the work of Jack and Reviers (1979), Avanzi and Mori (1983) we can obtain informations about decreases in fertility and hatchebility of domesticated birds kept under hot climate. In consequence of the aforesaid we began to study the prolification of geese under hot conditions.

Materials and methods

The examination was carried out with two years old Landes geese. The birds were separated into three groups. Thirty geese (40:10) were placed in each group. One group was kept in temperate ambiente (26-30°C) and the other two groups produced in warm ambiente (26-30 °C). The illumination period (12 hours), relative humidity (65-75 %), feeding and keeping methods were the same in every groups. We applied synchronization with darking treatment described by Bögre (1981).

Results

Egg production:

After the synchronization, the groups kept under heated rooms began the egg production two weeks earlier and reached the maximum rate three weeks earlier than the control group. The sexual activity of the gonads might begin earlier by the effect of high temperature.

The egg production period was elongated both under warm and temperate conditions (Table 1) presumably by the effect of 12 hours' illumination time (see: Sauveur, 1982.).

The hot environment did not alter, reduce the egg number layed by one laying goose, as it was expected from the literature. The geese layed 43 eggs in the heated rooms, too (Table 1).

We can characterize the egg production not only with the production period and the total egg production but with the intensity of production, too. At the time of maximum production the geese are capable of only 50 % egg production. Since the production period was elongated and the total egg production did not increase, so we could conclude that the

intensity of egg production diminished. The maximum rate of this intensity was 35-40 % independently of room temperature.

Characterization of the layed eggs:

There is a close correlation between the egg size and the goosling size. Therefore it was important to pay attention to the effect of hot climate on the size of goose egg. The eggs received from the heated rooms were smaller than the eggs of control birds, but the difference was not significant (Table 1).

The hot environment had a great effect on the egg shape and shell thickness, too. The cross-section of egg decreased and the egg length increased by the influence of high air temperature. The egg index expresses the ratio of the egg length and the egg diameter. The optimal index of goose egg for the incubation is 1.36-1.65 (Bogenfürst, 1987.). A close correlation was found between the egg index and the air temperature ($r = 0.734$, $P \leq 0.01$).

The shell thickness was decreased (Table 1) by the influence of hot environment in the case of Landes goose, too ($r = -0.555$, $P \leq 0.001$).

In the heated rooms the shell strength was worse than in the control, temperate room (Table 1). This diminution was considerable ($P = 0.001$ %) and it had a close correlation with the shell thickness ($r = 0.704$).

From the data of fertility we can estimate the sexual activity and the function of reproductive tract of goose (both the gander and the laying goose). The high ambiental temperature did not reduce the fertility of goose egg as it was expected from the publications (Table 1).

The date of incubation show that we cannot draw a definite conclusion about the influence of high temperature to the hatchebility (Table 1).

Table 1 Effect of high temperature on egg production, egg quality, hatchability of geese

	Groups		
	Control	Treated	
Average room temperature °C	15.1	28.3	28.4
Egg production (eggs/layer)	42.3	43.7	43.7
Egg weight (g)	173.10±12.55	170.22±7.25	172.36±8.68
Egg index	1.69±0.03	1.79±0.03***	1.79±0.04***
Egg shell thickness (mm)	0.620±0.057	0.533±0.054***	0.534±0.051***
Shell strength (kp)	8819.6±1294	7520.3±1084***	6603.8±1128***

Level of significance, comparing to the control: ***: $P \leq 0.001$

Resumé

La production et la couvaison des oeufs des oies tenues aux embiance chaude et tempérées.

On a fait cette étude comparative avec les oies Landes tenues dans les salles chauffées et non chauffées. (Dans l'experience la duée de l'éclairement a été 12 heures.) Sous l'action de la chaleur les oies ont commencé la production des oeufs et touché la période de la production intensive plus tôt que les oies du groupe contrôle. La durée de la période de la production des oeufs et la quantité des oeufs (43 oeufs/oie) ont été les mémes dans tous les groupes. La fécondité a augmenté á l'embiance chaude. La masse des oeufs n'a pas diminué significativement, mais la forme des oeufs, l'épaisseur et la solidité de la coquille ont changé significativement á cause de la chaleur.

Zusammenfassung

Die legeproduktion und Brütungsmöglichkeiten der Gans, bei heissem und gemässigter Umwelt.

Vergleich der Untersuchungen gehaltende Landeser Gänse in geheizten, ungeheizten Ráumen, beendigte der Verfasser. (Die Beleuchtung dauerte 12 stunden.). Die wirkung bei hoher Tempe ratur zeigte sich, mit dem früheren legen und der schnellen, erreichten intensiven legeproduktion aus. Die Persistenslange (22-24 Wochen) und die legeproduktion (43 Eier/Legegans) war ähnlich bei allen Gruppen. Die Fruchtbarkeit verbesserte sich bei hoher Temperatur. Das Eimass verminderte sich nicht signifikant, wo die Eiform, die Schalendicke und die Schalen stärke in warmer Umwelt sich signifikant veränderte.

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