

THE EFFECT OF DIFFERENT EGG SET WEIGHT ON CHICKEN HATCHING

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Summary

The influence of varied egg set weight of the Hampshire breed and ROSS 208 hybrid on the chicken eggs of medium weight on hatching was examined in the work. The highest hatchability ($89,67 \pm 6,79$ % and $89,07 \pm 8,53$ %) was recorded for the ($60,0 \pm 0,5$ g and $58,0 \pm 0,5$ g respectively). The highest embryonic mortality was observed close to the end of incubation. The highest egg set weight losses during incubation were recorded for the Hampshire breed hatching eggs with weight $58,0 \pm 0,5$ g ($30,47 \pm 0,92$ %) and for the ROSS 208 hatching eggs with weight $60,0 \pm 0,5$ g ($29,27 \pm 0,81$ %). The highest weight of hatched chicks ($43,89 \pm 3,15$ g and $42,85 \pm 3,23$ g) was recorded for the highest weight egg set ($63,0 \pm 0,5$ g and $61,0 \pm 0,5$ g respectively). The weight of hatched chickens fell between 65 – 72 % of the egg set weight.

Keywords: weight; embryonic mortality ; egg weight losses ; hatchability

Introduction

The fowl egg is a large and at the same time very complicated cell serving the reproduction purposes. The egg weight is directly proportional to the hen body weights. According to Arafa et al. (1982), the egg reaches its typical weight 3 months after the laying. Asuwou and Okon (1993) observed that the egg set weight had an evident influence on the hatchability. The highest hatchability is achieved from the medium size eggs (Wilson 1991). The weight of the hatched chicken is primarily determined by the weight of the egg and regularly represents 62 – 70 % of the egg set weight. Secondary, it is determined by the egg weight losses occurring during hatching, the hatching time, the age of the layer as well as the chicken sex (Wilson and Harms, 1988). Končková and Baumgartner (1990) examined the relationship between the weight of embryos and the egg set weight. No dependence was observed between the weight of the monitored embryos on the 8th, 13th and 15th day of incubation and the egg set size. Shamawany (1984) proved that there was a positive relationship between the egg set weight of embryos from the 18th day of hatching on as well as the weight of the hatched chicks. The aim of our work was to determine the influence of the egg set weight of the Hampshire breed and ROSS 208 meat hybrid on the hatching of chicks.

Material and methods

The Hampshire breed egg set with weight $55,0 \pm 0,5$ g, $58,0 \pm 0,5$ g and $61,0 \pm 0,5$ g as well as the ROSS 208 hybrid egg set with weight $57,0 \pm 0,5$ g, $60,0 \pm 0,5$ g and $63,0 \pm 0,5$ g from parental brood aged 30 – 48 weeks were used in the experiment. The egg set were hatched in BIOS MIDI hatcheries at $37,5 - 38,2$ °C. Relative air humidity in the hatcheries was between 55 – 60 % (first 18 days of incubation) and 65 – 90 % (final 3 incubation days). Before the eggs were set to the hatcheries, they were stored at $8 - 10$ °C temperature and 55 – 70 % relative air humidity for a week. The following indicator were observed during the hatching process: egg weight losses, embryonic mortality, hatchability from eggs placed to the hatcheries, and the weight of hatched chicks.

The results given in the tables were arrived at from our 4 successive repeating.

Results and discussion

In the experiment, the influence of the Hampshire breed and the ROSS 208 egg set weight on hatching was examined. The highest losses in weight were recorded for the Hampshire breed egg set with weight $58,0 \pm 0,5$ g. The losses reached $30,47 \pm 0,92$ %. High losses occurred also during the incubation of the $60,0 \pm 0,5$ g ROSS 208 hybrid egg set ($29,27 \pm 0,81$ %). On the contrary, the lowest egg set weight losses ($25,03 \pm 1,21$ %) for the Hampshire were recorded during the incubation of the $55,0 \pm 0,5$ g egg weight set. The lowest losses in weight for the ROSS 208 hybrid ($25,53 \pm 1,45$ %) were recorded during the incubation of the $57,0 \pm 0,5$ g weight set. During the incubation, the lowest losses were recorded in the period between the 7th and 14th incubation day. Our experiment showed higher than 20 % weight losses, which does not correspond with the findings of Bolla (1990). Higher weight losses are probably a result of a longer storage time (Noda et al. 1997) as well as a worse quality of the egg set (Whitehead et al. 1993). The weight of hatched chicks was directly proportional to the weight of egg set, which corresponds with the findings of Wilson and Harms (1988). The lower average chicken weight achieved from the $58,0 \pm 0,5$ g egg set, in the case of the Hampshire breed, and from the $60,0 \pm 0,5$ g egg set, in the case of the ROSS 208 can be seen as a result of the fact that in these groups there were more eggs from the 48th week of age of the layer, with an increased share of the white and shell (Burley and Vadehra 1989). In our experiment, the weight of hatched chicks reached 65 – 72 % of the egg set weight, which is also confirmed by (Wilson 1991). The lowest hatchability of the Hampshire

breed was recorded for the $61,0 \pm 0,5$ g egg set weight (the hatchability from the eggs placed to the hatchery reached $84,93 \pm 7,33$ %). In the case of the ROSS 208 hybrid the lowest hatchability ($86,48 \pm 5,68$ %) was recorded for the $63,0 \pm 0,5$ g weight egg set. On the contrary, the Hampshire breed reached the highest hatchability ($89,07 \pm 8,53$ %) from the $58,0 \pm 0,5$ g weight egg set, and the ROSS 208 reached its highest hatchability ($89,67 \pm 6,79$ %) from the $60,0 \pm 0,5$ g weight egg set. Our result correspond with the result of Polyanichkin and Vorokova (1992). Ausqou and Okon (1993) recorded their highest hatchability also from the medium size egg set. The highest embryonic mortality was observed during hatching ($9,28 \pm 3,81$ % for the Hampshire and $6,99 \pm 4,63$ % for the ROSS 208). This is confirmed also by the findings of Reddy et al. (1998). Our findings contradict the conclusion of Mindur (1985) who found out that almost 75 % embryonic mortality occurs during the final 3 hatching days. Our results do not correspond with the observations of Whitehead et al. (1988) either, since they claim that the highest embryonic mortality occurs during the first incubation week. The highest fertility of the Hampshire breed egg set ($93,14 \pm 3,28$ %) and the ROSS 208 hybrid egg set ($95,31 \pm 3,79$ %) was recorded for the $58,0 \pm 0,5$ g and $60,0 \pm 0,5$ g weight egg sets respectively. This does not correspond with the results arrived at by Appleby et al. (1998) either. According to Cunningham (1980), the utility of chickens is influenced more by the fact of belonging to specific breed or hybrid than by the weight of chickens hatched from the egg set with varied weight.

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