

Abstract of the doctoral dissertation of Rafał Zwierzyński, m.sc., entitled:

„The impact of vitamin C and E administered *in ovo* on hatchability and performance indicators in geese”.

Supervisor: dr hab. Ewa Gornowicz

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An innovative application in poultry farming is the use of *in ovo* technology to improve hatching rates, survival of chicks and reared birds, their performance parameters and meat quality. Research and applications primarily focus on crested poultry, with ducks receiving comparatively less attention, and geese given limited consideration. The aim of the study was to determine the effect of *in ovo* injections of different doses of vitamins C (5 and 10 mg) and E (15 and 30 mg) at specific dates of the embryogenesis period (13th and 20th day of incubation) of three selected breeds of geese (White Kołudzka®, Kielecka, and Slovak) derived from the greylag geese (*Anseranser* L.) on the evaluating hatchability, performance, and slaughter value indicators. Vitamins were injected into the air chamber, with each experimental group consisting of 36 eggs (totaling 1512 eggs). The results showed a significant impact ($p \leq 0.05$) of the genetic background of the geese on the formation of the studied parameters related to hatchability, performance indices, and slaughter value. *In ovo* injection of vitamin C at a dosage of 5 mg on the 20th day of incubation and 10 mg on the 13th day significantly improved hatchability rates in White Kołudzka® geese ($p \leq 0.05$). Additionally, a greater number of geese hatched ($p \leq 0.05$) from eggs injected with vitamin E at a dose of 15 mg on the 20th day of incubation. Similarly, more White Kołudzka® goslings ($p \leq 0.05$) hatched from eggs injected with this dosage on the 13th day of incubation. Moreover, *in ovo* injection of vitamin C at a dose of 5 mg on the 20th day of incubation significantly increased the length of wings and reduced the back length of the sternum in White Kołudzka® geese ($p \leq 0.05$). Regarding the evaluation of slaughtering value, it was observed that *in ovo* injection of vitamin C at a dosage of 5 mg on the 13th and 20th days of incubation, and 10 mg on the 20th day, contributed to the improvement ($p \leq 0.05$) of meat content and reduction ($p \leq 0.05$) in the proportion of skin with subcutaneous fat in the goose carcass, particularly in White Kołudzka® geese.

Among the two vitamins studied, vitamin C, especially when injected *in ovo* on the 20th day of incubation, demonstrated greater efficacy in influencing the rearing indicators of geese under study. Conversely, among the examined genetic groups of geese, the White Kołudzka® geese showed the highest susceptibility to changes in the values of the assessed rearing indicators following the *in ovo* injection.

High-producing commercial pedigrees or contemporary lines are the most vulnerable to vitamin C deficiency. Their response to *in ovo* administration of this vitamin is particularly significant.