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Egg Production Is Related to Light Length and Intensity

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Egg production is related to the length and intensity of light the bird receives daily. Light stimulates the anterior pituitary gland through the optic nerve to release FSH (follicle stimulating hormone) and LH (luteinizing hormone). Light energy also penetrates the skull, skin and feathers. FSH increases the growth of ovarian follicles. Upon reaching maturity, the egg is released under the influence of LH (Romanov A., Romanova A., 1959)

There are two stages of regulation of the secretion of follicle-stimulating and luteinizing hormones: fast and slow. In the rapid stage, exocytosis of hormone-containing granules from the cytoplasm of gonadotrophs is stimulated. In the slow stage, the expression of genes encoding these hormones changes

It has been widely accepted that the open period of the ovulatory cycle is a consequence of the synchronization of luteinizing hormone (LH) secretion (Dubocovich ML, 2007; Teubner BJ Freeman DA, 2007), which is driven by neuroendocrine releasing factors controlled by the master circadian clock located in the suprachiasmatic nucleus (SCN) .

With an optimal microclimate, normalized feeding, and lighting conditions, the development and maturation of the egg occurs, as well as the formation and laying of eggs determined by the genome of chickens. The process of egg formation in the body of birds, which is regulated by the central nervous system, is influenced by the neurohormonal activity of the body. Synchronicity in the maturation of follicles, ovulation of the egg - yolk, formation and laying of eggs is to the greatest extent due to the functional activity of the hypothalamus and pituitary gland, ovarian hormones (estrogens, progesterone).

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Egg production depends on feeding conditions, poultry maintenance, and breed (cross). One of the important factors is light. Additional artificial light can lengthen or shorten daylight hours and prolong the egg-laying cycle. In this case, not only hormones act, but also the fact that with longer days, chickens eat more nutrients to produce eggs. Reducing the duration of lighting is used when raising pullets. Light stimulation (usually increasing daylight hours by 1 hour) has a direct effect on the production of sex hormones. The optimal length of the subjective day for chickens is 14 - 16 hours (Golovkina O.O. et al., 2018; Kristensen HH et al, 2007).

As a result of complex neurochemical reactions, the light signal is converted into a nerve impulse. In this process, a huge role is played by the light-sensitive protein - pinopsin (Yashiro Y. et al 1994, Petersen J. et al 1999). Gonadotropin produced in the hypothalamus stimulates the

release of follicle-stimulating and luteinizing hormones and thereby affects the ovaries of chickens. Hormones influence the maturation of the ovaries, the release of eggs and the maintenance of a continuous egg-laying cycle in laying hens (Yurkov V.M., 1985; Yoshikawa T. et al 1998).

Thus, by changing the intensity of lighting, you can influence growth, development and productivity, and influence many organs and systems of the bird's body.

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