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Studying of FSH and LH genes in pituitary gland among some native hens populations

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Abstract

One of the effective factors on egg production and its quality is the profile of hen sex hormones, which affects the cycle and process and, consequently, the laying potential of the chicken. The secretion of sex hormones is controlled by the two pituitary hormones, LH and FSH. Since measuring the concentration of these hormones in body fluids using biological methods is not sensitive and costly, the expression of pituitary gonadotropin genes affecting laying performance in three native chicken populations of Golpayegan, Marandi and Isfahan and Hyline W-36 was studied. They were kept in the same cage system and their feeding and maintenance conditions were the same. Quantitative traits including egg number, egg weight, and laying percentage, average egg weight per month, egg mass production, feed intake and feed conversion ratio were measured and calculated. At the end of the period, five chickens from each group were randomly selected and after slaughter, their liver, ovary and oviduct weights were calculated. At the time of analysis, the pituitary gland was first isolated from the chicken brain and after extracting mRNA from the pituitary gland tissue and preparing specific primers for each gene, the expression of LH and FSH genes was determined using Real time PCR. The data were statistically analyzed using SAS software. The results showed that the Hiline W-36 strain had the highest number of eggs, egg weight, laying percentage; average egg weight per month and egg mass production and Marandi native chicken had the lowest values among the experimental groups. But feed consumption was the highest in the native population of Isfahan and the lowest in the native population of Marandi. Feed conversion ratio was highest in Marandi native population and lowest in Hyline W-36. Body weight and metabolic body weight in Golpayegan and Isfahan native populations were higher than Hyline W-36 strain and Marandi native population. Liver weight in Isfahan native population was higher than other groups, but there was no significant difference in relative liver weight between experimental groups. There was no significant difference in ovarian weight between the experimental groups, but the relative ovarian weight in the Hyline W-36 was higher than Golpayegan native hens. The weight of ovidoct in the Hyline W-36 was higher than the native hen of Golpayegan and the relative weight of ovidoct in the Hyline W-36 was higher than other

experimental groups. LH gene expression was not significantly different among experimental groups, but FSH gene expression was higher in the Hyline W-36 than other groups. A high correlation was seen between FSH gene expression and some function-related traits. Finally, it can be concluded that the difference between the production function of different genetic populations is mainly related to the difference in the expression of FSH gene in their pituitary gland. Therefore, by identifying the metabolic pathways from the gonadotropin gene expression to their effect on the ovaries and controlling the reproductive activities, it is possible to make better decisions to direct breeding programs of native chicken populations.

Key Words: Native hen, Oviposition, Gene expression, Pituitary gland Gonadotropin, Sexual Hormone