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The effects of Chaste-berry fruits on hypothalamic-pituitary-ovarian markers gene expression and immune response of laying hens: Phytoestrogens in Chaste-berry are ERβ-selective

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Abstract

Estrogen consumption in women can increase the risk of breast cancer. Estrogen stimulates the growth of cancer cells through the estrogen receptor alpha (ERα). One of the strategies that has recently been considered is the use of phytoestrogens. Previous studies have shown that Chaste-berry contains high levels of phytoestrogens. Scientists disagree on whether the phytoestrogens in Chaste-berry are used to treat many diseases in women, which are ERα or ERβ selective. In the present study, laying hens were used as a model to find the answer because only alpha estrogen receptor is expressed in the oviduct. In this study, the effect of Chaste-berry fruit powder on performance, egg quality, immune response, and the expression of GnRH, LH, ovalbumin (OVAL), and ovomucoid (OVM) genes in laying hens were evaluated. A total of 90 leghorns (Hy-Line, W-36) laying hens (at 72 to 80 weeks old) were used in a completely randomized design with three treatments and five replicates (n=6). The treatments were various levels of Chaste-berry fruit powder including zero, 1, and 2% levels of Chaste-berry fruit powder per kg of diet. Our results showed that performance parameters, egg quality factors, and immune responses were not significantly affected by various levels of Chaste-berry fruit powder. Moreover, the results indicated that the various levels of Chaste-berry did not have a significant effect on LH, OVAL, and OVM gene expression. However, GnRH gene expression was significantly increased in treatment 3 (a diet containing 2% Chaste-berry) compared to the control and 1% Chaste-berry groups. Moreover, the addition of 1% Chaste-berry fruit powder to the diet had no significant effect on GnRH gene expression. Therefore, Chaste-berry supplementation is not recommended in laying hens. Furthermore, our data reinforce this theory that phytoestrogens in Chaste-berry fruits are ERβ-selective.

Key words: Chaste-berry, Estrogen receptor, Phytoestrogen, Cancer

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