The effects of experimental administration of low doses of zearalenone on the histology of ovaries in pre-pubertal bitches

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Abstract

The experiment involved 30 clinically healthy Beagle bitches aged approximately 70 days with an initial body weight of approximately 8 kg. The animals were randomly divided into two experimental groups (EI and EII) and a control group of 10 animals each. Group EI was administered 50 μg of body weight zearalenone/kg per os for 42 days, group EII received 75 μg of body weight zearalenone/kg per os for 42 days, and the control group was administered placebo per os for 42 days. The bitches were ovariectomized at the end of the treatment period for anatomopathological examination. At the same time, peripheral blood samples were collected for endocrinological analyses (17β-estradiol and progesterone). Administration of zearalenone, particularly higher doses, resulted in the hyperestrogenism degeneration and atrophy of ovarian cells and tissues with accompanying edema and blood extravasation, leading to increased 17β-estradiol concentrations and an insignificant decrease in progesterone levels.

Key words: zearalenone, low dose, bitches, ovary, histology

Introduction

Fungi of the genus Fusarium are the most predominant fungal pathogens in all climate zones. Fusarium fungi produce mycotoxins, including zearalenone (ZEN), a widely distributed substance. ZEN is a non-steroidal estrogenic mycotoxin that regulates the sexual reproduction of Fusarium fungi (sexual stage: Gibberella zeae) (Suchorzyńska and Misiewicz 2009, Panini et al. 2011).

Mycotoxicosis has long been studied in humans and animals. ZEN-induced mycotoxicosis represents a growing problem in farm and companion animals. Dogs, one of the oldest companion animal species, have a monoestral reproductive pattern (Walter et al. 2011). Bitches are often affected by reproductive system dysfunction, such as ovarian cysts, prolonged estrus, or absence of estrus. The species-specific hormonal regulation of reproductive processes (Queiroga et al. 2009), including prolonged proestrus and estrus stages, prolonged progesterone (P₄) and prolactin secretion, and high sensitivity to endogenous and exogenous estrogens, may play an important role in the etiopathogenesis of these dysfunctions (Concan-