

Influence of Conjugated Linoleic Acid on Hormones of Axis of Female Reproduction System Involved in Ovulation Process

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Abstract : Ovulation is a physiologic process with an inflammatory response that depends on a coordinated activity of gonadotropins and steroid hormones, and inflammatory mediators such as cytokines, prostaglandins, leptin, nitric oxide (NO), etc. Conjugated linoleic acid (CLA) is composed of polyunsaturated fatty acids (PUFA) found in dairy products, beef, and lamb. There is strong evidence that dietary CLA affects mediators involved in ovulation. The objective of this study is to evaluate the impacts of various doses of dietary CLA on systemic and local hormones and parameters involved in ovulation. In this case-control research, 80 (50 ± 2-day old) female mice were randomly divided into 4 groups (C as control treatment and T1, T2 and T3 are considered as the treatment groups). There were four replicates in each group, and there were five mice in every replicate (20 mice, in total). The mice in the control group were fed with no CLA in their diet, but the ones in the treatment group received 0.1, 0.3 and 0.5g/kg of CLA (replacing corn oil in the diet), respectively for four months. After that, blood samples were obtained from the tails of animals that displayed estrus signs and estradiol (E2), progesterone (P4), LH, FSH, NO, leptin and TNF α were measured. In addition, the impacts of CLA on the ovarian production of prostaglandins (PGs) and NO were studied. The data were analyzed by SAS software. CLA considerably decreased serum levels of FSH ($p < 0.05$), LH, estradiol, NO, leptin and TNF α ($p < 0.01$). In addition, CLA decreased progesterone levels, but this effect was statistically not significant. The significantly adverse effects of CLA were observed in the ovarian production of PGE2 and PGF2 α ($p < 0.01$). It seems that CLA may play an important role in reducing the ovulation rate in mice as CLA negatively affected female reproduction and it had adverse effects on systemic and local hormones involved in ovulation.

Keywords : conjugated linoleic acid, nitric oxide, ovary, ovulation, prostaglandin, gonadotropin

Conference Title : ICANB 2017 : International Conference on Animal Nutrition and Breeding

Conference Location : Prague, Czechia

Conference Dates : September 04-05, 2017