

บทคัดย่อภาษาอังกฤษ

Growing evidence indicates that the supplemental polyunsaturated fatty acids (PUFAs) may target reproductive tissues to alter reproductive function and fertility in dairy cows. However, there is no direct evidence demonstrating the underlying mechanisms of PUFAs. The aim of the study was to investigate the effects of PUFAs [eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), linolenic acid and linoleic acid] on myometrial contractility arising either spontaneously or agonist stimulation, including prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$), estrogen, oxytocin, and progesterone in non-pregnant and pregnant dairy cows. Myometrial tissues were obtained from slaughtered dairy cows and longitudinal myometrial strips were isolated. The strips were mounted in organ baths for a measurement of contractility and the effects of PUFAs were examined. PUFAs inhibited myometrial contractility in both non-pregnant and pregnant dairy cows. EPA at 10 μ M significantly reduced the amplitude of spontaneous and hormones ($PGF_{2\alpha}$, estrogen and oxytocin)-induced contractions. Interestingly, EPA enhanced relaxing effect on the uterus produced by progesterone. Increased in external calcium concentration did not reverse the effect of the fatty acid. Three other PUFAs also exhibited similar effects compared with EPA. Thus, PUFAs can reduce myometrial contractility in the dairy cows, irrespective of how it is produced, they can also affect the contractility at any stage of reproduction. The underlying mechanism is unlikely to occur due to the inhibition of Ca entry via L-type calcium channels and may not involve PUFAs metabolites since the inhibitor of PUFAs metabolites, eicosatetraenoic acid, could not reverse the inhibitory effects of PUFAs. However, the inhibitory effects of PUFAs were deteriorated when bovine serum albumin was present. Thus, the inhibitory effects of PUFAs may possibly due to an alteration of membrane structure leading to less excitability of the myometrium. In conclusion, PUFAs may be beneficial to prevent early abortion and promote maternal recognition in the dairy cows.

Key words: polyunsaturated fatty acids, myometrium, contractility, dairy cow