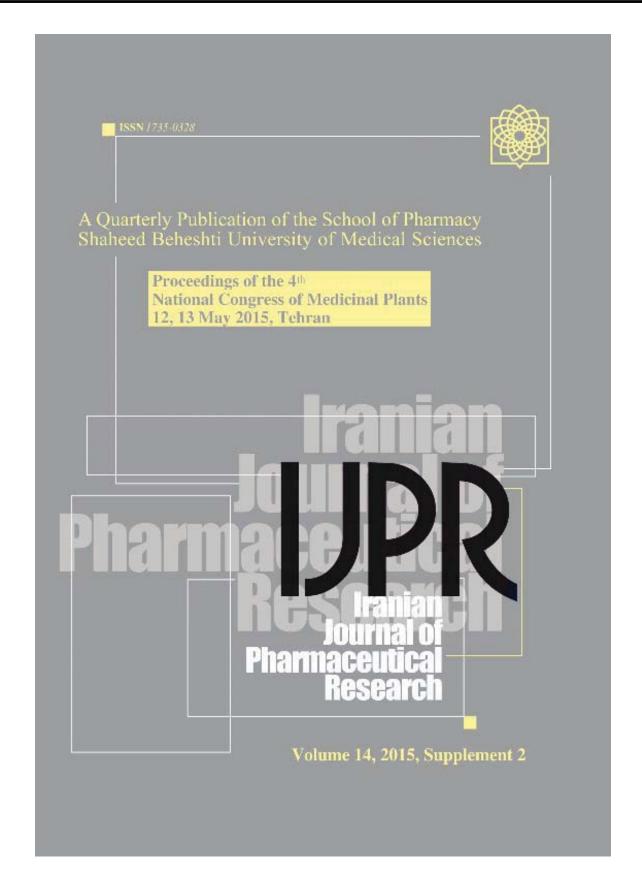


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MEDICINAL PLANT ESSENTIAL OILS REDUCE RUMINAL AND FECAL ESCHERICHIA COLI 0157:H7 POPULATION IN BEEF CATTLE

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Cattle are reservoirs of the pathogenic bacteria E. coli strain O157:H7, and approximately 30% of feedlot cattle shed Escherichia coli O157:H7. Feedlot cattle are fed high grain rations in order to increase feed efficiency. It has been reported that populations of E. coli O157:H7 were higher in grain-fed than in forage-fed cattle, and when cattle were abruptly switched from a high grain diet to an all hay diet, total E. coli populations declined 1000-fold [2]. Therefore, strategies that reduce E. coli O157:H7 prior to slaughter will reduce human exposures to this virulent pathogen. However, a dietary switch to forage in feedlots is not advocated due to feasibility, weight loss and other logistical issues, other feedstuffs rich in phenolics or essential oils (EO) may be a more feasible alternative strategy to decrease E. coli O157:H7 populations [2]. Essential oils are secondary metabolites present in many plants, and data available show a strong bactericidal activity of a number of EO against pathogenic bacteria such as E. coli O157:H7 [1]. Among the EO, thyme (THY) and cinnamon (CIN) oil have attracted considerable attention in several research studies because of their potential antimicrobial activity against ruminal microorganisms [1]. The objective of the present study was to evaluate the effects of THY and CIN on E. coli O157:H7 population in the rumen and feces of feedlot calves fed high-concentrate diets. Sixteen growing Holstein calves (213±17 kg initial BW) were used in a completely randomized design and received their respective dietary treatments for 45 d. Treatments were: 1-control (no additive), 2-THY (5 g/d/calf), 3-CIN (5 g/d/calf) and 4- forage (sudden switch from grain diet to forage diet in the last week of experiment; as positive control). Calves were fed ad libitum diets consisting of 15% forage and 85% concentrate. Ruminal and fecal samples were collected from animals at the end of the experiment. Quantitative detection of E. coli O157:H7 in samples were done using specific primers and real-time PCR method. The relative abundances of E. coli O157:H7 were determined using total bacteria as reference according to the 2 $\Delta\Delta Ct$ method and reported as fold change compared with control. The relative abundances of E. coli 0157:H7 decreased (P<0.05) in the rumen of calves when supplemented with additives. Treatments also decreased E. coli O157:H7 population in the feces of feedlot calves. Results suggest that the medicinal plant EO could potentially be used to control enterohemorragic E.coli colonization in cattle.

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