The Effects of Essential Oils of *Cinnamon*, *Garlic* And *Laurel* on Milk Fatty Acid in Dairy Cows

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INTRODUCTION

There is greater interest in using essential oils as alternative to antibiotics to manipulate ruminal fermentation, to improve feed utilization, productivity and animal product quality. Essential oils have been shown to alter the bacterial growth and metabolism of several types of bacteria, including rumen bacteria (Wallace, 2004) especially in *in vitro* condition. They have ability to inhibit biohydrogenation of PUFA (Lourenço et al., 2008). However limited study is available to evaluate their effectiveness to improve nutrient utilization, productivity and product quality *in vivo*. The study, therefore, was conducted to investigate the effects of cinnamon, garlic and laurel oils on milk fatty acid composition in dairy cows.

MATERIALS AND METHODS

A total of 28 dairy cows having 501 9.12 kg live weight, 25.19 0.73 kg milk yield, 68.1 5.8 DIM, 2.99 0.06 BCS and 2.03 0.19 lactation number were used. Cows were allocated into four experimental groups according to the live weight, milk yield, DIM, lactation number and body condition score. The first group received no essential oil, whereas the second, third and forth group received TMR containing 30ppm garlic oil, 60 ppm cinnamon oil and 90 ppm laurel oil respectively. The doses were determined by in vitro studies investigating the effects of these essential oils on in vitro true digestibility of nutrients of barley, soybean meal and wheat straw. TMR was formulated as isocaloric and isonitrogenic.

RESULTS

The results showed that total omega-3, C18:3:n3 and C17:0 were affected (P<0.05) by treatments and total Omega-3 and C18:3n3 were decreased by essential oil compared to control and garlic oil increased C17:0 level over control and other treatments (Table 1). Neither polyunsaturated nor saturated fatty acids in milk were affected by essential oils.

CONCLUSION

The results revealed that cinnamon, garlic and laurel essential oils did not have the potential to modify and improve fatty acid profile of milk when dairy cows fed with TMR containing 30 ppm garlic, 60 ppm cinnamon and 90 ppm laurel essential oils.

Table 1. Effects of cinnamon, garlic and laurel oils on milk fatty acid composition.

Essential Oils	Control	*Cinnamon* 60 ppm	*Garlic* 30 ppm	*Laurel* 90 ppm	SEM	P<
C8:0	2.45	2.27	2.12	2.23	0.14	0.41
C10:0	3.55	3.32	3.27	3.29	0.19	0.73
C12:0	0.38	0.36	0.62	0.39	0.12	0.38
C14:0	11.89	11.59	10.73	11.39	0.41	0.25
C14:1	1.05	1.02	0.94	0.92	0.07	0.48
C15:0	1.18	1.16	1.29	1.29	0.09	0.66
C15:1	0.31	0.33	0.26	0.29	0.02	0.15
C16:0	27.98	28.80	26.97	29.08	1.05	0.50
C16:1	1.84	1.68	1.86	1.81	0.10	0.55
C17:0	0.36b	0.38b	0.46a	0.40ab	0.02	0.01
C17:1	0.07	0.08	0.10	0.08	0.00	0.08
C18:0	9.31	9.86	9.10	9.31	0.48	0.72
C18:1 n9	28.75	28.13	29.60	28.58	1.19	0.85
C18:2 n6	4.13	4.05	4.17	4.03	0.19	0.95
C18:3 n6	0.08	0.23	0.08	0.07	0.08	0.38
C18:3 n3	0.55a	0.45b	0.46b	0.42b	0.01	0.00
C20:0	0.15	0.17	0.18	0.20	0.02	0.46
C20:1	0.04	0.03	0.04	0.06	0.00	0.08
C20:2 cis	0.22	0.26	0.26	0.26	0.01	0.13
C20:5 n3	0.05	0.04	0.04	0.04	0.00	0.31
C22:1 n9	0.03	0.03	0.02	0.03	0.00	0.42
C22:2 cis	0.03	0.03	0.03	0.03	0.00	0.82
C22:6 n3	0.04	0.05	0.04	0.05	0.01	0.94
Total	94.43	94.27	92.59	94.17	0.59	0.13
Unknown	5.57	5.73	7.41	5.83	0.59	0.13
Omega-3	0.61a	0.52b	0.53b	0.47b	0.02	0.01
Omega-6	4.24	4.29	4.24	4.09	0.24	0.94
Omega-9	28.77	28.15	29.62	28.61	1.18	0.85
PUFA	4.55	4.65	4.60	4.44	0.23	0.94
MONO	32.07	31.28	32.81	31.76	1.22	0.84
SATURATED	57.82	58.35	55.19	57.97	1.20	0.29

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LITERATURE

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