

## Effect of Anise Seeds (*Pimpinella anisum* L.) as Feed Additives on the Productive Performance and Some Blood Parameters of Lactating Cows

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### ABSTRACT

Three multiparous Simmental dairy cows, in the second stage of lactation were used in Latin square design to investigate the effect of anise seeds addition on performance of dairy cows. Lactation trial was initiated after peak of milk yield. The experimental include three periods each period were lasted 21 days, 16 days for adaptation and 5 days for milk yield cows were fed basal diet consist of concentrate mixture and roughage (alfalfa hay and wheat straw). Cows were randomly divided into three groups T1 control group fed without additive, T2 fed with addition 30 gm Anise seeds/cow/day and T3 fed with additive 50 gm Anise seeds/cow/day. The results showed that cows fed different levels of Anise seeds decreased milk yield as compared with control, but enhance milk fat% in T2, no significant differences was noted in milk protein, lactose, solid non-fat, pH, and fat yield also fat corrected milk 4% decreased with supplement Anise as compared with control group. Although results indicated no significant differences between treatments in triglyceride, cholesterol, urea, glucose, total protein, globulin, LH and FSH except that albumin were significantly increased.

### KEYWORDS

Anise Seeds, Simmental Cows, Milk Yield.

## Introduction

In previous years, the use of natural feed additives in animal nutrition feed has been encouraged (Faniyi *et al.*, 2016). Feed additives can improve feed efficiency, milk yield and components of lactating animals (Khattab *et al.*, 2010 and Abeer *et al.*, 2019). A large number of plant species contains various chemical substances which possess health benefits such as Anise seeds (Faniyi *et al.*, 2016). studies were reported that Anise seeds might be useful as a milk stimulant for lactating animals (El-Garhy and Mustafa 2007).

Anise seeds diet supplementation could be used as natural growth promoters in ewe diets to improve milk yield, milk composition (Sallam *et al.*, 2012). It contains many effective compounds, including anethole, fatty acids and plant estrogens, as well as volatile oils (Amin, 2005). Also, the presence of vitamins E, C and selenium in anise seed that acts as enzymatic accompaniments in many biological reactions may have an important role in improving metabolic pathways, which reflects positively on productive performance (Hussein *et al.*, 2020).

Generally, feed additives supplements in the diet led positive (increase) or negative (decrease) or unchanged effect on the concentrations of blood parameters (Abo El-nor *et al.*, 2007 and Sallam *et al.*, 2018) on lactating buffaloes.

The objective of this work was aimed to focus on exploit Anise seeds as plant bioactive natural feed additives in different levels on milk quality and quantity and some blood parameters in Simmental dairy cows.

## Material and Methods

This study was conducted at the private field in the Murtka - Erbil –Iraq.

### Animal's Management and Diet

Three healthy multiparous Simmental dairy cows, an average live body weight of  $750 \pm 10$  kg. In the second stage of lactation which initiated after peak of milk yield. Were used in Latin square design  $3 \times 3$ , which includes three periods

each period lasted 21 days, 16 days were for adaptation and 5 days for milk collection. The cows were established in the barn all treatments were fed the same concentrate mixture (1 kg concentrate : 2litter of their milk yield, alfalfa hay and wheat straw add libitum, anise seeds where add during mechanically milking mixed with 1 kg of concentrate feed 1 times a day in the morning, cows were randomly divided into three groups T1 control group fed without adding Anise seeds, T2 fed diet + 30 gm/cow/day of Anise seeds and T3 fed diet + 50 gm /cow/day of Anise seeds, concentrate feed mixture which included(%) soybean meal 10, corn 10, flour 9, barley 35 and wheat 35 bran as used in the field, chemical composition of all feeds are shown in table 1.

The concentrate mixture feed, alfalfa hay and straw were offered twice first meal offered at 6 Am and the second at 5 Pm, in addition of molasses block, drinking water was freely available to the animals.

### Milk Sampling

Milk yield were recorded individually of each cow in the morning and evening to obtain total milk yield during 5 days, also milk samples of morning and evening were taken every day which analyzed directly for fat, protein, solids not-fat (SNF), 4% fat corrected milk (FCM) was calculated using Gaines (1923) equation, pH were measured by pH meter and acidity of milk was estimated as lactic acid by titration method with sodium hydroxide (0.1N) according to Marshall (1992).

### Feed Sampling

Samples for ration, Alfalfa hay, wheat straw and Anise seeds were analyzed for dry matter (DM), crude protein (CP), ether extract (EE), crude fiber (CF) and ash according to (A.O.A.C. 2000), nitrogen free extract (NFE) was calculated by differences and metabolisable energy by using equation (MAFF,1975).

### Blood Sampling

Blood samples Five ml were collected from the jugular vein by a vial syringe at the last day of each period, and centrifuged at 3000 rpm for 20 minutes to separate the serum from the rest of the ingredients. The serum was then kept in sealed tubes under -20 °C (frozen) then analyzed for urea, cholesterol, triglycerides, total protein, albumin, globulin and glucose by using kit BT1500 Biotechnica instrument.

The concentration of FSH and LH hormones was estimated from blood serum by using analysis kit Biomerieux and VIDAS apparatus for each hormone.

**Table 1.** Chemical composition of concentrate and roughages as dry matter base

Nutrients composition	concentrate diet	Alfalfa hay	Straw	Anise seeds
Dry matter	92.21	94.63	96.47	90.43
Organic matter	96.48	90.04	92.86	92.59
Ash	3.52	9.96	7.14	7.41
Ether extract	3.24	1.53	1.42	10.76
Crude fiber	5.15	32.95	37.56	20.70
Crude protein	17.17	13.12	1.92	22.22
Nitrogen free extract	70.92	42.44	51.96	38.91
*ME MJ /kg DM	13.25	9.63	9.82	12.48

\*ME (MJ/Kg DM) =0.012 C.P + 0.031E.E + 0.005 C.F + 0.014NFE (MAFF, 1975)

### Statistical Analysis

Data were analyzed by using the Latin square design to study the effect of the treatments, using the statistical package for the social sciences SPSS procedure version 22. And the new least significant difference (LSD) was used when the treatments effect was significant (Steel and Torrie, 1980).

## Results and Discussion

Daily milk yield, fat, protein, lactose, solid not fat (SNF), pH, fat (gm/day) and fat corrected milk 4% are shown in table 2. Cows fed with different levels of anise seeds led to statistically lowered milk yield as compared with control but enhanced fat % in T2. Other milk components were not affected by anise addition and fat corrected milk 4% decreased in T2 and T3 as compared with control group. The absence of a significant effect in parameters may be attributed to the restricted number of observations in the treatments of the experiment or perhaps the reason is due to the occurrence of estrus in the third stage of the experiment, those results were in agreement with (Alsamarai *et al.*, 2018) when they fed Holstein cows on control diet consisted of concentrated feed without adding, control diet plus 30% anise untreated and third group was fed a control diet plus 30% anise treated with formaldehyde. While disagree with results obtained by (Sallam *et al.*, 2018) they found significant increase in daily milk yield and fat, lactose, solid not fat percentage except milk protein did not affect in buffalo fed with supplement Anise and active yeast as compared with control group.

**Table 2.** Effect of anise seeds as feed additives on milk yield and composition of Simmental dairy cows (Mean  $\pm$  SE)

Items	T1(Control)	T2 (30gm anise seeds)	T3(50gm anise seeds)	LSD
Daily milk yield (kg)	21.81 $\pm$ 4.74	17.35 $\pm$ 2.48	17.74 $\pm$ 1.87	10.97
Fat %	2.07 $\pm$ 0.61	2.48 $\pm$ 0.69	2.08 $\pm$ 0.48	2.81
Protein%	3.26 $\pm$ 0.09	3.29 $\pm$ 0.11	3.34 $\pm$ 0.06	0.38
Lactose%	4.55 $\pm$ 0.13	4.59 $\pm$ 0.16	4.67 $\pm$ 0.10	0.57
SNF%	8.48 $\pm$ 0.24	8.55 $\pm$ 0.30	8.69 $\pm$ 0.18	1.05
pH	6.63 $\pm$ 0.03	6.60 $\pm$ 0.001	6.63 $\pm$ 0.03	0.07
FAT yield gm/day	451.46 $\pm$ 94	431.66 $\pm$ 137.9	368.99 $\pm$ 110	1.05
Fat corrected milk 4%	15.49 $\pm$ 1.85	13.33 $\pm$ 2.96	12.63 $\pm$ 2.51	1.05

Table 3. Showed the effect of Anise seeds on feed additives on some blood parameters. The results indicated no significant differences between treatments in triglyceride, cholesterol, urea, glucose, total protein, globulin, LH and FSH with except albumin were increased significantly ( $p \leq 0.05$ ) in T2 as compared with control group however T3 were similar with T1 and T2. These results indicated that feeding dairy cows on Anise seed as feed additives did not effect on liver function or general cows health (Morsy *et al.*, 2012). While the results disagree with the results obtained by (Sallam *et al.*, 2018) they found significant decrease in cholesterol and triglycerides in buffalo fed with supplement Anise and active yeast as compared with control group.

**Table 3.** Effect of anise seeds as feed additives on some blood parameters of Simmental dairy cows (Mean  $\pm$  SE)

Items	T3(50gm anise seeds)	T2 (30gm anise seeds)	T1(Control)	LSD
Triglyceride mg/dl	6.88 $\pm$ 2.30	5.39 $\pm$ 0.08	6.48 $\pm$ 0.75	4.85
Cholesterol mg/dl	100.48 $\pm$ 19.95	106.62 $\pm$ 23.17	106.22 $\pm$ 16.52	86.15
Urea mg/dl	33.78 $\pm$ 1.98	35.54 $\pm$ 0.27	32.46 $\pm$ 4.38	9.08
Glucose mg/dl	44.77 $\pm$ 0.77	32.63 $\pm$ 9.60	43.48 $\pm$ 4.23	21.15
Total protein g/dl	6.13 $\pm$ 0.52	6.09 $\pm$ 0.17	5.89 $\pm$ 0.43	1.17
Albumin g/dl	3.28 $\pm$ 0.24 b	3.52 $\pm$ 0.23 a	3.38 $\pm$ 0.24 ab	0.18
Globulin g/dl	2.85 $\pm$ 0.75	2.57 $\pm$ 0.40	2.51 $\pm$ 0.61	1.19
LH ng/ml	0.23 $\pm$ 0.13	0.13 $\pm$ 0.03	0.36 $\pm$ 0.26	0.46
FSH ng/ml	0.13 $\pm$ 0.03	0.13 $\pm$ 0.03	0.33 $\pm$ 0.23	0.45

Different letters in the same row means significant differences at ( $P \leq 0.05$ ).

## Conclusion

This study concluded that Anise seeds additive to the feed of Simmental dairy cows had a negative effect in daily milk production with no effect in milk components.

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