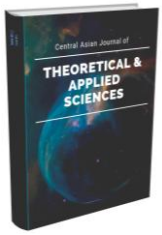

CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCE

https://cajotas.centralasianstudies.org/index.php/CAJOTAS

Volume: 06 Issue: 04 | October 2025 ISSN: 2660-5317

Article

Study of The Effect of Using Some Feed Additives on Milk Production and Some of Its Components in Ruminants (Review Article)

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Abstract: This study aims to know the influence of consuming some feed additives in ruminant rations on milk production and some of its components. It was found that adding fenugreek seeds to the ration of Damascus goats had a significant effect in increasing milk production, while milk production increased and fat percentage decreased significantly in Awassi ewes, in local Sharabi cows, milk production and fat percentage increased significantly. Adding anise seeds to the ration of Holstein cows led to a significant increase in milk production and its components (fat, protein and lactose percentage). Adding flax seeds to the ration of Holstein Friesian cows led to a significant increase in milk production while its components were not affected. Milk production and fat percentage increased significantly in Anglo-Nubian goats and Friesian cows when sesame seeds meal was added to the ration.

Keywords: Feed additives , Milk production and its components , Ruminants .

Citation: lattif, F. H. A, Hassan, I. F. A. Study of the effect of using some feed additives on milk production and some of its components in ruminants (Review article). Central Asian Journal of Theoretical and Applied Science 2025, 6(4), 648-652

Received: 10th May 2025
Revised: 16th Jun 2025
Accepted: 24th Jul 2025
Published: 10th Aug 2025

1. Introduction

Milk is an important ingredient in the diet of eight billion people worldwide, providing essential nutrients such as calcium, potassium and vitamin D, as well as protein, energy and fat. According to estimates by the Food and Agriculture Organization and the Organization for Economic Co-operation and Development, global milk production will reach 1020 million tons in 2023 [1].

Many researches have been carried out to improve milk production and quality using some plants (including medicinal plants as feed stuffs) because these plants are highly palatable, which increases feed consumption. They are also antioxidants , rich in omega-3 and are antibacterial and antifungal. They can reduce the harmful effects of heat stress or be described as a stimulating substance for milk production, whether in humans or dairy animals. In addition to their components of protein, energy, minerals and vitamins, they play an effective role in influencing the productive and health performance of the animal [2], [3], [4], [5].

Among these plants is fenugreek, as fenugreek seeds were used because they have a high nutritional value, as they contain nutritional elements such as protein, which reaches 28% and they also lead to activating the secretion of prolactin. Black seed, as it was shown

that it has a positive effect on milk production and feed conversion efficiency in goats [6], [7]. indicated that adding black seed to the ration of Awassi ewes led to a significant raise in total milk production and its components (fat, protein and lactose percentage) [5]. reported that adding anise seeds to the ration of Holstein cows under heat stress conditions led to a significant raise in milk production and its components (fat, protein and lactose percentage).

This study aims to clarify the influence of using some feed additives on milk production and some of its components in ruminants.

Review Literatures

[6] used different percentages of fenugreek seeds to the ration of Damascus goats 6%, 10% and 14% of the components of the concentrated ration. The results indicated a significant superiority (P<0.05) in the amount of milk produced in favor of the 14% group, while there was no significant difference in the components of the milk (protein ,fat, and lactose percentage), see Table 1.

Table 1. Effect of adding fenugreek seeds on milk production and its components in Damascus goat

Treatments	Milk production /g	Fat %	Protein %	Lactose %
6%	1300 c	3.064	3.167	4.686
10%	1450 b	3.616	3.236	4.372
14%	1950 a	3.928	3.068	4.598
0%	1010 c	4.346	3.184	4.714

*: (P≤0.05)

Different letters refers to a significant difference

[4] showed that when fenugreek seeds were added to the ration of Awassi ewes at a rate of 6% and 12%, the daily and total and milk production, and protein ratio in the milk enlarged significantly (P<0.05). On the contrary, the fat percentage in the milk decreased significantly (P<0.05) and lactose was not significantly affected, see Table 2.

Table 2 . Impact of adding fenugreek seeds on milk production and its components in Awassi ewes

Treatments	Daily milk production /Kg	Fat %	Protein %	Lactose %
0%	1.467 c	6.819 a	3.158 c	6.207
6%	1.910 b	6.093 b	3.897 b	6.152
12%	2.214 a	6.008 b	4.107 a	6.110

*: (P≤0.05)

Different letters refers to a significant difference

[8] found that there was a significant rise (P<0.05) in daily milk production and a significant decline (P<0.05) in the percentage of milk fat in Damascus cross-breed goats when fenugreek seeds were added to the ration at rates of 4% and 6% [9]. showed that there was a significant rise (P<0.05) in daily milk production and milk fat percentage when adding 50 and 100 g of fenugreek seeds powder to the ration of local Sharabi cows. In this regard, the results of [4]. indicated that there was a significant effect of adding fenugreek seeds to the ration of Awassi ewes in increasing total blood protein and decreasing cholesterol compared to the control group. The results of [8]. also revealed a significant decline in the level of blood glucose and a significant rise in the level of total blood protein and prolactin hormone in the blood serum of goats fed on rations to which fenugreek seeds were added. These results support the role played by fenugreek seeds in increasing milk production and influencing its components [7]. showed that the use of fenugreek seeds caused a significant raise (P<0.05) in milk production and a higher milk protein percentage compared to the control and black seed groups, while the black seed ration was significantly superior (P<0.05) in the percentage of milk fat for Awassi ewes [10]. showed that adding black seed meal to the ration of local cows at a rate of 5% had no significant effect on daily milk production and its components, which include the percentage of fat,

protein and lactose [11]. indicated that adding 6% of crushed black seed to the ration of Friesian cross-breed cows led to a significant superiority (P<0.05) in daily milk production, but this did not affect the milk components (protein ,fat and lactose percentage).

The results of [5]. showed that adding 30 g of anise to the ration of Holstein cows led to a significant enlarge (P<0.05) in daily milk production and its components (protein , fat , and lactose percentage). This is due to the fact that anise contains chemical compounds similar in composition to the estrogen hormone that regulate the work of hormones and enhance the growth of living tissues, which helps in the development of the mammary gland, which is positively reflected in increasing milk production.

The results of [3]. showed that there was a significant enlarge (P<0.01) in the daily milk production of Holstein cows fed flax seeds at a rate of 3% and 6%, while the milk components (protein ,fat and lactose percentage) were not significantly affected [2]. explained that the use of licorice residues in the rations of Holstein Friesian cows at a rate of 15% , did not have a significant impact on daily milk production and the percentage of lactose and protein in milk, while the fat percentage decreased significantly (P<0.05), see Table 3.

Table 3. Influence of using licorice residues on milk production and its components in Holstein Friesian cows

Treatments	Daily milk production /Kg	Fat %	Protein %	Lactose %
0%	22.24	4.03	3.26	4.87
15%	24.16	3.58	3.18	4.68
Significant	N.S	*	N.S	N.S

*: (P≤0.05) N.S: Non significant

[12] also indicated that the use of licorice residues at a level of 15% and 20% of the concentrated ration for Holstein Friesian cows, did not have a significant impact on milk production and composition (protein, fat and lactose percentage).

The results of [13]. showed that the dose of licorice extract at 250 mg and 350 mg/kg of body weight weekly to local black female goats, led to a significant rise (P<0.05) in the percentage of fat in milk , while milk production, milk protein and lactose were not influenced[14]. demonstrated that there was a significant enlarge (P<0.05) in daily milk production and percentage of milk fat in Anglo-Nubian goats fed rations including 10% and 15% sesame seeds cake. [15] found that feeding Awassi ewes on sesame seeds meal at rates of 6% and 12%, led to a significant enlarge (P<0.05) in daily and total milk production and a significant reduction (P<0.05) in milk protein and lactose, while the fat ratio fluctuated [16]. showed that using sesame seeds meal at a rate of 10% and 20% in feeding local Friesian cows, led to a significant enlarge (P<0.05) in daily milk production and the percentage of protein and fat in milk compared to the control group, see Table 4.

Table 4. Influence of using sesame seeds meal on milk production and its components in local Friesian cows

Treatments	Daily milk production /Kg	Fat %	Protein %	Lactose %
0%	9.17 b	3.18 b	2.92 b	4.61
10%	10.87 a	3.69 a	3.27 a	4.49
20%	11.94 a	3.82 a	3.36 a	4.43

*: (P≤0.05)

Different letters refers to a significant difference

[17] concluded that adding 3 and 5 g/head/day of Saccharomyces cerevisiae live yeast to Awassi ewes diets, led to a significant enlarge (P<0.05) in daily and total milk production, while milk components (fat, protein and lactose percentage) were not significantly affected.

2. Conclusion

The previous review of several studies examining the effect of some nutritional additives in ruminant rations on milk production and its components revealed that the addition of fenugreek seeds significantly affected milk production in Shami goats and Awassi ewes. In Sharabi cows, milk production and fat percentage significantly increased. The addition of anise seeds to Holstein cows' rations resulted in a significant raise in milk production and its components. The addition of flax seeds to Holstein Friesian cows' rations significantly increased milk production, while the addition of sesame seed meal to goat and cow rations significantly increased milk production and fat percentage.

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