

Effect of Legume and Non-Legume Green Fodder Diet on Cow Milk Production under Climatic Conditions of Tonk District

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Abstract

Milk contains many nutrients and provides a quick and easy way of supplying these nutrients to the diet within relatively few calories. The study was conducted at Krishi Vigyan Kendra, Banasthali Vidyapith. 11 Haryana, 02 Jersey, 18 Brown Swiss, 02 Holstein Friesian and 07 Nagori breed of cows were selected to collect samples. Haryana breed of cows produced 78±2.68 liter milk daily which was fed under leguminous green fodder but in case of non-leguminous diet it was 67±2.14 liter daily. The milk production of Jersey breed of cows was 28±1.99 liter per day under feeding of leguminous green fodder but in case of non-leguminous green fodder total milk production was 20±1.16 liter per day. The total milk production of Brown Swiss breed of cows was 144±4.35 liter per day under feeding of leguminous green fodder but in case of non-leguminous green fodder feeding total milk production was 108±3.28 liter per day. The total milk production of Holstein Friesian breed of cows was 140±4.43 liter per day under leguminous green fodder feeding but in case of non-leguminous green fodder feeding total milk production was 98±3.11 liter per day. Total milk production of Nagori breed of cows was 62±1.79 liter per day under feeding of leguminous green fodder but in case of non-leguminous green fodder feeding total milk production was 48±1.05 liter per day. It has been concluded that the portentous, vitamins and minerals composition of green fodder was increased milk production quantity and improved the health of animals.

Keywords: Legume and Non-Legume, Green Fodder, Cow Milk Production, Climatic Conditions

Introduction

The demand for milk would drive growth in milk production, which is expected to increase to more than 200 million tons by 2020 from the current level of about 121 million tons (NDDB, 2012). Feeding your animals well increases your income. Dairy cows require a balanced diet for milk production, body maintenance and good health. The feed requirements for lactating cows are different from that of calves and heifers. The amount of feed provided to the cows depends on the amount of milk it produces, its weight, temperature and levels of activity. Whatever the case, the cow needs balanced feeds that provide energy

(carbohydrates and fats), protein, fibre, minerals, vitamins and water in sufficient amounts. The feed given must be digestible so that the nutrients can be absorbed in the body and should not contain toxic substances. The expected daily consumption of energy feeds depends on the quality of the feeds, the size of the animal, level of milk production, quantity of supplements given and dry matter content of the feed material. Supplementary feeds such as concentrates cannot replace the basal diet. Protein is the second most important component of the diet. It builds the cow's body and helps in milk production. Adequate protein in the diet also helps microorganisms in the rumen (stomach) convert the roughage into nutrients. It is important for farmers to ensure that they supplement the forage diet with proteins. A cow should also be provided with mineral licks-the minerals provide calcium, phosphorus and other important minerals that

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support milk production and other body functions. Pregnant cows especially require adequate amounts of minerals to help in bone and tissue development of the calf. Vitamins like A, D and E are not produced in the cow's body and must be supplied in the diet. These help maintain the animal's health and can be supplied through supplements (The Organic Farmer, 2015).

Guar is mainly grown in the semi arid and subtropical areas of North and North-West India (notably in Rajasthan) and East and South-East Pakistan. Guar does not exist in a wild state and is believed to have originated from an African species imported to India as horse fodder by Arabian traders (Ecoport, 2010). It later spread to other Asian countries, including Indonesia, Malaysia and the Philippines, and is now grown in many parts of the drier tropics and subtropics. Its value as a gum-producing crop was recognized during the second World War in the USA (Wong et al., 1997).

Guar is hardy and drought-tolerant. It is well adapted to arid and semi-arid climates with hot temperatures but can grow in sub-humid conditions, from sea level up to an altitude of 1000 m. Drought stops growth and the plant sprouts when rain resumes. It is grown without irrigation in areas with 250-1000 mm of annual rainfall and most seed production occurs in areas with less than 800 mm. However, guar responds well to irrigation during dry periods but does not tolerate water logging. Excessive rainfall and humidity affect fertilization, pod development and seed quality. In high rainfall areas, guar is leafier and more suitable as a green manure and fodder crop. Guar grows well under a wide range of soil conditions and is tolerant of low fertility, soil salinity and alkalinity. It performs best on fertile, medium-textured and sandy loam alluvial soils but does not tolerate heavy black soils (Ecocrop, 2010, Ecoport, 2010,

In dairy cows, palatability problems have been reported when more than 5% guar meal was included in the diet. However, dairy cows and heifers fed rations containing 10-15% guar meal became accustomed to its odor and taste after a few days. Intake remained lower than with the control diet (cottonseed meal) but milk yield was not affected. In growing dairy calves, flavoured guar meal and toasted guar meal gave slightly better rates of intake and gain than raw guar meal during the first month of feeding (Rahman et al., 1968).

Methodology

The area under this study is Tonk District, Rajasthan, which is located in Eastern part of the state between 75° 07' 00" E to 76° 19' 00" E and 25° 04' 00" N to 26° 03' 00" N. The total geographical area covered by the District is 7194 km². Location map showing the sampling sites is represented in figure 1. The climate of the area is semi arid type. The average annual rainfall of the district is 598 mm. The area is having general flat to undulating topography. The Banas River, 135 km in length, is major one running through Tonk district (Sharma et al., 2015). The study was conducted at cow shed of Banasthali Vidyapith, Newai, Rajasthan in the supervision of Krishi Vigyan Kendra, Banasthali Vidyapith. 11 Haryana, 02 Jersey, 18 Brown Swiss, 02 Holstein Friesian and 07 Nagori breed of cows were selected to collect milk samples. There were 78 indigenous and mixed breed of milch cows maintained under stall feeding. Green fodder was purchased from the farmers of near villages of Banasthali. Green fodder was provided openly to the all cows. The reading of milk production noted daily in the morning and evening.

Results and Discussion

It is evident from the table 1 that the 11 Haryana breed of cows produced 78±2.68 liter milk daily which was fed under leguminous green fodder but in case of non-leguminous diet of other group of 11 Haryana cows it was 67±2.14 liter daily. It may also be observed that overall average milk production was higher on the leguminous feeding cows as compared to non-leguminous could be attributed to the keeping of superior quality of pod green fodder and other management practices.

The milk production of 02 Jersey breed of cows was 28±1.99 liter per day under feeding of leguminous green fodder but in case of non-leguminous green fodder of other group of 02 Jersey cows total milk production was 20±1.16 liter per day.

The results laid down in Table 1 indicated that the total milk production of 18 Brown Swiss breed of cows was 144±4.35 liter per day under feeding of leguminous green fodder but in case of non-leguminous green fodder feeding of other group of 18 Brown Swiss cows total milk production was 108±3.28 liter per day. These findings are fully corroborated with the study of Ashalatha et al. (2004) who have reported milk

Table 1: Milk production status

S. No.	Selected Breed	Number of Cows	Type of fodder	Milk Production Daily (Liter)
1	Haryana	11	Leguminous	78±2.68
		11	Non-Leguminous	67±2.14
2	Jersey	02	Leguminous	28±1.99
		02	Non-Leguminous	20±1.16
3	Brown Swiss	18	Leguminous	144±4.35
		18	Non-Leguminous	108±3.28
4	Holstein Friesian	02	Leguminous	24±1.43
		02	Non-Leguminous	18±1.11
5	Nagori	07	Leguminous	56±1.79
		07	Non-Leguminous	38±1.05

production similar quantity on across different breeds of cow.

Perusal of data presented in Table 1 revealed that the total milk production of 02 Holstein Friesian breed of cows was 24±1.43 liter per day under leguminous green fodder feeding but in case of non-leguminous green fodder feeding of other group of 02 Holstein Friesian cows total milk production was 18±1.11 liter per day.

Total milk production of 07 Nagori breed of cows was 56±1.79 liter per day under feeding of leguminous green fodder but in case of non-leguminous green fodder feeding of other group of 07 Nagori cows total milk production was 38±1.05 liter per day. Our results are fully corroborated with Sirohi, Joshi, and Kumar (2007) who have reported that the average milk production of crossbred cows was e” 9 liters during lactation.

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