



ORA- Experimental Research

Evaluation of a novel herbal formulation for improving milk fat and yield in Indian Gir Dairy Cattle: A seasonal controlled trial

[¹Kanishka Gupta](#), [²Sandhya Marskole](#), [³Divya Irpache](#), [⁴Surekha Yadav](#),
[⁵*Sheetal Choudhary](#)

ABSTRACT:

Background: This study looked at how a new herbal formulation called *Gou Graas* affected the body weight, milk output, and fat content of nursing dairy cows.

Materials and Methods: In a controlled study, nine healthy 'Indian Gir' dairy cows were divided into treatment and control groups at random. While the normal control group was fed a regular meal, the treatment group received an herbal formulation (100g & 250g/Day/Head) along with feed for eight weeks. Important parameters like body weight, milk fat percentage, and daily milk production were noted at the start of the experiment and at regular intervals throughout the winter and summer.

Results: After an 8-week trial, the treatment group-III (250g/day/head) experienced an average fat increase of 0.5% in the winter compared to the summer, and the treatment group-II (100g/day/head) experienced an average fat increase of -0.1%. After an 8-week trial, the treatment group-III had an average milk yield of 0.5 litre during the winter, compared to the summer and the treatment group-II (100g/day/head) experienced an average milk yield increase of -0.1 litre on day 56. The findings showed that in both seasons, cows produce more milk with increasing fat. Comparing the cows body weights following eight weeks of treatment during the winter. There is no discernible improvement in the normal control group I (no dose), but the treatment groups II and III showed average weight gains of 9 and 15 kg per cow, respectively. Similar results were also observed in the summer, in a dose-dependent manner. The impact of the herbal formulation on nursing cow's milk output and milk fat was compared using a one-way ANOVA. **Conclusion:** The results indicated a statistically significant increase ($p < 0.05$) in body weight, milk output, and milk fat content when comparing the treatment group to the controls.

KEYWORDS: Dairy industry, Lactation, Dairy cattle, Milk fat, Herbal formulation.

RECEIVED ON:

30-06-2025

REVISED ON:

30-07-2025, 08-08-2025

ACCEPTED ON:

09-08-2025

Access This Article Online:

Quick Response Code:



Website Link:

<https://jahm.co.in>

DOI Link:

<https://doi.org/10.70066/jahm.v13i7.2174>

[m.v13i7.2174](https://doi.org/10.70066/jahm.v13i7.2174)

Corresponding Author Email:

sheetal.choudhary8@gmail.com

CITE THIS ARTICLE AS

Kanishka Gupta, Sandhya Marskole, Divya Irpache, Surekha Yadav, Sheetal Choudhary. Evaluation of a novel herbal formulation for improving milk fat and yield in Indian Gir Dairy Cattle: A seasonal controlled trial. *J of Ayurveda and Hol Med (JAHM)*. 2025;13(7):2-14



1. INTRODUCTION

The dairy industry offers employment opportunities to millions of people worldwide, including farmers, processors, and retailers. Dairy product production and processing contribute significantly to rural economies and national incomes. The most crucial prerequisite for dairy economics is increasing milk production and quality. [1] Efficient ecological farming practices are necessary due to the growing global demand for dairy products, particularly in developing nations, and growing environmental concerns. [2] Comparing emerging nations to the global average, the milk yield per cow remains extremely low. [3] The increasingly globalized dairy industry offers opportunities for both investment and cross-border trade. Among the sustainability concerns facing the dairy industry are social responsibility, animal welfare, and environmental impact. Milk fat enhancement, which attempts to improve the composition and quality of milk fat, is crucial to dairy production. [4] The health and diet of cows can have an impact on the quality of milk fat, one of the most crucial ingredients in dairy products. Herbal formulations have been used to study the quality of milk fat and the overall health of dairy cows. The aim of this study was to develop and make available an herbal formulation to enhance the quality of milk fat in dairy cows. [5] [6] [7]

In recent years, there has been a lot of interest in the potential benefits of using herbal formulations in animal feed for animal welfare, productivity, and health. Herbal formulations can be used as a sustainable and natural alternative to antibiotics and other synthetic chemicals,

promoting a healthier and more sustainable livestock production system. Herbal remedies increase the amount and quality of milk while also helping with digestion. These natural treatments are believed to be side effect-free, cost-effective, safe, and environmentally benign. [8] It has been demonstrated that certain herb combinations have a number of positive effects, such as boosting metabolism and even serving as therapeutic agents. [9]

These days, plant-based drugs and products are used as a cure or to treat illnesses, either by themselves or in conjunction with other substances. Because herbal remedies are believed to be safe or to have few side effects, more and more people are using them. Interest in using medicinal plants to treat illnesses and increase the productivity of high-yielding animals like cattle has resurfaced as a result of the growing use of herbal preparations in animal healthcare procedures. [10] Growing consumer awareness of and concerns about animal health and welfare have led to a decrease in the use of medications in livestock farming, particularly in dairy calves that produce milk for PDO (Protected Designation of Origin milk) or organic dairy products. [11] In order to increase the milk fat content and yield in dairy cattle, we created and assessed an herbal formulation that included minerals.

2. MATERIALS AND METHODS

To analyze and test the efficiency of herbal formulation we tested milk parameter, including milk fat, milk yield and body weight of cows using an Essae digital milk analyzer (ABS MA 815). Improvement in milk fat and yield are main parameters observed during the study.

Ingredients of herbal formulation: In this herbal formulation, all the herbs and minerals are mixed in a definite proportion (Table-1). Our work has published for Indian patent (Application No.202521059884 <https://iprsearch.ipindia.gov.in//PublicSearch/PublicationSearch/ApplicationStatus>) to protect our intellectual property rights on this novel herbal formulation (*Gou Graas*).

Selection of experimental cows: Nine cows of the same breed (Indian Gir) and having a lactation period (between two and three months) were randomly divided into three groups.

Tagging of cows: Each cow was identified by a number, such as S1, S2, S3 to S9. The normal control group-I (No dose) is maintained for S1 through S3, the treatment group-II (100g dose per day per head) for S4 through S6, and the treatment group-III (250g dose per day per

head) for S7 through S9 in both season winter and summer.

Weighing of cows: The Lambourne formula, which reads $BW = (CC^2 \times BL) / 10.840$ is used to weigh each experimental cow. [12] **BW:** This indicates the animal's approximate body weight in kilograms. **CC:** This measurement, which is in centimeters, is the animal's chest circumference measured at its widest point. **BL:** This measurement, which is also given in centimeters, represents the length of the animal's body from shoulder to rump. **10.840:** Derived from the Lambourne formula itself, this constant component is used in the formula.

Preparation of herbal formulation (GOU GRAAS):

Identification of Herbs: We have chosen a few medicinal plants whose parts aid in boosting the amount of milk fat and enhancing the health of animals.

Table1: Showing ingredients of herbal formulation 'Gou Graas'

S. No.	Ingredients of formulation	Scientific Name	Plant Parts Used	Percentage of ingredients
1	Shatavari	<i>Asparagus racemosus</i>	Root Tuber	20%
2	Giloy	<i>Tinospora cordifolia</i>	Stem	20%
3	Fenugreek	<i>Trigonella foenum-graecum</i>	Seed	10%
4	Butter tree	<i>Madhuca longifolia</i>	Flowers	5.6%
5	Mustard	<i>Brassica juncea</i>	Seed Oil	9.2%
6	Cottonseed	<i>Gossypium species</i>	Seed Oil	9.2%
7	Limestone	Calcium carbonate	-	2%
8	Black salt	Sodium sulfide	-	2%
9	Iodine salt	Sodium chloride	-	2%
10	Jaggery	<i>Saccharum officinarum</i>	Juice	20%
11	Excipient	Maltodextrin	-	5%

Herb grinding: After selecting the herbs and drying them, we used an electric grinder to ground them into a powder.

Extraction of seed oil: The seeds were dried to reduce their moisture content after being washed to remove impurities. After the dried seeds were crushed to

remove the outer coating, a hydraulic processing machine was used to extract the oil.

Blending of materials: To make our powdered herbal formulation, we first collected the herbs, dried certain plants, and extracted oil from some plant seeds. After that, we mixed all the components in a specific proportion and added mineral supplements, such as limestone, iodine salt, black salt, and jaggery as a base.

Mixing of materials: In the material mixing process, the ground herbs are thoroughly blended first, followed by the formation of mineral supplements and the addition of oil. Make sure to thoroughly mix the ingredients so that no lumps remain.

Dose administration:

The normal control group-I not given any dose of herbal milk-fat booster naming as ‘*Gou Graas*’, treatment group-II received 100g dose per day per head and treatment group-III was given 250g dose per day per head at the evening on 4.00 p.m. with regular controlled diet.

Sampling of milk:

We collected morning and evening milk sample (10 ml. each) every week for 8 weeks at Bharat Bharti Gaushala Jamthi, District Betul (M.P.) India. Collected milk sample was tested in an Essae digital milk analyzer machine (ABS MA 815). It works on ultrasonic technology.

Diet regimen:

The animals were fed a diet consisting of cotton feed, wheat bran, green and dry fodder. The dietary regimen was designed to meet the nutrient requirements of lactating cows for winter and summer season trial (Table 02). The animals were fed a mixture of wheat bran,

green feed (Cherry grass/Napier grass), and dry fodder (Wheat straw). The diet chart was created to satisfy the nutritional needs of lactating cows. Water was freely available, and the meal was provided twice daily at 8:00 a.m. and 4:00 p.m. Every day, each cow in the treatment group received our herbal product, *GOU GRAAS*.

Table 2: Diet Chart for Experimental Cows

Matter	Quantity/ Day/ Head (kg)	
	Winter	Summer
Dry Fodder	Wheat straw	Wheat straw
Green Fodder	Cherry grass	Napier grass
Cotton Seed Cake	2 kg	2 kg
Wheat Bran (Choker)	2 kg	2 kg
Water	35 litres Approx.	41 litres Approx.
<ul style="list-style-type: none"> Formula- DMI (kg/cow/day) = 0.025 x Live Weight (kg) + 0.1 x Milk Production (kg) Green Fodder= 10% of body weight 		

Herbal formulation trial:

Pre-treatment period: Pre-treatment time frame a milk sample was taken 15 days prior to the trial's start in both the summer and the winter season, and a digital milk analyzer machine was used to examine the milk parameters. Pre-treatment check-up was done by a veterinarian 15 days before the test.

Treatment period: The winter season testing took eight weeks, from November 12, 2024, to January 6, 2025 and testing for the summer season ran for eight weeks, from April 1, 2025, to May 27, 2025. Each week, we took a sample of milk and used a digital milk analyzer to examine milk parameters.

Post-treatment period: The time after treatment in both summer and winter, a sample of milk was taken 15

days after the trial ended, and milk analyzer machine was used to examine the milk. The cows were tested by the veterinary doctor after 15 days of post treatment. In which all 9 cows were found healthy in both seasons.

Statistical analysis:

A one-way ANOVA was conducted to compare the effect of the herbal formulation on milk yield and milk fat in between and within the group of lactating cows (Table 5 and 6) using IBM SPSS Statistics 20.0.

3. RESULTS

After giving the herbal formulation, not only the fat in the milk of the cows increased but their milk production also increased. In the trial done by us, nine cows were selected in which we divided them into three different groups, Normal Control group-I (No dose), treatment group-II (100g/day/head) and treatment group-III(250g/day/head). All these cows were kept under observation by us for 8 weeks. We carried out this observation in two seasons, winter and summer. We observed effect of seasonal variations on milk production and fat metabolism in lactating cows.

Effect on milk fat: Positive results were found in the test done in winter season. We tested the milk fat percentage of the cows in which we compared their deference of average milk fat percentage on initial day 1 and last day 56 data (Table 3). In winter season, we found that the milk fat average deference of normal control group-I was not significant (-0.034%), milk fat average deference of treatment group-II was 1.4% and the milk fat average deference of treatment group-III was 2.4% in winter season on Day 56. Here we found that there is no increase in normal control group-I (As

shown in table 3). Standard Error of Mean (SEM) of milk fat in winter season is ± 0.0087 . On comparing between normal control group-I and treatment group-II, we found that average increase ($P < 0.05$) in milk fat between both the groups was 1.3% and between normal control group-I and treatment group-III (250g/day/head) average increase ($P < 0.05$) in milk fat was 2.4% and between treatment group-II (100g/day/head) and treatment group-III (250g/day/head) average increase ($P < 0.05$) in milk fat was 1% (Fig. 1).

We also found improvement in summer season. We found that the milk fat average deference of normal control group-I was 0.2%, milk fat average deference of treatment group-II was 1.5% and the milk fat average deference of treatment group-III was 1.9% in summer season comparing between day 56 and day 1. Here we again found that there is no increase in normal control group-I (As shown in table 3). SEM (Standard Error of Mean) of milk fat is ± 0.01084 .

On comparing between normal control group-I and treatment group-II, we found that average increase ($P < 0.05$) in milk fat between both the groups was 1.3% and between normal control group-I and treatment group-III (250g/day/head) average increase ($P < 0.05$) in milk fat was 1.6% and between treatment group-II (100g/day/head) and treatment group-III (250g/day/head) average increase ($P < 0.05$) in milk fat was 0.3% comparing between day 56 and day 1 (Fig. 2). If we compare both season data then winter season has showed better results.

Table 3: Effect of Herbal Formulation on Milk Fat

BREED: - INDIAN GIR		SEASON: - WINTER AND SUMMER																	
S. No.	Day of Milk Collection	Milk Fat Percentage																	
		Normal Control Group (No dose)						Treatment Group (100g/day/head)						Treatment Group (250g/day/head)					
		S1		S2		S3		S4		S5		S6		S7		S8		S9	
		W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
1	Day 1	4.8	4	3.4	3.5	5.4	5	3	3.1	3.5	2	4.2	2.2	5.3	3.9	3.2	3.1	6.2	4.5
2	Day 7	5	4.1	3.5	3.4	5.3	5.2	3.4	3	3.6	2.4	4.4	2.1	5.5	4.2	3.5	3	6.4	4.6
3	Day 14	4.9	3.9	3.4	3.2	5.5	5.1	3.5	3.2	3.8	2.7	4.6	2.1	5.4	4.5	4	3.2	6.3	4.4
4	Day 21	4.7	3.8	3.3	3.1	5.4	5	3.4	3.4	3.9	3	4.5	2.6	5.8	4.2	3.9	3.6	6.8	4.7
5	Day 28	4.8	4	3.5	3.3	5.4	5.3	3.7	3.3	4.2	2.9	4.3	2.9	6.2	4.4	4.2	4	7.2	4.9
6	Day 35	4.9	4.2	3.4	3.2	5.6	5.4	3.9	3.5	4.3	3.2	4.6	2.5	6.5	4.8	4.5	3.9	7.5	4.8
7	Day 42	4.7	4.5	3.3	3	5.4	5.2	4.2	3.7	4.5	3.6	4.8	3	6.9	5.1	4.8	4.5	7.8	5
8	Day 49	4.9	4.4	3.4	3.2	5.5	5.1	4.6	3.9	4.7	3.8	4.7	3.6	7.1	5.6	5.5	5	8	5.2
9	Day 56	4.7	4.6	3.5	3.4	5.3	5.2	4.9	4	5	3.9	5.1	4	7.5	5.9	6.2	5.7	8.3	5.6

*All Values are statistically significant at $p < 0.05$.

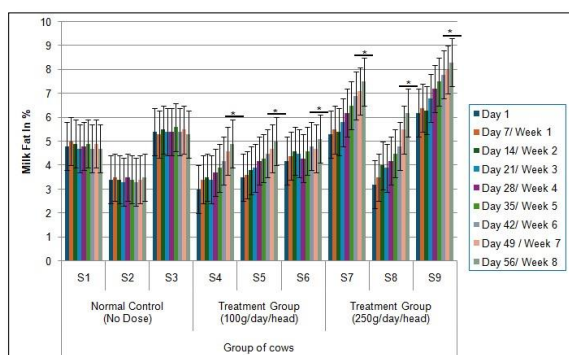


Fig. 1: Average Milk Fat % in Lactating Cows during Winter Season Trial

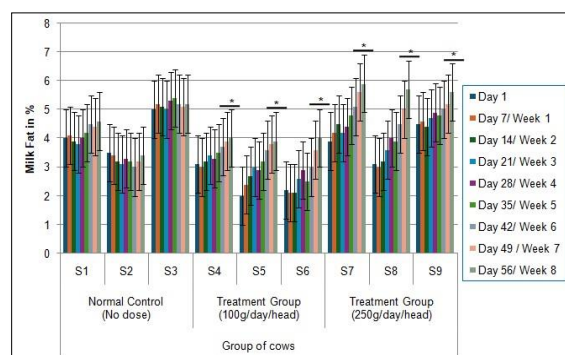


Fig. 2: Average Milk Fat % in Lactating Cows during Summer Season Trial

Table 4: Effect of Herbal Formulation on Milk Yield

BREED: - INDIAN GIR		SEASON: - WINTER AND SUMMER																	
S. No.	Day of Milk Collection	Weekly Milk Yield (In Litre)																	
		Normal Control Group (No dose)						Treatment Group (100g/day/head)						Treatment Group (250g/day/head)					
		S1		S2		S3		S4		S5		S6		S7		S8		S9	
		W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
1	Day 1	4.8	3.3	4.2	4.1	3.8	2	4.6	3.8	4.2	4.2	5.3	5.9	4.9	1.5	4.3	2	6.1	4
2	Day 7	4.9	3	4.1	4.3	3.9	2.4	4.8	4.2	4.5	4.1	5.2	5.4	5.4	1.9	4.7	2.4	6.4	4.2

3	Day 14	4.7	2.9	4.3	4.1	3.7	2.4	4.9	4.6	4.7	4.2	5.3	5.7	5.6	2.4	4.9	2.3	6.7	4.4
4	Day 21	4.9	2.3	4.4	4.3	3.8	2.7	5.1	4.8	4.8	4	5.5	6	5.9	2	5.2	2.9	6.6	4.3
5	Day 28	4.7	2.4	4.3	4.2	3.9	2.3	5.3	4.3	4.7	4.3	5.7	6.2	6.2	2.5	5.5	3.2	7.1	4.9
6	Day 35	4.7	2.3	4.3	4.5	3.8	2.3	5.4	5	4.9	5	5.9	6.3	6.5	2.8	5.7	3.4	7.4	5.2
7	Day 42	4.9	2.2	4.2	4.6	3.7	2.1	5.4	4.3	5.1	4.4	6.1	6.1	6.9	3	6	3.9	7.6	5.4
8	Day 49	4.9	2.7	4.4	4.1	3.9	2.4	5.6	4.6	5.2	5.3	6.3	6.7	7.4	2.8	6.4	4.5	7.8	5.6
9	Day 56	4.7	3.8	4.5	4.4	4	3	5.9	5.5	5.5	5.7	6.6	7	7.7	3	6.8	4.7	8.3	6

*All Values are statistically significant at $p < 0.05$.

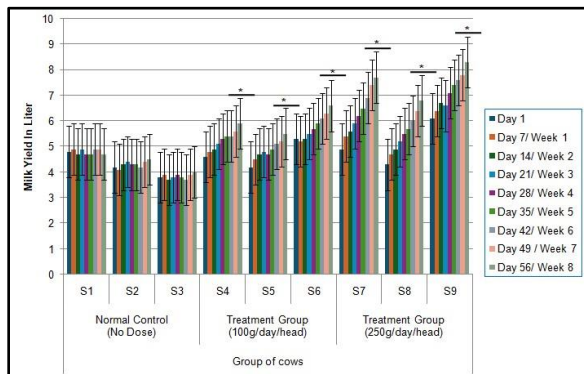


Fig. 3: Average Milk Yield (In Litre) in Lactating Cows during Winter Season Trial

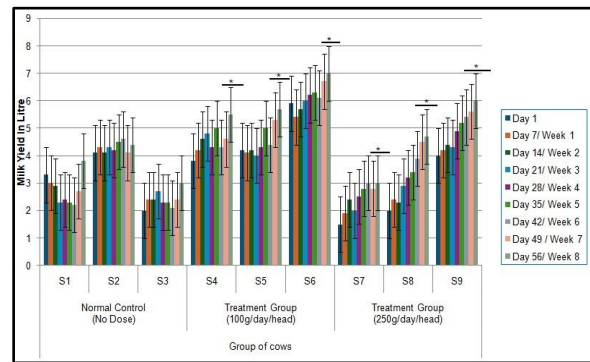


Fig. 4: Average Milk Yield (In Litre) in Lactating Cows during Summer Season Trial

Table 5: Showing Statistical data for winter and Summer Season Trial

AVERAGE FAT %																
Groups	N		Mean		Std. Deviation		Std. Error		95% CI for Mean				Minimum		Maximum	
	W	S	W	S	W	S	W	S	Lower Bound		Upper Bound		W	S	W	S
									W	S	W	S				
No Dose	3	3	4.5519	4.1963	.06246	.12283	.02082	.04094	4.5039	4.1019	4.5999	4.2908	4.47	3.97	4.63	4.40
100 g	3	3	4.1978	3.0963	.45488	.53797	.15163	.17932	3.8481	2.6828	4.5474	3.5099	3.57	2.43	5.00	3.97
250 g	3	3	5.9444	4.5296	.83693	.64568	.27898	.21523	5.3011	4.0332	6.5878	5.0259	4.90	3.83	7.33	5.73
Total	9	9	4.8980	3.9407	.93308	.78193	.17957	.15048	4.5289	3.6314	5.2672	4.2501	3.57	2.43	7.33	5.73
AVERAGE YIELD (LITRE)																
Groups	N		Mean		Std. Deviation		Std. Error		95% CI for Mean				Minimum		Maximum	
	W	S	W	S	W	S	W	S	Lower Bound		Upper Bound		W	S	W	S
									W	S	W	S				
No Dose	3	3	4.3112	3.1518	.06236	.23382	.02079	.07794	4.2633	2.9720	4.3592	3.3315	4.23	2.97	4.40	3.73
100 g	3	3	5.2777	3.5259	.42296	.71362	.14099	.23787	4.9526	2.9774	5.6028	4.0744	4.70	2.50	6.00	4.57
250 g	3	3	6.2962	5.0961	.82165	.48612	.27388	.16204	5.6646	4.7224	6.9278	5.4698	5.10	4.57	7.60	6.07
Total	9	9	5.2950	3.9246	.97267	.99150	.18719	.19081	4.9103	3.5324	5.6798	4.3168	4.23	2.50	7.60	6.07

Table 6: Showing Data Analysis by One Way ANOVA

WEEKLY AVERAGE MILK FAT %										
	Sum of Squares		df		Mean Square		F		Sig.	
	W	S	W	S	W	S	W	S	W	S
Between Groups	15.346	10.125	2	2	7.673	5.063	25.261	21.054	.000	.000
Within Groups	7.290	5.771	24	24	.304	.240				
Total	22.637	15.897	26	26						
WEEKLY AVERAGE MILK YIELD (LITRE)										
	Sum of Squares		df		Mean Square		F		Sig.	
	W	S	W	S	W	S	W	S	W	S
Between Groups	17.735	19.158	2	2	8.868	9.579	31.009	35.911	0.000	.000
Within Groups	6.863	6.402	24	24	0.286	.267				
Total	24.598	25.560	26	26						

Effect on milk yield: Following the treatment of the herbal formulation in winter season, the cows daily milk production also rose. Normal control group-I showed no significant improvement in milk yield (average 0.2 L/cow) on comparing between day 56 and day 1. The milk yield average deference of treatment group-II was 1.3 L/cow and the milk yield average deference of treatment group-III was 2.5L/cow in winter season on day 56. On comparing between normal control group-I and treatment group-II, we found that average increase (P<0.05) in milk yield between both the groups was 1.1 L/cow and between normal control group-I and treatment group-III (250g/day/head) average increase (P<0.05) in milk yield was 2.3 L/cow and between treatment group-II (100g/day/head) and treatment group-III (250g/day/head) average increase (P<0.05) in milk yield was 1.2 L/cow (Fig. 3). SEM (Standard Error of Mean) of weekly milk yield is ±0. 067.

In summer season, there was again no significant improvement in milk yield (average 0.6 L/cow) of

normal control group-I, milk yield average deference of treatment group-II was 1.4 L/cow and the milk yield average deference of treatment group-III was 2 L/cow in summer season comparing between day 56 and day 1(As shown in Fig. 4). When we compare between Group-I and Group-II, Group -II showed average (P<0.05) 0.8 L/cow increase after day 56 in dose dependent manner. Comparison between Group-I and Group-III, average increase (P<0.05) of milk yield in Group-III was 1.4 Liter/cow and between Group-II and Group-III, average increase (P<0.05) of milk yield in Group-III was 0.6 Litre /cow. Group-II and Group-III showed improvement in milk yield in dose dependent manner after the treatment. Standard Error of Mean (SEM) of weekly milk yield in summer season is ±0. 10801. While our winter and summer season investigations, we noticed that cows produce more milk during the winter than the summer (Table 4).

Effect on Body Weight: This herbal milk-fat booster also aims to enhance the dairy animal's general health,

which improves digestion, increases appetite, and boosts vigor, all of which have a favourable impact on milk production. The average weight gain was between 2 to 3 kg per cow in normal control group-I in both seasons. In 100 g of treatment group-II and 250 g of treatment group-III showed 5 to 8 kg and 9 to 15 kg average weight gain respectively in summer and winter

seasons. (Shown in Table 7). Winter season showed better results in gaining weight of cows after oral administration of herbal formulation. All the results showed an effect in a dose-dependent manner for milk fat, milk yield and body weight of cows. Normal control group doesn't show any significant improvement in this study.

Table 7: Effect of Herbal Formulation on Body Weight

BREED: - INDIAN GIR				SEASON: - WINTER AND SUMMER					
S. No.	Experimental Groups	Number of Cows	Tag Number	Weight of Cows on Day 56	Weight of Cows on Day 1	Increase in Body Weight*	Weight of Cows on Day 56	Weight of Cows on Day 1	Increase in Body Weight*
				Winter			Summer		
1	Normal Control Group (No dose)	3	S1	360kg	356kg	04kg	247 kg	245 kg	02kg
			S2	385kg	383kg	02kg	266 kg	266 kg	00kg
			S3	455kg	452kg	03kg	285 kg	281 kg	04kg
2	Treatment Group (100g/Day/Head)	3	S4	373kg	367kg	06kg	263 kg	257 kg	06kg
			S5	475kg	465kg	10kg	310 kg	306 kg	04kg
			S6	457kg	449kg	08kg	306 kg	301 kg	05kg
3	Treatment Group (250g/Day/Head)	3	S7	405kg	395kg	10kg	346 kg	334 kg	12kg
			S8	355kg	339kg	16kg	363 kg	356 kg	07kg
			S9	457kg	438kg	19kg	212 kg	204 kg	08kg

*Using the Lambourne formula for weight calculation

Feeding the dairy cattle by mixing the herbal formulation with balanced diet has been shown to increase the milk fat content and also improve the health and nutrition of the lactating cows. Average milk yield (L/week) and Milk fat (% per week) during post treatment period was also higher (P<0.05) in treatment group II and III which might be due its potent combinations of herbal galactagogues and minerals.

4. DISCUSSION

The research shows how herbal formulations (*Gou Graas*) may help increase the fat and milk production of

cattle in winter and summer season. The findings indicate that, in comparison to the normal control group, the group supplemented with herbal formulations had higher body weight, milk fat and enhanced milk output. This herbal formulation is made up of herbs and carrier minerals, so it can be considered ecologically healthy, easily available at low cost. This herbal should be included in the dairy industry and animal breeders. In this formulation, we have used some potent herbal ingredients. Here, we discuss previously reported works to prove efficiency of

ingredients in the formulation. Choudhary et al. reported that Shatavari (*Asparagus racemosus*) and Fenugreek (*Trigonella foenum graecum*) contains Shatavarine I and Diosgenin active compounds which are natural galactogogues, Shatavari and fenugreek shows positive result in improvement of milk yield of lactating mother. [13] Thakur et al. also reported that fenugreek contains some alkaloids like Trigonelline, Gentianine, Carpaine, which show galactogogues properties. [14] Giloy is another useful ingredient in this formulation. Sodha M. N. revealed in her work, Giloy's chemical composition includes a variety of classes, including polysaccharide-like compounds with therapeutic qualities, alkaloids, steroids, and glycosides. Giloy (*Tinospora cardifolia*) also shows immunity-booster properties. [15] Another work reported that by giving mustard seed oil there is an increase in the milk fat percent in Murrah buffaloes. [16] Bhinda et al showed that Shatavari helps in increment of milk fat and milk yield. [17] McCandlish et al reported that cottonseed meal helps in improving the milk fat and production of cows. [18] The sugar-rich flowers of Mahua (*Madhuca longifolia*), which also contain vital vitamins and minerals, are used to make food, alcohol, and animal feed. [19] Minerals play an important role in cattle's growth. We used natural mineral supplements in this formulation for overall growth of cattle and specially for improving gut fermentation. [20] The herbal milk-fat booster's mechanisms of action most likely include better hormonal control and gut fermentation, which increase milk production and nutritional absorption. Since using sustainable and

natural methods to increase milk output and quality is becoming more and more important, the effects are great for dairy farming. However, our study has certain limitations, such as its small sample size due to limited resources. Using herbal formulations in animal feed has a number of benefits, such as: **Increased productivity:** According to the study's findings, herbal formulations may help dairy farmers increase milk fat, milk yield and quality. (Similar results also reported by Saleh et al. 2023). [21] **Decreased antibiotic use:** By lowering the need for antibiotics, herbal formulations can support a healthier and more sustainable system of cattle production. (Similar works also done by Lillehoj et al.2018). [22] **Improved animal welfare:** Herbal formulations' natural and non-toxic qualities can help animals feel less stressed and have better health. (Similar results also reported by Winston et al.2019). [23] **Improve gut fermentation:** By affecting the gut microorganisms enhancing nutrient absorption, and increasing general health, herbal preparations can dramatically increase animal gastrointestinal fermentation (Similar results also suggested by Bąkowski et al. 2021). [24] In both seasonal trails, all results were statistically significant (Table 5 and 6). This formulation will provide an herbal, eco-friendly, cost effective and easy to administer solution for dairy workers and dairy farmers.

Future direction: Modify formulation: Research the best herbal formulations' ingredients and dosages for various animal species and production methods. [8]

Long-term effects: Research how herbal compositions affect the productivity and well-being of animals over

the long run. [25] [26] **Uniformity:** Create uniform techniques for assessing the quality and effectiveness of herbal mixtures. [27] [28]

Abbreviations

DMI (Dry Matter Intake)

Sig. (Statistically significant)

Authors Details:

¹Research Scholar, Department of Zoology, Government College Shahpur, District-Betul (M.P.) 460440, India

²Research Scholar, Department of Zoology, Government College Shahpur, District-Betul (M.P.) 460440, India

³Research Scholar, Department of Zoology, Government College Shahpur, District-Betul (M.P.) 460440, India

⁴Research Scholar, Department of Zoology, Government College Shahpur, District-Betul (M.P.) 460440, India

^{5*} Assistant Professor, Department of Zoology, Government College Shahpur, District-Betul (M.P.) 460440, India

Authors Contribution:

Conceptualization and Experimental management: Sheetal Choudhary

Data collection and literature search: All authors

Writing – original draft: All authors

Reviewing & editing: Sheetal Choudhary

Approval of final manuscript: All authors

Conflict of Interest – The authors declare no conflicts of interest.

Source of Funding - Government of India provided financial support under BIRAC E-Yuva scheme (Project reference ID-BT/EF0335/2.0/24) from BIRAC E-Yuva Centre Career College (Autonomous) Bhopal to conduct this study.

Source of Support – Blue Mountain Herbals LLP, Bhawrasla, Indore, Madhya Pradesh, India has provided Shatavari (*Asparagus racemosus*). Indian Jadi Booti, Shahdara, Delhi, India has provided Giloy (*Tinospora cordifolia*) & Limestone powder raw drug for the experimental study.

Additional Information:

Authors can order reprints (print copies) of their articles by visiting:

<https://www.akinik.com/products/2281/journal-of-ayurveda-and-holistic-medicine-jahm>

Publisher's Note:

Atreya Ayurveda Publications remains neutral with regard to jurisdictional claims in published maps, institutional affiliations, and territorial designations. The publisher does not take any position concerning legal status of countries, territories, or borders shown on maps or mentioned in institutional affiliations.

References:

1. Faye B, Konuspayeva G. The sustainability challenge to the dairy sector – The growing importance of non-cattle milk production worldwide. *International Dairy Journal* (Int. Dairy J.). 2012 Jan 31; 24(2):50–6. Available from: <https://doi.org/10.1016/j.idairyj.2011.12.011>
2. Van Vuuren AM, Chilibruste P. Challenges in the nutrition and management of herbivores in the temperate zone. *Animal (Animal)*. 2011 Sep 29; 7:19–28. Available from: <https://doi.org/10.1017/s1751731111001741>
3. Bhatt N, Singh M, Ali A. Effect of feeding herbal preparations on milk yield and rumen parameters in lactating crossbred cows. *International Journal of Agriculture and Biology (IJAB)*. 2009 Jan 1; 11(6):721–6. Available from: https://www.researchgate.net/publication/200783918_Effect_of_Feeding_Herbal_Preparations_on_Milk_Yield_and_Rumen_Parameters_in_Lactating_Crossbred_Cows
4. Lock AL, Bauman DE. Modifying milk fat composition of dairy cows to enhance fatty acids beneficial to human health. *Lipids (Lipids)*. 2004 Dec 1;39(12):1197–206. Available from: <https://doi.org/10.1007/s11745-004-1348-6>
5. Bora M, Srivastava B, Gaidhani SN, Sharma H, Gautam MK, Tiwari RK, et al. Development of a novel polyherbal formulation for augmenting milk production in healthy dairy cows. *Journal of Drug Research in Ayurvedic Sciences (JDRAS)*. 2019 Jan 1;4(2):84–94. Available from: <https://doi.org/10.5005/jdras-10059-0064>
6. Chavan MK, Bhosale TR, Deokar DK. Effect of Feeding Shatavari (*Asparagus racemosus*) Root Powder on Quantity of Milk in Crossbred Cows. *Asian Journal of Dairy and Food Research (AJDFR)*. 2022 Sep 6;(Of). Available from: <https://doi.org/10.18805/ajdfr.dr-1820>
7. Rane S, Ramteke B, Gadegaonkar G, Karambele N, Jagadale S. Effect of supplementation of herbal mixture on milk production

- and its composition in crossbred cows. *International Journal of Advanced Biochemistry Research (Int. J. Adv. Biochem. Res.)*. 2024 Jan 1;8(8S):603–7. Available from: <https://doi.org/10.33545/26174693.2024.v8.i8si.1888>
8. Bhatt N. Herbs and Herbal Supplements, a novel nutritional approach in animal nutrition. *Iranian Journal of Applied Animal Science (Iran. J. Appl. Anim. Sci.)*. 2014 Aug 31;5(3):497–516. Available from [:https://www.researchgate.net/publication/282001346_herbs_and_Herbal_Supplements_a_Novel_Nutritional_Approach_in_Animal_Nutrition](https://www.researchgate.net/publication/282001346_herbs_and_Herbal_Supplements_a_Novel_Nutritional_Approach_in_Animal_Nutrition)
 9. Das TK, Debinath BC, Sarkar BK, De A, Maini S. Effect of herbal feed supplements on milk yield and composition in crossbred cows in Tripura. *Indian Journal of Animal Science (Indian J. Anim. Sci.)*. 2017 Jun. 21 (cited 2025 Jul. 4);87(6):747–751. Available from: <https://epubs.icar.org.in/index.php/IJAnS/article/view/71180>
 10. Kuralkar P, Kuralkar SV. Role of herbal products in animal production – An updated review. *Journal of Ethnopharmacology (J. Ethnopharmacol.)*. 2021 May 27; 278:114246. Available from: <https://doi.org/10.1016/j.jep.2021.114246>
 11. Sutherland M, Webster J, Sutherland I. Animal Health and Welfare Issues Facing Organic Production Systems. *Animals (Animals)*. 2013 Jun;3(4):1021–35. Available from: <https://doi.org/10.3390/ani3041021>
 12. Nahari RV, Subagiarti N, Jauhari A, Alfita R, Wibisono KA, Ibadillah AF, Pramudia M. Cow weight estimation using local adaptive thresholding method and connected component labelling. In *International Conference on Science and Technology (ICST 2018) 2018 Dec (pp. 148-152)*. Atlantis Press. Available from: <https://doi.org/10.2991/icst-18.2018.32>
 13. Choudhary S, Gupta K, Marskole S, Irapache D, Yadav S, Dayma M. Phytoestrogens as galactagogues in human and dairy cattle. *International Journal of Veterinary Sciences and Animal Husbandry (Int. J. Vet. Sci. Anim. Husb.)*. 2025 Jan 1;10(1):283–91. Available from: <https://doi.org/10.22271/veterinary.2025.v10.i1e.2036>
 14. Thakur M, Khedkar R, Singh K, Sharma V. Ethnopharmacology of botanical galactagogues and comprehensive analysis of gaps between traditional and scientific evidence. *Current Research in Nutrition and Food Science Journal (Curr. Res. Nutr. Food Sci.)*. 2023 Aug 31;11(2):589–604. Available from: <https://doi.org/10.12944/crnfsj.11.2.11>
 15. Sodha MN. A review on *Tinospora cordifolia* (Giloy): Multipurpose medicinal plant. *World Journal of Pharmaceutical Research (World J. Pharm. Res)*. 2025; Volume 14(Issue 8, 691-701). Available from: <https://tinyurl.com/3cr37hct>
 16. Thul M, Oberoi P, Kumaresan A, Gonge D, Bharti P, Japheth K. Effect of mustard oil supplementation during transition period on milk composition and calves's birth weight in Murrah Buffaloes. *International Journal of Livestock Research (Int. J. Livest. Res.)*. 2017 Jan 1;1. Available from: <https://doi.org/10.5455/ijlr.20170528065433>
 17. Bhinda R, Choudhary J, Gupta L, Singh S. Effect of Shatavari (*Asparagus racemosus*) Supplementation on Milk Production and its Composition in Crossbred Cows. *International Journal of Livestock Research (Int. J. Livest. Res.)*. 2020 Jan 1;(0):1. Available from: <https://doi.org/10.5455/ijlr.20200306021823>
 18. McCandlish AC. The use of cottonseed meal to increase the percentage of fat in milk. *Journal of Dairy Science (J. Dairy Sci.)*. 1921 Jul 1;4(4):310–33. Available from: [https://doi.org/10.3168/jds.s0022-0302\(21\)94217-6](https://doi.org/10.3168/jds.s0022-0302(21)94217-6)
 19. Devanand P, Radha P, Hemaprabha K, Kumar P, Raja N, Sivakumar B, et al. The *Madhuca longifolia*: A multifaceted tree with rich in nutritional factors. *International Journal of Research in Agronomy (Int. J. Res. Agron.)*. 2024 Aug 1;7(8):209–13. Available from: <https://doi.org/10.33545/2618060x.2024.v7.i8c.1223>
 20. Dey D, Sharma B, Khare A, Gupta SK. Importance of mineral feeding in dairy animals: A review. *Bhartiya Krishi Anusandhan Patrika (BKAP)*. 2018 Dec 31;33(4). Available from: <https://doi.org/10.18805/bkap134>
 21. Saleh AA, Soliman MM, Yousef MF, Eweedah NM, El-Sawy HB, Shukry M, et al. Effects of herbal supplements on milk production quality and specific blood parameters in heat-stressed early lactating cows. *Frontiers in Veterinary Science*

- (Front. Vet. Sci.). 2023 Jun 1;10. Available from: <https://doi.org/10.3389/fvets.2023.1180539>
22. Lillehoj H, Liu Y, Calsamiglia S, Fernandez-Miyakawa ME, Chi F, Cravens RL, et al. Phytochemicals as antibiotic alternatives to promote growth and enhance host health. *Veterinary Research (Vet. Res.)*. 2018 Jul 28; 49(1). Available from: <https://doi.org/10.1186/s13567-018-0562-6>
 23. Winston, David. (2019). *Adaptogens: Herbs for Strength, Stamina, and Stress Relief - Updated and Expanded -2nd Edition*. https://www.researchgate.net/publication/335057545_Adaptogens_Herbs_for_Strength_Stamina_and_Stress_Relief_-_Updated_and_Expanded_-_2nd_Edition
 24. Bąkowski M, Kiczorowska B. Probiotic microorganisms and herbs in ruminant nutrition as natural modulators of health and production efficiency – a review. *Annals of Animal Science (Ann. Anim. Sci.)*. 2020 Oct 14;21(1):3–28. Available from: <https://doi.org/10.2478/aoas-2020-0081>
 25. Maghin, F., *Natural extracts in animal nutrition: Animal well-being and products quality* 2017; Available from: https://air.unimi.it/retrieve/dfa8b997-f853-748b-e0533a05fe0a3a96/phd_unimi_R10427.pdf
 26. Govindaraghavan S, Sucher NJ. Quality assessment of medicinal herbs and their extracts: Criteria and prerequisites for consistent safety and efficacy of herbal medicines. *Epilepsy & Behavior (Epilepsy Behav.)*. 52:363–71. Available from: <https://doi.org/10.1016/j.yebeh.2015.03.004>
 27. Panigrahi PN. Evaluation of therapeutic potential of poly herbal formulation on sub clinical mastitis. *Journal of Animal Research (J. Anim. Res.)*. 2022 Apr 25;12(2). Available from: <https://doi.org/10.30954/2277-940x.02.2022.13>.
 28. Wójtowski JA, Pikul J, Mikołajczak P, Czopowicz M, Kaba J, Foksowicz-Flaczyk J, et al. Effect of herbal feed additives on milk performance and health status of dairy goats. *Journal of Veterinary Research (J. Vet. Res.)* 2025 Apr 4; Available from: <https://doi.org/10.2478/jvetres-2025-0021>