Vol.11 No. 2, Page No. 101–105 (2022)
Received: October, 2022; Accepted: November, 2022

Evaluation the Effect of Yeast (*Sacchromyes cerevisiae*) along with Shatavari *(Asparagus racemosus)* on Performance of Buffaloes

Sandip Kumar[1] and S.P. Singh[2]
JNKVV – Krishi Vigyan Kendra, Nowgong, Chhatarpur , M. P., India
JNKVV, College of Agriculture, Tikamgarh, M.P., India
E-mail: getsandipkumar@rediffmail.com

Abstract

The effect of Yeast and Shatavari root powder supplementation on dry matter intake (DMI), milk production, its composition, reproductive performance and economic performance was studied in buffaloes at farmer's fields as on farm testing. Buffaloes were divided based on similar age, milk production, body weight and parity into a control group (n=12, T_1) and treatment group Yeast and Shatavari supplemented (n=12, T_2). T_2 group buffaloes were fed Yeast @ 20 gram/ day/buffalo and Shatavari root power@100 mg/kg live body weight once in the morning along with feed for 60 days, while T_1 group buffaloes were taken as control. The milk yield was significantly more (P<0.01) in T_2 group. Total solids and SNF (P<0.05) in treated group was significantly higher in comparison to control group. Buffaloes of treated group took less service period and higher conception rate (P<0.05) than the control group. Benefit cost ratio was higher in treated group as compare to control group. It was concluded that supplementation of Yeast along with Shatavari significantly increased Dry matter intake, milk yield, and reduced service period and services per conception in buffaloes.

Keywords: *Yeast, Shatavari, buffaloes, Milk yield, Milk composition, Reproduction.*

Introduction

In developing countries feeding practices to ruminants is mainly dependent on crop residues like straw and stovers. Most of them are low quality forages. Overall digestibility of nutrients is affected due to these low quality fibres. Addition of certain kind of yeast culture improves digestibility of fiber and protein. They increased rumen propionate, higher DMI, stabilization and stimulation of rumen digestion, maintain rumen P^H, faster rate of fiber degradation and increased milk yield. It was reported that cellulolytic, lactate utilizing and total anaerobe populations were increased when viable yeast culture was added to rumen simulators fed 54% corn diets. This is because of higher P^H.

Nutritional management is first line of guard that naturally affects the productivity and health status of animals. Mismanagement of which adversely affects milk production, reproduction and supposed animals susceptible to various diseases and ailment[1]. During first lactation phase animals required more energy failure of which leads to reduction in body weight of animals. Many drugs are used to increase milk productions in animals but their residual effects were seen in milk. However *Shatavari*, herbal plant has great and tremendous medicinal value due to presence of steroidal sapogenins, saponins and phytochemicals. It has galactagogue and mammogenic properties. Shatavari root powder is used for productive and reproductive improvements[4]. The present study was undertaken at farmers field to evaluate the effect of supplementation of Shatavari root powder and Yeast culture on productive and reproductive performance in buffaloes[5].

Materials and Methods

Asparagus racemosus (*Satavar*, *Shatavari* or *Shatamull*) is common throughout India. It grows 1-2 m tall and prefers to take root in gravelly, rocky soils high up in piedmont plains. Due to its herbal uses, the demand for *Asparagus racemosus* is gradually increased day by day. *Asparagus racemosus* (*Shatavari*) is recommended in Ayurvedic texts for the prevention of reproductive insufficiency, treatment of gastric ulcers and so many other uses like nervous disorders and agalactagogue etc. *Shatavari* means "curer of a hundred diseases" (shat: "hundred"; vari: "curer"). Yeast is stabilizes rumen P^H and increases nutrient utilization.

This research was conducted at Nandanpur Village located at block - Jatara, Tikamgarh in early lactating buffalo whose live body weight and milk yield were approximately similar (Table 1). 24 buffaloes were randomly divided into two groups (12 animals each), with 21 days of adaptation period and 7 days of the experimental period comprised the sampling period. *Saccharomyces cerevisiae and* Shatavari were used as dry form in this experiment.

Experimental rations were as follows: control (concentrate feed mixture) and treated (control ration plus 20 g live yeast (2.0x1000 CFU/g/d) plus 100 mg/kg live body weight per day per buffalo. The feeds offered as per NRC (2001) recommendations for buffalo. The experimental diet consisted of concentrate feed: green fodder: wheat straw (1:2:3 dry matter bases). The ration offered for each buffalo was twice daily at 5.30 a.m., 6:00 p.m. The buffaloes had *ad libitum* access to water. Dry matter intake was measured at the end of sample collection period by weighing the offered diet and refusals from the previous day. The animals were milked twice daily at 6:00 a.m. and 6:30 p.m. Milk yield was measured daily. Milk samples were collected at the end of sample collection period. All the samples were stored at 4°C before analysis.

The content of nutrients in the diets was analyzed as per methods given by AOAC[2]. Neutral detergent fiber (NDF) and acid detergent fibers (ADF) values were determined using methods by author[8]. Fat determination done by Gerber method and protein by Kjeldahl method.

The data collected on different parameters were subjected to statistical[2] analysis using t-test for means comparison between control group versus supplemented group at $P<0.05$ levels of probability[7].

Economics

The economic return, expressed as the ratio of output to input, was calculated as:

Output/input = (MY × CM) / (DMI × CF)

Where,

MY: Average milk yield (kg/animal)

CM: Cost of milk (Rs./kg)

DMI: Daily DM intake (kg/animal per day)

CF: Cost of feeds.

Table 1 Data of Experimental animals

S. No.	Groups	Number of buffaloes	Body weight (kg)	Days in milk	Milk yield (kg/day)
1.	Control (T_1)	12	560	19	5.1
2.	Treatment (T_2)	12	540	17	5.2

Table 2 Chemical composition of concentrate feed mixture (CFM) and green fodder (g/kg) DM

S. No.	Chemical (g/kg) DM composition	CFM (%)	Green fodder (%)
1.	DM	90.05	15.30
2.	OM	71.60	80.22
3.	CP	18.10	9.30
4.	EE	8.90	13.10
5.	ADF	12.30	61.52
6.	NDF	52.60	72.93
7.	Ash	60.00	11.00
8.	ME (Kcal/kg)	2611	

DM-dry matter; OM-organic materials; CP- crude protein; EE- Ether extract ; ADF- acid detergent-fibre; NDF-neutral detergent fibre. ME obtained by calculation[7]

Results and Discussion

Results of present study on body weight (BW) changes, DMI, milk production, FCM and milk composition (protein, fat, SNF and total solids) are given in Table 3. Buffaloes who were supplemented with treatment had positive effect on the BW changes of the lactating buffaloes ($P<0.05$). Total DMI was greater in treated animals compared to the control animals (12.83 ± 0.42 and 13.34 ± 0.39 kg, respectively), however, this increase was not statistically significant ($P>0.05$). Average daily milk production was increased by 12% (7.12 vs. 8.00 kg) in supplemented buffaloes compared to control group, respectively ($P<0.05$). Milk protein, SNF and total solids were similar ($P>0.05$) between the groups.

The economic benefit from feeding supplement to lactating buffaloes is shown in Table 4. On DM basis, the price of one kg concentrate feed was rupees 3.40, whereas the cost of green fodder was rupees 3.0 and wheat straw was 4.0. The market price of each litre of milk was considered as rupees 40. Therefore, total feed cost with supplementation was rupees 181 per buffalo per day and control feed cost was rupees 173. Therefore, economic benefit (ratio of output/input) of treated group had a slightly higher effect compared to control (1.77 vs. 1.64).

Table 3 Average DMI, milk yield and composition in control and treated group

Parameters	T_1	T_2
Body weight (kg)	505± 10.16	531± 11.62
DM intake (kg/day)	12.83 ± 0.42	13.34 ± 0.39
Milk yield (kg/day)	7.12^{a} ± 0.22	8.00^{b}± 0.27
4% FCM yield (kg/day)	8.32 ± 0.22	8.51 ± 0.18
Fat %	5.29^{a} ± 0.17	6.25^{b} ± 0.24
Protein	4.36 ± 0.08	4.48 ± 0.06
SNF %	12.58 ± 0.15	11.86 ± 0.11
Total solids %	17.83 ± 0.32	18.26 ± 0.23

Means with different superscripts $^{a, b}$ differ in a row ($P<0.05$)

Table 4 Economic of the experiment

Description	T_1	T_2
Cost of feed (Rs./ animal/ day)	173	181
Milk yield (kg/ animal/ day)	7.12	8.00
Cost of milk (Rs./ animal/ day)	284	320
Economic benefits	1.64	1.77

The positive effect of supplementation on post-partum (35 to 50 days) BW changes of lactating buffaloes compared to the control group may be due to the availability of energy that resulted in body restoration. The supplementation might have stimulated the growth of cellulolytic bacteria which resulted in higher NDF digestibility and more production of VFAs for energy which were also recorded in this study. No effect on DMI of buffaloes, in present study, was in accordance with the observations of previous researchers who stated that live yeast supplementation has no effect on DMI in dairy cattle[6] and heifers.

The positive effect on milk production in present study was in line with the findings of other authors[3,4] and may be due to an increase in NDF digestibility[1] and more VFA production thus higher energy availability for milk production.

Conclusion

Supplementation of lactating buffaloes with yeast and Shatavari had positive effects on milk production and NDF digestibility in buffaloes.

Acknowledgement

The authors thank JNKVV and ICAR for conducting trials at farmers field under doubling farmer income programme.

Conflict of interest

There is no conflict of interest by the authors for this research article.

References

1. Anjum, M.I., Javid, S. Ansar, M.S. and Ghaffar, A. (2018). Effect of yeast (Sacchromyces cerevisiae supplementation on intake, digestibility, rumen fermentation and milk yield in Nili-Ravi buffaloes. *Iranian Journal of Veterinary Research, Shiraz University*, 19(2): 96-100.
2. AOAC (1990). *Official methods of analysis*. 15th Edn., Association of Official Analytical Chemists, Washington, D.C., USA.
3. Degirmencioglu, T., Ozcan, T., Ozbilgin, S. and Senlurklu, L. (2013). Effects of yeast culture addition (*Saccharomyces cerevisiae*) to Anatolian water buffalo diets on milk composition and somatic cell count. Mljekartro, 63: 42-48.
4. Kumar Santosh, Mehla R.K. and Singh Mahendra (2014). Effect of Shatavari (*Asperagus racemosus*) on milk production and immune-modulation in Karan fries crossbred cows. *Indian Journal of Tradit Knowle*, 13(2):404-408.
5. NRC (2001). Nutrient requirements of dairy cattle. Washington D.C., National Academy Press.
6. Rossow, HA; Riordan, T and Riordan, A (2017). Effects of addition of a live yeast product on dairy cattle performance. *Journal of Applied Animal Research*, 46:1-5.
7. Steel, RGR; Torrie, J.H. and Dickey, D.A. (1997). Principles and procedures of statistics. A biochemical approach. 3rd Edn., NY, USA, McGraw Hill Book Co. Inc., PP:113-115.
8. Van Soest, P.J.; Robertson, H.B. and Lewis, B.A. (1981). Methods of dietary fibre, NDF and non-starch polysaccharides in relation to animal material. *Journal Dairy Science*, 74: 3583-3595.