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## Effect of feeding of guar meal on growth performance of buffalo calves at organized farm

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### Abstract

The objective of the present investigation was to study the effect of guar meal on the growth performance of Buffalo calves in 90 days experimental period. In the present investigation a total 11 buffalo calves for T<sub>0</sub> treatment 3 calves, T<sub>1</sub> treatment 4 calves and T<sub>2</sub> treatment 4 calves. The selected experimental buffalo calves were grouped in 3 groups viz; T<sub>0</sub> (Average age: 5 month and weight: 83.70 kg), T<sub>1</sub> (Average age: 6 month and weight: 84.11 kg) and T<sub>2</sub> (Average age: 5 month and weight: 83.18 kg), respectively. Treatment T<sub>0</sub> contain zero percent guar meal whereas T<sub>1</sub> and T<sub>2</sub> contains 10% and 20% guar meal respectively. Analysis carried out by Complete Randomized Design (Unequal Replications). The results showed that guar meal treatments were found statistically non-significant difference but numerically live body weight, body length, body height, chest girth and belly girth of buffalo calves were higher in treatment T<sub>2</sub> than treatment T<sub>0</sub> and T<sub>1</sub>. Total weight gain of buffalo calves of treatments T<sub>2</sub> shows statistically significant difference over control treatments T<sub>0</sub>. It was concluded that incorporation 20% guar meal in concentrate diet is economical without affecting the growth of the buffalo calves.

**Keywords:** Buffalo calves, guar meal, growth performance, body weight

### Introduction

Buffaloes (*Bubalus bubalis*) are the backbone of Indian dairy industry. India stands first in buffalo population in the world. The current buffalo population in India is 109.49 million (as per 2019 census) total buffalo population has increased by 1.1% over previous census. (2012-108.70). Female buffalo population increased by 8.61% where as male buffalo is declined by 42.35% over previous census. About 20.5% of the total livestock is contributed by buffaloes and these represent 92.52% of the world's buffalo population. Buffalo milk contributes to 91.82 million tonnes of milk produced in India. Uttar Pradesh has the highest buffalo population across India, at about 33.0 Million in 2019. According to livestock census 2019 Maharashtra rank 7<sup>th</sup> in buffalo population (5.6 Million) as compared to other states of India. Buffaloes which has been the backbone of white revolution /operation flood Programme in India and having a major contribution in the economy. Its better adaptability to wider range of climates and excellent feed conversion efficiency make them ideal livestock for Asian countries. Buffaloes plays a prominent role in rural livestock production in India. Indian buffaloes are an important source of milk supply even today. Buffalo has now come to occupy an important place in the dairy industry of India. Guar (*Cyamopsis tetragonoloba*) is a drought-tolerant kharif legume grown chiefly in arid and semi arid areas like Gujarat, Rajasthan and some part of Haryana. In Asia, guar bean is also used as a vegetable for human. Guar meal is the main by product of guar gum production, is a potential source of protein. It is a mixture of germs and hulls at an approximate ratio of 25% germ to 75% hull. Guar meal contains 42.52 % DCP and 83.49 % TDN. ME content is 2022-2274 Kcal of ME /kg. The experiment was under taken to evaluate effect of guar meal (*Cyamopsis tetragonoloba*) on growth performance of buffalo calves at organized farm.

### Materials and Methods

The experiment was conducted at Buffalo Unit, Department of Animal Husbandry and Dairy Science, College of Agriculture, Vasanttrao Naik Marathwada Krushi Vidyapeeth, Parbhani. Total 11 buffalo calves for T<sub>0</sub> treatment 3 calves, T<sub>1</sub> treatment 4 calves and T<sub>2</sub> treatment 4 calves were selected from the Buffalo Unit, Department of Animal Husbandry and Dairy Science, COA, VNMKV, Parbhani to conduct the experiment. The selected experimental buffalo calves were grouped in 3 groups viz; T<sub>0</sub> (Average age: 5 month and weight: 83.70 kg), T<sub>1</sub> (Average age: 6 month and weight: 84.11 kg) and T<sub>2</sub> (Average age: 5 month and weight: 83.18 kg), respectively.

The experiment was conducted during 18<sup>th</sup> February 2022 to 18<sup>th</sup> May 2022 at Buffalo unit. The experiment period was 90 days and 15 days pre-experimental period.

Ingredient used in Treatment (T<sub>0</sub>) : 20 parts GNC +17 parts jawar grain+ 15 parts wheat grain + 20 parts gram + 15 parts pigeon pea + 10 parts wheat bran + 2 parts mineral mixture + 1 parts salt.

Treatment (T<sub>1</sub>) : 10 parts GNC + 10 parts guar meal +17 parts jawar grain+ 15 parts wheat grain + 20 parts gram+ 15 parts pigeon pea+ 10 parts wheat bran+ 2 parts mineral mixture+ 1 parts salt.

Treatment (T<sub>2</sub>) : 20 parts guar meal +17 parts jawar grain+ 15 parts wheat grain + 20 parts gram+ 15 parts pigeon pea+ 10

parts wheat bran+ 2 parts mineral mixture+ 1 parts salt.

The observation recorded during the research was Body weight gain, body height, body length, chest girth, belly girth. The data was statistically analyzed by using CRD (Unequal Replications) experimental design.

## Results

### Body Measurement

#### 1. Body weight

The observations on body weight of each calves were recorded weekly during the experimental period of 90 days and analysed. The mean of the treatments has been presented in Table 1.

**Table 1:** Effect of guar meal on the body weight (kg) in buffalo calves

| Time interval (weeks) | T <sub>0</sub> (Control) | T <sub>1</sub> | T <sub>2</sub> | S.E. ± | CD at 5 % |
|-----------------------|--------------------------|----------------|----------------|--------|-----------|
| 0                     | 83.70                    | 84.11          | 83.18          | 3.394  | N.S.      |
| 1                     | 84.49                    | 85.69          | 86.74          | 3.417  | N.S.      |
| 2                     | 87.71                    | 88.45          | 88.90          | 3.763  | N.S.      |
| 3                     | 90.55                    | 91.33          | 92.94          | 3.384  | N.S.      |
| 4                     | 93.52                    | 94.68          | 95.99          | 3.873  | N.S.      |
| 5                     | 95.51                    | 97.93          | 98.63          | 3.983  | N.S.      |
| 6                     | 98.98                    | 99.04          | 101.34         | 4.284  | N.S.      |
| 7                     | 101.92                   | 103.65         | 105.56         | 4.043  | N.S.      |
| 8                     | 104.91                   | 106.96         | 108.53         | 4.243  | N.S.      |
| 9                     | 107.74                   | 110.15         | 112.03         | 4.410  | N.S.      |
| 10                    | 111.48                   | 112.92         | 114.85         | 4.555  | N.S.      |
| 11                    | 115.00                   | 116.60         | 119.28         | 4.631  | N.S.      |
| 12                    | 117.44                   | 120.73         | 123.94         | 5.569  | N.S.      |
| 13                    | 121.30                   | 126.66         | 131.10         | 5.497  | N.S.      |

The results showed that the average body weight in the beginning of the experiment in T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub> groups was 83.70, 84.11 and 83.18 kg, respectively. While the average body weight at the end of 90 days study period was 121.30, 126.66 and 131.10 kg, respectively. No significant difference in initial and final body weights was recorded among the three groups. The values of live weight gain were higher in T<sub>1</sub> and lower in T<sub>0</sub> but difference was non-significant. Similarly, difference between T<sub>1</sub> and T<sub>2</sub> among the treatments was also

statistically non-significant but numerically body weight gain in treatment T<sub>2</sub> (131.10 kg) was recorded higher as compared to T<sub>1</sub> and T<sub>2</sub>.

#### 2. Body weight gain

The body weight gain was calculated from difference between initial body weight (0 days) and final body weight (90 days) and has been analyzed. The mean of the treatments has been presented in Table 2.

**Table 2:** Effect of guar meal on body weight gain (kg) of buffalo calves

| Treatments               | Initial body weight (kg) | Final body weight (kg) | Average total body weight gain (kg) | Average daily body weight gain (g) |
|--------------------------|--------------------------|------------------------|-------------------------------------|------------------------------------|
| T <sub>0</sub> (Control) | 83.70                    | 119.63                 | 35.94                               | 0.399                              |
| T <sub>1</sub>           | 84.11                    | 126.16                 | 42.05                               | 0.473                              |
| T <sub>2</sub>           | 83.18                    | 131.10                 | 47.93                               | 0.533                              |
| S.Em. ±                  | 3.394                    | 5.507                  | 2.516                               | 0.028                              |
| CD at 5 %                | N.S.                     | N.S.                   | 7.342                               | 0.081                              |

It is observed from Table 2. that, the average total body weight gain of calves during experimental period was 35.94, 42.05 and 47.93 kg in treatments T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub>, respectively and average daily body weight gain of experimental calves was 0.399, 0.473 and 0.533 g in treatment T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub>, respectively. The minimum weight gain was observed in treatment T<sub>0</sub> and while the maximum in treatment T<sub>2</sub>. All treatments were significantly differed with each other which shows increasing level of guar meal in conc. mixture

increases the body weight gain in buffalo calves. It was observed that the high guar meal treatments i.e. T<sub>2</sub> (20 %) shows higher body weight gain of calves than low guar meal group T<sub>1</sub> (10 %) and T<sub>0</sub> (Control).

#### 3. Body length

The observations on body length of each calf were recorded weekly during the experimental period of 90 days and analyzed. The mean of treatment has been presenting Table 3.

**Table 3:** Effect of guar meal on the body length (cm) of buffalo calves

| Time interval (weeks) | T <sub>0</sub> (Control) | T <sub>1</sub> | T <sub>2</sub> | S.E. ± | CD at 5 % |
|-----------------------|--------------------------|----------------|----------------|--------|-----------|
| 0                     | 86.00                    | 85.00          | 87.00          | 0.886  | N.S.      |
| 1                     | 86.67                    | 85.75          | 88.25          | 0.711  | N.S.      |
| 2                     | 87.67                    | 86.75          | 89.00          | 0.742  | N.S.      |
| 3                     | 88.33                    | 88.00          | 90.00          | 0.673  | N.S.      |
| 4                     | 89.33                    | 89.50          | 91.25          | 0.854  | N.S.      |
| 5                     | 90.67                    | 91.00          | 92.25          | 1.025  | N.S.      |
| 6                     | 92.00                    | 93.00          | 93.25          | 0.977  | N.S.      |
| 7                     | 93.00                    | 93.75          | 94.50          | 1.065  | N.S.      |
| 8                     | 94.00                    | 94.00          | 95.50          | 1.053  | N.S.      |
| 9                     | 95.33                    | 95.00          | 96.75          | 1.092  | N.S.      |
| 10                    | 96.67                    | 96.00          | 97.75          | 1.125  | N.S.      |
| 11                    | 97.67                    | 97.50          | 99.00          | 1.029  | N.S.      |
| 12                    | 99.00                    | 99.25          | 101.00         | 1.176  | N.S.      |
| 13                    | 100.00                   | 101.00         | 103.25         | 1.114  | N.S.      |

The Table 3. showed that the average body lengths of calves in the beginning of the experiment in T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub> groups was 86.00, 85.00 and 87.00 cm, respectively. While the average body length at the end of 90 days study period was 100.00, 101.00 and 103.25 cm, respectively. There was no significant difference in initial and final body length was recorded among the three treatments. The values of body length were recorded higher in T<sub>1</sub> and lower in T<sub>0</sub> but difference was non significant. Similarly, difference between

T<sub>1</sub> and T<sub>2</sub> was also non significant. Also there was non significant difference between T<sub>0</sub> and T<sub>2</sub>.

#### 4. Chest girth

The observations on chest girth of each calf were recorded weekly during the experimental period of 90 days and analyzed. The mean of treatments has been presented in Table 4.

**Table 4:** Effect of guar meal on chest girth (cm) of buffalo calves

| Time interval (weeks) | T <sub>0</sub> (Control) | T <sub>1</sub> | T <sub>2</sub> | S.E. ± | CD at 5 % |
|-----------------------|--------------------------|----------------|----------------|--------|-----------|
| 0                     | 102.67                   | 103.50         | 102.00         | 2.185  | N.S.      |
| 1                     | 102.33                   | 104.25         | 103.00         | 2.247  | N.S.      |
| 2                     | 104.33                   | 105.00         | 104.00         | 2.273  | N.S.      |
| 3                     | 105.33                   | 106.00         | 105.50         | 2.296  | N.S.      |
| 4                     | 106.00                   | 107.00         | 106.75         | 2.289  | N.S.      |
| 5                     | 107.00                   | 108.00         | 107.75         | 2.289  | N.S.      |
| 6                     | 108.33                   | 109.00         | 108.75         | 2.247  | N.S.      |
| 7                     | 109.33                   | 110.00         | 109.75         | 2.247  | N.S.      |
| 8                     | 110.33                   | 111.00         | 111.00         | 2.257  | N.S.      |
| 9                     | 111.00                   | 112.00         | 112.00         | 2.299  | N.S.      |
| 10                    | 112.33                   | 113.00         | 113.00         | 2.257  | N.S.      |
| 11                    | 112.67                   | 113.75         | 114.25         | 2.173  | N.S.      |
| 12                    | 113.33                   | 114.75         | 115.75         | 2.331  | N.S.      |
| 13                    | 115.00                   | 116.50         | 117.00         | 2.457  | N.S.      |

The Table 4. showed that average body chest girth of calves in beginning of the experiment in T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub> groups was 102.67, 103.50 and 102.00 cm, respectively. While the average body chest girth at the end of 90 days experimental period was 115.00, 116.50 and 117.00 cm, respectively. No significant difference in initial and final body chest girth was recorded among the three treatments. The values of live body chest girth gain were higher in T<sub>1</sub> and lower in T<sub>0</sub> but difference was non significant. Similarly difference between T<sub>1</sub> and T<sub>2</sub> among the treatments it is also statistically there

was non significant difference observed among the treatments but numerically body chest girth recorded in treatment T<sub>2</sub> (117.00 cm) was higher as compared to T<sub>1</sub> and T<sub>0</sub>.

#### 5. Body height

The observations on height at wither of each calf were recorded weekly during the experimental period of 90 days and analyzed. The mean of treatments has been presented in Table 5.

**Table 5:** Effect of guar meal on body height (cm) of buffalo calves

| Time interval (weeks) | T <sub>0</sub> (Control) | T <sub>1</sub> | T <sub>2</sub> | S.E. ± | CD at 5 % |
|-----------------------|--------------------------|----------------|----------------|--------|-----------|
| 0                     | 84.67                    | 88.00          | 84.75          | 2.295  | N.S.      |
| 1                     | 85.00                    | 88.50          | 85.25          | 2.250  | N.S.      |
| 2                     | 86.00                    | 89.25          | 85.75          | 2.248  | N.S.      |
| 3                     | 86.57                    | 89.75          | 86.25          | 2.253  | N.S.      |
| 4                     | 87.33                    | 90.50          | 87.00          | 2.312  | N.S.      |
| 5                     | 88.00                    | 91.00          | 87.75          | 2.366  | N.S.      |
| 6                     | 88.67                    | 91.25          | 88.00          | 2.371  | N.S.      |
| 7                     | 89.00                    | 92.00          | 88.75          | 2.366  | N.S.      |
| 8                     | 90.00                    | 92.75          | 89.00          | 2.258  | N.S.      |
| 9                     | 91.00                    | 93.25          | 89.75          | 2.311  | N.S.      |
| 10                    | 91.67                    | 94.00          | 90.25          | 2.431  | N.S.      |
| 11                    | 92.67                    | 94.50          | 91.25          | 2.438  | N.S.      |
| 12                    | 93.67                    | 95.00          | 92.75          | 2.517  | N.S.      |
| 13                    | 94.00                    | 95.50          | 97.25          | 2.266  | N.S.      |

The Table 5. showed that the average body height at wither of calves in the beginning of the experiment in T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub> groups was 84.67, 88.00 and 84.75 cm, respectively. While the average body height at wither at the end of 90 days experimental period was 94.00, 95.50 and 97.25 cm, respectively. No significant difference in initial and final body height at wither was recorded among the three treatments. The values of live height at wither gain were higher in T<sub>2</sub> and lower in T<sub>0</sub> but difference was non-significant. Similarly, difference between T<sub>1</sub> and T<sub>2</sub> among the treatments it is also

statistically there was non significant difference observed among the treatments but numerically body height at wither recorded in treatments T<sub>2</sub> (97.25 cm) was higher as compared to T<sub>1</sub> and T<sub>0</sub>.

## 6. Belly girth

The observations on belly girth of each calf were recorded weekly during the experimental period 90 days and analyzed. The mean of treatments has been presented in Table 6.

**Table 6:** Effect of guar meal on belly girth (cm) of buffalo calves

| Time interval (weeks) | T <sub>0</sub> (Control) | T <sub>1</sub> | T <sub>2</sub> | S.E. ± | CD at 5 % |
|-----------------------|--------------------------|----------------|----------------|--------|-----------|
| 0                     | 123.33                   | 127.00         | 119.50         | 4.007  | N.S.      |
| 1                     | 124.33                   | 128.25         | 121.00         | 3.979  | N.S.      |
| 2                     | 125.33                   | 129.50         | 122.75         | 3.930  | N.S.      |
| 3                     | 126.67                   | 131.00         | 124.75         | 3.805  | N.S.      |
| 4                     | 127.67                   | 132.25         | 126.50         | 3.715  | N.S.      |
| 5                     | 129.33                   | 133.50         | 128.25         | 3.744  | N.S.      |
| 6                     | 130.00                   | 134.25         | 129.75         | 3.583  | N.S.      |
| 7                     | 131.33                   | 135.75         | 131.50         | 3.676  | N.S.      |
| 8                     | 133.00                   | 137.00         | 134.00         | 3.836  | N.S.      |
| 9                     | 134.67                   | 138.25         | 136.25         | 3.646  | N.S.      |
| 10                    | 136.00                   | 139.50         | 138.00         | 3.396  | N.S.      |
| 11                    | 137.33                   | 140.75         | 141.00         | 3.170  | N.S.      |
| 12                    | 138.67                   | 142.25         | 144.00         | 2.825  | N.S.      |
| 13                    | 140.00                   | 143.75         | 146.25         | 2.683  | N.S.      |

The Table 6. showed that average body belly girth of calves in the beginning of the experiment in T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub> groups was 123.33, 127.00 and 119.50 cm, respectively. While the average body belly girth at the end of 90 days experimental period was 140.00, 143.75 and 146.25 cm, respectively. No significant difference in initial and final body belly girth was recorded among the three treatments. The values of live body belly girth gain were higher in T<sub>1</sub> and lower in T<sub>0</sub> but difference was non-significant. Similarly, difference observed among the treatments between T<sub>1</sub> and T<sub>2</sub> among the treatments it is also statistically there was non-significant difference but numerically body belly girth recorded in treatment T<sub>2</sub> (146.25 cm) was higher as compared to T<sub>1</sub> and T<sub>0</sub>.

## Discussion

The non- significant effect on growth performance across different protein sources was also supported by Sadagopan and Tolapatra (1967) [2], Goswami *et al.* (2012) [1], Sharif *et*

*al.* (2014) [6]. Body weight gain has similar observations by Sandeep chikkara *et al.* (2019) [7]. In body length the current observations are consistent with the observation made by Sagar and Pradhan (1977) [4]. Observations of chest girth resemble to those made by Sagar and Pradhan (1975) [3]. The results of body height are more in line with those made by previous researchers.

## Conclusion

There was no significant effect of body weight, body length, height at wither, chest girth and belly girth buffalo calves under different diets. From the present investigation it can be concluded that incorporation 20% guar meal in concentrate diet is economical without affecting the growth of the buffalo calves.

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