



## Original Research Article

<https://doi.org/10.20546/ijcmas.2017.604.234>

## Animal Feed Technologies as an Appraisal Parameter in Pre-Service Para-Veterinary Professionals to Bridge the Productivity Gap in Dairy Cattle

J.S. Hundal<sup>1\*</sup>, Aparna<sup>2</sup>, U.S. Chahal<sup>1</sup>, Jaswinder Singh<sup>3</sup> and S.K. Kansal<sup>3</sup>

<sup>1</sup>Department of Animal Nutrition, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141 004, Punjab, India

<sup>2</sup>KVK, Roopnagar, PAU, Ludhiana-141 004, Punjab, India

<sup>3</sup>Department of Veterinary and Animal Husbandry Extension Education, GADVASU, Ludhiana-141 004, Punjab, India

\*Corresponding author

### A B S T R A C T

Animal Nutrition constitutes 60-65% of total cost in dairy enterprise. The objective to reduce the feeding costs needs emphasis on knowledge and utilization of latest feed technologies which can reduce the productivity gap. Extension plays an important role in diffusion of any such technology and local para-veterinary professionals are one of the key agents for this. Guru Angad Dev Veterinary and Animal Sciences, University (GADVASU) Ludhiana offers two year diploma course in Veterinary pharmacy at Veterinary Polytechnic College, Kaljharani, Bathinda (Punjab). One batch of 55 students were tested for their cognitive domain about animal feed technologies (Bypass fat, Bypass protein, Mineral mixture, Silage making, Tube silage, Total mixed ration, Feed block, Feed pelleting, Urea treatment of wheat straw, Uromin lick and Buffer) during their internship. The study revealed that 63.6% students had their knowledge level in low and medium level category. About 98.2% respondents had awareness about mineral mixture whereas only 5.4 % respondents had adroitness about chelated mineral mixture. 18.2% respondents were aware about the use of anions to prevent milk fever in dairy animals. 70.9% respondents were aware about the urea treatment of wheat straw but technical proficiency varied from 20-60%. About 58.2% knew about Uromin lick but merely 20% knew about its contents. Awareness about silage making was 100% however cognition on technical aspect was 28.2%. Only 25.4% respondents had knowledge about feed pelleting. Total mixed ration and feed blocks approached the awareness level of 60% and 21.8%, respectively. Lowest level of awareness was reported for tube silage (12.7%) and use of buffers (18.2%) in dairy ration. Therefore, from present study it may be concluded that low to medium knowledge level of para-veterinary professionals about animal feed technologies should need to be improved to minimize productivity gap and maximize profitability.

#### Keywords

Animal feed technologies, Appraisal, Para-veterinary professionals, Knowledge level.

#### Article Info

Accepted: 15 March 2017  
Available Online: 10 April 2017

### Introduction

Livestock research and extension services are the two most important services necessary in technology development and its dissemination to the farmers to enhance animal productivity.

Livestock research is being carried out at Universities and Research Institutes to generate new information, which is to be translated to the students through formal

education. The students further act as extension agents when they are employees and facilitate flow of information to the farmers. The attainment of information due to formal or non formal education is called knowledge acquisition. Successful acquisition is measured by the amount of information by which one is able to immediately recall based on predetermined learning objectives. The maintenance of knowledge acquired through teaching or training for an extended amount of time is called knowledge retention (John, 1982). The amount of content retained signifies the level of thinking at which the student or farmer acquired the information.

Animal Nutrition, the foundation of successful livestock production system, forms 60-65% cost in dairy enterprise (Moran, 2005). The objective to reduce the feeding costs needs emphasis on knowledge and utilization of feed technologies like bypass fat, bypass protein, mineral mixture, silage making, tube silage, total mixed ration, feed block, feed pelleting, urea treatment of wheat straw, uromin lick and buffer, which not only helps to cut the feed cost but also alleviate shortage of fodder, increase nutrient digestibility, maintain rumen environment, provide balanced nutrition, protect animals from metabolic and deficiency diseases. Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana also disseminate these animal feed technologies to the farmers directly through trainings or to the students through teaching which are further act as source of information for farming community. After gain in knowledge, its retention is must for students as well as for farmers because the adoption of any technology depends a lot on their own level of knowledge. Keeping this fact in mind a comprehensive study was designed with students of veterinary pharmacy to assess their awareness and technical knowledge level about animal feed technologies.

## Materials and Methods

Guru Angad Dev Veterinary and Animal Sciences, University (GADVASU) Ludhiana offers two year diploma course in Veterinary pharmacy at Veterinary Polytechnic College, Kaljharani, Bathinda (Punjab). After completion of course work in three semesters they undergone six month internship programme. Such batch of 55 internship students was selected and tested for their cognitive domain about animal feed technologies. A set of 16 knowledgeable items, containing information about various animal feed technologies (Bypass fat, Bypass protein, Mineral mixture, Silage making, Tube silage, Total mixed ration, Feed block, Feed pelleting, Urea treatment of wheat straw, Uromin lick and Buffer), which are commonly recommended by Department of Animal Nutrition, GADVASU, Ludhiana, were presented to the respondents. Each correct response was given a score of one. Respondents were categorized into three groups (Chandrashekhar *et al.*, 1998) based on the mean and standard deviation as a measure of check.

| Total score on knowledge              | Knowledge category |
|---------------------------------------|--------------------|
| Less than (Mean - $\frac{1}{2}$ S.D.) | Low                |
| Between (Mean $\pm \frac{1}{2}$ S.D.) | Moderate           |
| More than (Mean + $\frac{1}{2}$ S.D.) | High               |

The data were analyzed by ANOVA (Snedecor and Cochran, 1994) by using the software package SPSS version 16 (SPSS, 2007) and differences in mean were assessed by using Tukey b.

## Results and Discussion

Based on based on the mean (9.15) and standard deviation (3.28) values, the respondents were categorized into three categories of knowledge level (Table 1), which showed that only 36.4% students

belonged to high knowledge level category whereas 63.6% students had their knowledge level in low and medium level category. This indicates scope for improving their knowledge as the students were still undergoing internship and level of knowledge could be much higher. Table 2 indicated various innovations in the field of feed technologies, adroitness of respondents about them and frequency of correct responses in proficiency about these technologies. Mineral mixture is an economical and convenient technology that optimizes animal's productive and reproductive status. Remarkable indication of the study is that though 98.2% respondents had awareness about mineral mixture but only 58.2 % were aware about the recommended level of mineral mixture to be used animal feed. Only 5.4 % respondents had adroitness about chelated mineral mixture. Even the knowledge about use of anions to prevent milk fever was not up to the mark as merely 18.2% respondents were aware about the technique and just 7.3 % respondents could answer about the names of anions to be used. In case of forage scarcity straw becomes the source of roughage for cattle and its impregnation with urea improves its digestibility as well as crude protein content. Majority of respondents (70.9%) were aware about the technology of urea treatment of wheat straw (UTWS), but awareness about technical aspect i.e. its suitability for dairy

animals (60%), quantity of urea required for UTWS (23%) and recommended level of incorporation of urea in concentrate mixture (60%) was varied from low to medium. Similarly out of 58.2% who knew about innovation of Uromin lick, merely 20% knew about its contents. Most of the respondents (100%) had awareness about silage making, but 78.2 % and 28.2% of the respondents were aware about fodder being used for silage making and the acid dominate in good quality silage, respectively. Concentrate mixture formulation is the most widely queried technology in the field of animal nutrition but merely 25.4 % respondents had knowledge on feed Pelleting. Total mixed ration and feed blocks are techniques of composite feeding and awareness level about these techniques was 60% and 21.8%, respectively. Lowest level of awareness was reported for tube silage and use of buffers (12.7% and 18.2%, respectively). Surprisingly not even a single respondent was technically aware about use of buffers as well as feed blocks in dairy animals. Quddus *et al.*, (2012) concluded that adoption of improved feeding practices can increase the production level by 100%. The gaps in productivity and profitability can only be removed with the help of effective extension but it is difficult for untrained extension workers to provide the specific knowledge required (Ahmad *et al.*, 2010).

**Table.1** Knowledge level of para-veterinary professionals regarding animal feed technologies

| Knowledge level                | Frequency       | Percent |
|--------------------------------|-----------------|---------|
| Low (upto 7.51 score)          | 20 <sup>b</sup> | 36.4    |
| Moderate (7.52 to 10.78 score) | 15 <sup>a</sup> | 27.2    |
| High ( $\geq 10.79$ score)     | 20 <sup>b</sup> | 36.4    |

**Table.2** Awareness of respondents regarding animal feed technologies and their technical aspects

| S.No.                      | Item   | Frequency | Percent |
|----------------------------|--|-----------|---------|
| <b>General Awareness</b>   |  |           |         |
| 1                          | Have you learned about?  |           |         |
| 1.1                        | Bypass nutrients   | 30        | 54.5    |
| 1.2                        | Mineral mixture  | 54        | 98.2    |
| 1.3                        | Urea treatment of wheat straw  | 39        | 70.9    |
| 1.4                        | Feed block   | 12        | 21.8    |
| 1.5                        | Total Mixed ration   | 33        | 60      |
| 1.6                        | Uromin lick  | 32        | 58.2    |
| 1.7                        | Silage making  | 55        | 100     |
| 1.8                        | Tube silage  | 7         | 12.7    |
| 1.9                        | Buffer   | 10        | 18.2    |
| 1.10                       | Feed pelleting technology  | 14        | 25.4    |
| 1.11                       | Anionic Salts to prevent milk fever  | 10        | 18.2    |
| <b>Technical Awareness</b> |  |           |         |
| 2                          | Name the bypass nutrients used for dairy animals   | 22        | 40      |
| 3                          | How many kilogram of mineral mixture to be added in 100 kg of feed   | 32        | 58.2    |
| 4                          | What is chelated mineral mixture?  | 3         | 5.4     |
| 5                          | Kilogram of urea used to treat 100 kg of wheat straw   | 13        | 23.7    |
| 6                          | Can we use urea in feed of dairy animals?  | 33        | 60      |
| 7                          | If yes, how much quantity of urea can be used in 100 kg of feed?   | 11        | 20      |
| 8                          | Write contents of Uromin lick  | 11        | 20      |
| 9                          | Name fodder used for silage making   | 43        | 78.2    |
| 10                         | Name the acid dominate in good quality silage  | 21        | 38.2    |
| 11                         | Salt given before calving to prevent milk fever in dairy animals ( $\text{CaCl}_2/\text{NH}_4\text{Cl}/\text{Na}_2\text{CO}_3/\text{KI}$ ) | 4         | 7.3     |
| 12                         | Name the buffer used in feed   | 0         | 0       |
| 13                         | Why buffers are used in concentrate mixture?   | 0         | 0       |
| 14                         | What is feed block?  | 0         | 0       |
| 15                         | What is total mixed ration?  | 10        | 18.2    |
| 16                         | Write benefits of feed pelleting technology  | 4         | 7.3     |

The low knowledge level about feed technologies among veterinary pharmacy students may be due to the fact that there is only one course “Elementary Animal Nutrition (2+1)” in their course curriculum which may or may not be covered the applied aspects of animal nutrition. Secondly, the length of retention interval is another possible reason of skill decay as the course offers to

the students during first semester of the programme. Arthur *et al.*, (1998) also reported the low level of knowledge of para-professionals could be due to length of retention interval, non usage of knowledge, individual differences, task characteristics, method of testing in original learning and instructional strategies. Third possible reason is teaching method. Usually lecture and

discussion methods are used for education in this institution but demonstration method can be more beneficial in increasing the retention of knowledge (Auwal, 2013), however team based learning (Malone and Speith, 2012) and problem solving approach to teaching (Binkley and Tulloch, 1981) are considered as better method of learning as compared to power point based lectures and it leads to better knowledge acquisition and retention.

To conclude, animal feeding constitutes majority of dairy farming expenses and innovations in animal nutrition are the preventive products to support better health, minimizing productivity gap and maximize profitability. The knowledge level of Para-veterinary professionals about animal feed technologies is low to medium, which may be due to lacking applied animal nutrition aspects in their course curriculum, long retention interval, less effective method of teaching etc. Hence for improving the nutritional status of dairy cattle, competency of para-veterinary professionals along with adoption level of innovations and better productivity targets are the aspects to be substantially stressed upon.

## References

- Ahmad, S., Hinch, G., Prior, J., Thomas, P. and Burrell, D. 2010. The Role Of Extension In Changing The Dairy Industry In Pakistan: A Review. *Ani. Plant Sci.*, 22(Sup 2): 113-116.
- Arthur, W., Bennett, W., Stanush, P.L. and Mcnelly, T.L. 1998. Factors that influence skill decay and retention: A quantitative review and analysis. *Hum. Perform.*, 11: 57-101.
- Auwal, A. 2013. Effects of teaching method on retention of Agricultural Science knowledge in senior secondary schools of Bauchi Local Government Area, Nigeria. *Int. J. Sci. Techno. Edu. Res.*, 4: 63-69.
- Binkley, H.R. and Tulloch, R.W. 1981. Teaching vocational agriculture/agribusiness. Danville, Illinois: The Interstate Printers and Publishers, Inc.
- Chandrashekhar, B.R., Lakshminnarayan, M.T., Krishnamurthy, B. and Shivaramu, K. 1998. Rabies: factors influencing the knowledge of veterinarians. *Mysore J. Agri. Sci.*, 32: 225-28.
- John, A.R. 1982. Acquisition of a Cognitive Skill. *Psychol. Rev.*, 89: 369-406.
- Malone, E. and Spieth, A. 2012. Team-based learning in a subsection of a veterinary course as compared to standard lectures. *J. Scholarship of Teaching and Learning*, 12: 88 – 107.
- Moran, J. 2005. Economics of feeding dairy cows Tropical dairy farming-feed management for small holder dairy farmers in humid tropics. Land link press 312: 191-208.
- Quddus, M.A. 2012. Adoption of dairy farming technologies by small farm holders: practices and constraints. *Bang. J. Anim. Sci.*, 41(2): 124-135.
- Snedecor, G.W. and Cochran, W.G. 1994. Statistical Methods 8<sup>th</sup> ed. Oxford and IBH Publications, New Delhi.
- SPSS. 2007. Statistical packages for Social Sciences, Ver. 126, SPSS Inc., Illinois, USA.

## How to cite this article:

Hundal, J.S., Aparna, U.S. Chahal, Jaswinder Singh and Kansal, S.K. 2017. Animal Feed Technologies as an Appraisal Parameter in Pre-Service Para-Veterinary Professionals to Bridge the Productivity Gap in Dairy Cattle. *Int.J.Curr.Microbiol.App.Sci*. 6(4): 1962-1966.  
doi: <https://doi.org/10.20546/ijcmas.2017.604.234>