



Animal Nutritional Proficiency of Field Veterinarians of Punjab (India): A Concern

Jaswinder Singh¹, Jaspal Singh Hundal^{2*}, Harish Kumar Verma³ and Ravdeep Singh⁴

¹Department of Veterinary and Animal Husbandry Extension Education, GADVASU, Ludhiana, Punjab, INDIA

²Department of Animal Nutrition, GADVASU, Ludhiana, Punjab, INDIA

³Director of Extension Education, GADVASU, Ludhiana, Punjab, INDIA

⁴Department of Veterinary and Animal Husbandry Extension Education, GADVASU, Ludhiana, Punjab, INDIA

*Corresponding author: JS Hundal; Email: drjshundal@yahoo.com

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ABSTRACT

A purposive study on field veterinarians of Punjab was conducted to have the idea of their knowledge on applied animal nutrition aspects of dairy farming. A total of 116 veterinarians across the state were randomly selected for the said study. Veterinarians were asked to answer the 53 questions comprising of fill in the blanks, open ended question, interrogative and negative question on basic of distinct aspects of applied animal nutrition as knowledge of feed, green fodder, anti-nutritional factor, mineral mixture, urea feeding etc. The descriptive analysis of the survey revealed the major gap in knowledge about these aspects. Veterinarian knowledge score varies from 44.52 for concentrate to 57.64 % for forages. Overall score (50.52%) indicated the dire need to strengthen the knowledge of veterinary officers in applied animal nutrition subject so that they can match with the need of dairy farmers.

Keywords: Animal nutrition, field vets, knowledge level

Animal Nutrition ought to be an important subject in the success of any livestock enterprise. Around 65-70% of the total expenses incurred on the milk production account for feeding cost and almost same percentage of diseases occurred due to over or underfeeding of feed/nutrients (Singh *et al.*, 2012). Field vets are the extension workers at the village level and often approached by farmers for first-hand information on feed, fodder and ration formulation for animals to have optimum production.

Veterinarians are playing important role in the control, prevention and cure of diseases, facilitating welfare to animals and treatment of injuries but the contemporary role of veterinarians go far beyond these more visible tasks. Over the years veterinary professionals have played significant and contributory roles in improving the health and welfare of animals and humans. Veterinary professionals have also played a pivotal role in food quality, safety and security, distinctive role in ecology, etiology, epidemiology, physiology, psychology, and development

of drugs, pharmaceuticals and biomedical research. Their role as educators (Dolby and Litster, 2015), trainers and policy-makers is a boon for the society. Inevitable role of Vets in wildlife conservation, protection of the environment and biodiversity is another reason for the appreciation. As the world becomes intricately interconnected and more complex, so are the various obligations and responsibilities that veterinary professionals must undertake. To give an example, veterinarians at FAO work to reduce hunger and poverty across the globe through the development of animal production and health strategies that improve efficiency in production while upholding environmental and natural resource management principles (FAO, 2016). With the advent of internet, today veterinarians are facing more knowledgeable and educated clients, asking very technical and complex questions and often comes with greater expectations (Blackwell, 2001).

In the present curriculum of B.V.Sc and A.H. under Veterinary Council of India (VCI) system, whole animal

nutrition subject is included in first and second year of the degree course. Major focus in the last years of the degree course is on clinical subjects. In lieu of that students while moving towards end of the course, neglect and often forget this most vital subject. Even during the compulsory six month internship programme less focus is given on this applied subject.

Punjab (Located in northern India) is one of the leading milk producing State in the country. Around 17.31 million people in the State live in rural areas constituting 62.50% of the total Population. The livestock sector has contributed 8.4% to the Net State Domestic Product (NSDP) at constant (2004-2005) price in 2010-11 (GADVASU, 2014). Singh *et al.* (2016) in the study on information need and seeking behavior of the dairy farmers of Punjab revealed that 70% farmers need information on feed and fodder followed by 64.70% on animal breeding aspect. He further revealed that more than half (58.82%) farmers surveyed seek the needed information from veterinarians. Around one thousand vets related to Animal Husbandry Department, Punjab are working in field at village/tehsil/district level (The Tribune, 2016). Veterinarian must be trained alongside the changing dairy industry to provide the services required by their clients (Christopher *et al.*, 2013).

Keeping in view the role of field vets in creating awareness of farmers about animal nutrition vis-a-vis their own proficiency on the subject especially applied one. The present study was thus planned to evaluate the knowledge level of field vets on the applied animal nutrition subject.

MATERIALS AND METHODS

Sample size was calculated using online available sample calculating tools (www.surveymonkey.com) keeping the confidence level at 95%. Out of the total veterinarian working in Punjab, 116 were randomly selected from the twenty districts of Punjab (Fig. 1).

A set of 53 knowledgeable items comprising of fill in the blanks, open ended question, interrogative and negative question on the various aspects of applied animal nutrition,, which was obtained from book '*Santulit Ate Miyari Pashu Khurak* (Balanced and Quality Feed for Ruminants)' published by GADVASU, Ludhiana (Bakshi *et al.*, 2010) and by consultation with experts was pretested and presented to the respondents.

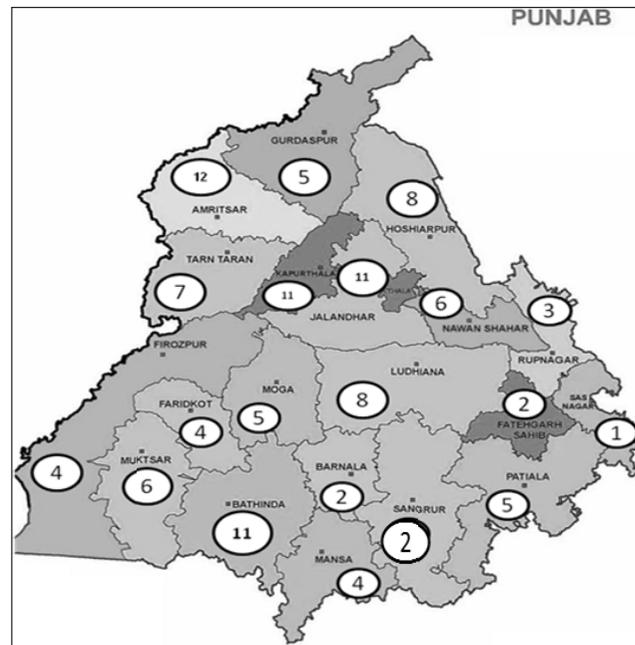


Fig. 1: Spatial distribution of the respondents

Information was collected personally. Difficulty and discrimination Index were also calculated for checking genuineness of the interview schedule prepared for the participants as per formula given below:

Difficulty Index (P)

The difficulty index indicates the extent to which an item is difficult. An item should not be so easy that all persons can pass it, nor should be so difficult that none can pass it. The item Difficulty index was worked out in this study as P; that is, the percentage of respondents answering an item correctly. The difficulty index was calculated by the following formula:

$$P = NC/N \times 100$$

Where, P= Difficulty index, NC = Number of respondents who answered correctly and N is total number of respondents. The higher the difficulty index (>75), the easier the item is understood to be and lower the difficulty Index (<25) difficult the item to answer.

Discrimination Index (DI)

The function of item discrimination index is to find out whether an item really discriminates a well-informed

respondent from a poorly informed respondent. In order to work out the discrimination index among the respondents for each question, the total score of the 116 respondents for the 53 knowledge items were ranked. The scores obtained were arranged in descending order of total scores and the respondents were divided into two equal groups – Upper and Lower with 58 respondents in each group. The following formula was used to calculate the discrimination index of each item.

$$\text{Discrimination Index (DI): } \text{NU-NL}/58$$

Where, DI =Discrimination index, NU = Number of respondents in upper group who responded correctly, NL= Number of respondents in lower group who responded correctly. A *positive discrimination index* (between 0 and 1) indicating that respondents who received a high total score chose the correct answer for a specific item more often than the respondents who had a lower overall score.

RESULTS AND DISCUSSION

All the field vets (100%) were having the opinion that nutrition plays a pivotal role in the success of dairy farming

but only 18% were aware that ruminants ate dry matter at 2-3% of their body weight and few of them even quoted dry matter intake as high as 10% of animals body weight.

Knowledge on forage

The difficulty index for this section ranged between 84.48 (easiest) to 16.38 (very difficult) and all items have positive discrimination index. Majority of field vets (74.14%) were able to correctly answer the name of leguminous fodder of *Rabi* season but figure decrease to about 50% when they were asked about leguminous fodder of *Kharif* seasons and non- leguminous fodder of *Rabi* and *Kharif* season (Table 1). Most of the field vets (>75%) knew that silage is made from non-leguminous and carbohydrate enriched fodder like maize. 79.31% were aware that hay was made from leguminous fodder like berseem and lucerne. About half of the respondents (56.03%) were able to correctly answer the optimum stage of harvesting for various fodders like maize, which is recommended to harvest at milk stage and *bajra* at flowering stage. Similarly, 53.45% were aware about the recommended size of chopped fodder.

Table 1: Knowledge level of field vets on forage aspect

Q. No.	Knowledge Items on forages aspect	Frequency	Difficulty Index(p)/ Percentage	Discrimination Index(DI)
1	Leguminous fodder of <i>Rabi</i> season	86	74.14	0.34
2	Leguminous fodder of <i>Kharif</i> season	62	53.45	0.59
3	Non leguminous fodder of <i>Rabi</i> season	63	54.31	0.57
4	Non leguminous fodder of <i>kharif</i> season	60	51.72	0.52
5	Type of fodder used for silage making	91	78.45	0.36
6	Name of five fodders used for silage making	98	84.48	0.14
7	Optimum stage of fodder harvesting	65	56.03	0.36
8	Type of fodder used for hay making	92	79.31	0.28
9	Percent crude protein in wheat straw	19	16.38	0.19
10	Feeding of rice straw recommend/not recommend	51	43.97	0.26
11	Condition/disease due to excessive feeding of rice straw	86	74.14	0.41
12	Fodder leading to HCN toxicity along with conditions	53	45.69	0.47
13	Fodder causing nitrate toxicity along with condition which prone fodder for nitrate toxicity	61	52.59	0.50
14	Which fodder cause oxalate toxicity	53	45.69	0.29
15	Which fodder leguminous/non leguminous has more crude protein	63	54.31	0.16

Surprisingly only 19 field vets (16.38%) knew the crude protein percentage in wheat straw. Majority (74%) were having the opinion that exclusive feeding of rice can lead to degnella disease/selenium toxicity and suggested that it should be fed as mixture with other forages/straw. 44.83% were aware about the fodder and their stages which can lead to HCN toxicity in animals. Similarly 52.57% correctly answered about conditions which can prone the fodder for nitrate toxicity like excessive use of urea, irrigation with sewage water etc. Only 45.69% vets were aware that Napier *Bajra* feeding can lead to oxalate toxicity/impaction. Non leguminous fodders have lesser

crude protein than leguminous fodders but more than fifty percent (53.45%) vets responded otherwise.

Knowledge on concentrate constituents and its formulation

The difficulty index for this section ranged between 88.79 (easiest) to 1.72 (extremely difficult) and all items except two have positive discrimination index (Table 2). Discrimination Index for knowledge items number 8 and 14 were nearly zero. Majority of the vets were able to correctly answer the five example of protein and energy

Table 2: Knowledge level of field vets on concentrate formulation aspect

Sl. No.	Knowledge items on concentrate aspect	Frequency	Difficulty index(p) /Percentage	Discrimination Index
1	Minimum %CP in Protein sources	62	53.45	0.24
2	Minimum% TDN in Concentrate	55	47.41	0.53
3	Example of protein source	101	87.07	0.12
4	Example of energy sources	103	88.79	0.19
5	Knowledge of Anti Nutritional Factors	60	51.72	0.52
6	ANF in Mustard cake	14	12.07	0.24
7	ANF in Cotton seed cake	52	44.83	0.55
8	ANF Soybean Cake	2	1.72	0.03
9	%Crude Protein in mustard cake	16	13.79	0.24
10	%Crude Protein in Cotton seed cake	24	20.69	0.34
11	% Crude Protein in Soybean cake	31	26.72	0.36
12	BIS specification of concentrate for dairy animals	20	17.24	0.21
13	Recommended (minimum) level of Mineral Mixture in concentrate	88	75.86	0.24
14	Recommended level of salt in concentrate	95	81.89	0.09

Table 3: Knowledge level of field vets on urea feeding aspect

Sl. No.	Knowledge items on Urea feeding aspect	Frequency	Difficulty index(p) /Percentage	Discrimination Index
1	Recommended level of urea inclusion in concentrate	51	43.97	0.09
2	If urea is used then which sources should be added in the concentrate	58	50.00	0.52
3	Procedure of urea treatment of straw	65	56.03	0.71
4	%Crude protein in urea treated straw	54	46.55	0.66
5	Time requirement for urea treatment of straw	60	51.72	0.45
6	Inclusion of urea in calves (Y/N)	107	92.24	0.09
7	Personal observation on urea feeding in favour/.against	44	37.93	0.24
8	Does Dietary urea comes in milk(Y/N)	65	56.03	0.10

sources (87%), but only 53 percent were aware that protein sources are those feed having equal or more than 20% crude protein and 47% knew that total digestible nutrients (TDN) in energy source is more than 60% (Table 2).

Mustard, cottonseed and soybean cake are the most commonly used protein sources used by livestock farmers but only 13.79%, 20.69% and 26.72% field vets were aware about the crude protein content in mustard, cottonseed and soybean cakes respectively. As per BIS specification and regulated by dairy development department Punjab, cattle feed can be two types (Type I and Type II) with Crude protein content 20% and 22% respectively, but most of the field vets(62.76%) were not aware about it. Majority of the field vets (>75%) were aware about the inclusion level of mineral mixture and iodized salt in the concentrate formulation. Half of the field vets(51.72%) reported that they knew about the anti-nutritional factor present in various feed stuff but only 12.07%, 44.83% and 1.72% correctly answer that glucosinolates, gossypol and trypsin inhibitors were the anti-nutritional factors present in mustard, cottonseed and soybean cakes respectively.

Knowledge on Urea Feeding

The difficulty index for this section ranged between 92.24 (easiest) to 37.93 (difficult) and all items except one have positive discrimination index (Table 3). Discrimination Index for knowledge item number 1 was nearly zero. Only 43.97% knew that urea can be added at 1% level in the concentrate ration. 46.55% were able to correctly answer the crude protein content of urea treated straw and 56% of respondents knew the procedure for urea treatment of straw. Fifty percent field vet respond correctly that quick energy source like molasses should be used if urea is to be used in ration. 92.24 % field vets responded as “NO” on asking that can urea be fed to calves for rapid growth. 37.93% vets revealed that they are in favor of urea feeding for high yielding animals.

More than fifty percent vets (56%) have the opinion that it is the dietary urea which comes in milk. Actually it is the ruminal ammonia which when goes to blood is converted to urea by the liver and is then excreted through various excretions including milk.

Table 4: Knowledge level of field vets on other applied animal nutrition aspect

Sl. No.	Knowledge items on Urea feeding aspect	Frequency	Difficulty Index(p)/ Percentage	Discrimination Index
1	Nutrition Play important role in successful dairy farming	116	100.00	0.00
2	Optimum chopped fodder length	62	53.45	0.48
3	Optimum size of grounded feed	23	19.83	0.22
4	Knowledge on TMR concept	37	31.89	0.05
5	Thumb rule of colostrums feeding	35	30.17	0.26
6	Artificial colostrums composition	22	18.97	0.17
7	Better source of calcium liquid/powder	62	53.45	0.14
8	Water requirement of an adult animal/day	77	66.38	0.43
9	Exclusive feeding of sugarcane tops can lead to deficiency of which mineral	8	6.89	0.07
10	Antibiotic contraindicated with calcium therapy	89	76.72	0.26
11	Amount of dung defecated by adult animal/day	64	55.17	0.38
12	Concept of prebiotic	53	45.69	0.29
13	Concept of probiotic	35	30.17	0.16
14	Thumb rule of DM feeding	21	18.10	0.12
15	Excessive feeding of cake/urea can lead to alkalosis	69	59.48	0.47
16	Excessive feeding of grains /sugar cake(gur) /chapatti / potato can lead to acidosis	103	88.79	0.19

Table 5: Knowledge score of field veterinarians

Parameters	Forages	Concentrate	Urea	Others	Total
Number of question	15	14	8	16	53
Maximum score (%)	93.33	64.29	87.5	81.25	75.47
Minimum Score (%)	6.67	14.29	12.5	6.25	15.09
Average score (%)	57.64	44.52	54.42	47.20	50.52
Mode	73.33	42.86	62.5	50.0	64.15
Median	60.00	42.86	62.5	50.0	50.94
SD	21.79	17.58	21.51	14.64	13.69

Knowledge about other applied animal nutrition aspects

The difficulty index for this section ranged between 100.00 (easiest/lead item) to 6.89 (extremely difficult) and all items except three have positive discrimination index (Table 4). Discrimination Index for knowledge items number 1, 4 and 9 were zero/ nearly zero. Majority of the field vets (>75%) believed that colostrums feeding is very vital for the health and growth of a calf and it should be fed within 1-2 hours after birth, but only 18.97% vets were aware about how to prepare artificial colostrum in case natural colostrum is not available. Contrary to belief, 53.45% vets reported that liquid calcium sources available are better source of calcium than powder sources available.

Only 31.89% vets were able to expand the abbreviation TMR (total mixed ration). 76.72 percent field veterinarians were aware that calcium therapy is contraindicated with oxytetracycline. Only 30.17% respondents were able to define the terms probiotics and prebiotics correctly. About sixty percent (59.48%) vets have the knowledge that excessive feeding of cakes/urea can lead to alkalosis and 88.79% reported correctly that excessive feeding of grains/sugar cakes(gur)/chapatti's can lead to acidosis.

Animal nutrition knowledge score of field veterinarians

A total of 53 questions on forages, concentrate, Urea and other applied animal nutrition aspects were asked from the respondents. Score "1" was given for each correct answer and "zero" for each wrong or blank answer. Percentage score attained by each respondent was calculated. Maximum Percent score attained was 75.47% and minimum was 15.09% respectively (Table 5). Average score was 50.52 percent and mode was 64.15 percent.

Above table clearly indicated that veterinarian of animal husbandry department, Punjab have medium level of knowledge on various applied animal nutrition aspects. Dawn *et al.* (2002) conducted a survey on "Individual animal medicine and animal production skills expected of entry level veterinarian in bovine practice" and reported the general nutrition skill as one of the must skills for the entry level veterinarian.

The results of present study can be concluded that there is a dire need to train the field vets in the field of applied animal nutrition. State Veterinary council can take the initiative to organize the same in consultation with the veterinary varsity. Secondly during the graduation programme applied aspect of animal nutrition should be taught in context with production performance, diseases prevention, Immune- booster, reproduction etc. The new VCI curriculum implemented from 2016 batch at all India level also restricts the animal nutrition subject to second year only and internship will of one year duration. During compulsory internship period, practical aspect like ration formulation, fodder and its conservation should be given proper consideration to inculcate their knowledge to outgoing vets.

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