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# Knowledge level and training needs of clientele on fodder and feed technologies

**[1]Nagaratna Biradar, [2]Mohanakumara V, [3]Gajendra TH and [4]Pushpa P**

[1]Principal Scientist, ICAR-IGFRI, Southern Regional Research Station, Dharwad, Karnataka, India

[2]Assistant Professor, Department of Agricultural Extension, ZAHRS, Brahmavar, KSNUAHS, Shivamogga, Karnataka, India

[3]Assistant Professor, Department of Agricultural Extension, KSNUAHS, Iruvakki Shivamogga, Karnataka, India

[4]Associate Professor, University of Horticulture Sciences, Sirsi, Karnataka, India

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**Corresponding Author:** Mohanakumara V

**Abstract**

The relevancy and effectiveness of training programs can be increased by scientifically designing them based on the training needs of the clientele. State department of Animal Husbandry and Veterinary Services (AHVS), Karnataka Milk Federation (KMF), Krishi Vigyan Kendra (KVK) and Non Government Organisations (NGO) working on livestock development in Karnataka formed the clientele group. Data was collected through questionnaires and received responses of 112 each from AHVS and KMF, 44 each from KVK and NGO and were considered for final analyses. So in all 312 responses were analysed for the study. Crop wise knowledge indices of KMF and NGOs were highest for fodder maize (5.53, 6.73) and fodder jowar (5.52, 6.42) among annual crops and Bajra Napier Hybrid for KMF (4.88) and Subabul (5.76) for NGO among perennial crops. Among annuals knowledge index was more for fodder maize (4.23, 4.77) and for perennials it was highest for Bajra Napier hybrid (6.56, 7.83) of AHVS and KVK. Overall average knowledge index values for maximum value of 10 were 5.78 for KVK, 4.94 for NGO, 4.81 for AHVS and 4.31 for KMF. Basics of forage production technologies (T1) emerged as the most important training need for KMF and AHVS and second important need for NGO and KVK. Post harvest and handling of crop residue (T2) was another training need identified as most important by KVK and third important need by other clients. Significant relationship was found between training needs of KMF and AHVS; and KMF and KVK, indicating that these organisations can be grouped for conducting training programs.

**Keywords:** Organisations, information sources, crop residues, feeding system

## Introduction

Agricultural extension services have developed around crop production and remain tied largely to the seasonal nature of cropping. Such system is less useful for livestock production, with a longer time-scale and a lack of synchronization of different animals and herds. The institutional arrangement in the state departments of animal husbandry which are mainly run by veterinarians have primarily emphasized the clinical and diagnostic aspects of animals' health rather than the preventive and extension aspects. The veterinary officers operate from their veterinary dispensaries to treat animals rather than approach farmers to educate and inform them about feed, fodder and animal health. There is no separate livestock production extension service in India.

The Karnataka Milk Federation (KMF) is a dairy cooperative from Karnataka, India, which sells products such as milk, curds, ghee, butter, ice cream, cholocates, and sweets (Kaju Katli, Besan Laddoo, Mysore Pak, Peda, etc.) under the brand name Nandini. Federation is striving to create a self-reliant and vibrant rural economy in Karnataka by providing a supportive and conducive environment for the growth of Dairy Cooperatives as autonomous economic and social institutions. The Federation is largely successful in realizing the objectives of dairying during the last four decades of dairy development in Karnataka State. It is by-and-large successful in providing a viable subsidiary occupation to unemployed rural poor so as to raise their income earning capacities and to supply adequate quantity of quality milk at reasonable prices to urban consumers. Besides, the farmers obtain income from livestock but they don't have knowledge about the importance of feed and fodder. The farmers must be sensitized about the importance of feed and fodder technologies in the overall development of the livestock sector.

However, fodder plays an important role in crop husbandry, animal husbandry, horticulture, forestry or any field of agriculture including nutritional security of the family. The national research institute working on grasslands and grasses thus has a typical situation where in its clientele is more diverse and their needs too are. Blanket approach to provide knowledge and skills to the clientele through training program, many times, may loose its relevancy and effectiveness when they are put back on the job. Training is defined as the act of increasing the knowledge and skills of an employee in doing a particular job (Flippo, 1965) [4]. Proctor and Thornton (1961) [13] defined training needs, as skills, knowledge and attitude an individual requires in

overcoming problems as well as avoiding creating problem situations. Williams (1978) [15] suggested that assessing training need is the first step in organising a successful training program. Scientifically studying the needs of client base helps to design training tool kits and provide relevant training to improve their role performance in their jobs and hasten the process of fodder development in the country. Designing training programs scientifically on the basis of evidence will play a catalytic role instead of organising on the basis of opinion precedence. To make training more effective the training needs have to be established prior to commencement of training programmes so that the subject matter of the training could be determined on the basis of the needs of the trainees. Assessment of individual training needs is also important as trainees come from different backgrounds, varies in their strengths and weaknesses. Assessment of individual training needs encourages trainees to become aware of their own limits or knowledge. Assessment of individual training needs forms a sound base for future learning and pave path for future training strategy. Thus, an effort has been made to study the training needs of clientele.

## Materials and Methods

**Clientele:** State department of Animal Husbandry and Veterinary Services (AHVS), Milk Unions of Karnataka Milk Federation (KMF), Non Government Organisations promoting livestock based activities (NGO) and Krishi Vigyan Kendras (KVKs) of Karnataka formed the clientele group for the study.

**Need analysis module selection for classification of organisations/clientele group**: Various training needs analysis modules used by different researchers were analysed. Present study considered 4 different organisations. Nowack's (1991) [10] model focuses on organisational processes and hence, it was selected. All the four organisations details were collected. Considering the functions of the organisations as suggested by Nowack (1991) [10] AHVS and KVK were classified as socio technical organizations, where as NGOs and KMF were grouped as rational organizations

**Defining Sample for the study:** Assistant Directors and Veterinary Officers of AHVS were taken as sample of the study. Director and Joint Directors were kept out of sample as they mainly have administrative responsibilities besides are very small in number. KMF has 13 Milk Unions throughout the state which procure milk from Primary Dairy Cooperative Societies (DCS) and distribute milk to the consumers. Veterinary field officers and agriculture field officers of all the unions of KMF were taken as sample for the study. Karnataka had 80 KVKs at the time of the study and Subject Matter Specialists in the field of animal science, agronomy and agriculture extension were considered as sample. Field officers of NGOs promoting livestock activities formed the sample from NGO.

**Preparation and Standardisation of study tool:** The study tool i.e. questionnaire was developed with the different set of questions on assessing competence on fodder crops separately for socio-technical and rational organizations. It was pretested at three stages for standardization. Variable 'organizational commitment' was deleted based on the responses received during pre-testing stage. Questionnaire has 7 themes of training on fodder development from basics of forage production technologies to socio-economic aspects of forage development in common areas. Each theme had detail indicative contents of the training. The questionnaire had the crop wise knowledge test with different difficulty level for rational organisations and socio technical organisations. The questionnaire was also developed in an online interactive mode using survey software. It made use of four types of questions *viz*., Radio boxes for single choice, Checkboxes for multiple choices, Text boxes for open questions and combinations of these three wherever required. Questionnaire developed was bilingual as some of the terminologies of training content could be better understood in English or otherwise by the clientele. Mentioning names of the respondent was kept optional in the questionnaires. Questionnaire intended to assess the knowledge level on fodder crops and as respondent is expected to remain unbiased the writing of his/her name in the questionnaire was kept optional. The questionnaires began with the brief purpose for which responses were sought and were serially numbered.

**Data collection:** These developed 260 questionnaires were mailed to 13 milk Unions, 220 questionnaires to AHVS department of 11 districts of Karnataka covering all the 10 agro-climatic zones. 160 questionnaires were mailed to 3 NGOs and Interactive online questionnaire was mailed electronically to all the 80 KVKs of zone VIII. Regular and periodical follow up was made to get maximum responses from the clientele. The in-completed questionnaires were rejected and finally responses of 112 each from AHVS and KMF, 44 each from KVK and NGO were considered for final analyses. So in all 312 responses were analysed for the study.

**Data analysis**: Data on the present knowledge level of 4 clientele on fodder and forage production technologies was sought and analysed by computing knowledge indices.

The training needs were analysed for all the clients for seven themes using Garret ranking technique. The themes were - Basics of forage production technologies (T1), Post harvest processing and handling of crop residue (T2), Forage seed production (T3), Silvipasture and agroforestry (T4), Forage crops for problematic, difficult and unutilized areas (T5), Feeding systems (T6), Socio economic aspects of forage production (T7). To find out the most important training need, Garrett's ranking technique was used.

## Results and Discussion

### Extent of importance to learn about fodder technologies in jobs (%)

Nearly 86.00 per cent of staff of milk union felt that learning about fodder technologies is extremely important in their jobs. Three fourth of AHVS staff (77.68%), more than half of KVK (59.09%) and NGO (56.82%) staff expressed the same. Almost negligible per cent of staff across all the clientele considered learning about fodder technologies is not important (Table 1). Improvement of livelihood of farmers' through livestock development activities is the

main job of all these clients. However, some are directly involved and some indirectly like NGOs who try to improve the productivity of wastelands to revive the fodder availability (Hegde, 2002) [5].

**Table 1:** Extent of importance to learn about fodder technologies in their jobs (%)

| Extent | KMF | NGOs | AHVS | KVK |
|---|---|---|---|---|
| Extremely important | 85.71 | 56.82 | 77.68 | 59.09 |
| Moderate | 10.71 | 36.36 | 19.64 | 31.82 |
| Least | 0.00 | 4.55 | 0.89 | 4.55 |
| Not important | 3.57 | 2.27 | 1.79 | 4.55 |

**Information source consultancy pattern of clientele**

One third of AHVS staff (33.04%) expressed that very often they consult senior colleagues and published literature and nearly quarter of them (23.21%) resorted to web searching to get new information. More than half of KMF staff consult seniors (55.36%) and published literature (53.57%) while half of them gain knowledge by participating in discussions in the meetings (Table 2). Staff are constantly looking to absorb new information from a variety of sources and these resources have evolved to include digital in the last decade or so. Despite that, colleagues and print journals continue to remain the most important information sources followed by attending meetings and digital sources for doctors (Brewster, 2014) [3]. For things difficult or impossible to know by personal experience, people frequently turn to an authority; that is, they seek knowledge from someone who has had experience with the problem or has some other source of expertise. For example: A beginning teacher asks an experienced one for suggestions and may try a certain technique for teaching reading because the teacher with experience suggests that it is effective. (Ary, Donald, 2010) [1] Senior colleagues are the most trusted information sources and could be accessed with comparatively little effort to retrieve more specific and timely information. Consulting colleagues provide more than just information as it allows discussions which can enable full understanding of a concept or technology.

**Table 2:** Information source consultancy pattern of clientele

| Source | Frequency | AHVS (%) | KMF (%) | NGO (%) | KVK (%) |
|---|---|---|---|---|---|
| Consulting senior colleagues | VO | 33.04 (I) | 55.36 (I) | 38.64 (III) | 31.81(V) |
| | O | 54.46 | 31.25 | 43.18 | 50.0 |
| Training programs | VO | 14.29 (V) | 33.93 (V) | 31.82 (IV) | 27.27 (VII) |
| | O | 52.68 | 43.75 | 47.73 | 59.09 |
| Published literature | VO | 33.04 (I) | 53.57 (II) | 50.0 (I) | 50.00 (III) |
| | O | 53.57 | 31.25 | 34.09 | 36.36 |
| Discussions in meeting | VO | 15.18 (IV) | 50.00 (III) | 45.45 (II) | 29.41(VI) |
| | O | 58.04 | 34.82 | 38.64 | 70.58 |
| Web search | VO | 23.21(II) | 26.79 (VI) | 31.82 (IV) | 36.84 (IV) |
| | O | 35.71 | 30.36 | 20.45 | 57.89 |
| Visit to research stations and Universities | VO | 11.61 (VI) | 19.64 (VII) | 25.0 (VI) | 63.15 (I) |
| | O | 55.36 | 41. | 43.18 | 36.84 |
| Participation in agri fairs | VO | 18.75 (III) | 35.71 (IV) | 29.55 (V) | 61.11 (II) |
| | O | 59.82 | 36.61 | 50.0 | 33.33 |

VO: very often O: Often

**Knowledge level of clientele on production technologies of fodder crops**

Subject-matter knowledge and communication techniques are considered vital for trainers, along with content-specific instructional knowledge such as specific training methods (Sussanne Wissak 2019). Crop wise knowledge indices computed for maximum value of 10 for rational organisations *viz*., KMF and NGOs were highest for fodder maize (5.53, 6.73) followed by Fodder jowar (5.52, 6.42) among annual crops. Among perennial crops highest knowledge index was for Bajra Napier Hybrid for KMF (4.88) and Subabul (5.76) for NGO. The least knowledge index was for Signal grass (3.47) for KMF and for Lucerne (3.87) for NGOs (Table 3).

**Table 3:** Knowledge indices of clientele on production technologies of different fodder crops

| Crops | KMF | NGOs | AHVS | KVK |
|---|---|---|---|---|
| **Annuals** | | | | |
| Fodder Maize | 5.53 | 6.73 | 4.23 | 4.77 |
| Fodder Jowar | 5.52 | 6.42 | 3.61 | 4.03 |
| Fodder Bajra | 4.07 | 4.30 | | |
| Fodder Cowpea | 4.54 | 5.41 | | |
| **Perennials** | | | | |
| Bajra Napier hybrid | 4.88 | 4.50 | 6.56 | 7.83 |
| Guinea grass | 4.31 | 4.58 | 4.21 | 6.36 |
| Perennial fodder sorghum | 4.20 | 4.63 | 5.73 | 5.45 |
| Subabul | 4.15 | 5.76 | | |
| Rhodes Grass | 3.88 | 4.30 | | |
| Lucerne | 3.59 | 3.87 | 4.53 | 6.25 |
| *Stylosanthes* spp | 3.58 | 4.66 | | |
| Signal grass | 3.47 | 4.15 | | |
| Average | 4.31 | 4.94 | 4.81 | 5.78 |

For socio technical organisations, among annuals knowledge index was more for fodder maize (4.23, 4.77) of AHVS and KVK. For perennials it was highest for Bajra Napier hybrid (6.56, 7.83) of AHVS and KVK. The least knowledge index was for Guinea (4.21) in case of AHVS and for perennial fodder sorghum (5.45) in case of KVK (Table3).

Maize is a photo insensitive plant and can be grown in any season. After kharif and rabi crops to meet the fodder shortage in summer, farmers cultivate fodder maize. African tall maize variety is a very popular fodder crop as its seeds are easily available and has well developed production technology. Fodder maize besides producing high tonnage also known for its lactogenic effect. Similarly among perennials Bajra Napier hybrid grows fast and yields very high. This is propagated vegetatively and establishes very well. Knowledge index value for subabul was high for NGOs. Many NGOs promote this as it is one of the fast growing and best fodder tree for marginal lands. Except for KVK knowledge index of Lucerne was less though it is known for its fodder quality and viewed as a farm fresh concentrate feed. Similarly for other dryland grasses and legumes knowledge index values were very poor. Non availability of seeds, difficulty in crop establishment and lack of awareness could be the reasons for it.

Overall average knowledge index values were 5.78 for KVK, 4.94 for NGO, 4.81 for AHVS and 4.31 for KMF. This indicated that knowledge index value was above 5 for only KVK staff. Other three clientele's knowledge index values were below 5. Almost all subject matter specialists in KVKs are post graduates in agricultural sciences except very few in animal sciences. This education background definitely influences knowledge level. NGO staffs have better knowledge index values as compared to other two clients (AHVS and KMF). NGOs considered for the study were those working for livestock sector. They work on project mode at field level and as they need to practically implement technologies in the field they tend to learn about technologies in detail for making rational choices suitable to a particular field conditions. Though AHVS staff work very closely with animals but much of their work is concentrated on treating animals and less on production technologies of fodder crops. The same is true even for KMF, however to bridge this gap it has started recruiting agriculture graduates. But their number is one or maximum of two per milk union which covers 3 to 4 districts.

**Training needs of clientele in respect of scientific subject matter**

Garret rankings were computed for seven themes of training needs. Basics of forage production technologies (T1), Post harvest processing and handling of crop residue (T2), Forage seed production (T3), Silvipasture and agroforestry (T4), Forage crops for problematic, difficult and unutilized areas (T5), Feeding systems (T6), Socio economic aspects of forage production (T7). First three ranked training needs were T1, T6, T2 by KMF and AHVS, T5, T1, T2 by NGO, T2, T1, and T6 by KVK. So, T1, T2 and T6 were the most sought after training needs by majority of the clients (Table 4).

**Table 4:** Training needs of clientele in respect of scientific subject matter

| Themes (T) | T | Garrett ranks | | | |
|---|---|---|---|---|---|
| | | KMF | NGO | AHVS | KVK |
| Basics of forage production technologies | T1 | 1 | 2 | 1 | 2 |
| Post harvest and handling of crop residue | T2 | 3 | 3 | 3 | 1 |
| Forage Seed production | T3 | 5 | 7 | 7 | 6 |
| Silvipasture and agroforestry | T4 | 7 | 4 | 6 | 5 |
| Forage crops for problematic, difficult and unutilised areas | T5 | 4 | 1 | 5 | 4 |
| Feeding systems | T6 | 2 | 6 | 2 | 3 |
| Socio economic aspects of forage production | T7 | 6 | 5 | 4 | 7 |

Basics of forage production technologies emerged as the most important training need for KMF and AHVS and second important need for NGO and KVK. The overall average knowledge index values for the clientele group were very low indicating lack of knowledge even on basic aspects. Cultivation aspects of perennial fodder crops differ with that of food crops owing to relatively small size of seeds and low germination percentage. Different fodder crops like signal grass, Rhodes grass, *Stylosanthes* spp. etc were not even heard of by many extension personnel. The general feeling among many organisations is that fodder crops need irrigation though many rainfed types are available.

Post harvest and handling of crop residue was another training need identified as most important by KVK and third important need by other clients. Land allocation to cultivation of green fodder crops is limited and has hardly ever exceeded 5 per cent of the gross cropped area. Crop residues, such as straw, leaves and stalks, are already an important source of fodder in India, providing more than 40 per cent of the available dry matter for feeding livestock (Bossuet 2012) [2]. The concept of crop residues management hence gains importance in livestock husbandry. In India a wide range of crops are cultivated in its different agro-ecological regions, it is but natural that a huge volume of crop residues are produced both on-farm and off-farm. The Ministry of New and Renewable Energy (MNRE, 2009) [9], Govt. of India has estimated that about 500 Mt of crop residues are generated every year. Pathak *et al*. (2010) [11] have estimated that about 93 Mt of crop residues are burnt on-farm in the country. Nearly 70 percent of our livestock are sustained on crop residues. Crop residues hence are not only a cheap source of feed to the livestock but also have become the only source of feed to the livestock. This source hence needs to be managed and utilized properly for the survival of many village animals. Management of crop residues at farmers' level thus attains importance for livestock rearing and for inclusive growth of all categories of farmers in the country. Realising this almost all the clients, have recognised the importance of this training theme and expressed that having more knowledge about crop residue management would help to use this available resource more efficiently to the livestock.

The theme feeding systems emerged as the second important training need for KMF and AHVS; and third important training need for KVK. Poor nutrition results in

low production and reproductive performance, slow growth rate, loss of body condition and increased susceptibility to diseases and parasites. Different supplementation strategies could be applied depending upon the type, accessibility and price of supplementary feeds in a given area. So understanding and developing alternate feeding system which make better use of local resource those are available throughout the year gains importance.

There existed relationship between training needs of KMF and AHVS (r=0.821) and KMF and KVK (r=0.786) at 10 percent level of significance (table 5).

**Table 5:** Relationship between training needs between clientele

| Clientele | Correlation coefficient "r" values |
|---|---|
| KMF and NGO | 0.286 |
| KMF and AHVS | 0.821* |
| KMF and KVK | 0.786* |
| NGO and AHVS | 0.321 |
| NGO and KVK | 0.500 |
| AHVS and KVK | 0.679 |

*Significant at 90% probability or at 10% level

NGOs considered forage crops for problematic, difficult and unutilised area (T6) as the most important training need. NGOs basically work with small and marginal farmers who may not come forward to spare their cultivable land for fodder production. However, these are the farmers who rear large junk of livestock. Increasing fodder availability means to them better income from livestock. The better option left is to rejuvenate common and waste lands with improved grasses and legumes. This could be the reason why NGOs look for getting knowledge on this theme.

The relationship between training needs of different clientele group indicated a positive and significant relationship at 10 per cent level of probability between KMF and AHVS and KMF and KVK (Table 5). So as the training needs of KMF match with that of AHVS and KVK, KMF can be grouped with either of two to conduct training programs.

## Conclusion

It was concluded that learning about fodder technologies was considered as extremely important by clientele group. However, their training needs about fodder technologies differ slightly based on the type of job they perform. Seniors and published literature were most consulted sources of information. Hence these sources may be exploited for capacity building on the training needs identified by each specific clientele group, Government should take care of their perceived need in order to formulate and design training programme for them so that farmers of the state may be able to get the maximum benefits out of their efforts and involvement. It is also recommended that both extensive and intensive hand on-training programmes should be emphasized for clientele group through proper assessment of their training needs. The concerned stakeholders should pay relatively higher emphasis and care on those specific most important needs, as identified while formulating different training strategies and programmes for the clientele group.

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