A TEST TO MEASURE KNOWLEDGE OF DAIRY FRAMERS ABOUT IMPROVED DAIRY FARMING PRACTICES

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ABSTRACT

Dairy farming is practised mainly by resource poor farmers who have limited access to knowledge, skill, training and credit. Extension interventions would help these farmers to access knowledge and technologies that can enhance their standard of living. This would facilitate them to obtain good economic returns. The major objective of study was to evaluate dairy farmers' knowledge about improved dairy farming practices. The knowledge test of resource poor dairy farmers on four major areas of dairy farming (breeding, feeding, healthcare and management practices) was conducted. A tentative list of 35 items was drafted keeping in view the application of statement suited to the area of study. After getting jury opinion on the items of test, Item difficulty index, Discrimination index and items of validity were worked out. Finally, 28 statements were selected in the final format to measure knowledge about improved dairy farming practices. The reliability coefficient (rtt=0.77) obtained indicated that the internal consistency of the knowledge test developed for the study was very high.

Keywords: resource poor farmers, adoption, knowledge, dairy farming, households

INTRODUCTION

Dairy farming is the second-largest source of revenue in rural India (Sabapara et al., 2013). It is a livelihood option for 80 million households in India (Ponnusamy *et al* 2019). Majority of them maintain one to two dairy animals. These farmers produce small quantity of milk which is of poor quality. They are practising subsistence farming. Empowering resource poor farmers is very vital because it will augment their income and harness the resources so that milk yield will increase and then it will increase the economy of the country (Ponnusamy and Padaria, 2021). Resource poor farm families have less contact with the extension agents and their level of adoption for new technologies is also dismally low. Resources poor farmers are not able to harness the technologies because there is lacuna of sources and resources (Ponnusamy *et al,* 2021).

It is widely acknowledged that better dairy farming practises in the areas of breeding, feeding, health care, and management must be adopted in order to increase production and productivity of dairy farming and make the dairy industry more profitable. There are significant inconsistencies between the adoption of better dairy farming practises by dairy farmers. This might be due to a lack of an effective method for disseminating knowledge, a lack of compatibility, complexity, and the inability to observe cutting-edge dairy farming practises. Farmers are unable to handle dairy farming

practises properly in their fields as a result. For measuring the knowledge level, a knowledge test was constructed and standardized with help of the following techniques.

OBJECTIVE

To develop a test to measure knowledge level dairy farmers about improved dairy farming practices

METHODOLOGY

Knowledge is a body of understood information possessed by an individual. For the purpose of this study, knowledge was operationalised as the information and understanding of the dairy farmer regarding improved practices of animal husbandry. For measuring the knowledge level, a knowledge test was constructed and standardized.

Construction of knowledge test

The knowledge test was developed in the line elucidated by Lindquist (1951). The procedure followed for constructing the knowledge test is described below:

Collection of items

The most important element of a knowledge test is the set of statements or questions called items. Here, the items for the test were constructed for improved dairy farming practices by resource poor dairy farmers. A set of

thirty raw items were selected covering almost all the aspects of improved dairy farming practices *viz*, breeding, feeding, health care and management to carry out item analysis. The items of the test were converted into genuine dichotomous objective type questions to facilitate facial scoring and analysis.

Pre-testing and item analysis

The preliminary knowledge test battery was administered to the respondents of non-sampling areas *i.e.,* Yamuna Nagar in this case. The score was assigned 1 and 0 for correct and incorrect answers respectively and then total score for each respondent was calculated by summing up his/ her scores of all the items. Later on, the Difficulty Index and Discriminatory Index for each of the items were calculated, separately. The procedures are followed as followed by Thorat *et.al*., 2015 and Saini, 2017.

Item difficulty index

Difficulty of an item refers to the relative aggravation faced by the respondents to answer the item or question correctly. Garret (1966) described several ways to determine the difficulty of an item (i) by the judgments of the competent people who rank the items in order of difficulty, (ii) speed with which the items can be correctly solved, and (iii) by the number of examinees in the group who can solve the item correctly. In the present study, the method of calculating the difficulty index of items was used to determine the difficulty level of all the items in the test battery. Difficulty index can be defined as proportion of the respondents giving correct answers to the particular item (Ray and Mondal, 2014). The difficulty index was calculated by using the following formula:

$DI = nc/N$

Where, DI= Item Difficulty Index,

nc = Number of respondents who answered the question correctly

N   = Total number of respondents

Discrimination index

Discrimination Index is calculated to expresses the extent to which a particular item discriminates the respondents who sharply has more knowledge about the topic with those who lacks the same. The statement or items which is either answered correctly by everyone or none in the sample, is supposed to have no power of discrimination. In order to compute discrimination indices for all the items, the total scores of all the respondents were arranged in the descending order. Out of this, the top 27 per cent and the bottom 27 per cent of the respondents were treated as high and low a group, which was further, used to calculate the discrimination index. Discrimination index was calculated using following formula:

$DI = (n1H - n2L)/n$

Where, DI= Discrimination Index

n1H = Number of non-sample respondents in 27 per cent high group who answered correctly

n2L = Number of non-sample respondents in 27 per cent low group who answered correctly and

n   = (n1+n2) = Total number of non-sample respondents in 27 per cent high group and 27 per cent low group.

Point-bi-serial correlation coefficient

Point-Bi-serial correlation coefficient is the statistics used to work out the internal consistency of the items of dichotomous or binary nature, which signifies the relationship of the total score to a dichotomized answer of any given item. The point bi-serial correlation for each of the item of initial knowledge test was calculated by using the formula given by Garret (1966):

$rpb = Mp - Mq/ \sigma * \sqrt{pq}$ where, rpb = point bi-serial correlation

Mp = mean of the total scores of the respondents who answered the items correctly.

Mq = mean of the total scores of the respondents who answered the items incorrectly.

p   = proportion of the sample in the first group

q   = proportion of the sample in the second group

σ   = standard deviation of the entire sample

Final selection of items

Those items, which met all the following conditions, were finally selected for the knowledge test: Difficulty index (DI) between 0.30 and 0.80 Discrimination index value between 0.30 and 0.55 and Point bi-serial correlation coefficient at five and one per cent level of significance.

Thus, a total of 28 items from a total 35 items were retained finally, for the final knowledge test.

Table 1 : Final format of the Knowledge test for dairy farmers knowledge regarding improved dairy farming practices

Sr. No.	Particulars	Level of knowledge	
		Maximum score	Obtained score
A	**Breeding practices**	**16**	
1	**Mention the improved breeds of dairy animals in your area?**	**2**	
	a) Enumeration of two breeds	2	
	b) Enumeration of one breed	1	
	c) Enumeration of none/wrong answer	0	
2	**After how many days of interval, a normal cow comes into regular heat?**	**3**	
	a) Between 18 and 24 days	1	
	b) Between 24 and 30 days	2	
	c) Between 45 and 60 days	3	
	d) No answer	0	
3	**What is the right time of AI when cow is in normal heat?**	**3**	
	a) Between 12 to 18 hrs	3	
	b) Between 18 to 24 hrs	1	
	c) After 24 hrs	2	
	d) No answer	0	
4	**What is/are breeding method(s) used for improvement in your cattle and buffaloes?**	**2**	
	a) A.I	1	
	b) Natural	1	
	c) Both	2	
5	**When the animals attain the peak yield?**	**1**	
	a) Immediately after parturition	0	
	b) After 3 to 6 week	1	
	c) After 6 to 8 week	0	
6	**What is the next time of service after calving?**	**1**	
	a) Before 2 months	0	
	b) Between 2-3 months	1	
	c) After 3 months	0	
7	**Which practice of breeding should be followed in animals so as to reduce the chance of any kind of disease transmission?**	**1**	
	a) A.I	1	
	b) Natural service	0	
8	**What is the gestation period of dairy animals?**	**1**	
	a) 200 days	0	
	b) 280-290days	1	
	c) Any other	0	
B	**Feeding practices**	**10**	
1	**Mention the component of balanced ration for dairy animals?**	**1**	
	a) Dry fodder+ green fodder + concentrates+ mineral mixture+ common salt	1	
	b) Any other	0	
2	**Mention the component of balanced ration for dairy animals?**	**1**	
	a) Dry fodder+ green fodder + concentrates+ mineral mixture+ common salt	1	
	b) Any other	0	

Sr. No.	Particulars	Level of Knowledge	
		Maximum score	Obtained score
3	How much concentrate to be fed for a milch animal for every kg of milk production?	1	
	a) 2-2.5 kg	1	
	b) Any other	0	
4	How much extra concentrate to be fed for advance pregnant animals?	1	
	a) 1-1.5 kg	1	
	b) 0.5 kg	0	
	c) Any other	0	
5	What should be done to green fodder before feeding it to animals?	1	
	a) Chopping /grinding	1	
	b) Any other	0	
6	Green fodder can be preserved by which method?	1	
	a) Hay/Silage	1	
	b) Any other	0	
7	Amount of fiber in dairy animal diet should be increased or decreased during heat stress period?	1	
	a) Decreased	1	
	b) Increased	0	
8	In what stage green fodder is to be cut for feeding of dairy animals?	1	
	a) Before flowering	1	
	b) Any other	0	
9	How much quantity of colostrum to be fed to new born?	1	
	a) 10% of B.Wt	1	
	b) Any other	0	
C	HEALTH CARE PRACTICES	14	
1	When should a calf be dewormed at the earliest?	2	
	a) Within one week	2	
	b) Within two week	1	
	c) Within three week or above	0	
2	What interval adult animal should be dewormed?	3	
	a) Every three to four month	2	
	b) Every six month	1	
	c) Every one year	0	
3	Against which disease animal should be vaccinated during quarantine period?	1	
	a) FMD/HS/Brucellosis	1	
	b) Any other	0	
4	What are the common diseases against which vaccination should be done?	2	
	a) Enumeration of two or more diseases	2	
	b) Enumeration of one disease	1	
	c) Enumeration of none	0	
	(FMD, HS, R.P, Anthrax)		
5	What are the common disinfectants used in the farm?	1	
	a) Phenol/washing soda/ KMnO4/ lime powder	1	
	b) Any other	0	
6	What is the very first step to be taken in animal in case of suspected to be sick?	1	
	a) Isolate the animal from the main herd	1	
	b) Any other	0	

Sr. No,	Particulars	Level of Knowledge	
		Maximum score	Obtained score
D	**MANAGEMENT PRACTICES**	**6**	
1	**What would you do to protect your animals during extreme summer?**	**1**	
	a) Provide shade	1	
	b) Proper ventilation facilities	1	
	c) Fan	1	
	d) any other	0	
2	**How will you protect animals in winter season?**	**1**	
	a) By using blanket around it	1	
	b) Floor mat	1	
	c) Any other	0	
3	**What are the different methods of treating farm waste?**	**1**	
	a) Cow dung cake	1	
	b) Manure pit	1	
	c) Composting	1	
	d) biogas production	1	
	e) any other	0	
4	**What is used in vermicomposting?**	**1**	
	a) Earthworms	1	
	b) Sand/bricks		
	c) Any other	0	
5	**What is the optimum time for complete milking process?**	**1**	
	a) < 2 min	0	
	b) 2-3 min	0	
	c) 3-4 min	0	
	d) 5-8 min	1	
6	**Which method is considered ideal for milking?**	**1**	
	a) Full hand milking	1	
	b) Knuckling method	0	
	c) Fisting method	0	
	d) Milking machine	0	
	e) Any other	0	

Reliability and validity of the knowledge test

The reliability examined by employing split halves method. The 28 items were divided into two equal halves, with 14 odd and the 14 even. These were administered purposively to 20 respondents separately. Having obtained the two sets of scores for each of the respondents, coefficient of correlation between two sets of score was calculated, which was found to be significant. The reliability coefficient (rtt=0.77), thus obtained indicated that the internal consistency of the knowledge test developed for the study was high.

The validity of the scale was examined for content validity by determining how well the content of the scale is representative of the subject matter under study. Since as many items were selected by discussion with the experts, reviewing the literature and strict adherence to the judges' ratings, it was assumed that the test has satisfactory content validity.

CONCLUSION

Though the aforesaid criteria were the main consideration for the final selection of the knowledge items, care was taken not to eliminate the important aspect, if any. Finally, 28 items were selected, which formed the actual (final) format of the knowledge test. The items are presented in Table 1.

CONFLICT OF INTEREST

No conflict of interest among researchers.

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