RESEARCH NOTE

Development of a Scale to Measure Adoption of Improved Dairy Husbandry Practices of Dairy Farmers

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ABSTRACT

It is well recognised that India is the largest producer of milk in the world, but productivity of our animal is far lrsser than the world average. Therefore, researchers recommended location specific package of practices to improve the productivity of our millions of cattle and buffalo. But, dairy farmers adopted package of practices which are more suitable or profitable for them. Therefore, the present study made an attempt to quantify the exact level of adoption of improved dairy husbandry practices, with the specific objective to develop and standardize a scale to measure dairy farmers' adoption of improved dairy husbandry practices. The process started with selection of 86 statements and finally 26 statements were retained for scale development through editing and item analysis. Validity and reliability of the developed scale indicated high level precision and internal consistency of the scale.

Key words: *Adoption scale; Animal husbandry; Dairy husbandry;*

India continues to be the largest producer of milk in the world. Several measures, like location specific package of practices etc., have been initiated by the Government and other organizations to increase the productivity of livestock, which has resulted in increasing the milk production significantly to the level of 100.9 million tonnes at the end of the Tenth Plan (2006-07) as compared to 53.9 million tonnes in 1990-91 (*Anonymous, 2011*). But, desire curve of change is very slow. This may be due to non-adoption and/or rejection of any packages of practices or part of it. The adoption of specific practices is not of a single decision to act but series of actions and thought decisions. The ultimate adoption of the technologies or practices is based on profitability, relative advantage over an existing practice and less complexity etc. Therefore, dairy farmers adopt technologies or package of practices which are more suitable for their existing situation. But, there is a lack of proper measuring instruments to quantify adoption of improved dairy husbandry practices by the dairy farmers. Hence, the present study were designed to develop and standardize a scale for measuring dairy farmers' adoption of improved dairy

husbandry practices particularly for Aligarh district of Uttar Pradesh and the developed scale may be used in the other parts of the country with suitable modification.

METHODOLOGY

The adoption, in extension science, is a decision to make full use of an innovation as the best course of action available. Adoption was operationally defined as the extent to which the improved dairy husbandry practices are used by the dairy farmers. The following points were considered for measuring the adoption of improved dairy husbandry practices of dairy farmers of Aligarh district of Uttar Pradesh.

Collection and editing of statements: Referring the available literature on improved dairy husbandry practices a large number of statements covering the entire universe of content was collected. A total a 86 statements covering four important aspects of improved dairy husbandry practices *viz.* breeding (20 statements), feeding (29 statements), management (26 statements) and healthcare (11 statements) were collected for the development of scale. The researchers, dairy farmers and extension experts were consulted for preparation

of statements. In all, 31 statements (breeding-8 statements; feeding-11 statements; management-9 statements; and healthcare-3 statements) were deleted after applying the criteria laid down by *Edward (1969)* for selection of statements. Finally, 55 statements (breeding practices consisting of 12 statements; feeding practices consisting of 18 statements; management practices consisting of 17 statements; and health care practices consisting of 8 statements) were selected for item analysis as these were found to be non-ambiguous and non-factual.

Item analysis: It was essential to delineate the items based on the extent to which they can differentiate the respondents with high level of adoption from the respondent with low level of adoption of improved dairy husbandry practices. For this purpose, item analysis was carried out on the statements selected in the first stage. A schedule consisting of 55 statements was prepared and used for personally interviewing a sample of 40 judges consisting of Subject Matter Specialist and Veterinary Officer(s) from the Aligarh district of Uttar Pradesh. The responses for the statements were obtained on a three point continuum *viz.*, 'very important', 'important' and 'not so important' with scores of 3, 2 and 1, respectively.

Arithmetic mean of each statement as well as four components was calculated. The statements having mean value equal or greater than mean value of their respective component were retained for final scale preparation (Annexure-I). Thus, a total of 26 statements (5 statements for breeding, 6 statements for feeding, 10 statements for management and 5 for healthcare) were retained for final scale preparation and remaining 29 statements were rejected. Finally the selected 26 statements under their respective component are presented in Table 1.

Standardization of the scale: The validity and reliability was ascertained for standardization of the scale. The validity was confirmed by the content validity and the split-half method was used for testing reliability.

Content validity: The content validity is the representativeness of sampling adequacy of the content, the substance, the matter and the topics of measuring instrument. This was ensured while selecting adoption statements. Due care was exercised in selecting and wording the statements so as to cover all the relevant aspects of improved dairy husbandry practices under

Table 1. The final adoption scale with 27 statements representing four components

Statement	AC	AR	NA
Breeding			
Having AI done at proper time of heat			
Having the cow/buffalo served within 60 to 90 days after calving			
Treatment of repeat breeders and anoestrus by a veterinarian			
Having pregnancy diagnosis done between 60 to 90 days after service			
Follow the natural service for their animals by superior breeds			
Feeding			
Feeding of balanced diet to their calves			
Feeding of balanced diet to their heifers			
Feeding of balanced diet to their adults (dry and milk animals)			
Cultivation of hybrid fodder for their animals			
Use of hybrid fodder for their animals			
Providing mineral mixture to animals			
Management			
Practising deworming in calves			
Castration of male calves			
Practising weather protection practice in animals			
Timely drying off animals			
Care of advanced pregnant animal			
Proper care at the time of parturition			
Following clean milk practices and right method of milking			
Providing clean drinking water for animals			
Colostrum feeding to new born calves			
Keeping record of milk production			
Healthcare			
Timely and regular vaccination of animals (i) HS. (ii) FMD (iii) BQ			
Isolation of sick animals			
Treatment of sick animals/diseased animals by veterinarian			
Periodical check up of animals against disease by veterinarian			
Protection against ectoparasites			

each component. Finally, Subject Matter Specialist gave their view about the suitability of each statement. Thus, a fair degree of content validity was established for this scale.

Reliability: The split-half method for testing reliability was used. The scale was split into two halves on the

Annexure I. Arithmetic mean of statements of Improved Dairy Husbandry Practices

Statements	Mean
Breeding practices	
Having AI done at proper time of heat	3.00
Having the cow/buffalo served within 60 to 90 days after calving	3.00
Treatment of repeat breeders and anoestrus case by a veterinarian.	3.00
Having pregnancy diagnosis done between 60 to 90 days after service.	2.75
Castration of calves at the age of 6 months.	2.10
Providing of proper bedding to cow in advanced stage of pregnancy.	2.25
Adequate exercise of pregnant animals	2.00
Keeping the animals in door in advanced stage of pregnancy	2.00
Providing of loose housing to animals in advanced stage of pregnancy separately	1.50
Practice of AI in buffaloes as compared to natural service	1.50
Monthly check-up of pregnant animals by a veterinarian.	1.50
Follow the natural service for their animals by superior breeds.	2.75
Average	2.31
Feeding practices	
Feeding of balanced diet to their calves	2.8
Feeding of balanced diet to their heifers	2.85
Feeding of balanced diet to their adults (dry and milk animals)	2.75
Cultivation of hybrid fodder for their animals	2.55
Use of hybrid fodder for their animals.	2.35
Providing mineral mixture to animals.	2.35
Use of urea treated straw.	1.65
Timely irrigation of fodder crops	1.05
Fodder production all the year round.	1.25
Feeding the calf on body weight basis.	1.65
Feeding of mixture of fodder consistency of cereals and leguminous fodder crops.	1.65
Use of fertilisers for fodder crops.	1.65
Provision of salt licks in animal house.	1.25
Feeding of 50-60 kg green fodder per animal/daily	1.35
Keeping record of fodder production.	1.15
Silage and hay making	1.00
Cutting fodder at the flowering stage of plants.	1.65
Insecticide spray on fodder crops.	1.00
Average	1.76

	Mean
Management practices	
Practising deworming in calves	3.00
Castration of male calves	2.85
Practising weather protection practice in animals.	2.25
Timely drying off animals.	3.00
Care of advanced pregnant animals	2.85
Proper care at the time of parturition.	2.45
Following clean milk practices and right method of milking.	2.45
Providing clean drinking water for animals.	2.75
Colostrums feeding to new born calves.	3.00
Culling of less productive animals.	2.15
Use of sterilised scalpel for cutting naval cord and application of tincture iodine on the cut end of the naval cord.	1.80
Keeping record of milk production.	2.35
Dehorning of calves.	1.55
Poeticising weaning in their animals.	1.15
Use of comfortable house for animals.	1.35
Massage of milch animals daily dandy brush as a regular practice	1.35
Use of strip cup as a regular practice	1.45
Average	2.22
Health care practices	
Timely and regular vaccination of animals (i) HS. (ii) FMD (iii) RP (iv) BQ	3.00
Isolation of sick animals	2.70
Treatment of sick animals/diseased animals by veterinary staff.	2.70
Periodical testing of animals against disease by veterinary doctors	2.55
Protection against ectoparasites.	2.50
Control of flies in cattle sheds.	1.95
Daily recording of temperature in case of crossbred animals.	1.15
Provision of separate attendant for sick animals	1.10
Average	2.21

basis of odd and even number of items and administered to randomly drawn 40 dairy farmers from the two villages namely Songara and Rahmapur of Aligarh district of Uttar Pradesh. Thus, two sets of scores were obtained. The Pearson's product moment correlation coefficient for each component was calculated. The values of correlation coefficient were 0.780, 0.976, 0.877 and 0.887 for breeding, feeding, management and healthcare respectively. These correlation coefficients were further corrected by using Spearman's Brown formula and obtained the reliability coefficients (r) of

each component of dairy husbandry practices.. The r-values were 0.876, 0.988, 0.935 and 0.940 for breeding, feeding, management and healthcare, respectively. All these reliability coefficients were significant at 0.01 p indicating high level reliability of the developed scale.

RESULTS AND DISCUSSION

The final scale consisting of 26 statements representing four components were presented in Table 2. The responses had to be recorded on a three point continuum representing continued adoption, rejection after adoption and not adopted with scores of 3, 2, and 1, respectively. The adoption score of each respondent can be calculated by adding up the scores obtained by him/her on each component as well as all the items. The adoption score on this scale will range from 5 to 15; 6 to 18; 10 to 30; 5 to 15; and 26 to 78 for breeding, feeding, management, healthcare and overall adoption. The high scores indicate that the respondent had high adoption of the improved dairy husbandry practices in each component as well as overall and vice-versa.

CONCLUSION

The validity and reliability of the developed scale indicated the precision and consistency of the scale. This scale can be used to test the differential level adoption of improved dairy husbandry practices before introducing any development programme related to animal husbandry and dairying. This scale can also be used beyond the study area with little modifications.

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