

- 800 Project Code**
 8001 Institute Project Code No. : EESE 1.01
 8002 ICAR Project Code No.
801 Name of the Institute and Division
 8011 Name and address of the Institute : Central Institute for Research on Goats,
 Makhdoom, P.O. Farah-281 122, Mathura
 (U.P.),
 8012 Name of Division/Section : Extension Education and Socio-Economics Section
 8013 Location of the Project : CIRG, Makhdoom
**802 Project Title : Development of Tests, Scales to Measure the
 Knowledge and Attitude of the Goat Farmers
 towards Selected Goat Husbandry Practices.**

803 Priority Area: Transfer of goat production technology

- 8031 Applied Res./Basic Res./Process or./Transfer of Tech/Tech. Dev.
 01 02 03 04

804 Specific Area Transfer of improved goat production Technology

- 805 Duration of the Project :**

8051 Date of start : Date of Start of Project: April 2007

8052 Date of completion : June 2009

8053 Total Cost/Expenditure Incurred : Rs. 12.56 lakhs

8054 Executive Summary
 Please see Annexure-I

806 Key words Development, tests, scales, knowledge, attitude, and goat husbandry practices

PART-II : Investigator Profile

- 810 Principal Investigator** : Dr. R.L. Sagar, Principal Scientist, EE&SE Section,
 CIRG, Makhdoom, P.O. Farah-281 122, Mathura, U.P.
 (Retired in June 2009)
811 Co-Investigator : Dr. Braj Mohan, Sr. Scientist, EE&SE Section,
 CIRG, Makhdoom, P.O. Farah-281 122, Mathura, UP.
812 Co-Investigator : Dr. Khushyal Singh Scientist, EE&SE Section,
 CIRG, Makhdoom, P.O. Farah-281 122, Mathura, U.P.

PART-III : Technical Details**820 Introduction and Objectives****8201 Introduction**

The adoption of improved goat husbandry practices ensures better results and good returns to the goat farmers. But the decision to adopt improved goat husbandry practices depends upon the knowledge and attitude of the goat farmers towards goat husbandry practices in general and the merit of the practice (s) to be adopted in particular. It is, therefore essential to know the knowledge and attitude of the goat farmers in order to develop and formulate suitable extension programmes and strategy. The measurement of knowledge and attitude through reliable tests and scales are necessary for the assessment of the goat farmers' knowledge and attitude by

survey method. A survey of goat farmers' knowledge and attitude require reliable tests and scales for the adoption of goat husbandry practices. The tests and scales are not available at present on the goat husbandry practices. It is believed that the goat farmers who have more knowledge and favourable attitude towards goat husbandry practices are more likely obtained higher production from their goats. Keeping this in view an attempt has been taken up to develop tests and scales to measure the goat farmers' knowledge and attitude towards some selected goat husbandry practices.

Knowledge: Knowledge as defined in this study included those behaviour and test situations which emphasized the remembering either by recognition or recall ideas, material or phenomenon (Bloom et al, 1956)

English and English (1958) defined knowledge as a body of understood information possessed by an individual or by a culture.

Attitude: Attitude in this study refers to the degree of positive or negative affect associated with some psychological object(Thurstone, 1946).

8202 Project Objectives

- To develop tests to measure the knowledge of goat farmers about selected goat husbandry practices.
- To develop scales to measure the attitude of goat farmers about selected goat husbandry practices.

8203 Background information and importance of the project

The steps like item collection, initial selection of items, item analysis, calculation of difficulty and discrimination indices of knowledge items, selection of items for test scoring method, reliability of knowledge test (Split- half, test- retest method) and content validity will be followed in developing the knowledge test for the study.

The method of equal appearing interval of Thurstone and Chave (1929) and Likert's Summated rating method (1932) with slight modification in the procedure by Edwards(1969) will be used in this study for developing the attitude scales.

821 Project Technical Profile

8211 Technical Programme

2007-08

A. DEVELOPMENT OF KNOWLEDGE TEST

Dr. R.L. Sagar

1. Collection of review of literature
2. Collection of items for the selected practices
3. Initial selection of items

4. Item analysis
5. Computation of difficulty index

Dr. Khushyal Singh

1. Help in collection of items for the selected goat husbandry practices
2. Help in initial selection of items
3. Help in computation of difficulty index

Braj Mohan

1. To help in collection of items for the selected goat husbandry practices
2. To help in initial selection of items
3. To help in computation of difficulty index

2008-09

Dr. R.L. Sagar

1. Computation of discrimination index
2. Selection of items for tests
3. Scoring
4. Reliability of knowledge test
 - a) Split-half method
 - b) Test-retest method
5. Content validity of knowledge test
6. Collection of data in the field

Dr. Khushyal Singh

1. To help in computation of discrimination index
2. Selection of items for the test
3. Reliability of knowledge test
4. To help in collection of data in the field

Dr. Braj Mohan

1. To help in computation of discrimination index
2. Selection of items for the test
3. Content validity of knowledge test
4. To help in collection of data in the field

2009-10

Dr. R.L. Sagar

1. Compilation of data
2. Analysis and tabulation of data
3. Final report writing

Dr. Khushyal Singh

1. To help in compilation of data

2. To help in analysis and tabulation of data
3. To help in report writing

Dr. Braj Mohan

1. To help in compilation of data
2. To help in analysis and tabulation of data
3. To help in report writing

**B. DEVELOPMENT OF ATTITUDE SCALES
TECHNICAL PROGRAMME 2007-08**

Dr. R.L. Sagar

1. Collection of review of literature
2. Decide the technique to measure the attitude
3. Preparation of the items for goat husbandry practices
4. Initial scrutiny and selection of items

Dr. Khushyal Singh

1. To help in collection of review of literature
2. To help in preparation of the items for goat husbandry practices
3. Initial scrutiny and selection of items

Dr. Braj Mohan

1. To help in collection of review of literature
2. To help in preparation of the items for goat husbandry practices
3. Initial scrutiny and selection of items

2008-09

Dr. R.L. Sagar

1. Getting the items rated by judges
2. Compilation of attitude statements
3. Calculation of median (scale) values
4. Calculation of Q- values
5. Final selection of the attitude statements

Dr. Khushyal Singh

1. To help in getting the items rated by judges
2. To help in calculation of median (scale) values
3. To help in calculation of Q- values

Dr. Braj Mohan

1. To help in getting the items rated by judges
2. To help in calculation of median (scale) values
3. To help in final selection of attitude statements

2009-10

Dr. R.L. Sagar

1. Final format of the scales and scoring procedure
2. Test of reliability of the attitude scales
3. Test of validity of the attitude scales
4. Final report writing

Dr. Khushyal Singh

1. To help in calculation of reliability of the attitude scales
2. To help in preparation of final report

Dr. Braj Mohan

1. To help in calculation of reliability of the attitude scales
2. To help in preparation of final report writing

8212 Total man months per year involvement of component project workers

Dr. R. L. Sagar	50	13.50
Dr. Khushyal Singh	25%	6.75
Dr. Braj Mohan	25%	6.75

822 Final Report on the Project

Please see Annexure-I

8221 Achievements in terms of targets fixed for each activity

Please see Annexure-I

8222 Questions-answered : Nil

8223 Process/Product/Technology/Developed : NA

8224 Practical Utility:

The present study has been taken up to develop the tests and scales to measure knowledge and the attitude of the goat farmers. These tests and scales will be useful in measuring the levels of knowledge and attitude of goat farmers for identifying the training needs, planning the training programmes and accordingly implementing and accelerating the process of adoption of the goat production technologies in an operational area. It will also be helpful to the scientist, researchers, students and extension personnel in collecting empirical data on knowledge and attitude of the goat husbandry practices.

8225 Constraints, if any : Nil

823 Publications and material development

8231 Research Papers Nil

8232 Popular articles: Nil

8233 Reports : Nil

8234 Seminars, Conferences and Workshop
(relevant to the project in which scientists have participated) : Nil

824 Infrastructural facilities developed: Nil

825 Comments /suggestions of project leader regarding possible future line of work that may be taken up arising out of this project.

PART-IV: Project expenditure Budget Estimates (Rs. In lakh

(Summary)

**830 Budget Summary
(Recurring)**

8301 Salaries	Year (1)	Year (2)	Year (3)	Total
1. Scientific	3.90	4.29	1.14	9.33
2. Technical	1.26	1.39	0.38	3.03
Sub Total	5.16	5.68	1.52	12.36
8302 Consumable				
1. Chemicals	--	--	--	--
2. Glass wares	--	--	--	--
3. Others (Stationery and & Postal charges)	0.05	0.10	0.05	0.20
Sub Total	0.05	0.10	0.05	0.20
8303 Travel	--	--	--	--
8304 Miscellaneous (other costs)				
Expenditure on Miscellaneous	--	--	--	--
Sub total	--	--	--	--
Sub total (Recurring)	--	--	--	--
831 Non- recurring (Equipments)	--	--	--	--
832 Total (230 & 231)	5.21	5.78	1.57	12.56

833 Salaries/ Wages

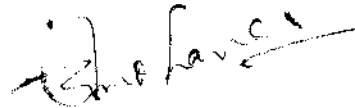
1. Principal Scientist	5.776
2. Senior Scientist	2.140
3. Scientist	1.430
4. Technicians	3.030

Part -V : Declaration

Signature of the Principal Investigator R.L.Sagar (Retired in June, 2009)

Signature of the Co-investigators:

Braj Mohan

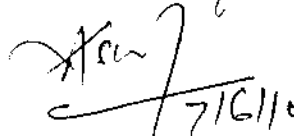


Khushyal Singh



Signature & comments of the Head of the Division/Section

*Project completed as per IIR
Technical programme and inference
are valuable for transfer of technology
approach*



7/6/10

Signature and comments of the Director

Research Project No. EESE 1.01

Development of Tests, Scales to measure the Knowledge and Attitude of the Goat Farmers towards Selected Goat Husbandry Practices

R.L. SAGAR, BRAJ MOHAN & KHUSHYAL SINGH

Introduction

The knowledge and attitude of the goat farmers who play a major role in goat development is expected to have an effect on the adoption of goat husbandry practices, Knowledge and attitude of the goat farmers towards different goat husbandry practices assume still higher importance in India as the percolation and adoption of the available goat technologies to the ultimate users has not been smooth. The desire for a quick and convenient measure of knowledge and attitude that could be used with large groups has led to the development of knowledge and attitude scales. There are some of the important and significant technologies, which can help in augmenting goat production, generating additional employment and income. One of the important reason for their poor adoption can be lack of knowledge and unfavourable attitude of the goat farmers towards the goat husbandry practices. Relationship between attitude and adoption has been established in India and abroad.

THE KNOWLEDGE TESTS

The knowledge tests for measuring the level of knowledge of the goat farmers of the selected goat husbandry practices i.e. H.S., F.M.D., PPR, E. T., Goat Pox and Vaccination against them, Deworming in Small Ruminants, Artificial Insemination in Goats, Feeding of Mineral Mixture and Preparation of Goat Milk Pander have been developed.

Selection of Items for Tests

Two criteria viz. item difficulty index and item discrimination index were considered for selection of items in the final format of the knowledge Tests. The index of item difficulty reveals how difficult an item is where as the index of discrimination indicates the extent to which an item discrimination the well informed from the poorly informed ones.

Item Analysis

The item analysis of a test usually yields two kinds of information; item difficulty and item discrimination.

Calculation of Difficulty Index

The difficulty index of an item was defined as the proportions of goat farmers giving correct answers to that particular item. This was calculated by the formula:

$$P_i = \frac{n_i}{N_i} \times 100$$

Where,

- P_i = Difficulty index in percentage of i th item,
 n_i = Number of goat farmers giving correct answers to i th item
 N_i = Total number of goat farmers to whom i th item was administered.

Calculation of Discrimination Index

For calculating of discrimination index the method suggested by Mehta (1958) was adopted for the present study. The formula by which the items discrimination index was calculated is given below:

$$E_{1/3} = \frac{(S_1 + S_2) - (S_5 - S_6)}{N/3}$$

Where,

$E_{1/3}$ = Discrimination index

S_1, S_2, S_5 and S_6 were the frequencies of correct answers in G_1, G_2, G_5 and G_6 groups respectively, and

N = Total number of goat farmers in the sample of item analysis

Selection of Items for Tests

Two criteria viz. item difficulty index and item discrimination index were considered for selection of items in the final format of the knowledge test. In the present study, items with difficulty index ranging from 30 to 80 and discrimination index ranging from 0.30 to 0.55 were included in the final format of the knowledge test. The knowledge test had five components. Twenty six items of knowledge about H.S., F.M.D., P.P.R., E.T., Goat Pox and Vaccination against them, 10 items about deworming in small ruminants (goat and sheep), 26 items about Artificial Insemination in Goats, 14 items about Feeding of Mineral Mixture and 14 items about Preparation of Goat Milk Paneer, totaling 90 items which fulfilled both the criteria were selected for the final format of the knowledge test.

Scoring Method:

The summation of scores for correct replies over all the items of particular respondent indicated his level of knowledge about selected goat husbandry practices. The range of scores was, therefore, from 0 to 90.

Reliability of Knowledge Test:

The reliability of the knowledge test developed was tested in two ways.

- (i) **Split – half Method:** All the 90 items of the knowledge test were first arranged randomly and then divided into two equal halves. These two sets, each having 45 items,

one with odd numbers and the other with even numbers, were administered to 50 respondents separately. The co-efficient of correlation between two sets of scores was computed and the value 0.852 was found to be significant at 1% level. The reliability co-efficient, thus obtained, indicated that the "internal consistency" of the knowledge test developed for the study was quite high.

- (ii) **Test –retest Method:** The knowledge with 90 items was administered to 30 goat farmers, twice at an interval of 15 days. The Co-efficient of Co-relation was 0.861, which was found to be significant at 1% level. Hence the knowledge constructed was highly stable and dependable for measurement of the knowledge.

Content Validity of Knowledge Test:

In the final selection of items, care was taken to include items covering the entire universe of relevant behavioral aspects of the respondents with respect to knowledge about goat husbandry practices in relation to goat production. Items were collected through various sources including Specialists and hence it was assumed that the scores obtained by administering this test-measured knowledge of the respondent as intended.

The Attitude Scale

Attitude in this study refers to the degree of Positive or negative affect associated with some Psychological object (Thurstone, 1946). The attitude towards a Psychological object may be formed by the inter relation of cognition, feeling and action tendencies about the object. The cognitive component of an attitude consists of the evaluative beliefs, which involves attributes like favourable or unfavourable, desirable or undesirable, good or bad etc. The feeling component refers to the emotions i.e. likes or dislikes, pleasing or displeasing etc. which gives attitudes a motivating, character or action tendencies. It is actually a Physical manifestation. The action tendency component of an attitude includes all behavioral readiness associated with it. These three components of attitude are, however, consistently related to each other i.e. more favourable the belief, more is the liking for the object and then more intense is the action tendency in its favour.

Methodology

The method of equal appearing intervals of Thurstone and Chave (1929) was used to construct the attitude scales for quantitative measurement of vaccination against contagious diseases in goats, deworming in small ruminants (goat and sheep), artificial insemination in goats, feeding of mineral mixture and goat milk paneer. The methods as described by Edwards (1969) and followed by Chattopadhyay (1963), Ray (1967), Sharma (1974), Samanta (1977), Singh (1981), Haque (1981), Sagar (1983), Sagar (1987) and Sagar et al (1988) for the scales developed by them have been used for developing the attitude scales.

Collection and Editing of Attitude Statements

On the basis of relevant literature, informal discussions with the subject matter specialists and goat farmers of T.O.T. villages of the Institute, initially 60 statements, for vaccination against contagious diseases in goats, 51 for deworming in small ruminants (goat and sheep), 58 for artificial insemination in goats, 38 for feeding of mineral mixture and 42 for goat milk paneer were prepared and edited by applying the criteria suggested by Thurstone and Chave (1929), Wang (1932), Likert (1932), Bird (1940) and Edwards and Kilpatrick (1948).

Judges' Rating of Attitude Statements

Each statement initially prepared for each scale were sent for rating on a 7-point continuum namely, 'Strongly Favorable,' 'Favorable,' 'Moderately Favorable,' 'Neutral,' 'Moderately Unfavorable,' 'Unfavorable' and 'Strongly Unfavorable' to 70 judges. The judges selected for the study comprised of Extension Specialists, Subject Matter Specialists in Goat Health, Physiology, Reproduction and Shelter Management, Genetics Breeding, Nutrition Feed Resources and Products Technology etc of the Central Institute for Research on Goats, other I.C.A.R. Institutes, Krishi Vigyan Kendra etc. Out of the 70 judges, 63 judges returned the statements after duly reporting their judgments. But 3 judges reported partly for vaccination against contagious diseases, feeding of mineral mixture and goat milk paneer and hence they were eliminated. An other 2 judges were rejected on the criteria of Thurstone and Chave (1929) for carelessness in judging or other wise failed to respond to the instructions sent for judgment. Thus, finally the responses of 60 judges for all five practices i.e. vaccination against contagious diseases in goats, deworming in small ruminants, artificial insemination in goats, feeding of mineral mixture and goat milk paneer were considered for calculation the scale and Q values of the attitude statements. Based on the median and Q – values of the statements were finally selected to constitute the attitude scales taking into account the following criteria.

Final Selection of Attitude Statement

- (i) The median values of the statements should be fairly distributed through out the continuum.
- (ii) The statement should have smaller Q value as far as possible.
- (iii) The statements selected should represent the universe of opinions or content with respect to the related goat husbandry practices.
- (iv) There should be an equal number of statements indicating favorable and unfavorable attitudes.

Based on these criteria, 30 statements for vaccination against contagious diseases, 26 for deworming in small ruminants (goat and sheep), 40 for artificial insemination in goats, 20 for feeding of mineral mixture and 26 for goat milk Pander were finally selected. Statements with median values above 2, with their Q values below 2 were selected.

Final Format of the Scale and Scoring Procedure

In the final format of the scales there was a three point continuum of agreement to disagreement to the statements, viz. 'Agree', 'Undecided', and 'Disagree' with weights of 3, 2 and 1 respectively for the favorable statements and 1, 2 and 3 respectively for the unfavourable statements. This procedure was adopted by Gupta and Sohal (1976) Sharma and Sohal (1987) and Sagar et. al (1988).

Reliability of the Scales

The reliability of the attitude scales constructed for the present study was tested by split-half and test-retest methods.

(i) Split-half Method

In the split-half method, the scales administered to 50 goat farmers were divided into two equal halves based on odd-even numbers of the statements. The coefficients of correlation between the two sets of scores for each scales were found to be significant at 1 percent level (r values = 0.891, 0.887, 0.917, 0.857 and 0.871 for vaccination against contagious diseases, deworming in small ruminants (goat and sheep), artificial insemination in goats, feeding of mineral mixture and goat milk Paneer, respectively).

(ii) Test-retest Method

In test-retest method, the scales were administered to 30 goat farmers twice with 15 days interval. Thus two sets for each attitude scales scores were obtained for the same respondents, which were then correlated. The coefficient of correlation was found to be significant at 1 percent level (r values = 0.917, 0.937, 0.837, 0.763 and 0.971 for vaccination against contagious diseases, deworming in small ruminants, artificial insemination in goats, feeding of mineral mixture and goat milk Paneer, respectively) and hence the scales were found to be highly stable and dependable for measurement.

Validity of Scale

The validity of the attitude Scales was tested in relation to content validity and construct validity.

Content Validity

The content validity is a kind of validity by assumption (Guilford, 1954). The main criterion of the content validity is how well the contents of the Scales. The contents of the attitude scales were derived from various literature, experts, opinions and feelings as a measure of checks. This was ensured in the collection and selection of statements for the scales. Care was taken to include all the statements, which represent the universe of content of the goat farmers' attitude towards various selected goat husbandry practices.

Construct Validity

The construct validity in the present study was tested by calculating the correlation coefficient between the adoption scores and attitude scores of 20 respondent goat farmers. The method adopted by Sengupta (1967) was followed to calculate the adoption quotient of the respondents. The correlation coefficient between the adoption quotient of vaccination against contagious diseases in goats, deworming in small ruminants (goat and sheep), use of improved breeding buck, feeding of mineral mixture and goat milk Paneer of the goat farmers and attitude towards vaccination against contagious diseases, deworming in small ruminants (goat and sheep), artificial insemination in goats, feeding of mineral mixture and goat milk Paneer were calculated and found to be significant at 1 percent level (r - values = 0.827, 0.789, 0.903, 0.841 and 0.867, respectively.