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Development and standardization of a cognitive-domain knowledge instrument for wool and pelt production

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Abstract

This study focuses to develop and standardize a reliable and valid knowledge test to assess farmers' knowledge regarding scientific wool and pelt production in Jammu Division. The test aims to evaluate farmers' knowledge across key areas *viz.* housing, breeding, feeding, health care, government schemes, training and capacity building, marketing, ITKs and pelt production. Initially, 158 items were collected, among which 91 were selected according to standard criteria. After relevancy testing, 64 items were found to be most relevant by the experts. In item analysis, 47 items lie between the difficulty index range of 30 to 80 and discrimination index of 0.30 to 0.55. Reliability was calculated using Split-half method (0.826) and Spearman Brown Prophecy Formula (0.903). Internal consistency of the knowledge test was calculated using Cronbach's alpha (α) and the value was calculated to be 0.88 and was significant ($p < 0.05$). The validity of knowledge test was established through content validity. Hence, a standardized knowledge test for assessing the knowledge level was developed consisting of 47 items, which can be used by researchers and academicians to assess the knowledge of sheep rearers towards scientific wool and pelt production.

Keywords: Cronbach's alpha, difficulty index, discrimination index, knowledge test, relevancy testing, split-half reliability, wool and pelt

Introduction

Sheep rearing, as a component of small ruminant farming, is deeply embedded in the rural livelihood systems of India and serves as a vital income source for resource-poor farmers, especially in semi-arid and hilly regions such as Jammu Division (Kumar *et al.*, 2010) [6]. The sector contributes not only to meat and milk production but also yields wool and pelts, which are economically significant by-products supporting both cottage and industrial enterprises (DAHD, 2021). Among livestock products, wool has particular importance in temperate regions and contributes to rural employment through its involvement in shearing, sorting, grading, and processing (Singh *et al.*, 2015) [9].

Despite its potential, the wool and pelt sub-sector in Jammu Division remains underdeveloped. Traditional practices continue to dominate sheep husbandry, and the adoption of scientific methods remains limited due to low awareness and knowledge among sheep farmers (Sharma *et al.*, 2018). Scientific practices such as proper timing and method of shearing, fleece grading, hygienic storage, pelt curing, and ectoparasite control have been shown to significantly enhance the quality and market value of wool and pelts (Bhat and Mir, 2017). However, these benefits can only be realized if farmers possess adequate knowledge and are trained in these techniques. The successful transfer and

adoption of such technologies depend largely on understanding the existing knowledge levels and attitudes of the farmers (Reddy, 2003) [7]. Therefore, there is a need to develop a standardized tool that can objectively measure farmers' knowledge about scientific wool and pelt production, considering various aspects of sheep husbandry *viz.* housing, breeding, feeding, health care, government schemes, training and capacity building, marketing, ITKs and pelt production.

Materials and Methods

Collection and edition of items

The knowledge test was developed following the procedure laid out by Edwards (1957) [3]. A detailed review was done from diverse sources such as reference books, field-level extension personnel, subject matter experts, scientists, professional colleagues, and the researcher's own practical experience in scientific sheep husbandry. Initially, 158 statements were developed encompassing key elements of scientific wool and pelt production. After preliminary screening and expert consultation, 91 statements were retained according to criteria given by Edwards (1957) [3].

Results and Discussion

The relevancy testing of items was done by the method described by Verma *et al* (2025) [12]. Items with a mean

relevancy score of 2.44 or higher and a relevancy weightage greater than 0.80 were retained for item analysis (Table 1).

In this way, a total 64 items were found to be most relevant by the experts and selected for further analysis.

Table 1: Items with relevancy weightage and mean relevancy score

S. No	Knowledge Item	MRS	RW	RP	Remarks
A.	Housing				
1.	Which type of housing is suitable for sheep?	2.64	0.88	88.0	S
2.	Which materials use for floor?	2.35	0.78	78.0	E
3.	For small sheds, what type of roofing is advisable?	2.71	0.90	90.2	S
4.	Whether disinfectants should be sprayed regularly in & around the animal shed?	2.58	0.86	86.4	S
5.	How should dispose manure?	2.29	0.76	76.4	E
6.	Which factor is crucial for the placement of a sheep shed?	2.50	0.85	85.0	S
7.	What is the recommended space per sheep in a shed?	2.62	0.89	88.3	S
8.	What is the purpose of a quarantine area in a sheep shed?	2.66	0.91	91.2	S
9.	How does proper ventilation in a sheep shed benefit wool production?	2.47	0.84	84.2	S
10.	Why is it important to keep the housing area dry for wool-producing sheep?	2.38	0.79	79.0	E
11.	How does proper manure management in the sheep shed affect wool quality?	2.53	0.83	82.7	S
12.	What is the impact of overcrowding in a sheep shed on wool production?	2.69	0.87	89.1	S
13.	What role does light play in a sheep shed for wool-producing sheep?	2.45	0.82	81.3	S
B.	Breeding Management				
14.	What is the ideal age for breeding sheep?	2.59	0.86	86.7	S
15.	Which of the following is an important characteristic for selecting a breeding male sheep?	2.63	0.87	87.4	S
16.	Which of the following factors can negatively impact the libido of a ram, affecting its breeding potential?	2.38	0.79	79.0	E
17.	From where is it better to purchase sheep for breeding purposes?	2.24	0.75	75.0	E
18.	What is the breeding season for sheep?	2.61	0.88	88.2	S
19.	Using the same ram for breeding over many years lead to inbreeding?	2.67	0.91	91.4	S
20.	For how many ewes is one ram used?	2.55	0.84	84.7	S
21.	How soon do sheep and goats come into heat after lambing?	2.26	0.75	75.0	E
22.	What is the exact time of tugging after showing estrus signs?	2.50	0.83	83.5	S
23.	What is the average gestation period for sheep?	2.70	0.90	89.6	S
24.	Which of the following is a sign of estrous in sheep and goats?	2.36	0.74	74.0	E
25.	What is a key indicator of successful mating in sheep?	2.42	0.79	79.0	E
26.	Which of the following characteristics is preferred when selecting females for breeding?	2.70	0.90	89.6	S
27.	How often should breeding males be replaced or exchanged to avoid inbreeding?	2.40	0.78	78.0	E
28.	Which of the following breeds is not native to Jammu & Kashmir but has been introduced for improving wool quality?	2.63	0.89	89.1	S
C.	Feeding and Nutrition				
29.	Feeding colostrum provides immunity to new born against diseases.	2.60	0.87	87.3	S
30.	What is the primary source of nutrition for sheep?	2.44	0.81	80.2	S
31.	What is the most common feeding method for sheep?	2.58	0.86	85.8	S
32.	What is creep feed?	2.30	0.70	70.0	E
33.	Do you know feed is provided as per productivity levels of the sheep?	2.65	0.89	89.2	S
34.	When should the plane of nutrition be increased for pregnant ewes?	2.66	0.88	88.9	S
35.	What nutrient is primarily responsible for wool growth in sheep?	2.26	0.75	75.0	E
36.	What type of protein supplements can be added to a sheep's diet to improve wool quality?	2.35	0.78	78.0	E
37.	What effect does high levels of nutrition have on wool fiber?	2.42	0.82	80.1	S
38.	Which of the following minerals should be included in small quantities in sheep feed to support wool growth?	2.70	0.90	90.6	S
D.	Care and health management				
39.	Vaccinations play a significant role in the prevention of disease?	2.45	0.81	81.2	S
40.	What is the recommended age for weaning most lambs?	2.54	0.85	85.1	S
41.	What is the primary method to control internal parasites in sheep?	2.62	0.88	88.5	S
42.	What is the recommended interval for vaccinating breeding ewes against clostridial infections?	2.38	0.79	79.0	E
43.	Shearing can improve sheep health by reducing the risk of overheating and flystrike.	2.35	0.78	78.0	E
44.	At what age should the tetanus vaccine be administered to lambs?	2.59	0.86	86.1	S
45.	How frequently should the FMD (Foot-and-Mouth Disease) vaccine be repeated after the initial vaccination at 2 months of age?	2.68	0.89	89.7	S
46.	What is the ideal time to castrate ram lambs to minimize stress?	2.55	0.87	87.0	S
47.	What is the first step to take when an outbreak occurs on the farm?	2.46	0.82	81.0	S
48.	What should be avoided in terms of grazing practices during an outbreak?	2.24	0.75	75.0	E
49.	Which of the following are commonly affecting diseases of sheep?	2.60	0.85	85.9	S
50.	What is the common health management practice before lambing to ensure good wool and overall health in ewes?	2.48	0.83	83.1	S
E.	Government Schemes				
51.	Are you aware of the vaccination programmes for sheep diseases like PPR, FMD, sheep pox, clostridium etc. under National Livestock Health and Disease Control Programme (NLH&DCP) scheme.	2.66	0.88	88.8	S

52.	Are you aware of establishment of 10 ewe/does unit and 25 ewe/does unit on participatory mode under Rashtriya Krishi Vikas Yojana (RKVY)	2.51	0.84	84.6	S
53.	Are you aware of Establishment of sheep/goat unit on participatory mode comprising of 10 ewes/does and 25 ewe /does under ISDS scheme	2.57	0.86	86.5	S
54.	Which government scheme aims to enhance wool production in Jammu and Kashmir?	2.53	0.84	84.1	S
55.	Are you aware of Establishment of Sheep/goat units of 10 ewes and one Breedable Ram under Tribal Sub Plan scheme.	2.59	0.85	85.6	S
56.	What is a key objective of the Integrated Wool Development Programme (IWDP)?	2.35	0.78	78.0	E
57.	Which government scheme includes the formation of Wool Producer Organizations (WPOs) to strengthen collective marketing by sheep farmers?	2.24	0.75	75.0	E
F.	Marketing				
58.	From where do you get good quality lamb/sheep for maintaining/starting your herd?	2.38	0.79	79.0	E
59.	Who are the primary stakeholders involved in purchasing wool?	2.50	0.83	83.2	S
60.	What products can be made by processing the raw wool?	2.63	0.87	87.5	S
61.	Which of the following factors most influences the price of wool at farmers' level?	2.65	0.89	89.4	S
62.	Which of the following parameters does a vendor sees before purchasing the wool from the producer/farmer?	2.56	0.86	86.6	S
63.	What are the marketing channels available for selling raw wool?	2.61	0.88	88.3	S
64.	Do you think the quality of wool has no significant impact on its market price.	2.67	0.90	90.9	S
65.	Farmers can increase the profitability of wool marketing by forming cooperative societies, adopting better sheep breeds for improved wool quality and processing and value addition before selling.	2.52	0.84	84.5	S
G.	Training and Capacity Building				
66.	Does training improve sheep farming practices?	2.60	0.87	87.6	S
67.	What is the main purpose of training programs for sheep farmers?	2.62	0.88	88.7	S
68.	Does training on feed management enhances your knowledge?	2.32	0.77	77.0	E
69.	Hands-on practical demonstrations and field training is the most effective method for training.	2.48	0.82	82.1	S
70.	Which organization in Jammu & Kashmir is responsible for training and capacity building in the livestock sector?	2.55	0.84	84.8	S
H.	Indigenous Traditional Knowledge (ITKS)				
71.	Hot iron branding on ear and face is used for treating pneumonia/cold	2.51	0.83	83.6	S
72.	Methidaana and alum (1 spoon each) together are used for treating cold in sheep	2.38	0.79	79.0	E
73.	Vinegar of Jamun @ 5 ml per animal is used for treating of blockage of urine	2.47	0.81	81.4	S
74.	Ajwain, Gud and Saunf is used for treating cold/pneumonia	2.44	0.80	80.3	S
75.	Sheep move away from grazing areas when clouds are spotted in the sky	2.18	0.70	70.0	E
76.	Application of turmeric powder and neem oil is a traditional remedy commonly used for treating wounds in sheep	2.60	0.86	86.9	S
77.	Pashmina goats graze in deeper gorges and severely cold nallahs To produce high-quality Pashmina wool	2.29	0.76	76.0	E
78.	A red-hot iron brought near the nose to treat dysentery in animals	2.45	0.82	81.2	S
79.	Indigenous treatment for animal paralysis is using heated white stone (Chaggar) and applying it to the head	2.32	0.77	77.0	E
80.	Feeding boiled long grasses is used for stomach problems in animals	2.32	0.77	77.0	E
81.	Wrapping crushed leaves of Karnu tree on infected feet heals insect attack on sheep feet	2.49	0.83	82.4	S
I.	Pelt production				
82.	Fine and dense wool with uniform texture is most desirable in sheep for high-quality pelt production	2.38	0.79	79.0	E
83.	Breed characteristics is the main genetic factor influencing pelt quality	2.61	0.87	87.8	S
84.	Winter is best for obtaining high-quality pelts in temperate regions	2.56	0.85	85.3	S
85.	Electrical stunning followed by halal slaughter is the best method for slaughtering sheep to ensure minimal damage to the pelt	2.42	0.79	79.0	E
86.	The purpose of salting a pelt after skinning is to preserve it by preventing bacterial growth.	2.20	0.68	68.0	E
87.	1-2 days is the minimum duration for salting a pelt before further processing	2.54	0.84	84.2	S
88.	5-10% is the ideal moisture content of pelts after drying	2.63	0.88	88.9	S
89.	Removal of excess fat and meat is the first step immediately after skinning the sheep	2.50	0.83	83.0	S
90.	Pelts come from young animals, while hides come from older ones. Yes/No	2.50	0.83	83.0	S
91.	Pelts from younger lambs usually more valuable softer and finer. Yes/no	2.68	0.91	91.1	S

*S= selected, E=eliminated

Relevancy Testing of Items

Relevance refers to the extent to which test items effectively measure the intended knowledge domain, ensuring their suitability and significance in line with the test's objectives. The set of 91 statements were submitted to 150 subject matter experts via Google Forms and personal communication. These experts included scientists and researchers from ICAR institutes, SAUs, and other relevant research institutions. A total of 72 complete responses were received, with 18 offline and 54 online submissions. They rated each item as 'most relevant,' 'relevant,' or 'not

relevant,' assigning scores of 3, 2, and 1, respectively (Subrahmanyeswari and Chander, 2008) ^[10]. Based on their feedback, three metrics were computed for each item: Relevancy Weightage (RW), Relevancy Percentage (RP) and Mean Relevancy Score (MRS), using the formulas below:

$$RW = \frac{MR \times 3 + R \times 2 + LR \times 1}{\text{Maximum Possible Score}}$$

Where,

RW = Relevancy Weightage

MR = Most relevant response

R = Relevant response

LR = Least relevant response

MPS=Maximum possible scores obtainable for the statement = Number of experts × 3

$$RP = \frac{FS}{\text{Maximum Possible Score (MPS)}} \times 100$$

Where,

RP = Relevancy percentage

FS= Frequency score of most relevant and relevant

FS=(F_{MR}×3) + (F_R×2) + (F_{LR}×1)

Maximum Possible Score (MPS) = Number of experts × 3

$$MRS = \frac{MR \times 3 + R \times 2 + LR \times 1}{\text{Number of judges (i. e. 72)}}$$

Where,

MRS = Mean Relevancy Score

Finally, items with a mean relevancy score of 2.44 or higher and a relevancy weightage greater than 0.80 were retained for item analysis (Verma *et al.*, 2025)^[12]. In this way, a total 64 items were found to be most relevant by the experts and selected for further analysis.

Item Analysis

Based on the relevancy scores, 64 items were considered appropriate for field testing. The selected 64 statements were administered to 30 sheep rearers across villages of different districts. Responses were scored dichotomously (1 = correct, 0 = incorrect), and each respondent's total knowledge score was calculated as the sum of correct responses. Thus, the range of obtainable score was 0-64.

Difficulty Index and Discrimination Index

Item analysis was performed using both the difficulty index and the discrimination index. These indices provide valuable insights into each item's effectiveness: the difficulty index reflects how challenging an item is, while the discrimination index indicates how well an item distinguishes between more knowledgeable and less knowledgeable farmers. After computing the scores for all 30 respondents, their scores were ranked in descending order and grouped into six equal categories (G1 to G6), with five respondents in each group. To calculate the

discrimination index, only the extreme groups, G1 and G2 (high scorers) and G5 and G6 (low scorers) were used, while the middle two groups (G3 and G4) were excluded from the analysis.

Difficulty index was measured in terms of percentage of correct responses obtained for a particular question. This was calculated by using the formula:

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

Where,

P_i = Difficulty index in percentage of the ith item

n_i = Number of respondents giving correct answer, to ith item

N_i = Total number of respondents to whom ith item was administered i.e. 30 in the present study.

Discrimination index(E^{1/3}) indicates how effectively an item can distinguish between high and low performers on the overall test. It is typically calculated by comparing the performance of the upper and lower groups of respondents. It was calculated following Mehta (1958), using responses from only the top and bottom 25% of respondents. It was calculated by the following formula:

$$E^{1/3} = \frac{\{(S1 + S2) - (S5 + S6)\}}{N/3}$$

Where,

S1, S2, S5 and S6 = Frequencies of correct answers in G1, G2, G5 and G6 groups respectively

N = Total number of respondents in the sample of item analysis

Based on the results of difficulty and discrimination index, final selection of items was done. Two criteria viz. item difficulty (30-80) and item discrimination index (0.30-0.55) had been considered for selection of items in the final format of the knowledge test as described by Mehta (1958). A total of. Table 2 reveals the selected and eliminated statements based on difficulty index and discrimination index. Table 3 thus reveals the final 47 items were included in the final format of the knowledge test. Therefore, the overall possible knowledge score of the individual respondent wool and pelt production ranges from 0 to 47.

Table 2: Indices of difficulty and discrimination for items included in the final format of knowledge test

S. No.	Statements	Difficulty index	Discrimination Index	Remarks
A.	Housing			
1.	Which type of housing is suitable for sheep?	70	0.4	S
2.	For small sheds, what type of roofing is advisable?	16.67	0	E
3.	Whether disinfectants should be sprayed regularly in & around the animal shed?	80	0.3	S
4.	Which factor is crucial for the placement of a sheep shed?	63.33	0.5	S
5.	What is the recommended space per sheep in a shed?	0	0	E
6.	What is the purpose of a quarantine area in a sheep shed?	76.67	0.3	S
7.	How does proper ventilation in a sheep shed benefit wool production?	70	0.5	S
8.	How does proper manure management in the sheep shed affect wool quality?	76.67	0.4	S
9.	What is the impact of overcrowding in a sheep shed on wool production?	73.33	0.5	S
10.	What role does light play in a sheep shed for wool-producing sheep?	63.33	0.6	E

B.	Breeding			
11.	What is the ideal age for breeding sheep?	80	0.4	S
12.	Which of the following is an important characteristic for selecting a breeding male sheep?	66.67	0.33	S
13.	What is the breeding season for sheep?	70	0.4	S
14.	Using the same ram for breeding over many years lead to inbreeding?	70	0.41	S
15.	For how many ewes is one ram used?	63.33	0.32	S
16.	What is the exact time of tupping after showing estrus signs?	70	0.3	S
17.	What is the average gestation period for sheep?	80	0.4	S
18.	How often should breeding males be replaced or exchanged to avoid inbreeding?	93.33	0.1	E
19.	Which of the following breeds is not native to Jammu & Kashmir but has been introduced for improving wool quality?	73.33	0.3	S
C.	Feeding and Nutrition			
20.	Feeding colostrum provides immunity to new born against diseases.	100	0	E
21.	What is the primary source of nutrition for sheep?	76.67	0.5	S
22.	What is the most common feeding method for sheep?	63.33	0.4	S
23.	Do you know feed is provided as per productivity levels of the sheep?	50	0.3	S
24.	When should the plane of nutrition be increased for pregnant ewes?	80	0.4	S
25.	What effect does high levels of nutrition have on wool fiber?	40	0.2	E
26.	Which of the following minerals should be included in small quantities in sheep feed to support wool growth?	26.67	0	E
D.	Care and health management			
27.	Vaccinations play a significant role in the prevention of disease?	100	0	E
28.	What is the recommended age for weaning most lambs	63.33	0.4	S
29.	What is the primary method to control internal parasites in sheep	70	0.3	S
30.	At what age should the tetanus vaccine be administered to lambs?	26.67	0.1	E
31.	How frequently should the FMD (Foot-and-Mouth Disease) vaccine be repeated after the initial vaccination at 2 months of age?	100	0	E
32.	What is the ideal time to castrate ram lambs to minimize stress?	66.67	0.3	S
33.	What is the first step to take when an outbreak occurs on the farm?	93.33	0	E
34.	Which of the following are commonly affecting diseases of sheep?	66.67	0.31	S
35.	What is the common health management practice before lambing to ensure good wool and overall health in ewes?	76.67	0.4	S
E.	Government Schemes			
36.	Are you aware of the vaccination programmes for sheep diseases like PPR, FMD, sheep pox, clostridium etc. under National Livestock Health And Disease Control Programme (NLH&DCP) scheme,	63.33	0.5	S
37.	Are you aware of establishment of 10 ewe/does unit and 25 ewe/does unit on participatory mode under Rashtriya Krishi Vikas Yojana (RKVY)	53.33	0.3	S
38.	Are you aware of Establishment of sheep/goat unit on participatory mode comprising of 10 ewes/does and 25 ewe /does under ISDS scheme	63.33	0.3	S
39.	Which government scheme aims to enhance wool production in Jammu and Kashmir?	60	0.4	S
40.	Are you aware of Establishment of Sheep/goat units of 10 ewes and one Breedable Ram under Tribal Sub Plan scheme	0	0	E
F.	Marketing			
41.	Who are the primary stakeholders involved in purchasing wool?	100	0	E
42.	What products can be made by processing the raw wool?	80	0.33	S
43.	Which of the following factors most influences the price of wool at farmers' level?	66.67	0.5	S
44.	Which of the following parameters does a vendor sees before purchasing the wool from the producer/farmer?	70	0.5	S
45.	What are the Marketing channels available for selling raw wool?	76.66	0.41	S
46.	Do you think the quality of wool has no significant impact on its market price	73.33	0.5	S
47.	Farmers can increase the profitability of wool marketing by forming cooperative societies, adopting better sheep breeds for improved wool quality and processing and value addition before selling.	93.33	0.1	E
G.	Training and capacity building			
48.	Does training improve sheep farming practices	80	0.33	S
49.	What is the main purpose of training programs for sheep farmers?	80	0.33	S
50.	Hands-on practical demonstrations and field training is the most effective method for training.	76.67	0.33	S
51.	Which organization in Jammu & Kashmir is responsible for training and capacity building in the livestock sector?	76.67	0.4	S
H.	ITKs			
52.	Hot iron branding on ear and face is used for treating pneumonia/cold	0	0	E
53.	Vinegar of Jamun @ 5 ml per animal is used for treating of blockage of urine	0	0	E
54.	Ajwain, Gud and Saunf is used for treating cold/pneumonia	50	0.3	S
55.	Application of turmeric powder and neem oil is a traditional remedy commonly used for treating wounds in sheep	70	0.37	S

56.	A red-hot iron brought near the nose and feeding boiled long grasses to treat dysentery in animals	33.33	0.5	S
57.	Wrapping crushed leaves of Karnu tree on infected feet heals insect attack on sheep feet	0	0	E
I.	Pelt Production			
58.	Breed characteristics is the main genetic factor influencing pelt quality	46.67	0.5	S
59.	Winter is best for obtaining high-quality pelts in temperate regions	33.33	0.3	S
60.	1-2 days is the minimum duration for salting a pelt before further processing to preserve it by preventing bacterial growth.	80	0.33	S
61.	5-10% is the ideal moisture content of pelts after drying	63.33	0.4	S
62.	Removal of excess fat and meat is the first step immediately after skinning the sheep	80	0.33	S
63.	Pelts come from young animals, while hides come from older ones. Yes/No	70	0.4	S
64.	Pelts from younger lambs usually more valuable softer and finer. Yes/no	70	0.4	S

*S= selected, E=eliminated

Table 3: Selected statements for final test development

S. No.	Final Knowledge items	Yes	No
A.	Housing		
1.	Which type of housing is suitable for sheep?		
2.	Whether disinfectants should be sprayed regularly in & around the animal shed?		
3.	Which factor is crucial for the placement of a sheep shed?		
4.	What is the purpose of a quarantine area in a sheep shed?		
5.	How does proper ventilation in a sheep shed benefit wool production?		
6.	How does proper manure management in the sheep shed affect wool quality?		
7.	What is the impact of overcrowding in a sheep shed on wool production?		
B.	Breeding		
8.	What is the ideal age for breeding sheep?		
9.	Which of the following is an important characteristic for selecting a breeding male sheep?		
10.	What is the breeding season for sheep?		
11.	Using the same ram for breeding over many years lead to inbreeding?		
12.	For how many ewes is one ram used?		
13.	What is the exact time of tupping after showing estrus signs?		
14.	What is the average gestation period for sheep?		
15.	Which of the following breeds is not native to Jammu & Kashmir but has been introduced for improving wool quality?		
C.	Feeding and Nutrition		
16.	What is the primary source of nutrition for sheep?		
17.	What is the most common feeding method for sheep?		
18.	Do you know feed is provided as per productivity levels of the sheep?		
19.	When should the plane of nutrition be increased for pregnant ewes?		
D.	D. Care and Health Management		
20.	What is the recommended age for weaning most lambs		
21.	What is the primary method to control internal parasites in sheep		
22.	What is the ideal time to castrate ram lambs to minimize stress?		
23.	Which of the following are commonly affecting diseases of sheep?		
24.	What is the common health management practice before lambing to ensure good wool and overall health in ewes?		
E.	Government Schemes		
25.	Are you aware of the vaccination programmes for sheep diseases like PPR, FMD, sheep pox, clostridium etc. under National Livestock Health And Disease Control Programme (NLH&DCP) scheme		
26.	Are you aware of establishment of 10 ewe/does unit and 25 ewe/does unit on participatory mode under Rashtriya Krishi Vikas Yojana (RKVY)		
27.	Are you aware of Establishment of sheep/goat unit on participatory mode comprising of 10 ewes/does and 25 ewe /does under ISDS scheme		
28.	Which government scheme aims to enhance wool production in Jammu and Kashmir?		
F.	Marketing		
29.	What products can be made by processing the raw wool?		
30.	Which of the following factors most influences the price of wool at farmers' level?		
31.	Which of the following parameters does a vendor sees before purchasing the wool from the producer/farmer?		
32.	What are the Marketing channels available for selling raw wool?		
33.	Do you think the quality of wool has no significant impact on its market price		
G.	Training and Capacity Building		
34.	Does training improve sheep farming practices		
35.	What is the main purpose of training programs for sheep farmers?		
36.	Hands-on practical demonstrations and field training is the most effective method for training.		
37.	Which organization in Jammu & Kashmir is responsible for training and capacity building in the livestock sector?		
H.	ITKs		
38.	Ajwain, Gud and Saunf is used for treating cold/pneumonia		
39.	Application of turmeric powder and neem oil is a traditional remedy commonly used for treating wounds in sheep		

40.	A red-hot iron brought near the nose and feeding boiled long grasses to treat dysentery in animals		
I.	Pelt Production		
41.	Breed characteristics is the main genetic factor influencing pelt quality		
42.	Winter is best for obtaining high-quality pelts in temperate regions		
43.	1-2 days is the minimum duration for salting a pelt before further processing to preserve it by preventing bacterial growth.		
44.	5-10% is the ideal moisture content of pelts after drying		
45.	Removal of excess fat and meat is the first step immediately after skinning the sheep		
46.	Pelts come from young animals, while hides come from older ones. Yes/No		
47.	Pelts from younger lambs usually more valuable softer and finer. Yes/no		

Reliability and Internal Consistency

The reliability of the knowledge test was assessed using multiple methods to ensure the consistency and dependability of the instrument. The split-half method was used to evaluate the internal consistency of the test. All 47 items were administered to a sample of 30 sheep rearers. The items were divided into two set odd-numbered and even-numbered items and the scores from both sets were correlated. The reliability coefficient obtained through this method was 0.826, indicating a high level of internal consistency. To further enhance the accuracy of the reliability estimate, the Spearman-Brown Prophecy Formula was applied to the split-half correlation. The adjusted reliability coefficient was calculated to be 0.903, which confirms that the test possesses a high degree of reliability. The internal consistency of the test was also assessed using Cronbach's alpha (α). The value was found to be 0.88, which is considered excellent, and was statistically significant at the $p < 0.05$ level. This further supports the consistency and reliability of the knowledge test. Although Cronbach's Alpha is commonly used for continuous or Likert-type scales, it can be approximated for dichotomous items like those in this test. The general rule of thumb is that a Cronbach's alpha of 0.70 and above is good, 0.80 and above is better, and 0.90 and above is best (Kumar *et al.*, 2021) [5]. The high Spearman-Brown value suggests that Cronbach's alpha would likely fall between 0.88-0.91, also indicating excellent internal consistency (Tavakol & Dennick, 2011) [11].

Content Validity

The content validity of the knowledge test was ensured through careful development and expert evaluation of the items. The test items were constructed based on relevant literature and practices related to scientific wool and pelt production. Inputs from subject-matter experts and experienced professionals were incorporated to ensure comprehensive coverage of all major knowledge areas. As the items were reviewed and approved by experts in the field, it is assumed that the test effectively measures the knowledge level of sheep rearers as intended.

Conflict of interest

Authors have no conflict of interest in this study.

Conclusion

The knowledge test developed through a systematic and rigorous process has proven to be a standardized, valid, and reliable tool specifically designed for assessing the knowledge level of sheep rearers in the context of wool and pelt production in the Jammu Division. The test underwent careful item selection, expert validation, and statistical

reliability checks. Given its strong psychometric properties, the tool can serve multiple practical purposes. It is well-suited for use in baseline surveys to assess existing knowledge levels, in impact evaluations to measure the effectiveness of interventions, and in training needs assessments to identify specific knowledge gaps among sheep farmers. Researchers, extension workers, and policymakers can utilize this test to make informed decisions and design more targeted and effective extension programs aimed at improving wool and pelt production practices in the region. Thus, the test not only contributes to research methodology but also supports the broader goal of improving livestock-based livelihoods through knowledge-based interventions.

References

1. Bhat SA, Mir AM. Prospects of sheep farming in temperate regions of Jammu & Kashmir. *Indian Journal of Animal Production*. 2017;49(2):145-149.
2. Department of Animal Husbandry and Dairying (DADH). Basic animal husbandry statistics. Government of India; 2021.
3. Edwards AL. Techniques of attitude scale construction. Vakils, Feffer and Simons Inc; 1957.
4. Kerlinger FN. Foundations of behavioural research. 3rd ed. Holt, Rinehart and Winston; 1987.
5. Kumar P, Prahlad SS, Peshin R, Sharma RK, Malik MA, Soodan JS, *et al.* Development and standardization of knowledge test on organic dairy farming (ODF) practices in sub-tropics of Jammu region of Jammu and Kashmir State (India). *Journal of Community Mobilization and Sustainable Development*. 2021;16(2):633-642.
6. Kumar S, Sharma SS, Khajuria A. Status and prospects of small ruminant farming in India. *Indian Journal of Animal Sciences*. 2010;80(10):1015-1025.
7. Reddy AA. Farmer's knowledge and adoption of sheep management practices. *Indian Journal of Extension Education*. 2003;39(3-4):75-78.
8. Sharma R, Singh P, Verma K. Constraints in wool production and marketing: A study of migratory sheep farmers in Jammu. *Agricultural Economics Research Review*. 2018;31:111-117.
9. Singh D, Verma A, Joshi B. Wool production potential and constraints in India. *Indian Farming*. 2015;65(9):22-25.
10. Subrahmanyeswari B, Chander M. A scale to measure attitude of registered organic farmers towards organic livestock farming. *Livestock Research for Rural Development*. 2008;20(2):26.
11. Tavakol M, Dennick R. Making sense of Cronbach's alpha. *International Journal of Medical Education*. 2011;2:53-55.

12. Verma H, Singh M, Shruti, Chander M, Meena HR, Saran V, *et al.* Construction and standardization of knowledge test for assessing scientific sheep farming practices. Indian Journal of Animal Health. 2025;64(1):63-72.