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## Development of knowledge test to measure the knowledge level of farmers on scientific pig farming practices

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### Abstract
The present study was undertaken to develop and standardize a reliable and valid knowledge test to assess the knowledge level of pig farmers regarding scientific pig farming practices in Kerala. A total of 97 knowledge items were initially prepared and then subjected to expert evaluation for relevancy rating and 55 items were selected for item analysis. The analysis was conducted with 30 non-sample pig farmers across five districts of Kerala. Items that had a difficulty index (25 to 75 per cent), discrimination index (0.30 to 0.70) and point bi-serial correlation values significant at the 5 per cent level were selected for the final knowledge test. Out of 55 items, 18 items were finally selected. The reliability of the test was established using Cronbach's alpha coefficient, which was 0.826, indicating a good level of internal consistency. This test can be effectively used to measure the existing knowledge level of pig farmers and identify knowledge gaps. It will be highly useful for extension functionaries, policymakers and administrators in formulating skill oriented and need-based training programmes as well as implementing effective extension strategies for improving the livelihoods of farmers.

Keywords: Pig farming, scientific pig farming practices, knowledge test, scale development, reliability and validity

### Introduction
Livestock play a vital role in sustaining the livelihoods of farmers in our country. Among various livestock species, pig farming serves as a major source of income for tribal communities, socially backward groups and economically weaker sections of society. It holds great potential due to several advantages, including high fecundity, prolificacy, a short generation interval, rapid body weight gain, efficient feed conversion and a superior dressing percentage compared to other livestock species (Das and Bujarbaruah, 2005 [3]; Sastry and Thomas, 2021 [15]).

Despite these advantages, pig farmers in India, including those in Kerala, face several challenges, such as the unavailability of improved breeds, lack of knowledge on balanced ration feeding, frequent disease outbreaks and inadequate marketing facilities (Islam et al., 2016 [8]; Pooja et al., 2024 [12]). The success of piggery development programmes and the adoption of scientific pig farming

technologies largely depend on the knowledge level of pig farmers. Therefore, assessing the existing knowledge levels of pig farmers is crucial for the effective implementation of welfare schemes and the dissemination of modern technologies.

According to Bloom et al. (1956) [2] knowledge refers to includes those behaviours and test situations which emphasize the remembering either by recognition or recall of ideas, materials or phenomenon. Knowledge is a key component of behaviour and plays an important role in the covert and overt behaviour of an individual. A test is a set of questions, each of which has a correct answer, to which people respond (Ray and Mondal, 2011) [13]. A well-constructed knowledge test helps determine the level of relevant knowledge of the target population. It indicates the extent of knowledge, with respect to scientific pig farming practices, that the respondents possessed at the time of the interview, as evident from their responses to a set of

questions scientifically prepared for this purpose.

## Materials and Methods
The present study aimed to develop and standardize a suitable knowledge test to assess the knowledge level of farmers regarding scientific pig farming practices, by following the procedure suggested by Davis (1951) [4], Sagar (1983) [14] and Arun (2022) [1] which included the following steps.

## Item collection
The content of a knowledge test consists of questions known as items. These items were prepared by referring to the Kerala Veterinary and Animal Sciences University Package of Practices Recommendations 2022, relevant textbooks and through discussions with experts from the Centre for Pig Production and Research, Mannuthy. Finally, a thorough scrutiny of the item pool was done with the assistants of subject matter specialist. The questions were designed to test the knowledge level of pig farmers regarding scientific pig farming. The items covered various domains such as scientific breeding, feeding, housing, health care, general management, piglet management and marketing practices.

## Initial selection of items
The selection of items was done based on the following criteria.
- Items should promote thinking rather than rote memorization.
- Items should differentiate the well- informed respondents from the poorly informed ones.
- Items should have a certain difficulty value.

A total of 97 knowledge items were initially prepared.

## Relevancy rating by experts
These prepared 97 items were subjected to scrutiny by an expert panel of judges to determine the relevancy and screening for inclusion in the final scale. The judges comprised faculties Extension Education, Livestock Production Management and pig farming experts from various departments across veterinary universities in India, as well as Assistant Directors working in the Department of Animal Husbandry, Government of Kerala.
The items were sent to 98 Judges with request to critically evaluate each item for its relevancy to measure knowledge level of pig farmers in scientific pig farming practices. The judges were requested to give their response on a four-point continuum *viz.*, very relevant, relevant, somewhat relevant and irrelevant with scores of four, three, two and one respectively. A total of 60 judges returned their responses, which were used for the relevancy analysis. The relevancy score of each item was established by adding the scores on the rating scale based on each judge's response. From the data, three types of tests relevancy percentage, relevancy weightage and mean relevancy scores were worked out for all the items.
The items which had relevancy percentage 85 and above, mean relevancy weightage 0.85 and above, mean relevancy score 3.40 and above were considered for selection. Based on the above criteria a total of 55 items were selected for item analysis.

## Item analysis
Item analysis is a technique through which those items which are valid and suited to the purpose are selected and the rest are either eliminated or modified to suit the purpose (Singh, 2006) [16]. It examines respondent's answers to individual test items (questions) to assess the quality of those items and the test as a whole. The procedure for item analysis was based on a very simple method for what happens when any person encounters any item. The method says that the outcome of such an encounter is governed by the product of the ability of the person and the easiness of the item. The more able the person, the better his chances for success with any item. The easier the item, the more likely that any person to solve it (Wright and Panchapakesan, 1969) [20].
A schedule was prepared with 55 items in different formats such as multiple-choice questions, true or false questions and open-ended questions. These items were administered to non-sampling 30 pig farmers across five districts of Kerala, *viz.*, Palakkad (10), Idukki (6), Ernakulam (6), Thrissur (4) and Wayanad (4). All the items collected for the construction of the knowledge test were in the objective form. For each correct answer, one mark was assigned and while wrong answer was scored as zero. The total knowledge score of each respondent was calculated by adding the scores of all the questions. These knowledge scores were then used to calculate difficulty index, discrimination index and point bi-serial correlation which formed the criteria for selection of the items for the final knowledge test.

## Difficulty index
The difficulty index of an item was defined as the proportion of respondents giving correct answer to that particular item (Ray and Mondal, 2011) [13]. An item should not be so easy that all respondents answer it correctly nor so difficult that no one can answer it. The difficulty index ranges from 0 to 100 per cent, with higher values indicating easier items. The recommended range of difficulty is between 25 and 75 per cent. Items with difficulty indices below 25 per cent were considered too difficult, while those above 75 per cent were considered too easy (Hingorjo and Jaleel, 2012) [7].
The difficulty index of each of the 55 items were calculated by dividing the total correct answers for a particular item by the total number of respondents. It was calculated by the following formula:

$$Pi = \frac{ni}{Ni} \times 100$$

Where,
Pi= Difficulty index in percentage of the ith item.
ni =Number of respondents giving a correct answer to the ith item.
Ni = Total number of respondents to whom the items were administered (30 in the present study)

Items with $Pi$ values ranging between 25 and 75 per cent were considered for selection in the final knowledge test.

## Discrimination index
The item discrimination index is the ability of an item to

differentiate between respondents of higher and lower abilities (Namdeo and Sahoo, 2016) [11]. The statement which was answered correctly by everyone or the one which was not answered by anyone in the sample had no discrimination value. Therefore, only those statements with high power to discriminate the respondents who varied in the level of knowledge were included in the final list. The discrimination power of all the 55 items was worked out using $E^{1/3}$ method to find out the item discrimination, as given below.

In this study, after calculating the total score obtained by 30 respondents, then the scores were arranged in a descending order. These respondents were divided into six equal groups, each having five respondents. These groups were named as G1, G2, G3, G4, G5 and G6 respectively. For item analysis, the middle two groups (G3 and G4) were eliminated. Only four extreme groups with high scores (G1 and G2) and low scores (G5 and G6) were considered to calculate the 'Discrimination index'. It is calculated by the following formula:

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

Where,

N = Total number of respondents to whom the items were administered (30 in the present study).
S1 and S2 = Frequencies of correct answers of highest and higher scores, respectively
S5 and S6 = Frequencies of correct answers of lower and lowest scores, respectively.

**Point bi-serial correlation**
A correlation between a continuous and a dichotomous variable is known as the point-bi-serial correlation (Demirtas and Hedeker, 2016) [5]. It is a special case of the Pearson product moment correlation. It is used to calculate the correlation between the scores on a single test item (right or wrong) with scores on the total test (Vercruyssen and Hendrick, 2012) [19]. For establishing internal consistency of each item, the point biserial correlation coefficient (rpbis) was estimated. It is calculated by the following formula:

Point bi-serial correlation was computed as

$$rpbis = \frac{Mp-Mq}{\sigma} \times \sqrt{pq}$$

where,
rpbis = Point bi-serial correlation
Mp = The mean of the total score of the respondents who answered an item correctly
Mq = The mean of the total score of the respondents who answered an item incorrectly
$\sigma$ = The standard deviation of the entire sample
p = The proportion of the respondents giving correct answer to an item
q = The proportion of the respondents giving incorrect answer to an item.

**Results and Discussion**
**Final selection of the items for the test**
All the items which had a difficulty index ranging from 25 to 75 per cent, discrimination index ranging from 0.30 to 0.70 and point bi-serial correlation value that was significant at 5 per cent level were selected for the final knowledge test. Out of 55 items 18 items were finally selected.

**Table 1:** Difficulty index, discriminative index and point bi-serial correlation of the knowledge items

| S. No | Items | Difficulty Index | Discriminative Index | Point bi-serial correlation | Item Selection |
|---|---|---|---|---|---|
| I | Knowledge about scientific breeding management practices | | | | |
| 1 | At what age is a boar ready for regular breeding? | 46.67 | 0.3 | 0.231 | Rejected |
| 2 | What is the recommended body weight for boars before being used for regular breeding? | 73.33 | -0.2 | -0.199 | Rejected |
| 3 | At what age is a sow ready for regular breeding? | 83.33 | 0 | -0.156 | Rejected |
| 4 | What is the recommended body weight for gilts before being used for breeding? | 86.67 | 0.2 | 0.292 | Rejected |
| 5 | What is the recommended boar-to-sow ratio for breeding purposes ………? | 63.33 | 0.1 | 0.252 | Rejected |
| 6 | Breeding boars should be changed every 1-2 years to avoid inbreeding | 80.00 | 0.1 | 0.096 | Rejected |
| 7 | What is the minimum number of functional teats a gilt should have for breeding purposes? | 63.33 | 0.4 | 0.291 | Rejected |
| 8 | What is the length of the oestrous cycle in a sow (in days)? | 56.67 | 0.5 | 0.455 | Selected |
| 9 | What is the duration of heat in a sow? | 70.00 | 0.6 | 0.511 | Selected |
| 10 | Optimum time for mating in sow | 46.67 | 0.7 | 0.580 | Selected |
| 11 | What is the recommended average number of services for breeding? | 73.33 | 0.4 | 0.311 | Rejected |
| 12 | What is the average gestation period of a sow? | 56.67 | 0.2 | 0.227 | Rejected |
| 13 | When do weaned sows come into heat after weaning _____ days? | 56.67 | 0.3 | 0.284 | Rejected |
| II | Knowledge about scientific feeding management | | | | |
| 1 | Why is colostrum given to newborn animals? | 90.00 | 0.1 | 0.197 | Rejected |
| 2 | How much concentrate does a breeding boar require daily per 100 kg of body weight? | 46.67 | 0.4 | 0.410 | Selected |
| 3 | How much feed should give to a 100 kg sow with 8 piglets per day? | 16.67 | 0.1 | 0.231 | Rejected |
| 4 | For the preparation of 100 kg of concentrate feed, how much amount of mineral mixture should be added? | 50.00 | 0.3 | 0.301 | Rejected |
| 5 | For the preparation of 100 kg of concentrate feed, how much common salt should be added? | 23.33 | 0.4 | 0.470 | Rejected |
| 6 | Feeding raw or improperly cooked garbage to swine is recommended. | 30.00 | 0.6 | 0.566 | Selected |

| | | | | | |
|---|---|---|---|---|---|
| 7 | At what age should creep feeding start for piglets? | 40.00 | 0.3 | 0.372 | Selected |
| 8 | What is the recommended level of protein in creep feed? | 0.00 | 0 | 0 | Rejected |
| 9 | What is the purpose of giving laxatives in feed to sows 3 days before farrowing? | 13.33 | 0.1 | 0.150 | Rejected |
| 10 | Flushing is an important practice for sows and gilts in profitable pig farming. | 70.00 | 0.3 | 0.275 | Rejected |
| III | **Knowledge about scientific housing management practices** | | | | |
| 1 | The pig sty should preferably be constructed in. orientation | 73.33 | 0.3 | 0.311 | Rejected |
| 2 | What is the maximum number of fattening or grower pigs that should be allowed per pen? | 36.67 | 0.3 | 0.275 | Rejected |
| 3 | Breeding boars should be housed together? | 86.67 | 0.2 | 0.320 | Rejected |
| 4 | Guardrails. cm above the floor level and 20 cm from the wall all around the farrowing pen installed to protect piglets from crushing their mother. | 36.67 | 0.5 | 0.421 | Selected |
| 5 | What type of flooring is preferred in pig pens for easy cleaning and durability? | 80.00 | 0.3 | 0.355 | Rejected |
| 6 | Piglets housed on concrete floors have a higher risk of anemia. | 43.33 | 0.6 | 0.390 | Selected |
| 7 | A creep box provides warmth and protects piglets from being crushed by their mother. | 76.67 | 0.2 | 0.253 | Rejected |
| IV | **Knowledge about health care management practices** | | | | |
| 1 | Vaccination is an essential management practice in pig farming. | 90.00 | 0.1 | 0.229 | Rejected |
| 2 | At what age piglets should be vaccinated for swine fever ………. | 50.00 | 0.3 | 0.451 | Selected |
| 3 | How often should the swine fever vaccination be repeated? | 40.00 | 0.2 | 0.169 | Rejected |
| 4 | At what age piglets should receive their first foot and mouth disease vaccination | 26.67 | 0.5 | 0.518 | Selected |
| 5 | When is the appropriate time to vaccinate pigs against hemorrhagic septicemia? | 3.33 | -0.1 | -0.171 | Rejected |
| 6 | Which vaccine should be given to piglets before castration? | 50.00 | 0 | 0.122 | Rejected |
| 7 | What are the symptoms of foot and mouth disease in pigs? | 73.33 | 0.5 | 0.364 | Selected |
| 8 | What are the symptoms of swine fever in pigs? | 70.00 | 0.6 | 0.460 | Selected |
| 9 | Name one zoonotic disease in pigs. | 10.00 | 0.1 | 0.335 | Rejected |
| 10 | Deworm sows and gilts two weeks before farrowing. | 46.67 | 0.6 | 0.599 | Selected |
| 11 | At what age should piglets receive their first deworming? | 70.00 | 0.3 | 0.306 | Rejected |
| 12 | Footbaths and foot dips with disinfectants are not necessary at the entrance of the farm and buildings | 60.00 | 0.4 | 0.407 | Selected |
| 13 | Newly purchased pigs do not need to be quarantined as long as they are healthy. | 76.67 | 0.3 | 0.208 | Rejected |
| V | **Knowledge about general management practices** | | | | |
| 1 | Keeping detailed records of pigs is unnecessary work in scientific pig farming. | 63.33 | 0.3 | 0.272 | Rejected |
| 2 | What is the daily water requirement for a lactating sow with 10-12 piglets? | 23.33 | 0 | -0.019 | Rejected |
| 3 | Pigs are prone to heat stroke because they lack sweat glands and have a poor thermoregulatory mechanism. | 66.67 | 0.4 | 0.462 | Selected |
| VI | **Knowledge about scientific piglet management practices** | | | | |
| 1 | What is the best substitute for sow milk for orphan piglets? | 36.67 | -0.1 | -0.038 | Rejected |
| 2 | When should the needle teeth of piglets be clipped? | 50.00 | 0.7 | 0.564 | Selected |
| 3 | How long should the navel cord be left when cutting it from a newborn piglet? | 36.67 | 0.6 | 0.577 | Selected |
| 4 | When can the first dose of the iron injection be given to piglets? | 90.00 | 0.3 | 0.433 | Rejected |
| 5 | Brooding is necessary during the first week of life in piglets to prevent pneumonia and cold shock. | 80.00 | 0 | -0.033 | Rejected |
| 6 | At what age is the weaning period of piglets? | 53.33 | 0.3 | 0.419 | Selected |
| 7 | What is the recommended age for castration in piglets? | 70.00 | 0.3 | 0.275 | Rejected |
| VII | **Knowledge about marketing management practices** | | | | |
| 1 | The ideal age for marketing fattening pigs is. months | 66.67 | 0.1 | 0.123 | Rejected |
| 2 | What are the typical market weights of pigs? | 83.33 | -0.1 | 0.034 | Rejected |

## Standardization of the scale
### Validity of the knowledge test
Validity is the ability of an instrument to measure what it is designed to measure (Kumar, 2014) [10]. The validity of the knowledge test was established through content validity. The content validity of the knowledge test was ensured by choosing items in consultation with various subject matter specialists. All possible care was taken while selecting the items and the same was subjected to difficulty and discrimination index and point bi-serial correlation, to select the final items. Hence, it was logical to assume that the test satisfied representative approach of test construction, the criteria for content validity.

### Reliability of the knowledge test
According to the Kerlinger (1973) [9] 'reliability' is the accuracy or precision of a measuring instrument and it is also concerned with repeatability or consistency. A measure is considered reliable if it gives the same result over and over again (Singh, 2013) [17]. An instrument cannot be valid unless it is reliable. The reliability of the knowledge test was assessed by calculating the Cronbach's alpha coefficient of reliability, which ranges between 0 and 1 (Singh, 2006 [16]; Tavakol and Dennick, 2011 [18]). For this purpose, the knowledge test was administered to 30 non-sample pig farmers selected randomly from Ernakulam (8), Idukki (8), Thrissur (5), Wayanad (5) and Thiruvananthapuram (4) districts of Kerala. The collected data were tabulated and analysed to estimate the alpha value. The formula for calculating the alpha value is as follows.

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{k} \sigma^2_{yi}}{\sigma^2 x}\right)$$

Where,

$\alpha$ = Cronbach's alpha reliability coefficient.

K = Number of items.

$\sigma^2 yi$ = The variance of item i for the current sample of persons.

$\sigma^2 x$ = The variance of the observed total test scores.

**Table 2:** Reliability statistics of the final knowledge test.

| Reliability statistics | |
|---|---|
| Cronbach's Alpha | No of items |
| 0.826 | 18 |

In the present study, the knowledge test yielded a Cronbach's alpha of 0.826 across 18 items, indicating a good level of internal consistency. This means that respondents who gave higher scores on one item generally gave higher scores on other items, and vice versa.

**Table 3:** Cronbach's alpha test results for internal consistency of knowledge test items

| Items | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| Item 1 | 8.23 | 15.840 | 0.620 | 0.806 |
| Item 2 | 8.43 | 15.495 | 0.672 | 0.802 |
| Item 3 | 8.23 | 17.771 | 0.108 | 0.833 |
| Item 4 | 8.70 | 16.907 | 0.408 | 0.818 |
| Item 5 | 8.13 | 17.499 | 0.210 | 0.827 |
| Item 6 | 8.40 | 17.145 | 0.246 | 0.827 |
| Item 7 | 8.70 | 17.045 | 0.365 | 0.820 |
| Item 8 | 8.60 | 16.179 | 0.544 | 0.810 |
| Item 9 | 8.47 | 15.430 | 0.696 | 0.800 |
| Item 10 | 8.47 | 15.913 | 0.565 | 0.808 |
| Item 11 | 8.20 | 16.372 | 0.490 | 0.813 |
| Item 12 | 8.17 | 16.695 | 0.419 | 0.817 |
| Item 13 | 8.37 | 17.413 | 0.181 | 0.830 |
| Item 14 | 8.63 | 15.620 | 0.736 | 0.800 |
| Item 15 | 8.40 | 17.352 | 0.195 | 0.830 |
| Item 16 | 8.40 | 16.041 | 0.525 | 0.811 |
| Item 17 | 8.57 | 16.599 | 0.412 | 0.817 |
| Item 18 | 8.20 | 17.752 | 0.119 | 0.832 |

The column containing the "corrected item–total correlation" indicates the correlation between a given item and the summated score of all the other remaining items. For example, the correlation between item 1 and the summated score of items 2 to 18 was r = 0.620, indicating a positive association between the score on item 1 and the combined score of the remaining items (item 2 to item 18). The column containing the "Cronbach's alpha if item deleted" indicates the value of Cronbach's alpha that would result if an individual item was removed from the scale. For example, if item 1 was deleted, the Cronbach's alpha would decrease from 0.826 to 0.806, showing that item 1 contributes positively to the overall reliability of the knowledge test.

The rule of thumb for Cronbach's alpha ($\alpha$) is as follows: $\alpha > 0.90$ – excellent, $\alpha > 0.80$ – good, $\alpha > 0.70$ – acceptable, $\alpha > 0.60$ – questionable, $\alpha > 0.50$ – poor, and $\alpha < 0.50$ – unacceptable (George and Mallery, 2003). In the present study, the knowledge test had a Cronbach's alpha value of 0.826, indicating a good level of internal consistency among the 18 items. Hence, it was concluded that the items used in the scale were both appropriate and reliable.

**Table 4:** Final items selected for the knowledge test on scientific pig farming practices

| S. No | Final items |
|---|---|
| 1 | What is the length of the oestrous cycle in a sow (in days)? (17-21 days) |
| 2 | What is the duration of heat in a sow? <br> a) 1 day   b) 2-3 days   c) 4-5 days   d) 6-7 days |
| 3 | Optimum time for mating in sow <br> a) Immediately after heat signs appear b) 24-36 hours after the onset of heat <br> c) 44-48 hours after the onset of heat   d) Anytime |
| 4 | How much concentrate does a breeding boar require daily per 100 kg of body weight? <br> a) 1-1.5 kg   b) 2-2.5 kg   c) 3-3.5 kg d) 4-4.5 kg |
| 5 | Feeding raw or improperly cooked garbage to swine is recommended. (True or False) |
| 6 | At what age should creep feeding start for piglets? <br> a) Less than 1 week old   b) 2 weeks old   c) 3 weeks old d) 4 weeks old |
| 7 | Guardrails. cm above the floor level and 20 cm from the wall all around the farrowing pen installed to protect piglets from crushing their mother. <br> a) 15 cm   b) 25 cm   c) 40 cm   d) 50 cm |

| 8 | Piglets housed on concrete floors have a higher risk of anaemia. (True or False) |
|---|---|
| 9 | At what age piglets should be vaccinated for swine fever ………. <br> a) 2-3 weeks　　　b) 6-8 weeks　　　c) 10-12 weeks　　　d) 14-16 weeks |
| 10 | At what age piglets should receive their first foot and mouth disease vaccination ………. <br> a) 1-2 months　　　　b) 3-4 months　　　　c) 5-6 months　　　　d) 7-8 months |
| 11 | What are the symptoms of foot and mouth disease in pigs? <br> (Severe lameness and fever, pustules on the feet and in the buccal cavity, ropy salivation, abortions in sows etc.,) |
| 12 | What are the symptoms of swine fever in pigs? <br> (Staggering gait, fever, diarrhoea, blue or red-coloured rashes on the ears, belly and thighs etc.,) |
| 13 | Deworm sows and gilts two weeks before farrowing. (True or False) |
| 14 | Footbaths and foot dips with disinfectants are not necessary at the entrance of the farm and buildings. (True or False) |
| 15 | Pigs are prone to heat stroke because they lack sweat glands and have a poor thermoregulatory mechanism. (True or False) |
| 16 | When should the needle teeth of piglets be clipped? <br> a) Shortly after birth　　　b) 5 days old　　　c) 10 days old　　　d) 14 days old |
| 17 | How long should the navel cord be left when cutting it from a newborn piglet? <br> a) 1 cm　　　b) 2.5 cm　c) 5 cm　　　d) 10 cm |
| 18 | At what age is the weaning period of piglets? <br> a) Less than 28 days　　　b) 40-45 days　　　c) 56-63 days　　　d) More than 70 days |

## Administration of the knowledge test

The developed knowledge test will be administered to the respondents to assess their knowledge level regarding scientific pig farming practices. Each respondent will be given a score of 'one' for every correct answer and 'zero' for each incorrect response. The total knowledge score of each respondent will be calculated by summing the scores of all correctly answered items. The knowledge score for an individual will range from a minimum of 0 to a maximum of 18. Based on the total scores obtained, the respondents will be categorized into three groups *viz.*, low, medium and high knowledge levels.

## Conclusion

This study is a part of Ph.D. research work wherein a knowledge test was developed and standardized by using reliability and validity. The finalized test comprised a total of 18 questions. It is intended to assess the existing knowledge level of pig farmers regarding scientific pig farming practices. Identifying knowledge gaps through this tool will be highly useful for extension functionaries, policymakers and administrators in formulating skill oriented and need-based training programmes as well as implementing effective extension strategies for improving the livelihoods of farmers.

## Acknowledgements

## Conflict of Interest

There is no conflict of interest.

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