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A TEST TO MEASURE THE KNOWLEDGE LEVEL OF DAIRY FARMERS ABOUT ZOONOTIC DISEASES

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ABSTRACT

One hundred and twenty-four items were initially constructed based on promoting thinking rather than memorization and differentiating the well-known target people from the poorly known ones to knowledge about the zoonotic disease. The scores from sample respondents were subjected to item analysis, item selection comprising of item difficulty index, item discrimination index and point biserial correlation. Sixty-two items with a difficulty index ranging from 20 to 80 per cent; discrimination index ranging from 0.2 to 0.8 and items with significant point biserial correlation either at 1 per cent or 5 per cent level were included in the final format of the knowledge test. The reliability of the knowledge test was found to be 0.96 using split–half method which was highly significant. The knowledge test was developed and standardized which is highly stable and dependable for measurement.

Keywords: *dairy farmers, knowledge test, zoonotic diseases*

INTRODUCTION

Zoonotic diseases have great public health importance in India. There is 68.00 per cent of the workforce depends on farming and close contact with livestock, pet animals, and poultry with frequent exposure to diseased animals. Many factors are responsible for spreading zoonotic diseases, like unhygienic living conditions, lack of education, poor personal hygiene, poor veterinary and public health services, poverty, and malnourishment (Pavani, 2014). Lack of awareness regarding the occurrence of zoonotic diseases and their true impact on public health has been a major obstacle in commencing adequate and effective control measures (Asokan *et al.,* 2011). In our perspective, dairy farming management, culture and eating habits and perception of farmers about zoonotic diseases and their prevention need to be assessed to know the actual status about the knowledge level of dairy farmers about zoonotic diseases. As defined here, knowledge includes behaviors and test situations that emphasize remembering by recognizing or recalling ideas, material, or phenomena (Bloom *et al.,* 1956). In the present study, an attempt has been made to develop a test that can scientifically measure dairy farmers' knowledge about zoonotic diseases.

OBJECTIVE

To develop a test to measure the knowledge level of dairy farmers about zoonotic diseases

METHODOLOGY

Knowledge is a body of understood information possessed by an individual. For this study, knowledge was operationalized as the information and understanding of the dairy farmer regarding zoonotic diseases. For measuring the knowledge level, a knowledge test was developed and standardized.

I. Collection of items

Items mean the content of a knowledge test is composed of questions. Initially, 124 items were collected, focusing on various aspects of zoonotic diseases with the help of different reference books, research papers, and discussions with experts on the subject. Items for the knowledge test were prepared based on three criteria. 1) It should promote thinking rather than rote memorization. 2) Items should differentiate the well-informed dairy farmers from the poorly-informed dairy farmers and should have a certain difficulty value. 3) Items included should cover all the areas of knowledge about zoonotic diseases. After screening, correction, and editing based on the opinion of the experts in veterinary public health, 77 items remained. The 77 items were subjected to item analysis to screen some more items based on the opinion of the respondents in the sample area.

II. Item analysis

The item analysis was carried out regarding the difficulty index, discrimination index, and point biserial correlation. The difficulty index specifies the extent to which an item was difficult. Whereas the discrimination index provides information on how well an item discriminates in agreement, whether an item discriminates against well-informed dairy farmers from poorly-informed dairy farmers. The point biserial correlation provided information on how well item measures or discriminates in agreement with the rest of the test. Pretesting of the items was done, as suggested by Conard (1948). The items were revised and administered to 60 dairy farmers in a controlled situation.

The 77 items were administered to 60 dairy farmers with a two-point response continuum. The scores were assigned, like one for a correct response and zero for an incorrect response. After calculating the total score obtained for each of the 60 respondents on 77 items, they were arranged in descending order. Sixty dairy farmers were divided into six equal groups. These groups were labelled as G1, G2, G3, G4, G5, and G6, respectively, with ten dairy farmers in each group. For item analysis, the middle two groups, G3 and G4, were eliminated, keeping only four extreme groups with high and low scores.

Table 1: Range of scores obtained by the respondents

Group No.	G1	G2	G3	G4	G5	G6
Score Range	55-66	49-53	43-47	38-42	31-38	23-30
No. of Respondent	10	10	10	10	10	10

III. Item selection

The items for the knowledge test about zoonotic diseases were selected based on the following criteria.

(A) Item difficulty index (P)

The item difficulty index means the proportion of dairy farmers giving correct answers to that particular item. The index indicates the extent to which an item is difficult. In the present study, the higher index means a high proportion of dairy farmers correctly answer the items about zoonotic diseases. The difficulty level was calculated using the following formula-

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

Where,

P_i = Difficulty index in the percentage of the i^{th} item

n_i = Number of respondents giving correct answers to i^{th} item

N_i = Total number of respondents to whom i^{th} item was administered, i.e., 60

The difficult indices of all items of knowledge test about zoonotic diseases were calculated separately.

For example, the calculation of the item difficulty index of item no. 1 of the knowledge test about zoonotic diseases mentions in Table 2.

$$P_i \text{ (difficulty index)} = \frac{n_i}{N_i} \times 100 = \frac{36}{60} \times 100 = 60.00$$

The items with 'P' values ranging from 20 to 80 were considered for the final selection of the knowledge test, which is the first criterion for item selection.

(B) Item discrimination index ($E^{1/3}$)

The item discrimination index was obtained by calculating the Phi-Coefficient formulated by Michael *et al.* (1952). However, Mehta (1958), in using E 1/3 method to find item discrimination, emphasized that this method was analogous to, hence, a convenient substitute for the Phi-Coefficient. The method Mehta (1958) suggested was adopted for the present study. The item discrimination index is indicated by "E 1/3", which is calculated by the formula:

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

Where,

E 1/3 = Discrimination index of an item.

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

N = Total member of respondents of the sample selected for the item analysis, and here that is 60.

For example, the calculation of the discrimination index of item no. 1 of the knowledge test about zoonotic diseases mentions in Table 2.

$$E\ 1/3 \text{ (discrimination index)} = \frac{(S_1+S_2) - (S_5+S_6)}{N/3} = \frac{(10+7) - (7+5)}{60/3} = 0.25$$

The discrimination index varies from 0 to 1. The items discrimination index ranging from 0.20 to 0.80 were selected for the final knowledge test. This is the second criterion for item selection of knowledge test.

(C) Point biserial correlation (r_{pbis})

The main aim of calculating point biserial correlation was to work out the internal consistency of the items, *i.e.*, the relationship of the total score to a dichotomized answer to any given item. In a way, the validity power of the item was computed by the correlation of the individual item of the preliminary knowledge test calculated using the formula suggested by Garret (1966). Point biserial correlation for each item to the preliminary knowledge test was calculated by:

$$\text{Point biserial correlation } (r_{pbis}) = \frac{Mp - Mq}{\sigma t} \times \sqrt{pq}$$

Where,

Mp = Mean of total scores of dairy farmers who answered the item correctly,

Mq = Mean of total scores of respondents who answered the item incorrectly,

$$Mp = \frac{\text{Sum total of xy}}{\text{Total number of correct answers}}$$

$$Mq = \frac{\text{Sum total of x - Sum total of xy}}{\text{Total number of incorrect answers}}$$

x = Total score of the respondent for all items

y = Response of the individual for the items, *i.e.,* (Correct=1; Incorrect=0)

xy = Total score of the respondent multiplied by the response of the individual to the item. *i.e.,* (Correct=1; Incorrect=0)

σt = Standard deviation of the entire sample

p = Proportion of respondents who answered the item correctly

$$p = \frac{\text{Total number of correct answers}}{\text{Total number of respondents}}$$

q = Proportion of respondents who answered the item incorrectly (or) q= 1-p

The calculated point biserial (r_{pbis}) correlation of every item determined the construct validity of the test. The items with a significant correlation coefficient at 1 or 5 per cent level were selected for the final knowledge test about zoonotic diseases.

For example, the calculation of point biserial (r_{pbis}) correlation of item no. 1 of knowledge test about zoonotic diseases mentions in Table 2.

$$\text{Point biserial correlation } (r_{pbis}) = \frac{Mp - Mq}{\sigma t} \times \sqrt{pq}$$

$$Mp = \frac{\text{Sum total of xy}}{\text{Total number of correct answers}}$$

$$Mp = \frac{1636}{36}$$

$$Mp = 45.44$$

$$Mq = \frac{\text{Sum total of x - Sum total of xy}}{\text{Total number of incorrect answers}}$$

$$Mq = \frac{2562 - 1636}{24}$$

$$Mq = \frac{926}{24}$$

Mq = 38.58

σt = 11.159

$$p = \frac{\text{Total number of correct answers}}{\text{Total number of respondents}}$$

$$p = \frac{36}{60}$$

p = 0.6

q = 1 - p = 1 - 0.6

q = 0.4

$$\text{Point biserial correlation } (r_{pbis}) = \frac{45.44 - 38.58}{11.159} \times \sqrt{0.6X0.4}$$

$$\text{Point biserial correlation } (r_{pbis}) = \frac{6.86}{11.159} \times \sqrt{0.24}$$

Point biserial correlation (r_{pbis}) = 0.615 × 0.490

Point biserial correlation (r_{pbis}) = 0.301

Table 2: Difficulty index, Discrimination index and Point biserial correlation value of all 77 items of knowledge test about zoonotic diseases

Item No.	Frequencies of correct answers of respondents in four extreme groups				Total frequencies of correct answers (G1 to G6)	Difficulty index	Discrimination index	Point bi-serial correlation	Selected /Not Selected
	G1	G2	G5	G6					
1	10	7	7	5	36	60.00	0.25	0.301*	S
2	9	10	6	5	43	71.67	0.40	0.394**	S
3	9	9	6	3	40	66.67	0.45	0.390**	S
4	10	9	7	2	42	70.00	0.50	0.495**	S
5	7	7	3	4	32	53.33	0.35	0.295*	S
6	10	9	7	4	39	65.00	0.40	0.381**	S
7	9	5	5	2	30	50.00	0.35	0.377**	S
8	9	7	2	3	31	51.67	0.55	0.459**	S
9	9	6	4	4	34	56.67	0.35	0.314*	S
10	7	7	3	2	31	51.67	0.45	0.390**	S
11	7	6	3	4	31	51.67	0.30	0.209NS	NS
12	5	4	0	1	15	25.00	0.40	0.357**	S
13	9	9	6	4	39	65.00	0.40	0.305*	S
14	5	1	1	0	11	18.33	0.25	0.371**	NS
15	8	7	4	3	33	55.00	0.40	0.357**	S
16	6	5	2	1	21	35.00	0.40	0.367**	S
17	10	8	6	2	43	71.67	0.50	0.491**	S
18	10	8	8	9	47	78.33	0.05	0.073NS	NS
19	10	8	8	8	48	80.00	0.10	0.152NS	NS
20	10	10	10	8	53	88.33	0.10	0.173NS	NS
21	8	7	5	4	35	58.33	0.30	0.307*	S
22	6	7	2	0	34	56.67	0.55	0.441**	S
23	5	5	3	0	21	35.00	0.35	0.342**	S
24	8	8	5	5	38	63.33	0.30	0.267*	S
25	8	5	3	4	28	46.67	0.30	0.303*	S
26	5	4	3	1	16	26.67	0.25	0.302*	S
27	10	10	10	7	57	95.00	0.15	0.353**	NS
28	10	8	6	6	44	73.33	0.30	0.321*	S
29	7	9	7	7	47	78.33	0.10	0.048NS	NS
30	5	5	3	1	20	33.33	0.30	0.275*	S
31	10	9	7	8	51	85.00	0.20	0.183NS	NS
32	7	6	1	4	27	45.00	0.40	0.294*	S
33	7	2	4	1	23	38.33	0.20	0.303*	S
34	9	8	4	5	39	65.00	0.40	0.337**	S
35	8	8	2	3	35	58.33	0.55	0.380**	S
36	7	6	5	2	28	46.67	0.30	0.288*	S
37	6	6	1	2	24	40.00	0.45	0.363**	S
38	9	8	7	4	40	66.67	0.30	0.307*	S
39	8	7	5	4	37	61.67	0.30	0.285*	S
40	9	8	10	7	51	85.00	0.00	0.119NS	NS
41	6	5	4	2	25	41.67	0.25	0.313*	S
42	8	8	8	8	49	81.67	0.00	0.011NS	NS
43	8	3	2	2	28	46.67	0.35	0.367**	S
44	6	5	2	2	23	38.33	0.35	0.322*	S
45	6	5	3	2	24	40.00	0.30	0.271*	S

Item No.	Frequencies of correct answers of respondents in four extreme groups				Total frequencies of correct answers (G1 to G6)	Difficulty index	Discrimination index	Point bi-serial correlation	Selected /Not Selected
	G1	G2	G5	G6					
46	10	8	7	4	47	78.33	0.35	0.395**	S
47	5	5	3	0	19	31.67	0.35	0.339**	S
48	8	7	5	3	33	55.00	0.35	0.321*	S
49	6	5	4	1	25	41.67	0.30	0.316*	S
50	9	9	9	9	49	81.67	0.00	-0.021NS	NS
51	9	4	4	2	30	50.00	0.35	0.358**	S
52	10	9	8	6	46	76.67	0.25	0.288*	S
53	6	6	1	3	25	41.67	0.40	0.325*	S
54	10	7	3	6	41	68.33	0.40	0.341**	S
55	9	8	5	5	39	65.00	0.35	0.334**	S
56	9	8	4	5	40	66.67	0.40	0.326*	S
57	7	7	7	1	36	60.00	0.30	0.295*	S
58	8	8	4	5	38	63.33	0.35	0.245NS	NS
59	5	3	1	0	15	25.00	0.35	0.374**	S
60	6	5	2	2	19	31.67	0.35	0.349**	S
61	7	3	4	0	19	31.67	0.30	0.378**	S
62	8	9	4	5	41	68.33	0.40	0.302*	S
63	6	5	4	1	23	38.33	0.30	0.297*	S
64	6	4	3	2	22	36.67	0.25	0.299*	S
65	9	7	3	3	34	56.67	0.50	0.399**	S
66	8	8	2	4	37	61.67	0.50	0.366**	S
67	9	9	9	8	51	85.00	0.05	0.031NS	NS
68	7	6	1	4	27	45.00	0.40	0.273*	S
69	7	8	0	0	22	36.67	0.75	0.580**	S
70	6	5	0	1	13	21.67	0.50	0.490**	S
71	5	4	2	1	19	31.67	0.30	0.303*	S
72	5	4	3	0	19	31.67	0.30	0.323*	S
73	8	7	4	3	34	56.67	0.40	0.298*	S
74	6	5	3	0	21	35.00	0.40	0.320*	S
75	10	9	9	7	51	85.00	0.15	0.200NS	NS
76	8	7	6	2	34	56.67	0.35	0.353**	S
77	10	9	8	8	50	83.33	0.15	0.186NS	NS

* =Significant at 0.05 level; ** =Significant at 0.01 level, NS= Non-Significant, S= Selected, NS= Not Selected

The calculated point bi-serial correlation was tested with (n-2) degree of freedom.

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

Where,

t = the t value of correlation

r = point biserial correlation coefficient

n = total no. of respondents = 60

t = 2.403

Degree of freedom = 60 - 2 = 58

Where t-calculated value (2.403) was greater than the t-tabulated value (2.000) at degree of freedom 58, it was significant at 0.05 level of probability. This meant that item no. 1 appeared to be widely understood by the respondent.

RESULTS AND DISCUSSION

Out of 77 items, 62 were selected based on fulfilling all three criteria. Items with difficulty level indices ranging from 20 to 80. Items with discrimination indices ranging from 0.2 to 0.8. Items having significant point biserial correlation either at 1 per cent or 5 per cent level.

Items have 0.80 and 0.20 as correct proportions. The average of these proportions is equal to (0.80 + 0.20)/2 = 0.50. Thus, the finally selected knowledge test items comprised two types of questions, *viz*. multiple choice and true/false, totalling 62 items to measure the knowledge of dairy farmers about zoonotic diseases. The selected items with P, E 1/3 and R_{pbis} values are shown in Table 2.

Reliability of the test

Table 3: Reliability of knowledge test using the split-half method

Respondents	Score of odd statements	Score of even statements	d (X_0–X_e)	d^2	t (X_0 + X_e)	t^2
1	20	19	1	1	39	1521
2	15	15	0	0	30	900
3	17	13	4	16	30	900
4	15	13	2	4	28	784
5	21	23	-2	4	44	1936
6	23	25	-2	4	48	2304
7	6	9	-3	9	15	225
8	16	16	0	0	32	1024
9	18	18	0	0	36	1296
10	12	14	-2	4	26	676
11	15	17	-2	4	32	1024
12	13	14	-1	1	27	729
13	20	15	5	25	35	1225
14	9	11	-2	4	20	400
15	8	10	-2	4	18	324
16	17	17	0	0	34	1156
17	8	6	2	4	14	196
18	9	14	-5	25	23	529
19	22	21	1	1	43	1849
20	23	18	5	25	41	1681
Total			**-1**	**135**	**615**	**20679**

In the research study, the split-half method was used to determine the reliability of the knowledge test (Table 3). In this method, all 62 items were randomly arranged and then divided into two equal halves, one containing the odd items and the other containing the even items. The test was administered to twenty respondents, and the two sets of knowledge scores obtained by dairy farmers were correlated. Thus, two sets of scores were obtained, and then scores were correlated with each other by product-moment correlation. The product-moment correlation coefficient for two sets of scores was 0.63. Using the Spearman-Brown formula, the reliability coefficient was calculated as follows:

Rulon's Formula

$$rtt = 1 - \frac{\sigma^2 d}{\sigma^2 t}$$

$$\sigma^2 d = \frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n}$$

$$\sigma^2 t = \frac{\sum t^2 - \frac{(\sum t)^2}{n}}{n}$$

Where,

rtt= Coefficient of reliability

$\sigma^2 d$ = Variances of differences

$\sigma^2 t$= Variance of total score

Calculation

$\sum d$ = -1

$\sum d^2$ = 135

$\sum t$ = 615

$\sum t^2$ = 20679

n = 20

$$\sigma^2 d = \frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n}$$

$$= \frac{135 - \frac{1}{20}}{20}$$

$$= \frac{135 - 0.05}{20}$$

$$= \frac{134.95}{20}$$

$$= 6.75$$

$$\sigma^2 t = \frac{\Sigma t^2 - \frac{(\Sigma t)^2}{n}}{n}$$

$$= \frac{20679 - \frac{(615)^2}{20}}{20}$$

$$= \frac{20679 - \frac{378225}{20}}{20}$$

$$= \frac{20679 - 18911.25}{20}$$

$$= 88.39$$

$$rtt = 1 - \frac{\sigma^2 d}{\sigma^2 t}$$

$$= 1 - \frac{6.75}{88.39}$$

$$= 1 - 0.076$$

rtt = 0.924

The correction factor can be calculated by using Spearman-Brown formula.

$$tt = \frac{2roe}{1 + roe}$$

Where,

rtt= Coefficient of the reliability of the original test

roe= Reliability of coefficient of odd and even score

$$rtt = \frac{2(0.924)}{1 + 0.924}$$

$$rtt = \frac{1.848}{1.924}$$

rtt= 0.96

The value of rtt came to be 0.924, testifying to the internal consistency of the knowledge test. The coefficient correlation (r = 0.96) was highly significant, indicating a high degree of dependability of the test for measuring the knowledge of dairy farmers about zoonotic diseases.

Validity of the test

The two methods employed to know the validity of the test were jury opinion and point biserial correlation. Content validity was ensured initially by administering every item to different experts to evaluate the representation of the universe by the test, its relevance, and appropriateness.

Scoring method

The results of the knowledge test obtained are as follows in Table 2. Out of 77 items, 62 items were finally selected. There were 16 statements for brucellosis, 16 for rabies, 15 for tuberculosis, 10 for leptospirosis, and 5 for the general aspects of zoonotic diseases. A weightage of 1 will assigned to the correct answer, and a weightage of "0" will assigned to an incorrect answer. The possibility of getting the knowledge scores ranged from 0 to 62 for an individual. The final format of the scale is presented in Table 4.

Table 4 : The Find Frmate of the scale

Sr.No.	Statements
1	What is a zoonotic disease?
	A) Diseases which are transmitted from animal to animal.
	B) Diseases which are transmitted from human to human.
	C) Diseases which are transmitted from animal to human and vice-versa.
	D) Diseases which are transmitted from bird to bird.
2	Is brucellosis a zoonotic disease? Yes / No
3	Is rabies one of the zoonotic diseases? Yes / No
4	Is tuberculosis a zoonotic disease? Yes / No
5	Is leptospirosis not be one of the zoonotic diseases? Yes / No
6	Which are the animals that can have brucellosis?
	A) Cow, B) Buffalo, C) Goat, D) Sheep, E) Human, F) All of the above
Disease Transmission	
7	Can bovine brucellosis transmit to humans? Yes / No
8	Is ingestion of contaminated food with discharges of aborted foetus or foetus membranes transmitting brucellosis? Yes / No
9	Is ingestion of contaminated milk unable to transmit brucellosis? Yes / No

Sr.No.	Statements
10	Is brucellosis spread through the inhalation route to others? Yes / No
	Symptoms of animal (Suffering from brucellosis)
11	Which symptoms are seen in the animals suffering from brucellosis?
	A) Abortion in the first trimester
	B) Abortion in the middle trimester
	C) Abortion in the last trimester
	D) No abortion
12	What symptoms are seen in the animals suffering from brucellosis?
	A) Retention of placenta, B) Infertility, C) Interrupted lactation, D) All of the above
13	Is hygroma seen in the animals suffering from brucellosis? Yes / No
	Symptoms of person (Suffering from brucellosis)
14	Which symptoms are seen in humans who suffering from brucellosis?
	A) Infertility, B) Undulant fever, C) Arthralgia, D) Abortion, E) All of the above
	Prevention & control aspects
15	What did you do to the carcass of a dead calve of infected animals?
	A) Burial or Burnt
	B) Thrown outside village or farm
	C) Thrown outside for other animals
	D) Thrown outside for birds
16	Should care be taken while handling and disposing of foetus, placental membrane, and uterine discharge to prevent brucellosis? Yes / No
17	Can ingestion of pasteurized milk cause brucellosis? Yes / No
18	Which vaccine is useful for bovine brucellosis?
	A) BCG Vaccine, B) Rakshatriovac, C) *B.abortus* Strain-19, D) Raksharab
19	Does direct sunlight helpful to *Brucella* vaccine? Yes / No
20	Which is the ideal age of cattle for using *B.abortus* Strain-19 vaccine?
	A) 4 days, B) 4 months, C) 4 years, D) Any age of life
21	Which type of animal can use *B.abortus* Strain-19 vaccine?
	A) Male calf, B) Female calf, C) Both sex, D) None
	Rabies
22	Which are the sources of rabies?
	A) Dog, B) Cat, C) A& B both, D) A&B wrong
23	Is any specific treatment for rabid animals? Yes / No
	Transmission route
24	Is ingestion of contaminated food, meat, or milk can transmit rabies disease? Yes / No
25	Is it impossible to transmit rabies disease via contamination of skin wounds by fresh saliva of rabid animals? Yes / No
26	Can a rabid animal's scratch be infected? Yes / No
	Symptoms in animal (Suffering from rabies)
27	Which symptoms are seen in rabid cow & buffalo?
	A) Aggressiveness
	B) Difficult in swallowing & cease to ruminate
	C) Excessive salivation
	D) All of the above
28	Which are the symptoms of rabies in cattle?
	A) Hydrophobia, B) Bellowing, C) A& B both, D) A&B wrong
29	Which are the symptoms of rabies in cattle?
	A) Paralysis of muscles, B) Low milk production, C) Bite to other animal or human, D) All of the above
	Symptoms in human (Suffering from rabies)
30	Which symptoms are seen in the human who suffering from rabies?
	A) Aggressiveness, B) Increase salivation, C) Hydrophobia, D) All of the above

Sr.No.	Statements
31	What are the symptoms of rabies in humans?
	A) Photophobia, B) Difficulty in swallowing, C) Paralysis, D) All of the above
	Prevention & control aspects
32	Can post-bite vaccination unable to prevent rabies in humans? Yes/ No
33	Can superstition (bhuva-dhaga) help to cure rabies in animals? Yes/ No
34	Can avoiding contact with bats able to prevent rabies? Yes / No
35	Can red chili powder help to cure rabies? Yes/ No
36	Can wash dog bite site with soap and running water helps to prevent rabies? Yes / No
37	Can suture the dog bite site to control the spread of rabies virus? Yes / No
	Tuberculosis
38	Are exotic cattle relatively more resistant to bovine tuberculosis than zebu cattle? Yes/ No
	Transmission route
39	Are common feeding and drinking troughs important sources of tuberculosis infection? Yes / No
40	Can infected animal's feaces & urine unable to transmit tuberculosis? Yes / No
41	Can poor hygiene and poor ventilation contribute to the entry and establishment of tuberculosis? Yes / No
42	Is TB infected animal's milk safe for human consumption? Yes/ No
43	Can TB be transmitted via inhalation route? Yes / No
44	Is human TB unable to infect cattle? Yes / No
45	Is bovine tuberculosis can transmit to other cattle animals? Yes / No
46	Can bovine tuberculosis unable to transmit humans? Yes / No
	Symptoms in animal (Suffering from tuberculosis)
47	What symptoms are seen in the animals suffering from tuberculosis?
	A) Lose body weight, B) Dry, painful and hacking cough, C) Dyspnoea, D) All of the above
48	What are the symptoms of TB in animals?
	A) Abortion in late pregnancy, B) Milk secretion gradually diminished, C) Infertility, D) All of the above
	Symptoms in human (Suffering from tuberculosis)
49	Which symptoms are seen in the human who suffering from tuberculosis?
	A) Haemoptysis, B) Cough, C) Lose body weight, D) All of the above
	Prevention & control aspects
50	Can thorough cleaning of feed and water troughs prevent tuberculosis? Yes / No
51	Should calves be given pasteurized milk to prevent tuberculosis? Yes / No
52	Can human TB unable to prevent by vaccination? Yes / No
	Leptospirosis
53	Which animals can be susceptible to leptospirosis?
	A) Cow, B) Buffalo, C) A&B both, D) A&B wrong
54	Which animals can be susceptible to leptospirosis?
	A) Sheep, B) Goat, C) Human, D) All of the above
55	Do rats act as a major source of leptospirosis? Yes / No
	Transmission route
56	Which are the transmission routes for leptospirosis?
	A) Drinking contaminated water
	B) Infected animal urine
	C) Contaminated soil and mud
	D) All of the above
57	Which are the transmission routes for leptospirosis?
	A) Abrasions or cuts in skin
	B) Intact skin after prolonged immersion in contaminated water
	C) Cattle may be infected through infected bulls or AI
	D) All of the above
	Symptoms of animal (suffering from leptospirosis)
58	What are the symptoms of leptospirosis in animals?
	A) Fever, B) Haemoglobinuria, C) Abortion, D) All of the above

Sr.No.	Statements
59	What symptoms are seen in the animal suffering from leptospirosis?
	A) Weak & premature birth calves
	B) Drop in milk production
	C) Both A & B
	D) None of the above
Symptoms in human (Suffering from leptospirosis)	
60	Which symptoms are seen in the human who suffering from leptospirosis?
	A) Jaundice ,B) Difficulty in urination, C) Red eye, D) All of the above
Prevention & control aspects	
61	Is avoid contact with rodents can prevent leptospirosis? Yes / No
62	Is isolation of infected animals unable to prevent leptospirosis? Yes / No

CONCLUSION

A reliable and valid knowledge test about zoonotic diseases was developed. This knowledge test covered every possible area of four zoonotic diseases like brucellosis, rabies, tuberculosis and leptospirosis. Researchers can use this to test the knowledge level of dairy farmers about zoonotic diseases.

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