

A SCALE TO MEASURE THE ATTITUDE OF DAIRY FARMERS TOWARDS ANIMAL WELFARE

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ABSTRACT

Animal welfare has become an emotional and public policy issue and the concerns have increased in the past few decades. Yet the social science research investigating public attitudes about animal welfare in the food sector is limited in theoretical and empirical development. Present study made an attempt to develop an attitude scale to measure farmers' attitude towards animal welfare using Likert's summated ratings method. Article describes in detail the methodological steps followed in the development of the scale. Scale so developed has a high reliability with the internal consistency coefficient being 0.82. Content validity of the scale is also satisfactory given the steps followed. This scale will find wide use in future to measure the farmers' attitude especially in India.

Key words: Attitude scale; dairy farmers; summated rating method; animal Welfare

Social and political interest in animal welfare and welfare management has increased substantially in recent years (Bayvel and Cross, 2010; Ingenbleek and Immink, 2010). Animal welfare has become an emotional, public policy issue. The animals can no longer be considered machines that can be manipulated at will for human purposes (Duncan, 1993; Veissier and Boissy, 2007). Globalization of animal production and trade has made animal welfare a global issue (Bayvel, 2004; Thiermann and Babcock, 2005; Fraser, 2008).

Higher animal welfare standards are also increasingly seen to be a prerequisite for enhancing business efficiency and profitability, satisfying international markets and meeting consumer expectations (IFC, 2006). Animal welfare is a concept that can be studied scientifically but our understanding of this concept is influenced by value based ideas about what is important or desirable for animals to have a good life. Thus we have a concept that is both science based and value based (Fraser, 2008). Therefore, a better understanding of underlying attitudes towards animal welfare is of paramount importance.

An attitude is a personal disposition common to individuals but possessed in different degrees. This impels them to react to objects, situations or propositions in ways that can be called favourable or unfavourable

(Guilford, 1954). In simple words, attitude is a disposition to respond favourably or unfavourably to an object, person, institution or event (Ajzen, 1988). These (attitudes) are acquired through experience and exert a directive influence on subsequent behaviour and help individuals to interpret new information and make decisions more efficiently (Baron and Byrne, 1991). Both direct and indirect methods of attitude measurement have been attempted in the past. An attitude scale is designed to provide a valid, or accurate, measure of an individual's attitude towards a real or psychological object. The present article describes the development of scale to measure attitude of farmers towards animal welfare.

MATERIALS AND METHODS

Likert's method of summated ratings was employed for construction of the attitude scale. Likert (1932) has claimed that the method of summated ratings is simpler and easier to apply in the development of an attitude scale than the method of equal appearing interval. Different steps and procedure adopted are described below:

Collection of Statements: Literature search and discussions with experts, subject matter specialists, academicians, veterinarians, farmers, friends were the primary sources for collection of statements (items) reflecting attitude towards animal welfare. In all 130 items were collected at the first stage.

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Table 1
Agreement scores of judges on the statements collected for construction of attitude scale

S. No.	Statements	Agreement scores	Selected/ Rejected
1	Concept of animal welfare is more future-oriented and optimistic.	51.78	Rejected
2	It is morally correct to leave the cow with a broken leg for one week while you await her calving.	68.35	Rejected
3	I am concerned about animal welfare.	98.58	Selected
4	Animal has a value independent from production.	62.5	Rejected
5	Livestock should not be allowed to move according to their natural behavioral pattern.	68.43	Rejected
6	In my opinion, the animals are not treated at the slaughterers very well.	60.25	Rejected
7	Farmers should participate in a protest or demonstration related to animal welfare.	38.11	Rejected
8	To have space to behave as they wish is essential for animal welfare.	42.67	Rejected
9	It is ridiculous to suppose that animals are sentient beings.	72.06	Selected
10	It is immoral to use animals if it inflicts suffering in the animal.	81.5	Selected
11	Animals are sturdy enough to bear excesses of the nature and man.	51.68	Rejected
12	Any animal that is a nuisance should not be destroyed.	61.98	Rejected
13	Trying to achieve animal welfare can increase the production costs but extra cost is worth paying.	76.59	Selected
14	Animal welfare is a subjective feeling.	58.76	Rejected
15	One's perception of animal welfare should be less sentimental.	64.57	Rejected
16	The first step to increase understanding of animal welfare is to increase the value of animals to us.	60.29	Rejected
17	Human needs should have priority over animal needs.	67.18	Rejected
18	A farmer has to seek his own welfare what to talk of animal's welfare.	83.06	Selected
19	I think that government is doing nothing about animal welfare.	50.47	Rejected
20	In my opinion inflicting cruelty to animals is sin.	76.98	Selected
21	I feel it is better to cull the diseased animal than providing treatment.	52.22	Rejected
22	I am in complete sympathy with those who feel powerful concern for welfare of animals.	64.67	Rejected
23	I think there should be effective education of farmers for understanding of the elements of good and bed welfare.	57.81	Rejected
24	I think that human economic gain is more important than setting aside more land for animal shelter.	50.29	Rejected
25	Farmers should not be concerned about the humane handling of animals.	89.77	Selected
26	Livestock (cattle, pigs, etc.) should not be used for food products.	58.59	Rejected
27	I consider all animals on the farm equal- all are dumb animals.	52	Rejected
28	I think of animals mainly in terms of the profit they will bring in.	67.97	Rejected
29	I would not sale my animal to an individual who does not care for it well if paid a premium.	83.22	Selected
30	It is important for an animal's psychological needs to be met.	50.83	Rejected
31	In my opinion animal welfare is neither important to animal nor to human beings.	91.77	Selected
32	I think carrying out dehorning in very young age result in more pain.	51.36	Rejected
33	In my view it is better to kill the animal if the animal continuously perceives non curable pain and suffering.	54.13	Rejected
34	The only rights an animal has are those that are assigned to it by humans.	78.99	Selected
35	I think one should provide ready access to fresh water and a diet to maintain good health and vigour to his animal.	58.33	Rejected
36	Too much fuss is made over the welfare of animals these days when there are many problems that need to be solved.	56.25	Rejected
37	It does not matter how animals are reared as they do not know any better.	99.47	Selected
38	I often stroke my cows during milking.	69.20	Rejected
39	A farmer should treat his animals like he treats his children.	71.31	Selected
40	Those farmers who don't care for their animal's welfare should be punished.	78.93	Selected
41	People will have expectations for high welfare levels in expensive animals.	48.78	Rejected
42	In general the welfare of farm animals in our country needs to be improved.	85.57	Selected
43	I think consumers should pay more for products of animals raised under good welfare conditions.	68.31	Rejected
44	High livestock product prices are more important than the well-being of farm animals.	89.49	Selected
45	I think there is nothing wrong to transport animals through all weather extremes.	67.92	Rejected

S. No.	Statements	Agreement scores	Selected/ Rejected
46	Until we learn to significantly reduce human suffering, we should not worry about the well-being of farm animals.	69.32	Rejected
47	I would vote for a law that requires farmers to treat their animals humanely.	92.49	Selected
48	Humans are the only species deserving of moral consideration.	62.99	Rejected
49	It is farmer's responsibility to ensure animal welfare at his farm.	97.07	Selected
50	I get upset when I see animals in bad conditions.	89.35	Selected
51	It is important to decide autonomously what is good for my cows.	49.88	Rejected
52	If I think of animal welfare, I cannot do farming at all.	80.00	Selected
53	Most farmers give their animals a comfortable life.	69.00	Rejected
54	I consider cost of treatment before calling the vet to sick animal.	66.89	Rejected
55	Farmers should be compensated if forced to adopt more stringent animal welfare standards.	65.43	Rejected
56	I can't change other people to adopt good welfare conditions.	59.98	Rejected
57	I would like to adopt animal welfare conditions, even if price premiums are not available.	79.79	Selected
58	I think farmers can cause unnecessary pain to animals.	64.51	Rejected
59	One should never psychologically or physically harm another animal.	60.35	Rejected
60	The welfare of animals on farms does not matter as long as they produce.	98.68	Selected
61	Marching animals for long distances on foot to abattoirs is inhumane.	65.42	Rejected
62	Animals that are regarded as members of the family will generally be assured high welfare levels.	68.57	Rejected
63	Animals understand the language of stick only.	99.66	Selected
67	Animal welfare is important for animal health.	50.00	Rejected
68	Most farmers are animal lovers.	64.11	Rejected
69	The use of animals for human entertainment such as bull-fighting and circuses is cruel.	91.60	Selected
70	I think use of spiked stick to drive animal is not cruel.	95.44	Selected
71	After all the worth of an animal is merely economic.	75.45	Selected
72	In my opinion products from animals raised under good welfare conditions will be healthier than others.	43.78	Rejected
73	The welfare of a cow is important for the choice whether or not to treat a cow.	63.05	Rejected
74	Compassion and empathy for animals is the duty of a farmer.	76.59	Selected
75	I think all living beings are equally valuable and must be accorded equal moral weight.	95.61	Selected
76	In my opinion there is nothing wrong to use animals in research if it benefits human beings.	73.63	Selected
77	Animals should be able to express natural behaviour on farms.	63.45	Rejected
78	Everyone should boycott all such farmers who don't treat their animals well.	87.53	Selected
79	I think that animals have a different attitude to death from human beings.	58.12	Rejected
80	The government should not take an active role in prompting farm animal welfare.	69.12	Rejected
81	Livestock need not to be fed according to their requirement.	68.97	Rejected
82	I think animal welfare can't be maintained in large farms.	85.78	Selected

Editing the Statements: The items so collected were edited in the light of the informal criteria suggested by Thurstone and Chave (1929) and Edward and Kilpatrick (1948). The statements which were ambiguous, irrelevant and not conforming to the suggested criteria were deleted. Eighty two items were retained for scale construction (Table 1).

Rating of Statements by Judges: Academician, experts, scientists, subject matter specialists in the field of extension education, social sciences and veterinary sciences were approached for seeking their valued judgment and opinion about the selected items. Selected 82 items were listed randomly and mailed to 70 judges with well-defined instructions to carefully and critically evaluate the statements. They were requested to give

their opinion as to whether a particular item indicates favourable or unfavourable attitude towards animal welfare. Ambiguous option was also given in the mailed questionnaire. They were requested to add/delete or modify any item which they deemed fit. The purpose of administration of these statements to the judges was to screen out statements that were not clear and direct. Fifty one judges returned the questionnaire and their responses were considered relevant. Based on their ratings, the agreement scores for each of the 82 items were calculated (Table 1). Items with agreement scores higher than 70% were retained. In this way, of the 82 items, only 30 were retained.

Selection of Respondents and Scoring Procedure: These 30 items so obtained were arranged alternatively

Table 2
Mean scores and difference of high and low groups of respondents

S. No.	Statements	High group	Low group	Difference
1	I am concerned about animal welfare.	4.67	1.34	3.33
2	It is ridiculous to suppose that animals are sentiment beings.	1.27	4.5	-3.23
3	It is immoral to use animals if it inflicts suffering in the animal.	4.78	1.49	3.29
4	Trying to achieve animal welfare can increase the production costs but extra cost is worth paying.	3.916	1.25	2.66
5	A farmer has to seek his own welfare what to talk of animal's welfare.	1.33	4.42	-3.09
6	In my opinion inflicting cruelty to animals is sin.	3.42	2.56	0.86
7	Farmers should not be concerned about the humane handling of animals.	1.03	4.14	-3.11
8	I would not sale my animal to an individual who does not care for it well if paid a premium.	4.74	1.68	3.06
9	In my opinion animal welfare is neither important to animal nor to human beings.	1.00	4.05	-3.05
10	The only rights an animal has are those that are assigned to it by humans.	1.99	4.88	-2.89
11	It does not matter how animals are reared as they do not know any better.	1.87	4.99	-3.12
12	A farmer should treat his animals like he treats his children.	4.98	1.79	3.19
13	Those farmers who don't care for their animal's welfare should be punished.	4.13	2.43	1.7
14	In general the welfare of farm animals in our country needs to be improved.	4.29	1.09	3.13
15	High livestock product prices are more important than the well-being of farm animals.	1.9	4.93	-3.03
16	I would vote for a law that requires farmers to treat their animals humanely.	4.77	1.56	3.21
17	It is farmer's responsibility to ensure animal welfare at his farm.	3.87	2.94	0.93
18	I get upset when I see animals in bad conditions.	3.66	2.75	0.91
19	If I think of animal welfare, I cannot do farming at all.	1.56	3.22	-1.66
20	I would like to adopt animal welfare conditions, even if price premiums are not available.	4.61	1.57	3.04
21	The welfare of animals on farms does not matter as long as they produce.	1.49	4.61	-3.12
22	Animals understand the language of stick only.	1.54	4.2	-2.66
23	The use of animals for human entertainment such as bull-fighting and circuses is cruel.	4.58	1.08	3.5
24	I think use of spiked stick to drive animal is not cruel.	1.42	4.75	-3.33
25	After all the worth of an animal is merely economic.	2.75	3.66	-0.91
26	Compassion and empathy for animals is the duty of a farmer.	4.69	2.77	1.92
27	I think all living beings are equally valuable and must be accorded equal moral weight.	3.45	2.33	1.12
28	In my opinion there is nothing wrong to use animals in research if it benefits human beings.	4.98	3.5	1.48
29	Everyone should boycott all such farmers who don't treat their animals well.	4.33	2.17	2.17
30	I think animal welfare can't be maintained in large farms.	1.42	4	-2.58

(positive and negative) and were personally administered to 40 dairy farmers randomly chosen from non-study area. Respondents were asked to respond to each one of these items on a five point's continuum viz. strongly agree, agree, undecided, disagree and strongly disagree. A weightage of 5, 4, 3, 2 and 1 for positive items (statements reflecting favourable attitude towards animal welfare) were assigned. Reverse scoring was done in case of negative items (statements reflecting unfavourable attitude towards animal welfare). Total score for each respondent was obtained by summing up the scores obtained for each item. Thereafter, farmers falling in first and last quartile were designated as high and low group category. Mean score of each statement was calculated for both the categories (high and low) of farmers. Difference between the mean scores of

both categories for each item was calculated (Table 2). It indicated the extent to which a given item differed between the high and low groups. Finally, the items where difference between high and low groups was more than 3, were retained. In this way, only 16 items were finally retained (Table 3).

Reliability of the Scale: A scale is said to be reliable when it consistently produces the same results if applied to measure the same phenomena from time to time. It also refers to the consistency of scores obtained by the same individual when examined with test on different occasions or with different sets of equivalent items or under other variable examining conditions. Reliability coefficient is a mathematical estimate of the degree to which an instrument is free from measurement error (Talmage and Rasher, 1981). In the present study, split-

Table 3
Final attitude scale

S.No.	Statements	Strongly agree	Agree	Un-decided	Dis-agree	Strongly disagree
1	I am concerned about animal welfare. (+)	5	4	3	2	1
2	It is ridiculous to suppose that animals are sentiment beings. (-)	1	2	3	4	5
3	It is immoral to use animals if it inflicts suffering in the animal. (+)	5	4	3	2	1
4	The welfare of animals on farms does not matter as long as they produce. (-)	1	2	3	4	5
5	A farmer should treat his animals like he treats his children. (+)	5	4	3	2	1
6	I think use of spiked stick to drive animal is not cruel. (-)	1	2	3	4	5
7	The use of animals for human entertainment such as bull-fighting and circuses is cruel. (+)	5	4	3	2	1
8	High livestock product prices are more important than the well-being of farm animals. (-)	1	2	3	4	5
9	I would not sale my animal to an individual who does not care for it well if paid a premium. (+)	5	4	3	2	1
10	It does not matter how animals are reared as they do not know any better. (-)	1	2	3	4	5
11	I would vote for a law that requires farmers to treat their animals humanely. (+)	5	4	3	2	1
12	A farmer has to seek his own welfare what to talk of animal's welfare. (-)	1	2	3	4	5
13	It is farmer's responsibility to ensure animal welfare at his farm. (+)	5	4	3	2	1
14	In my opinion animal welfare is important neither to animal nor to humans. (-)	1	2	3	4	5
15	In general the welfare of farm animals in country needs to be improved. (+)	5	4	3	2	1
16	Farmers should not be concerned about the humane handling of animals. (-)	1	2	3	4	5

half method of reliability was applied to test the reliability of the scale.

Final 16 statement's attitude scale was split into two equal halves on the basis of odd and even number of statements. Odd-even method was favoured because it assured parallelism and ensured that approximately same amount of time was devoted to each half. Also it tended to keep testing conditions more nearly constant for the two halves and avoided informant fatigue which might have altered the true correlation.

Two equal halves were given to 30 dairy farmers from non-sample area. Score of all the 30 respondents for each item of two halves were calculated. The Pearson product moment co-efficient of correlation was computed between the two sets of scores of the scale with the following formula:

$$r = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{[(N \sum X^2 - (\sum X)^2)] [(N \sum Y^2 - (\sum Y)^2)]}}$$

Where,

N= Number of pairs of scores respondents

$\sum XY$ = sum of product of paired scores

$\sum X$ = sum of X scores

$\sum Y$ = sum of Y scores

$\sum X^2$ = sum of squared X scores

$\sum Y^2$ = sum of squared Y scores

The 'r' value obtained was 0.69. Since this really measures the reliability of only half of the test, an adjustment was made to obtain the true reliability using the Spearman-Brown prophecy formula. The formula used was:

$$\text{Reliability coefficient of the whole test} = \frac{2 \times (\text{reliability of the half test})}{1 + (\text{reliability of the half test})}$$

The obtained 'r' value was 0.82 which indicated a high reliability of the scale.

Validity of the Scale: Validity of the scale refers to degree to which the scale is capable of achieving the aims or purposes. When attitudes are measured, using either Likert scaling or any other type of attitude measurement, the investigator must establish the validity of the instruments. An instrument ought to take into account four aspects of validity namely content, predictive, concurrent and construct validity. In the present study, keeping in view the resource limitations,

only content validity of scale was aimed at. In collection and selection of items for the construction of the present scale, sufficient care was taken by the researcher. At the same time, ambiguous items were rejected based on judge's ratings as described earlier. Given the number of steps taken like item collection by wide discussions, and their ultimate conformity with the opinion of experts and social scientists, and working out their agreement scores, it is concluded that the scale satisfies the content validity. Moreover, validity usually is a matter of degree rather than an all-or-none property and validation is an unending process (Nunnally and Bernstein, 1994).

RESULTS AND DISCUSSION

In this study, attitude of dairy farmers towards animal welfare was measured by administering the attitude scale that was specially constructed for this purpose. Attitude score of each respondent was calculated by adding up the scores obtained by him/her on all the items. Minimum and maximum possible scores of attitude scale were 16 and 80, respectively. Higher scores indicated that respondent had more sensation towards the animal welfare aspect and vice-versa. Final format of the scale is given in Table 3. The scale values/agreement score of each statement reflecting the attitude of dairy farmers revealed that all the statements of attitude scale of dairy farmers were found to have highly significant. Thus, all the statements had agreement score more than 70%. Hence, attitude scale was found to be a standardized and an objective one, as indicated by the validity, reliability and norms of distribution of scores. Therefore, this scale can be used by all persons and organizations to measure the attitude of dairy farmers towards animal welfare in an objective way.

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