

# A scale to measure attitude of registered organic farmers towards organic livestock farming

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**(Part of PhD work by the first author)**

## **Abstract**

Organic farming an innovative area gaining importance worldwide and became a boon to the areas which are organic by default and far from the reach of green revolution technologies. Uttarakhand state in India, where most of its farming is organic by default, promoting organic farming in a systematic way through creation of special institutions like UOCB. As attitudes assist individuals in processing complex information and to make decisions, an instrument has been developed to measure attitude of organic farmers towards organic livestock farming, for which 'Likert method of summated ratings' was followed. A total of 102 statements were developed from the subject matter of organic animal husbandry standards, worked out by the Ministry of Commerce and Ministry of Agriculture, Government of India (GOI), and published by the Agriculture Processed Food and Exports Development Authority (APEDA).

A total of 94 statements resulted after edition of 102 statements as per the criteria suggested by Edwards (1969), and were sent to 101 extension specialists working in various Indian Council of Agriculture Research (ICAR) and State Agriculture and Veterinary Universities throughout India for the critical evaluation of statements on a 3 point continuum. Of the responses received from 50 out of 101 judges, a total of 47 statements were selected basing on relevancy weightage, percentage and mean relevancy scores, and these were subjected to item analysis by administering to 60 farmers from a non-sample area. A total of 21 statements were selected based on the 't' values (above 2.75) resulted from the item analysis and included in the final scale. Thus, the instrument developed to measure attitude of farmers towards organic livestock farming consists of 13 positive and 8 negative attitude statements representing the various areas of organic animal husbandry standards (NSOP, 2000) viz. sustainability, ecology, environment, animal health and welfare, animal production, certification, quality of organic products including philosophical and ideological views of organic farmers.

**Key words:** attitude, farmers, organic livestock farming, scale

## **Introduction**

Organic farming has gained importance worldwide, in view of increased environmental awareness, consumer preferences as well as sustainability of farm resources. Organic products, both animal and crops are increasingly attractive to farmers with high lucrative values and sales, thus, organic agriculture production and trade is rapidly expanding world over. In India, the state of Uttarakhand (77° 34' and 81° 02' E longitude and 28° 43' to 31° 27' latitude) is the first state

declared as organic by Government of India and Uttarakhand Organic Commodity Board (UOCB) has been promoting organic farming in the state through registering and encouraging farmers to take up organic farming. Due to the initiation taken by Diversified Agriculture Support Project (DASP), a World Bank funded project and continued efforts by UOCB, nearly 4,459 farmers are practicing organic farming with their mixed crop-livestock integrated farming systems. Though, animals are an essential component of organic farming, much has not been done to orient organic farmers towards organic livestock farming, unlike in crop sector, where farmers are getting premium prices for organic food products.

Attitudes are acquired through experience and exert a directive influence on subsequent behavior and moreover, help individuals to interpret new information and to make decisions more efficiently than would otherwise be the case (Baron and Byrne 1991). To promote organic animal husbandry alongside crop production which is in innovative stage, it is essential to study the attitude of farmers towards organic livestock farming, as attitude forms an essential component for better implementation and success of any innovative farming practice. Hence, in order to study the attitude of organic farmers towards organic livestock farming, a scale has been developed.

## **Methodology**

‘Likert’ method of summated ratings was followed with certain modifications and the details of the procedure in the construction and standardization of scale to measure attitude of organic farmers towards livestock farming was as followed.

### **Collection of statements**

The organic animal husbandry standards worked out by the Ministry of Commerce and Ministry of Agriculture, GOI, and published by APEDA (NSOP 2000) formed the basis for the subject matter of attitude scale. Further, available literature was also taken into consideration in framing out the statements covering various aspects representing the organic livestock farming. Thus, a total of 102 statements covering various aspects of organic livestock farming were developed. These statements were carefully edited in the light of 14 criteria suggested by Edwards (1969) resulting in a total of 94 statements.

### **Relevancy of statements by experts**

The statements selected for construction of scale were so worded as to express varying degrees of attitude towards organic livestock farming. The list of attitude statements so selected were sent to 101 experts with instructions to critically evaluate the items for relevancy in including the attitude scale and to give responses on a 3 point continuum viz. ‘More relevant, relevant and least relevant’ with the score of 3, 2, and 1, respectively. The judges selected for the study comprised extension specialists of various State Veterinary and Agricultural Universities, National Dairy Research Institute (NDRI), Indian Veterinary Research Institute (IVRI) and Extension Education Institute (EEI). The judges were also requested to make necessary modifications and additions or deletions, if they desired so. Out of 101 judges, only 50 judges, could give response in a stipulated span of 3 months.

### Selection of items

The responses of judges were tabulated and analyzed to work out relevancy percentages, relevancy weightage, and mean relevancy score for all statements.

### Relevancy Percentages (RP)

It is the number of respondents who rated the statements as “most relevant” and “relevant”, which is converted into percentage.

The calculated values of RP were found in the range of 24 (minimum) to 98 (maximum) percentage.

### Relevancy Weightages (RW)

It is the ratio of actual score obtained to the maximum possible scores obtainable by each respondent.

The calculated values of RW were found in the range of 0.48 (minimum) to 0.92 (maximum).

### Mean Relevancy Scores (MRS)

It is the ratio of actual score obtained by each respondent to the number of judges responded for the variable.

The calculated values of MRS were found in the range of 2.01 (minimum) and 3.76 (maximum).

**Table 1.** Statements with relevancy percentage, relevancy weightage and mean relevancy scores as given by extension specialists

S.No	Statements	Relevancy ratings		
		RP	RW	MRS
1.	I am the right kind of person to convert to organic livestock farming.	98.00	0.88	3.52*
2.	Bio-fertilizers do maintain the soil fertility than the chemical fertilizers in the long-run.	83.00	0.80	3.21*
3.	If I convert to organic livestock farming, it will make a difference to the environment.	94.00	0.87	3.01*
4.	I feel that investing in conversion to organic livestock farming is of no use to farmers.	60.00	0.67	2.02
5.	Organic livestock farming helps to retain levels of farm land organism and birds.	88.00	0.79	3.38*
6.	Organic livestock farming will help to save the environment for future generations	94.00	0.91	3.74*

7.	My family will have a better quality of life in organic livestock farming compared to conventional farming.	96.00	0.92	3.28*
8.	I will make more profit by converting to organic livestock farming.	86.00	0.71	2.14
9.	My livestock farm will be more sustainable through organic agriculture.	88.00	0.84	3.31*
10.	I need to employ more labor for converting to organic livestock farming.	34.00	0.48	2.40
11.	The quality of organic products is better than the products from conventional livestock farming	82.00	0.82	3.46*
12.	I will have problems in sourcing organic inputs, if I convert to organic livestock farming.	96.00	0.92	3.76*
13.	Preventive management practices are better than curative treatment in organic livestock farming.	92.00	0.87	3.62*
14.	I cannot manage my livestock health without allopathic medicines.	96.00	0.89	3.54*
15.	There are more challenges in organic livestock farming compared to conventional farming	60.00	0.57	2.72
16.	Converting to organic livestock farming will deteriorate my socio-economic conditions.	90.00	0.87	3.30*
17.	Feeding of livestock according to organic standards increases the risk of underfeeding and malnutrition.	79.00	0.76	3.04*
18.	I believe that organic livestock farming is kinder to the environment.	79.59	0.79	3.18*
19.	I am interested in organic livestock farming, because it is popular among local farmers.	26.00	0.51	2.41
20.	The organic livestock standards are too complicated to follow	86.00	0.83	3.48*
21.	My farm structure is not at all suitable for organic livestock production.	92.00	0.70	2.12
22.	Effective management of a farmer lies in ruling out the cause of any illness or disease outbreak.	78.00	0.69	2.08
23.	I feel it is better to cull the diseased animal than providing treatment to it.	72.34	0.74	2.97
24.	I feel allopathic medicines be allowed for treating the animal when no other alternative medicine is available.	44.89	0.61	2.43
25.	Dehorning need to be allowed in organic livestock farming.	50.00	0.61	2.46
26.	Organic livestock farming gives farmers a chance to make good use of their skills.	56.00	0.73	2.48
27.	I can manage my livestock on preventive practices as per organic standards.	85.10	0.79	3.13*
28.	Livestock need not be fed according to their requirement.	62.00	0.55	2.42
29.	Livestock should be allowed to move according to their natural behavioral pattern.	64.00	0.61	2.84
30.	Vaccinations are not at all required in a well managed farm.	36.00	0.51	2.54
31.	Conventional livestock farming is better than organic farming system.	44.89	0.61	2.46
32.	In organic livestock farming, farmer need not consider the well-being of animals.	64.00	0.62	2.16
33.	Profits are more important to farmers than welfare/well-being of livestock.	58.00	0.56	2.08
34.	Recycling of nutrients between plants, animals and soil is of no economical use to the farmer.	94.00	0.85	3.56*

35.	Good human- animal relationship helps in minimizing the risk of dealing with the animals.	24.00	0.61	2.44
36.	There will be little/no risks to the farmer with animals in organic livestock farming.	58.00	0.59	2.16
37.	Organic livestock farming is of little or no value in these modern days of living.	62.00	0.48	2.08
38.	Certification is important to promote organic trade to assure the consumers the quality of production and processing.	94.00	0.85	3.56*
39.	Day to day to recording of farm activities is burden to me.	80.00	0.75	3.24*
40.	Organic livestock farming improves the lifespan of farm.	70.00	0.65	2.06
41.	Mutilations should not be allowed in organic farming.	87.75	0.83	3.31*
42.	Locally adaptable and disease resistant breeds are preferable in organic farming.	72.00	0.58	2.60
43.	There is no farming without synthetic fertilizers and pesticides.	80.00	0.79	3.36*
44.	Organic livestock farming is nearer to traditional way of farming.	90.00	0.89	3.38*
45.	Organic livestock farming is expensive.	94.00	0.82	3.46*
46.	Farmer needs technical and financial assistance to convert to organic livestock farming.	88.00	0.84	3.52*
47.	Land should be used to its maximum extent with the help of synthetic chemicals and fertilizers.	64.00	0.69	2.08
48.	If I think of animal welfare, I cannot do farming at all.	88.00	0.76	3.28*
49.	I can save the input costs, if I covert to organic farming.	64.00	0.63	2.28
50.	Animals will have better living in organic systems than conventional raising systems.	94.00	0.78	3.34*
51.	I can attain the optimum production levels with livestock under organic management	94.00	0.82	3.46*
52.	Farmers who convert from conventional to organic livestock farming must convert not only their farms but also their minds.	98.00	0.85	3.54*
53.	Organic livestock farming values are in line with the values and beliefs of farming community.	94.00	0.85	3.04*
54.	Certification of products in organic agriculture shouldn't be mandatory	98.00	0.87	3.62*
55.	Future market will be more for organic products due to increasing consumer quality consciousness.	80.00	0.71	2.12
56.	It is better for farmers to convert to organic farming.	96.00	0.84	3.52*
57.	Organic livestock farming is a boon to Indian farmers.	92.00	0.71	2.12
58.	It is very difficult to meet all the inputs required on farm itself.	98.00	0.81	3.12*
59.	Organic livestock farming works better, when farmers operates in groups than individually.	80.00	0.65	2.46
60.	There should be some relaxation for usage of external inputs besides maximum usage of farm's own resources.	90.00	0.85	3.01*
61.	I converted to organic livestock farming due to concern towards environment.	92.00	0.84	2.52
62.	I prefer to maintain livestock in organic ways.	94.00	0.85	3.14*

63.	Organic foods do need to get premium prices for encouragement of organic production.	44.00	0.52	2.26
64.	Without herbicides weed problems increase.	24.00	0.52	2.46
65.	Use of growth promoters and hormones are essential in livestock farming.	76.00	0.65	2.06
66.	Organic livestock farming improves animal as well as public health.	56.00	0.49	2.60
67.	Organic livestock farming is suitable for specialized farms but not for diversified farming.	84.00	0.77	3.32*
68.	Organic livestock farming better maintains animals' natural requirements.	68.00	0.51	2.52
69.	Fertilizers has to be applied to supply nutrients just in time	98.00	0.88	3.24*
70.	There will be less risk of pollution in organic livestock farming.	40.00	0.53	2.60
71.	I would like to convert to organic livestock farming, even if price premiums are not available.	98.00	0.85	3.06*
72.	Organic livestock farming is more future-oriented and optimistic.	32.00	0.48	2.44
73.	Products from organic livestock systems will be healthier than products from conventional systems.	92.00	0.85	3.54*
74.	Changing to an organic livestock system is an exciting new challenge.	74.00	0.73	2.20
75.	Through feeding livestock according to its specific requirements, farmer can get optimum yields.	62.00	0.57	2.27
76.	Child labor in organic livestock farming should be discouraged, as it produces an illiterate farmer to future.	56.00	0.55	2.16
77.	Organic livestock farming contributes more towards balancing the ecology than conventional livestock farming.	85.00	0.81	3.56*
78.	Farmer is internally related and part of agriculture.	24.00	0.48	2.32
79.	In organic livestock farming there is no need to maintain soil fertility.	92.00	0.83	3.08*
80.	Nature of farming practices has no role in ecological problems/ environmental pollution.	72.00	0.69	2.08
81.	I believe organic farming more as a way of life and then as a business.	84.00	0.79	3.36*
82.	Organic livestock farming is a method of balancing of nutrients and farm ecosystem for long run.	66.00	0.69	2.06
83.	All living beings are equally valuable and must be accorded equal moral weight.	52.00	0.57	2.12
84.	Nature is meant for human usage and exploitation only.	48.00	0.56	2.11
85.	All of nature possesses intrinsic values, which are interdependent.	68.00	0.57	2.18
86.	Organic livestock farming is a mixture of complex technologies.	40.00	0.49	2.48
87.	Our indigenous breeds are good at performance and production.	40.00	0.52	2.13
88.	Organic livestock farming provides great opportunity for a farmer to produce diversified products.	80.00	0.78	3.04*
89.	Organic farming is a new road forward for agriculture.	72.00	0.73	2.44
90.	Organic farming is a way to preserve old traditions and traditional values.	84.00	0.81	3.20*

91.	Future of livestock organic farming lies in consumers hands.	71.00	0.61	2.44
92.	Animal health and product quality are indicators of farmers efficient management.	80.00	0.76	3.18*
93.	Farmer has the right to subject the other living beings to more suffering than the natural.	48.00	0.53	2.60
94.	Animals should be provided natural service to satisfy its natural requirement.	26.00	0.61	2.41

The variables with relevancy percentages, relevancy weightage and mean relevancy scores were tabulated in table 1. From these, the statements each of which having relevancy percentage, relevancy weightage and mean relevancy scores of more than 75.00, more than 0.75 and more than 3.00, respectively were considered for selection of statements.

By this process, 47 items were isolated for the item analysis of attitude scale construction in the first stage (Table 2).

#### Item analysis

A questionnaire was prepared consisting of 47 statements and was used to collect responses from 60 farmers from non-sample area through direct interview. The respondents were asked to indicate the degree of agreement on a three point continuum namely agree, undecided and disagree with the weightages of 3, 2, 1 for positive statements and 1, 2, 3 for negative statements respectively. The attitude score of a respondent was obtained by summing up the scores of all items. Thus, total score obtained by each respondent was calculated ranging from '47' to '141'. And the scores of respondents were arranged in the descending order. For the purpose of item analysis, 25 percent of the respondents with highest total scores and 25 per cent of the respondents with lowest total scores were selected. These two groups provided the criterion groups in terms of which item analysis was conducted. The 't' value (critical ratio), a measure of the extent to which a given statement differentiates between high and low groups of subjects for each statement, was calculated using the formula given by Edwards (1969).

Where,  $X_H$  = the mean score on a given statement for the high group

$X_L$  = the mean score on the same statement for the low group

$S^2_H$  = the variance of the distribution of responses of high group to the statement

$S^2_L$  = the variance of the distribution of responses of low group to the statement

$n_H$  = number of subjects in the high group

$n_L$  = number of subjects in the low group

**Table 2.** Statements of item analysis by farmers of non-sample area

S.No	Statements	't' values
1.	I am the right kind of person to convert to organic livestock farming.	6.57*
2.	Bio-fertilizers do maintain the soil fertility than the chemical fertilizers in the long-run.	5.94*
3.	If I convert to organic livestock farming it will make a difference to the environment.	1.67

4.	Organic livestock farming helps to retain levels of farm land organism and birds.	1.92
5.	Organic livestock farming will help save the environment for future generations	2.34
6.	My family will have a better quality of life in organic livestock farming compared to conventional farming.	2.19
7.	My livestock farm will be more sustainable through organic agriculture.	3.90*
8.	The quality of organic products is better than products from conventional livestock farming	3.00*
9.	I will have problems in sourcing organic inputs, if I convert to organic livestock farming.	2.46
10.	Preventive management practices are better than curative treatment in organic livestock farming.	2.56
11.	I cannot manage my livestock health without allopathic medicines.	1.28
12.	Converting to organic livestock farming will deteriorate my socio-economic conditions.	3.59*
13.	Feeding of livestock according to Organic standards increases the risk of underfeeding and malnutrition.	3.86*
14.	I believe that organic livestock farming is kinder to the environment.	2.42
15.	The organic livestock standards are too complicated to follow	4.18*
16.	Vaccinations are not at all required in a well managed farm.	2.09
17.	Conventional livestock farming is better than organic farming systems.	2.11
18.	In organic livestock farming farmer need not consider the well-being of animals.	0.98
19.	Profits are more important to farmers than welfare of his livestock.	0.97
20.	Recycling of nutrients between plants, animals and soil is of no economical use to the farmer.	3.87*
21.	Certification is important to promote organic trade to assure the consumers the quality of production and processing.	2.65
22.	Day to day to recording of farm activities is burden to me.	3.79*
23.	There is no farming without synthetic fertilizers and pesticides.	2.03
24.	Organic livestock farming is nearer to traditional way of farming with some additional scientific care.	1.49
25.	Organic livestock farming is expensive.	1.55
26.	Farmer needs technical and financial assistance to convert to organic livestock farming.	2.33
27.	If I think of animal welfare, I cannot do farming at all.	4.05*
28.	Animals will have better living in organic systems than conventional raising systems.	3.83*
29.	I can attain the optimum production levels with livestock under organic management.	4.18*
30.	Farmers who convert from conventional to organic livestock farming must convert not only their farms but also their minds.	2.99*
31.	Organic livestock farming values are in line with the values and beliefs of farming community.	1.56
32.	Certification of products in organic agriculture shouldn't be mandatory.	3.05*
33.	Future market will be more for organic products due to increasing consumer quality consciousness.	1.11
34.	It is better for farmers to convert to organic farming.	1.21
35.	It is very difficult to meet all the inputs required on farm itself.	5.08*
36.	There should be some relaxation for usage of external inputs.	1.76
37.	I prefer to maintain my livestock in organic ways.	3.91*
38.	Organic livestock farming is suitable for specialized farms, but not for diversified farming.	1.38
39.	Fertilizers has to be applied to supply nutrients just in time	2.10
40.	I would like to convert to organic livestock farming even if, price premiums are not available.	3.48*
41.	Products from organic livestock systems will be healthier than products from conventional systems.	5.08*
42.	Organic livestock farming contributes more towards balancing the ecology than conventional livestock farming.	2.91*
43.	In Organic livestock farming there is no need to maintain soil fertility.	0.93

44.	I believe organic farming more as a way of life and then as a business.	3.33*
45.	Organic livestock farming provides great opportunity for a farmer to produce diversified products.	3.26*
46.	Organic farming is a way to preserve old traditions and traditional values.	1.87
47.	Animal health and product quality are indicators of farmer's efficient management.	0.99

The calculated 't' values were found to be distributed between 0.93 and 6.57. The statements with 't' values of 2.75 and above (Table 2) were considered for final inclusion. Thus, 13 positive and 8 negative statements with highest 't' values were selected for the final scale (Table 3) as they differentiate between highest and lowest groups.

**Table 3:** Statements selected for inclusion in the final scale

S.No	Attitude statement	Degree of statement
1.	I am the right kind of person to convert to organic livestock farming.	+
2.	I prefer to maintain livestock in organic ways	+
3.	If I think of animal welfare, I cannot do farming at all.	-
4.	Feeding of livestock according to organic standards increases the risk of underfeeding and malnutrition due to some restrictions.	-
5.	Day to day recording of activities of my farm is a burden to me.	-
6.	I would like to convert to organic livestock farming, even if price premiums are not available.	+
7.	Recycling of nutrients between plants, animals and soil is of no economical use to the farmer.	-
8.	Organic livestock farming contributes more towards balancing the ecology than conventional livestock farming.	+
9.	I believe organic farming more a way of life than as a business.	+
10.	My livestock farm will be more sustainable in organic production systems.	+
11.	Organic livestock production provides great opportunity for a farmer to produce diversified products.	+
12.	It is very difficult to meet all the inputs required on farm itself.	-
13.	Bio-fertilizers do maintain the soil fertility than the chemical fertilizers in the long run.	+
14.	Under organic livestock management, I can attain the optimum production levels.	+
15.	Certification of products in organic agriculture shouldn't be a mandatory.	-
16.	Animals will be healthier in organic production systems than in conventional production systems.	+
17.	Products from organic livestock systems will be healthier and safer than from conventional production systems.	+
18.	The organic livestock standards are too complicated to follow.	-
19.	Converting to organic livestock farming will deteriorate my socio-economic conditions.	-
20.	Farmers, who convert from conventional to organic production, must convert not only their farms, but, also their minds.	+
21.	There is less risk of pollution in organic production systems than in conventional systems.	+

### Reliability of the scale

The split half method for testing reliability was employed. The scores were split into two halves on the basis of odd and even numbers of statements and administered to 60 respondents. Thus, two sets of scores were obtained. The Pearson Product Moment Correlation Coefficient analysis

was employed to determine the degree of relationship between the two scores. It was found to be 0.73 which was significant indicating high internal consistency of attitude scale constructed for the study.

### **Content validity**

The validity of this scale was established through content validity, which means the representativeness or sampling adequacy of the content of a measuring instrument. The scale satisfied both these criteria as the clause of all possible statements that could be made about organic livestock farming, was formulated from the standards and also in consultation with experts who had knowledge about this psychological object. This ensures high content validity of attitude scale. The scale was constructed in accordance with the steps enunciated in the summated rating scale. Therefore, it was assumed that the scores obtained by administering this scale measured nothing other than the attitude towards organic livestock farming. While selecting attitude statements, due care was taken for obtaining a fair degree of content validity. The calculated “t” value being significant for all the finalized statements of the score indicated that the attitude statements of the scale had discriminating values.

### **Final scale**

The final scale with 21 items represents various aspects of organic animal husbandry standards viz., animal welfare, certification, farm diversity, quality of products, record keeping, sustainability, ecology and environment, input usage, animal feeding, as well as philosophy and ideological views of organic farmers about conversion to organic livestock farming.

### **Conclusion**

- Organic farming in general and organic livestock farming in particular, is in innovative stage in India and moreover, development of organic farming depends on the proper adoption of practices which in turn depends upon the attitude of farmers.
- The scale developed will be of use to assess the attitude of farmers towards organic livestock farming in order to plan the organic livestock farming developmental programmes.
- The scale can be used by future researchers in measuring the attitude of farmers in similar agro-ecological regions.

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*Received 17 August 2007; Accepted 10 November 2007; Published 1 February 2008*

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