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Research Article

SCALE TO MEASURE THE UTILITY PERCEPTION OF CATTLE OWNERS

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Abstract- The term utility perception about cattle by the owners has been a problem for a researcher in agriculture. Keeping in view the subjectivity, there was a need to evolve a methodology, which would introduce much needed objectivity in the assessment of utility perception of cattle. In this content, it is worth mentioning that the study of utility perception about Deoni cattle and other Non-descriptive cattle by the cattle owners is a means to making animal husbandry more useful. Development of a scale to measure utility perception of cattle by the cattle owners was attempted by using the normalized rank approach recommended by Guilford, 1978 . The scale developed was found reliable and valid. This utility perception scale was administrated to 240 cattle owners in Latur district of Maharashtra state. The results revealed that majority (83.00 %) of deoni cattle owners belonged to medium category of utility perception and more than two third (66.50 %) of non-descriptive cattle owners were having medium utility perception about cattle.

Keywords- Scale, Utility, Perception, Utility perception, Cattle, Cattle owners

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Introduction

In the rural agriculture, the most commonly employed farm power apart from manual labour invariably comes from cattle, which distinctly stand out from other farm animals. Efficient use of these animals in turn depends on their feeding, maintenance of their health and fitness and training them to adapt to different kinds of work has a definite say in successful agriculture. A good measure of efficiency of livestock enterprise in any country is its contribution to the country's national income. Livestock production and agriculture are intrinsically linked, each being dependent on the other, and both crucial for overall food security. Cattle are an important source of livelihood for the rural people particularly for women, landless labour and marginal farmers living in the interior areas, who do not have the other means of survivals. Cattles are a multifunctional animal and plays a significant role in the economy and nutrition of the people. Cattles are kept as a source of additional income and as an insurance against disaster in farming. In addition to this, cattles have religious and ritualistic importance in many societies. Cattle rearing is very good enterprise for small and marginal farmers, and landless agricultural labours [2]. Cattle provide milk, which has medicinal value recommended for patients suffering from peptic ulcers, jaundice, insomnia, etc. The term utility perception about cattle by the owners has been a problem for a researcher in agriculture. Keeping in view the subjectivity, there was a need to evolve a methodology, which would introduce much needed objectivity in the assessment of utility perception of cattle. In this content, it is worth mentioning that the study of utility perception about Deoni cattle and other Non-descriptive cattle by the cattle owners is a means to an end of making animal husbandry more useful. Considering the importance and utility of cattle in Indian culture and economy the present study was conducted with objective of developing a scale to measure the utility perception of cattle owners.

MaterialsandMethods

The study was conducted in twenty four villages in Latur district of Maharashtra state. Two hundred forty cattle owners were personally interviewed using the scale developed to measure their utility perception towards cattle. The collected data were scored and analyzed using frequency and percentage. Development of a scale to measure utility perception of cattle by the cattle owners was attempted by using the normalized rank approach recommended by Guilford, 1978 [1]. The advantage of this method was that it can be used with almost any number of variables and does not require a large number of judges for ranking the variables. Hence, this method was used in developing the present instrument. This procedure included collection of items, allocation of weight ages to them, standardization of the scale including the testing of its reliability and validity, norms of distribution of scores. The details of the steps actually followed in developing present instrument are discussed as under.

Item collection

Items related to utility perception of cattle were collected from the various sources. Items were selected from different literature, articles and publications. Researcher has contacted the experts in the field of extension education, veterinary extension and also experts in the department of animal husbandry and dairy science who were working in different agricultural universities all over India. Forty-eight statements were included in the scale to measure the utility perception of cattle by the cattle owners. It was necessary to list sub-items under each main item to help in administering the scale and to have objective assessment of the scale items. These forty eight statements were categorized into six subcategories *viz*, general utility, social utility, physical utility, economic utility, management utility and health utility of the cattle. There are 05 statements under general utility, 04 statements under social utility, 08 statements under physical utility and 14 statements under economic utility of the cattle. Whereas, 05 and 12 statements under the management utility and health utility, respectively.

Selection of the judges

In order to judge the relevancy of the item and also to obtain the rank for the selected items, 80 judges were selected, who were expert in the field of extension education/sociology, veterinary extension and animal husbandry and dairy science working in different agricultural universities all over India.

Obtaining the judge's opinion

Judges were requested to select relevant items, which, they felt, contributed to the utility perception of cattle. The judges were also requested to add the items, which they feel appropriate for its inclusion in the scale.

Relevancy of scale items

The responses received from the judges supported the relevancy of all the sixty eight items. Those items, which received more than 75 per cent relevancy were considered as 'relevant' for inclusion in the scale. Thus on the basis of their relevancy finally forty eight items were included in the final scale..

Table-1 *Computed scale values of different items of the scale*

Sr. No	Items/Statements in final scale	Scale value
A)	**General utility**	
1.	Cattle are multi-functional animals.	03.75
2.	Cattle are playing a significant role in improving financial status of owners.	03.50
3.	Cattle are playing a significant role in nutrition of cattle owners.	03.03
4.	A cattle rearing is one of the important enterprise for small and marginal farmers and landless labours.	02.17
5.	Cattle are kept as insurance against disaster farming.	01.88
B)	**Social utility**	
1.	Cattle have religious importance in the society.	03.19
2.	Cattle are accepted as divine.	02.95
3.	Feeding of cattle is part of daily rituals in the society.	02.27
4.	Cattle are treated as member of family in the society.	01.96
C)	**Physical utility**	
1.	Cattle are attractive than other livestock animals.	05.70
2.	Cattle are suitable for rearing at low or high temperature.	06.33
3.	Cattle require less space for rearing.	02.32
4.	Cattle have high disease resistance power.	06.24
5.	Age at first calving is earlier in cattle.	05.07
6.	Age of puberty is earlier in cattle.	04.50
7.	Dry period is less in the cattle.	04.23
8.	Pregnancy period is less in cattle.	03.15
D)	**Economic utility**	
1.	At low cost investment owners can get higher income by rearing of cattle.	10.80
2.	Cattle gets good price in the market.	09.94
3.	Cattle are used for both milk and other purpose.	11.03
4.	Cattle are rearing as source of additional and continuous income throughout the year.	11.41
5.	Selling of cattle improves seasonal cash flow.	10.72
6.	Milk and milk products from cattle have high demand and price in the market.	07.45
7.	Cow milk is used in preparing wholesome dishes and food products.	05.96
8.	Income is generated through cattle shows and exhibition.	04.63
9.	Covering seeds in dung before planting helps to protect against pests and diseases.	04.08
10.	Cattle dung and urine are rich source of nitrogen, phosphorous and potash (NPK).	05.98
11.	Cow dung slurry is used as manure for crops.	03.53
12.	Cow dung cakes used as fuel.	04.06
13.	Cow dung also used in biogas plants.	03.23
14.	Cow urine is used as insecticide.	05.18
E)	**Management utility**	
1.	Management of cattle is easy than other milch animals.	04.46
2.	Cattle require minimum concentrates during development period.	03.38
3.	Most cattle are easy to handle for anybody as compare to other livestock animals.	02.85
4.	Most cattle allow any body to milk.	02.26
5.	Need not to take more management practices for cattle rearing.	01.53
F)	**Health utility**	
1.	Cattle milk is more nutritious than milk of other livestock.	09.77
2.	Cattle milk has better digestibility than milk of other livestock.	08.63
3.	Cattle milk has high medicinal value and will be used as precaution and control over many diseases.	07.70
4.	Milk of cattle is good source of vitamins and minerals.	09.34
5.	Cattle milk is most useful for growth and development of children.	09.67
6.	Cattle milk ghee is rich source of vitamins and minerals.	06.38
7.	Colostrums is a highly concentrated mixture of proteins and minerals.	06.51
8.	Colostrums is very good source of vitamin- A.	05.07
9.	Colostrums help in regulating cholesterol level.	03.93
10.	Colostrums may overcome the emerging problems relating to respiratory disorders.	03.44
11.	Cattle urine has antiseptic properties.	03.82
12.	Being part of farming, food and medicine cattle also contribute to the health of the environment.	03.54

Obtaining the scale value for the items

Normalized rank approach recommended by Guilford, 1978 [1]. was used and scale value for each main item was worked out. The advantage of this method is that it can be used with almost any number of observers. Similar methodology was being adopted by Bawajir and Nandapurkar, 1984 [3] while developing the scale to measure the 'Socioeconomic Status' of the farmer, Chole, 1986 [4] for constructing 'Development Opportunity' scale, Tayade, 2006 [5] while developing the scale to measure the 'Empowerment of Rural Women', Lad, 2014 [6] for developing the scale to measure the 'Utility Perception of Mass Media' by the farm women and Sidam, 2015 [7] for developing the scale to measure the 'Disabilities of Tribal People in Their Socio-economic Development'. The question of giving weight ages to various main items was considered on the basis of mean value. In many scales, arbitrary weight ages are given which is not scientific. Therefore, in obtaining the scale values for the main items following procedure was followed. The judges were asked to rank the items under each sub category of utility of cattle. The reverse weight ages were given i.e. first rank was given to the highest score and last rank was given to the lowest score. The scale values were worked out by using the following formula.

$$AM = \frac{\Sigma Wi \times Xi}{\Sigma Wi}$$

Where,

AM = Arithmetic mean Wi = Weight age Xi = Value of the variate

Reliability of the scale

In order to judge the reliability of the scale, test-retest reliability test was used. These final statements then again retested from the judges for their reliability and rank for including in the final statement of scale. After their judgments, the statements were finalized and included in the final scale, which was then applied to the cattle rearers for measurement of their utility perception about cattle. Test-retest reliability of the scale was calculated on the basis of the responses of sample of 40 cattle owners who were not included in the final sample. The scale was administered twice to these respondents. The second administration was done approximately three weeks after the first one. Pearson's product moment coefficient of correlation was used for the two sets of scores in order to obtain the test-retest reliability coefficient. The reliability coefficient obtained (0.362) was quite high, indicating that the developed scale was reliable. The coefficient of correlation was also statistically highly significant at 1 per cent level. This finding is in line with the findings quoted by Bawajir and Nandapurkar, 1984 [3], Chole, 1986 [4] and Tayade, 2006 [5], Lad, 2014 [6] and Sidam, 2015 [7].

Validity

The content validity of the scale was established in two ways, firstly the various main and sub items for inclusion in the scale were based on extensive literature review from Indian and foreign studies. Secondly, the opinion of the panel of 61 judges who were expert in the field of extension education / veterinary extension / animal husbandry and dairy science / administration and development was obtained to find whether the items suggested were relevant for inclusion in the scale.

Norms of distribution of scores

In the present study, the following norms of distribution of scores were worked out.

I) Frequency distribution II) Measures of central tendency

For this purpose, the data obtained from two hundred forty cattle owners were considered.

I) Frequency distribution

The procedure recommended by Garrett, 1967 [8] was used to tabulate the frequency distribution and also to work out other graphical presentation. The data regarding utility perception of cattle scale was grouped into eight classes with class interval of 5 units. The frequency distribution has been given in [Table-2].

Table-2 *Frequency distribution of UPI of 240 respondents*

Sr. No.	Class Interval	Mid Point	Frequency	Smoothed frequency
1.	60.5 – 65.5	63	05	08.33
2.	65.5 – 70.5	68	20	23.66
3.	70.5 – 75.5	73	46	43.00
4.	75.5 – 80.5	78	63	54.66
5.	80.5 – 85.5	83	55	49.00
6.	85.5 – 90.5	88	29	33.00
7.	90.5 – 95.5	93	15	17.00
8.	95.5 – 100.5	98	07	07.33

Graphical presentation of the frequency distribution

The graphical presentation of the frequency distribution helps to translate numerical facts into more concrete and understandable form. The data in [Table-2] have been presented in histogram [Fig-1] shows the histogram based on observed and smoothed frequency in column number 4 and 5 of [Table-2]. Further, theoretical normal curve superimposed on smoothed frequencies asymmetrically and closed resembled to normal probability curve. This indicates that the scores of two hundred forty respondents were normally distributed.

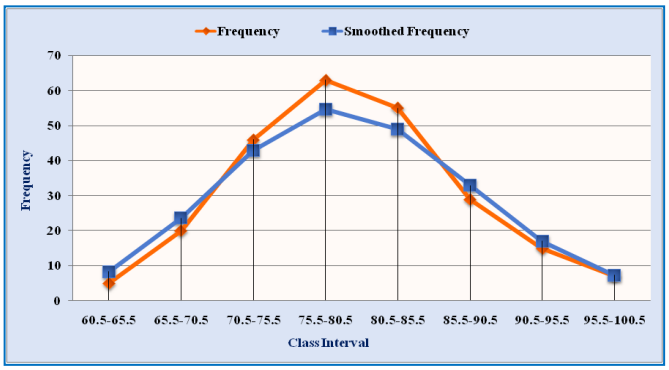

Fig-1 Histogram of observed and smoothed frequencies with normal curve superimposed on smoothed frequency

Smoothed frequency

In smoothing, a series of 'moving' or 'running' averages were taken from which new adjusted frequencies were determined. This method is illustrated to find an adjusted or 'smoothed' frequencies, we add the frequency on the given interval and the frequencies on the two adjacent intervals (the interval just below and the interval just above) and divide the sum by 3.

Cumulative percentage curve and 'ogive'

Cumulative percentage curve is another graphical method of representing frequency distribution. To compute cumulative percentage, cumulative frequencies were required to be found out. [Table-3] indicates necessary conversion of cumulative frequencies into percentage of the total number of respondents (N). The cumulative percentage curve was later on drawn with interval limits laid on the x-axis and cumulative percentage on y-axis. Data are presented in [Fig-2]. The figure drawn was quite regular, thereby indicating that scores obtained by the instrument developed followed normal distribution.

Table-3 *Percentage cumulative frequency of UPI of 240 respondents*

Sr. No.	Class Interval	Upper limit	Frequency	Cumulative frequency	Cumulative per cent
1.	60.5 – 65.5	65.5	05	05	02.08
2.	65.5 – 70.5	70.5	20	25	10.42
3.	70.5 – 75.5	75.5	46	71	29.58
4.	75.5 – 80.5	80.5	63	134	55.83
5.	80.5 – 85.5	85.5	55	189	78.75
6.	85.5 – 90.5	90.5	29	218	90.83
7.	90.5 – 95.5	95.5	15	233	97.08
8.	95.5 – 100.5	100.5	07	240	100.00

II) Measures of central tendency

The different values of central tendency as indicated in the chapter 'methodology' were worked out for 240 respondents were as follows.

Mean : 79.97 Median : 79.17 Mode : 78.13

These values being very close, indicating that distribution followed normal curve.

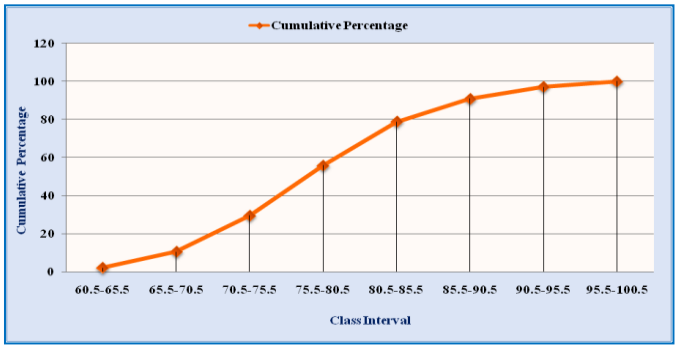

Fig-2 Cumulative percentage curve (ogive) of utility perception index of 240 respondents

Results

Overall utility perception

Table-4 *Distribution of respondents according to overall utility perception*

Sr. No.	Category	Deoni Cattle owners (n=120)			Non-Descriptive Cattle owners (n=120)		
		Score	F	%	Score	F	%
1.	Low	Up to 71	19	15.84	Up to 69	23	19.17
2.	Medium	72 to 84	82	68.32	70 to 81	80	66.67
3.	High	85 & above	19	15.84	82 &above	17	14.17
		Total	**120**	**100**	**Total**	**120**	**100**
		Mean	**78.35**		**Mean**	**75.78**	
		SD	**07.00**		**SD**	**06.64**	

The data presented in the [Table-4] revealed that, nearly two third (68.32 %) of Deoni cattle owners had medium level of perception regarding overall utility of cattle, while equal percentage i.e. 15.84 of them were having high and low level of perception about overall utility perception of cattle. In relation to non-descriptive cattle owners the data given in [Table-4] shows that, two third (66.67 %) respondents were having medium level of level of perception about overall utility perception of cattle whereas, 19.17 per cent had low level and 14.17 per cent had high level of perception regarding overall utility of cattle.

Utility perception index

Utility perception index of all the respondents was calculated and presented in the [Table-5]. It is apparent from [Table-5] that, majority (83.00 %) of deoni cattle owners belonged to medium category of utility perception, while 17.50 per cent and 16.00 per cent of them were from low and high utility perception of cattle, respectively.

Table-5 *Distribution of respondents according to utility perception index*

Sr. No.	Category	Deoni Cattle owners (n=120)			Non-Descriptive Cattle owners (n=120)		
		Score	F	%	Score	F	%
1.	Low	Up to 74.32	21	17.50	Up to 72.01	25	20.83
2.	Medium	74.33 to 88.90	83	83.00	72.02 to 85.84	81	67.50
3.	High	88.91 & above	16	16.00	85.85 & above	14	11.67
		Total	**120**	**100**	**Total**	**120**	**100**
		Mean	**81.61**		**Mean**	**78.93**	
		SD	**07.29**		**SD**	**06.92**	

It is also noticed from [Table-5] that more than two third (66.50 %) of non descriptive cattle owners were having medium utility perception followed by 20.83 per cent of them had low and 11.67 per cent of them had high utility perception of cattle.

Conclusions

In the present study, the scale to measure the utility perception of cattle by the owners was constructed. For the construction of scale, sixty eight items pertaining to utility perception of cattle were collected through review of literature and discussion with academic staff at various levels. These items/statements were sent to eighty judges, the academic and administrative extension personnel, veterinary extension personnel and experts from animal husbandry and dairy science working in various universities and institutions in India. The judges were requested to indicate whether each of the main items sent to them was relevant and suitable for inclusion in scale. Sixty one judges responded out of eighty. The responses received from the judges supported the relevancy of all the sixty eight items. Those items, which received more than 75 per cent relevancy, were considered as relevant for inclusion in the scale. Thus on the basis of their relevancy, finally forty eight items were included in the final scale. The scale values of finally selected items were worked out by using the Normalized Rank Approach.

The reliability of the scale was determined by Test-retest method. Pearson's Product Moment Coefficient of Correlation was worked out for correlating the two sets of scores for test-retest method. The value of correlation coefficient between two scores of Test-retest reliability was 0.362. Validity of scale was established by content validity method. The content validity was determined by using review of literature and opinion of 61 judges who were experts in the field of extension education, veterinary extension and animal husbandry and dairy science. Norms of distribution of utility perception score obtained by using the constructed scale indicated that the distribution was, in general, normal. This was tested and confirmed by the values of central tendency.

Utility perception of cattle owners were measured under six subcategories and finally their overall utility perception were measured. It relation to the deoni cattle owners, it was found that nearly two third (68.32 %) of deoni cattle owners had medium level of perception regarding overall utility of cattle, while equal percentage i.e. 15.84 of them were having high and low level of perception about overall utility of cattle. As far as non-descriptive cattle owners were concerned, it was found that two third (66.67 %) of non-descriptive cattle owners were having medium level of perception about overall utility perception of cattle whereas, 19.17 per cent had low level and 14.17 per cent had high level of perception regarding overall utility of cattle.

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Conflict of Interest: None declared

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