P-ISSN 2322 - 0678 & E-ISSN 3048 - 9946
Gujarat Journal of Extension Education Vol. 38 : Issue 2 : December 24 https://doi.org/10.56572/gjoee.2024.38.2.0033

A SCALE TO MEASURE ENTREPRENEURIAL BEHAVIOUR OF COMMERCIAL DAIRY FARMERS

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ABSTRACT

Entrepreneurial behaviour is one of the most vital factors in making a dairy business commercially successful. With the growing demand for milk and milk products, the scope of dairy entrepreneurship becomes more attractive. Fewer scales are available to measure the entrepreneurial behaviour of commercial dairy farmers, indicating a need to develop a new scale tailored to this context. Existing options do not fully capture the specific nuances of entrepreneurial behaviour in commercial dairying. To develop and validate an entrepreneurial scale, the 14-point statement selection criteria of Edwards (1969) were followed. A total of 45 statements were selected based on nine components of entrepreneurial behaviour: risk-taking ability, self-confidence, knowledgeability, persuasibility, manageability, innovativeness, achievement motivation, decision-making ability, and profit orientation. These statements illustrated the entrepreneurial behaviour of commercial dairy farmers. Selected statements were sent to 120 judges, of whom 64 responded. A total of 34 statements were included in the final scale. The developed scale will assist researchers in studying the entrepreneurial behaviour of commercial dairy farmers, identifying dairy entrepreneurs, designing training and seminars through educational and research institutions, and shaping government policies.

Keywords**:** *commercial dairy farmers, entrepreneurial behaviour, scale*

INTRODUCTION

As the dairy industry undergoes modernization and commercialization entrepreneurial behaviour of the commercial dairy farmers plays a vital role in success of their dairy enterprise. India is the largest milk producer country in the world which contributes 24 per cent of the global milk production, (Anonymous, 2022) and dairy farming has a leading role in the rural economies. Madhya Pradesh stands at third position in milk production in India. It produces around 19,004 metric tons of the milk in the year 2021-2022. Madhya Pradesh's dairy industry is distinguished by an integration of traditional and modern practices. Farmers engaged in the mixed farming benefit from mutually beneficial interaction between crop production and dairy farming. Entrepreneurial behaviour among the commercial dairy farmers can help to transform the dairy enterprise into a more profitable and sustainable business. The development of any nation depends primarily on the important role played by entrepreneurs (Ekhande and Suradkar, 2023).

Entrepreneurship development among the dairy farmers ensures optimal utilization of resources and facilitates value addition to product and services. Considering the need for the development of entrepreneurship among dairy farmers, it is felt necessary to measure the entrepreneurial behaviour of the dairy farmers since dairy enterprise is recognized to play a constructive role in reducing poverty and promoting rural welfare at farm level. Raina V. et al. (2016) reported that most dairy farmers (68.40%) had medium-level entrepreneurial behaviour. Innovative extension efforts are needed to enhance awareness and adoption of scientific practices, improving their dairy businesses and livelihoods.

OBJECTIVE

To develop and standardize a scale to measure entrepreneurial behaviour of the commercial dairy farmers.

METHODOLOGY

The developed scale composed of nine components of entrepreneurial behaviour including risk taking ability, self-confidence, knowledgeability, persuasibility, manageability, innovativeness, achievement motivation, decision making ability and profit orientation. The statements reflecting the entrepreneurial behaviour were included in the scale were carefully edited in the light of 14 criteria suggested by Edwards (1969). A list of 45 statements pertaining to the entrepreneurial behaviour was prepared based on the available literatures, dissertations, reports and discussions

with agricultural extension and other experts. After identifying the components and evolving the rationale for their inclusion in the scale, it was decided to obtain judges rating, so as to eliminate less important. Content validity and Split half method of reliability is assured for standardization of scale.

RESULTS

Table 1. Final statements to measure entrepreneurial behaviour with "t" value

Sr. No.	Statements	MRS	RW	"t" value
	Risk Taking Ability			
1	I am willing to invest in new technologies or practices that may bring higher returns.	2.58	0.86	2.17
2	I am open to trying new methods of farming even if they involve some level of uncertainty.	2.25	0.75	3.30
3	I believe taking calculated risks is essential for business growth in the dairy.	2.56	0.85	2.23
	Self Confidence			
4	I have confidence in my decisions and choices regarding my dairy business.	2.58	0.86	2.12
5	I trust my abilities to handle challenges and uncertainties in dairy farming.	2.59	0.86	2.29
6	I have enough confidence in my abilities to succeed in the dairy enterprise.	2.30	0.77	2.67
	Knowledgeability			
7	I stay updated on the latest advancements and best practices in the dairy industry.	2.61	0.87	2.11
8	I take an active role in training programmes, workshops and seminars to increase my knowledge of the many facets of dairy farming, including genetics, disease control and nutrition.	2.55	0.85	2.43
9	On my dairy farm, I consistently foster a culture of continuous learning by exchanging information and experiences with experts and other farmers.	2.38	0.79	2.54
	Persuasibility			
10	I am effective at convincing others of the benefits of my dairy products or services.	2.39	0.80	3.63
11	I can influence stakeholders to support my dairy business initiatives.	2.36	0.79	2.47
12	I am skilled at negotiating and persuading partners or customers in the dairy industry.	2.34	0.78	2.50
13	I actively build and maintain strong relationships with key stakeholders, such as suppliers, distributors and customers to gather support for my dairy business initiatives.	2.41	0.80	2.23
	Manageability			
14	I am adept at organizing and managing the various aspects of my dairy farm operation.	2.38	0.79	1.98
15	I can efficiently allocate resources to optimize productivity and profitability.	2.53	0.84	2.33
16	I have systems in place to effectively manage and control the operations to my dairy business.	2.33	0.78	3.40
17	To manage my dairy business, I seek expert advice.	2.48	0.83	2.51
	Innovativeness			
18	I am regularly brainstormed and implement innovative ideas to improve my dairy farm.	2.66	0.89	3.09
19	I am open to experimenting with new technologies and methods in dairy production.	2.53	0.84	2.44
20	I try to stay ahead of competitors by innovating and adapting in the dairy industry.	2.38	0.79	3.43
21	I regularly look for partnerships and cooperation with different dairy industry players to promote creativity and share fresh concepts.	2.39	0.80	2.28
22	On my dairy farm, I make research and development investments to investigate new methods and technologies that may improve productivity, sustainability and product quality.	2.31	0.77	2.82
	Achievement Motivation			
23	My motivation comes from a desire to be the best in dairy farming.	2.44	0.81	2.33
24	I have high expectations for myself and my dairy farm and I work very hard to achieve them.	2.53	0.84	2.29
25	Overcoming obstacles and reaching goals in my dairy farm gives me a sense of fulfillment.	2.38	0.79	2.28
26	I like to satisfy the minimum needs of my customer and peoples working in my enterprise.	2.25	0.75	3.57
	Decision Making Ability			
27	I get advice from relevant people and consider their viewpoints before making decisions that are important for dairy farm.	2.44	0.81	2.45
28	I am decisive and can make timely and informed decisions for my dairy farm.	2.38	0.79	2.46
29	I evaluate the pros and cons carefully before making significant decisions in my dairy business.	2.44	0.81	2.33

Sr. No.	Statements	MRS	RW	"t" value
	Profit Orientation			
30	I strategically optimize the use of feed, labour and infrastructure on my farm to maximize profits.	2.64	0.88	2.74
31	Every decision I make is geared towards maximizing the financial returns for my dairy operation.	2.38	0.79	2.57
32	I continuously seek opportunities to enhance profitability, whether through cost-saving measures or exploring innovative revenue streams.	2.38	0.79	2.45
33	I adapt milk production and marketing strategies based on market demands and consumer preferences to maximize profits.	2.48	0.83	2.51
34	Before investing in any new farm equipment or technology, I assess its potential to increase revenue and profitability.	2.39	0.80	2.57

Table 1. Represents the calculated mean relevancy score, relevancy weightage and 't'-value of the 34 selected statements. The statements cover nine sub-components of entrepreneurial behaviour of commercial dairy farmers. Validity and reliability were assessed for the standardization of the scale. Split Half Method was employed to measure the reliability of the scale. The reliability co-efficient of the scale was found to be 0.834, which indicates high reliability of the scale. It was concluded that the entrepreneurial behaviour scale constructed was reliable. Reliability was also measured by analysis of "Cronbach alpha" using SPSS. The value of "α" was 0.86 which shows the items are acceptable whereas the items included in the scale was based on review of literature and expert judgements. Therefore, it was assumed that the scale developed was valid with reference to inclusion of the relevant contents of the concepts under study.

Judges rating

After identifying the component and evolving the rationale for their inclusion in the scale, it was decided to obtain judges rating, so as to eliminate less important statements/items.

Relevancy test

After rigorous scrutiny of the statements related to the entrepreneurial behaviour, scale containing a set of 45 statements were mailed to 120 experts consisting of department of agricultural extension, KVK scientists and other related field personnel in SAU's and ICAR institutions to know the relevancy of the statements. Each statement was critically evaluated by these experts/judges to understand the relevancy of each statement on the given measures viz. Most Relevant (MR), Relevant (R) and Not Relevant (NR) with the assigned score of 3, 2 and 1 respectively. The judges were requested to make necessary modifications and additions or deletion of statements, if they desire so. Out of 120 judges, 64 judges returned the duly filled questionnaires and they were considered for further processing. From the data gathered, "Relevancy Percentage (RP)", "Relevancy Weightage (RW)" and "Mean Relevancy Score (MRS)" were calculated for all the statements Gupta and Saha (2021), Bardhan et al. (2023).

$$RP = \frac{MR \times 3 + R \times 2 + NR \times 1}{Maximum\ possible\ score} \times 100$$

$$RW = \frac{MR \times 3 + R \times 2 + NR \times 1}{Maximum\ possible\ score} \times 100$$

$$MRS = \frac{MR \times 3 + R \times 2 + NR \times 1}{Number\ of\ judges\ respond} \times 100$$

$$\textbf{ean Relevancy Score (MRS)} = \frac{MR \times 3 + R \times 2 + NR \times 1}{Number\ of\ judges\ respond}$$

MR= Most Relevant, R= Relevant, NR= Not Relevant

Maximum Possible Score (MPS) = No. of Judges Responded x 3 = 64 x 3 = 192

Accordingly using the criteria followed by Bardhan et al. (2023), with the help of above calculation statements with relevancy percentage of more than 75, relevancy weightage of more than 0.75 and mean relevancy score of more or equal to 1.5 were considered for the final selection of statements. Thus, total 39 statements were selected for further testing.

Item analysis

Item analysis was carried out to examine responses to individual test items (questions) in order to assess the quality of those items and of the test as a whole. Item analysis was done including 39 statements selected in the first stage. By including those selected 39 statements an interview schedule was framed used for interviewing 30 respondents from non-sampling area. There was a three-point continuum to get the responses as agree, undecided and disagree with scores 3, 2 and 1 respectively. The final interview schedule after having item analysis will also have this three-point continuum stated above. Item analysis was conducted using the procedure followed by Rajeshwari and Dolli (2020), the statements

were arranged in descending order based on relevancy score. 25 per cent of the statements with the highest total score and 25 per cent with the lowest total scores were selected. These two groups provided the standard group for which item analysis was conducted and critical ratio was worked out by using the following formula:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\left(\sum \bar{X}_H^2 - \frac{(\sum \bar{X}_H)^2}{n}\right) \times \left(\sum \bar{X}_L^2 - \frac{(\sum \bar{X}_L)^2}{n}\right)}{n(n-1)}}}$$

Where,

H = Mean score of given statement in high group

L = Mean score of given statement in low group

$\sum(H)^2$ = Sum of squares of the individual score on a given statement for high group

$\sum(L)^2$ = Sum of squares of the individual score on a given statement for low group

$\sum H$ = Summation of scores on given statement for high group

$\sum L$ = Summation of scores on given statement for low group

Final selection of statements

Critical ratio ('t' value) of each statement was calculated for the final selection of items. Item or statements were selected on the basis of 't' value equal or more than 1.75 as this 't' value significantly differentiates between high and low group of items. Therefore, 34 statements were retained in the final scale for measuring the entrepreneurial behaviour of commercial dairy farmers by using the procedure provided by Singh (2024).

Reliability

Reliability refers to the precision of the scale constructed for any purpose. It is also called as, the extent to which repeated measure should produce the same results. In social science research, newly constructed scale has to be verified for its reliability before it is used. Split half method developed by Spearman Brown prophecy employed to measure the reliability of the scale. The reliability co-efficient of the scale was found to be 0.834, which indicates high reliability of the scale. It was concluded that the scale constructed to measure the entrepreneurial behaviour of the commercial dairy farmers was reliable.

R = 2 r / 1+ r = 0.834

Where,

R = Reliability of the scale

r = Estimated correlation between two halves (Pearson r)

Reliability was also measured by analysis of "Cronbach alpha" using SPSS-

The value of "α" was 0.86 which shows the items are acceptable.

Validity

It refers to the ability of the tool to measure what it proposed to measure. Validity of a scale is the property which ensures that the test scores are found to measure the variable they are supposed to measure.

Content validity

According to Kerlinger (1986), content validity refers to representativeness or sampling adequacy of the content, the substance, the matter and topics of a measuring instrument. He further stated that, content validation consists essentially in judgment alone or with others, but one judges the representativeness of the item. The items included in the scale were based on extensive review of the literature and expert judgments. Therefore, it was assumed that the scale developed was valid with reference to inclusion of relevant contents of the concepts under study.

DISCUSSION

The research aimed to develop and standardize entrepreneurial behaviour scale, a tool which can measure entrepreneurial behaviour of the commercial dairy farmers. 45 statements were collected initially based on 14-point criteria suggested by Edwards from various scientific literatures, dissertations, reports and discussions with agricultural extension and other experts. 39 statements were selected in relevancy test having mean relevancy score equal to or more than 1.5, relevancy weightage equal to or more than 0.75 and relevancy percentage equal to or more than 75 per cent. Further those selected 39 statements sent for item analysis in the non-sampling area. Responses were collected from thirty persons on three-point continuum. Item analysis was conducted using the procedure followed by Rajeshwari and Dolli (2020), the statements were arranged in descending order based on relevancy score. Twenty-five per cent of the statements with the highest total score and 25 per cent with the lowest total score were selected. Critical ratio ('t'-value) of each statement was calculated for the final selection of the statements. Items/ statements selected on the basis of 't'-value equal to or greater than 1.75 as this 't'-value significantly differentiating between high and

low groups of items. Reliability and validity are important tools to standardize the developed scale. Reliability refers to precision of the scale constructed for any purpose. It is also called as, the extent to which repeated measure should produce the same results. Split half method developed by Spearman Brown prophecy employed to measure the reliability of the scale. The reliability co-efficient of the scale was found to be 0.834, which indicates high reliability of the scale. Cronbach alpha value calculated for the scale was 0.86 signifying high degree of internal consistency (Cronbach, 1951). Validity refers to the ability of the tool to measure what it proposed to measure. Content validity according to Kerlinger (1986) refers to representativeness or sampling adequacy of the content, the substance, the matter and the topics of a measuring instrument. The items included in the scale was based on extensive review of literature and expert judgments. Therefore, it was assumed that the scale developed was valid with reference to inclusion of relevant contents of concepts under study. The findings are also in contrast with the findings of Gulkari and Dohat, (2022).

CONCLUSION

The developed entrepreneurial behaviour scale can be a valuable tool to measure behaviour of the dairy entrepreneurs in Indian context. Judges' opinion and scientific literatures were considered while selecting the statements which signifies the validity of the scale developed. The scale is reliable as per the value of reliability coefficient. By satisfying all the reliability and validity norms the scale can be considered as a standardized tool, which can be used by the researchers, policy makers as well as dairy entrepreneurs.

IMPLICATIONS

(1) The findings of the study contribute to a deeper understanding of entrepreneurial behaviour within the context of dairy farming.

(2) The measurement and assessment of entrepreneurial traits and capabilities in the dairy sector will be refined with the help of this study.

(3) The government should intensify efforts in the development and implementation of policies and programs that promote commercial dairy farming.

(4) There should be a concerted push to foster innovation and facilitate the adoption of advanced technologies within the dairy industry.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to my guide, institution and all the individuals for their contribution and support to made this research possible.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Received : September 2024 : Accepted : November 2024