

Application of Logistic Regression Affecting Behavior of Farmers in Adopting Economic Cooperation in Beef Cattle Business

by St Rohani

Submission date: 30-Mar-2022 08:09AM (UTC+0700)

Submission ID: 1796512037

File name: ers_in_Adopting_Economic_Cooperation_in_Beef_Cattle_Business.pdf (86.16K)

Word count: 5648

Character count: 29644

APPLICATION OF LOGISTIC REGRESSION AFFECTING BEHAVIOR OF FARMERS IN ADOPTING ECONOMIC COOPERATION IN BEEF CATTLE BUSINESS

¹²
⁹ S T Rohani*, A R Siregar, T G Rasyid, M Darwis¹ and M E Kurniawan²
 Faculty of Animal Science, Hasanuddin University, Perintis Kemerdekaan Street KM. 10, Makassar

ABSTRACT

Received on: 24.03.2021

Accepted on: 01.05.2021

² Economic cooperation in beef cattle business can be successful if farmers accept the system used in this collaboration. To be accepted by farmers, the economic cooperation must be able to solve problems experienced by farmers, one of which is capital. The purpose of this study were to describe the behavior of beef cattle farmers adopting the beef cattle business economic cooperation and to analyze what affects the behavior of farmers in adopting economic cooperation in beef cattle business in Libureng District, Bone Regency. The study was conducted on 150 randomly selected farmers consisted of 100 farmers who executed economic cooperation and 50 people who did not cooperate in the economy of beef cattle business in Libureng District. Datas were collected through interviews with the help of questionnaires and each variable were scored using Likert scale.

Key words: Economic cooperation, farmer behavior, beef cattle

Introduction

The types of beef cattle cultivated in Indonesia include native Indonesian cattle and imported cattle. To carry out a beef cattle breeding or fattening business, it is very important to know the types of cows to be cultivated because each type of beef cattle has unique characteristics, both from its outer shape (body size, coat color) and genetics (growth rate). Original Indonesian cattle that are commonly cultivated as a source of meat are Bali cows, Ongole cows, PO cows (Ongole breeds), Madura cows, and Aceh Cows. Meanwhile, imported cattle that are widely cultivated in Indonesia include Aberdeen Angus (Scotland), Simmental cows (Switzerland), Brahman cows (India), and Limousine (France) (Salim, 2013). Beef cattle are one of the resources for producing food in the form of meat which has high economic value and is important in people's lives. Because a beef cow can produce various kinds of needs, especially as a food ingredient in the form of meat in addition to other by-products such as manure, skin, bones, and so on. According to Rusdiana *et al.* (2010) contribution of beef cattle is expected to increase income of farmers and at the same time provide opportunity for economic growth of rural farmers. The availability of sufficient quantity and quality of forage is one of the factors that can determine the success of large, medium and small scale beef cattle business (Dwiyanto *et al.*, 2010).

The success of the beef cattle business economic cooperation really depends on how the farmers accept the cooperation.

In order for farmers to be able to accept economic cooperation, the cooperation must be able to solve the problems experienced by farmers so that it can be considered well and in the end farmers will behave as they think. Therefore, it is very important to create a good impression from the farmers as it will determine the behavior of the farmers in adopting economic cooperation in the beef cattle business (Ajzen, 2006).

Several research results regarding the decision to adopt

economic cooperation in beef cattle can be concluded that what is conveyed to the farmer is not always heard by the farmer, and if it is heard it is not always understood by the farmer, if they understand it does not necessarily mean that the farmer agrees with this, and even though they agree with what is delivered, it turns out that breeders do not necessarily do it. Finally, if they apply what is said, in many cases it turns out that the application of these innovations is not always maintained or is not sustainable (Prager and Posthumus, 2010).

Farmers as recipients of innovation are a very influential factor in the adoption of economic cooperation. Because the adoption of economic cooperation can be said to be successful when farmers are able to apply what they get through the information / materials they receive. Theory of planned behavior includes three things, namely: beliefs about possible outcomes and evaluation of these behaviors (behavioral beliefs), beliefs about expected norms and motivation to fulfill these expectations (normative beliefs), and beliefs about the existence of factors that can support or hinder behavior and awareness of the strength of these factors (control beliefs). The purpose of this study was to describe the behavior of beef cattle farmers adopting the beef cattle business economic cooperation and to analyze what influences the behavior of farmers in adopting economic cooperation in beef cattle business in Libureng district, Bone Regency.

Materials and Methods

Present study was conducted in Libureng District, Bone Regency, using descriptive and explanatory research. For this 150 farmers were selected randomly. Out of 150 farmers 100 farmers have economic cooperation in the beef cattle business of Libureng District and 50 farmers did not have any economic cooperation. Data were collected through interviews with the help of questionnaires. The first research objective was analyzed using descriptive statistics and the second research objective was analyzed using logistic regression (Sugiyono, 2014).

¹Center for Research and Development of Community Dynamics, Culture and Humanities of Research and Community Service Institutions ²Faculty of Science and Technology, University of Muhammadiyah Sinjai, Teuku Umar Street Number 8 Biringere, Sinjai, *Corresponding author email:nanirohani24@yahoo.co.id

The variables of farmer behavior in adopting economic cooperation in beef cattle business are as follows: (1) farmer attitudes (X₁); (2) farmer subjective norms (X₂); and (3) farmer behavior control (X₃). Scoring were performed using Likert scale with score 1 = not good; 2 = less good; and 3 = good.

The attitude variable (X₁) and the farmer subjective norm variable (X₂) and class range have been calculated as follows:

Highest score = Highest weight x number of respondents x number of questions

$$(3) \times (150) \times (5) = 2250$$

Lowest score = Lowest weight x number of respondents x number of questions

$$(1) \times (150) \times (5) = 750$$

$$\text{Class Range} = \frac{\text{Highest score} - \text{Lowest score}}{\text{Number of Classes}} = \frac{2250 - 750}{3} = 500$$

The study categories as follows:

Good = 1750 - 2250

Less good = 1250 - 1750

Not good = 750 - 1250

The farmer behavior control variable (X₃) is measured using a range of classes as follows:

Highest score = Highest weight x number of respondents x number of questions

$$(3) \times (150) \times (3) = 1350$$

Lowest score = Lowest weight x number of respondents x number of questions

$$(1) \times (150) \times (3) = 450$$

$$\text{Class Range} = \frac{\text{Highest score} - \text{Lowest score}}{\text{Number of Classes}} = \frac{1350 - 450}{3} = 300$$

The study categories as follows:

Good = 1050 - 1350

Less good = 750 - 1050

Not good = 450 - 750

Analysis of the influence of the farmer behavior factor variables consisting of attitude (X₁), subjective norms (X₂), and farmer behavior control (X₃) on the adoption of economic cooperation in beef cattle business (P) was used logistic regression. Logistic regression mathematical model can be written as follows:

$$\text{Log} \left(\frac{p}{1-p} \right) = \beta_0 + \beta_1 Y + \beta_2 X_2 + \beta_3 X_3$$

P = Opportunity for farmers to adopt beef cattle business cooperation with the value of Y = 1; does not adopt the economic cooperation in beef cattle business with the value of Y = 0.

β₁, β₂ and β₃ = Variable Regression Coefficient X₁, X₂ and X₃

X₁ = Farmer attitude (score)

X₂ = Farmer subjective norms (score)

X₃ = Control farmer behavior (score)

Results and Discussion

Description of research variables

The independent variable of the study is described by describing the farmer attitude variable (X₁), the farmers subjective norm (X₂), and the farmers behavior control (X₃) which are described as follows:

Attitude of farmers to adoption of beef cattle business economic cooperation

Farmer behavior towards economic cooperation in beef cattle business based on farmer attitudes consists of sub variables: (a) relative advantage (b) flexibility (c) observability (d) reliability and (e) complexity. The descriptions of the research results on the farmer attitude variables are described in Table 1.

Table 1. Farmer behavior towards economic cooperation in beef cattle business based on farmer attitudes

Number	Attitude of Farmer	Score	Frequency (Person)	Percentage	Weight (score x frequency)
1.	Relative Advantage	3	116	77.33	348
	Good	2	23	15.33	46
	Less good	1	11	7.34	11
	Not good				
Total			150	100	405
2.	Flexibility	3	113	75.33	339
	Good	2	28	18.67	56
	Less good	1	9	6.00	9
	Not good				
Total			150	100	404
3.	Observability	3	100	66.67	300
	Good	2	39	26.00	78
	Less good	1	11	7.33	11
	Not good				
Total			150	100	389
4.	Reliability	3	116	77.33	348
	Good	2	28	18.67	56
	Less good	1	6	4.00	6
	Not good				
Total			150	100	410
5.	Complexity	3	101	67.33	303
	Good	2	45	30.00	90
	Less good	1	4	2.67	4
	Not good				
Total			150	100	397
Total Score					2005

Table 1 shows that the score for the assessment of farmers attitudes towards economic cooperation in beef cattle business in Libureng district, Bone Regency based on the sub-variables of relative advantage, flexibility, observability, reliability, and complexity is 2005. From the results of this study it means that the value of farmer attitudes is in the good category range. (1750-2250). This shows that the attitude of the farmers towards economic cooperation in beef cattle business as a whole has a good attitude. The attitude of farmers can be influenced by the relative benefits obtained when conducting cooperation so that they are willing to adopt the cooperation system. According to Rahab (2009), the relative advantage of an innovation has a significant effect on innovation adoption.

According to Ramdhani (2010), attitudes are the number of affections a person has in accepting or rejecting an object or a behavior and that is measured by a procedure that put the individual on a two-pole evaluative scale, for example good or bad; agree or reject, and others. Attitudes are relatively difficult to change and attitudes make people behave relatively consistently towards an object. A comprehensive evaluation that allows individuals to respond in a consistently favorable or unfavorable way with regard to an object, can be defined as an attitude (Burhannudin, 2007).

Farmers subjective norms on the adoption of beef cattle business economic cooperation

Farmer behavior towards economic cooperation in beef cattle business based on farmer subjective norms is described in Table 2.

Table 2 shows that the score for the subjective norms of farmers on economic cooperation in beef cattle business in Libureng District, Bone Regency which is based on the role of family, the role of other farmers, the role of community leaders, the role of government, and the role of information media is 1944.

From the results of this study it means that the value the subjective norms of farmers are in the good category range (1750 - 2250). This can occur because farmers feel that it is not themselves that encourages them to carry out economic cooperation in beef cattle farming. Subjective norms show an individual's belief in the approval or at least from social figures if he commits an action. Important social figures may include parents, close friends, husband or wife, coworkers. Nurjaman, Ujang, and Kirbrandoko (2015) suggest that normative beliefs refer to perceived behavioral expectations from individual or group references.

A farmer's interest in doing or not doing the behavior that is considered is greatly influenced by a farmer's view of the beliefs of others. The decision to behave cannot be separated from the behavioral activities of the breeder. A farmer in making a decision will be based on their own considerations and the considerations of others that they deem important. Decisions that are chosen can fail to be made if other people's considerations do not support, even if personal considerations are favorable. Thus, the subjective considerations of other parties can provide encouragement to undertake entrepreneurship or entrepreneurial decisions; this is called subjective norms (Jogiyanto, 2007).

Two components of subjective norms according to Ajzen (2006): (a) norm belief: reference to display behavior or not depends on the perceptions and expectations of others for them. Perceptions related to the opinions of important figures or other people have an influence on individuals or role models in doing or not doing certain behaviors; (b) motivation to fulfill: individual motivation to meet these expectations. Subjective norms can be seen as the dynamics between the drives that individuals perceive from the people around them with the motivation to follow their views in following or not following the same.

Table 2: Farmer behavior towards economic cooperation in beef cattle business based on farmer subjective norms

Number	Subjective Norms Farmer	Score	Frequency (Person)	Percentage	Weight (score x frequency)
1.	The role of the family				
	Good	3	110	73,33	330
	Less good	2	33	22,00	66
	Not good	1	7	4,67	7
Total			150	100	403
2.	The role of other farmers				
	Good	3	103	68,67	309
	Less good	2	44	29,33	88
	Not good	1	3	2,00	3
Total			150	100	400
3.	The role of community leaders				
	Good	3	107	71,33	321
	Less good	2	39	26,00	78
	Not good	1	4	2,67	4
Total			150	100	403
4.	The role of government				
	Good	3	99	66,00	297
	Less good	2	31	20,67	62
	Not good	1	20	13,33	20
Total			150	100	379
5.	The role of information media				
	Good	3	68	45,33	204
	Less good	2	73	48,67	146
	Not good	1	9	6,00	9
Total			150	100	359
Total Score					1944

Behavior control of farmers on the adoption of beef cattle business economic cooperation

Farmer behavior towards economic cooperation in beef cattle business based on farmer behavior control is described in Table 3.

Table 3 shows that the assessment score of farmer behavior control on economic cooperation in beef cattle business in Libureng District, Bone Regency is based on the availability of beef cattle business facilities and infrastructure, the suitability of economic cooperation with farmers habits, the risk received by farmers following economic cooperation in beef cattle business is 1135. The results of this study showed that the value of farmer behavior control is in the good category range (1050 - 1350). This can occur because of the belief of the farmers in conducting economic cooperation in the beef cattle business. The ease or difficulty of carrying out a behavior is largely determined by a number of beliefs about the factors in a behavior control.

Behavioral control directly affects the intention to carry out a behavior and also affects behavior (Ajzen, 2006). Where in a situation the user intends to carry out a behavior but is prevented from carrying out the action. Perceived behavioral control is indicated by a person's response to obstacles from within or from outside while carrying out behavior or behavior. Behavioral control can measure a person's ability to get something in taking an activity.

Behavior will depend on the interaction between attitudes, beliefs, and behavioral intentions. A person's behavioral intention will also be influenced by the behavioral control he has. Behavioral control that is owned is a condition in which a person believes that an action will be easy or difficult to do, if it is influenced by past experiences and obstacles that are considered by the person (Tjahjono, 2005). Direct influence can occur if there is actual control outside the individual's will so that it affects behavior. The more positive the attitude towards subjective behavior and norms, the greater the perceived control a person will have, so the stronger the person's intention to elicit certain behaviors.

Behavioral control according to Ajzen (2006) refers to a person's perceptions of his ability to display certain behaviors. In other words, behavioral control refers to the extent to which a person feels that displaying or not displaying certain behaviors is under the control of the individual concerned. Behavioral control may be indicated by the individual's response to internal or external constraints when carrying out a behavior or behavior. Behavioral control can measure a person's ability to achieve something in an activity.

Influence of beef cattle business factors on the decision to adopt economic cooperation in beef cattle business

The influence of farmer behavior factors on the decision to adopt economic cooperation in beef cattle business was analyzed using logistic regression analysis. This is done because the dependent variable (P) is categorical, namely the opportunity for farmers to adopt economic cooperation in beef cattle business is given a value of 1 and not to adopt economic cooperation in beef cattle business is given a value of 0. While the independent variable consists of farmer attitudes (X₁), subjective norms farmer (X₂), and farmer behavior control (X₃).

Model feasibility test

In order to determine whether the model of the influence of farmer behavior factors is feasible on the decision to adopt economic cooperation in beef cattle business, a feasibility test of the model is carried out. The feasibility test of this research model can be seen in the Omnibus Tests of Model Coefficients table as in Table 4.

In Table 4, it shows that G2 = 18,574 with significant (sig) = 0.028, because $\alpha = 0.05 > sig = 0.028$, then there is at least one independent variable that affects the model. In the column sig. shows a value of 0.028, which means that the research model is significant and can be continued on a feasible sample or is able to predict the nature of the population?

Table 3: Farmer behavior towards economic cooperation in beef cattle business based on farmer behavior control.

Number	Behavior Control Farmer	Score	Frequency (Person)	Percentage	Weight (score x frequency)
1.	Availability of beef cattle business facilities dan infrastructure				
	Good	3	79	52,67	237
	Less good	2	45	30,00	90
	Not good	1	26	17,33	26
Total			150	100	353
2.	The compatibility of the economic cooperation system with the farmers habits				
	Good	3	104	69,33	312
	Less good	2	46	30,67	92
	Not good	1	0	0	0
Total			150	100	404
3.	The risks received by breeders following economic cooperation				
	Good	3	89	59,33	267
	Less good	2	50	33,33	100
	Not good	1	11	7,34	11
Total			150	100	378
Total Score					1135

Table 4: Omnibus test coefficient model

		Chi-square	Df	Sig.
Step 1	Step	18.574	3	.028
	Block	18.574	3	.028
	Model	18.574	3	.028

Furthermore, the goodness-of-fit test is carried out using the Hosmer-Lemeshow method, the results of which can be seen in Table 5.

Table 5 shows a significant level (0.034) which is smaller than Alpha 5%, in other words the hypothesis is accepted (there is a significant difference between the model and the observed value), because $\alpha = 0.05 > \text{sig.} = 0.034$. This means that the model used is relatively able to explain the data at a 95% confidence level of the logistic binary regression model.

Table 5: Results of model goodness test with the Hosmer-Lemeshow method

Step	Chi-square	df	Sig.
1	17.583	3	.034

To see how good the model is, parameter estimation is carried out to predict and classify farmers on the dependent variable. The parameter estimation value is obtained by comparing the factual Y with the estimated Y. The results of parameter estimation are presented in Table 6.

Table 6 shows the results that the overall percentage value is 70.4, this indicated that the used binary logistic regression model is able to provide an explanation of 70.4% of the actual condition.

Simultaneous influence test of independent variables

The joint effect of the independent variables on the dependent variable can be seen through the R Square results in the Summery model. The results of the summery model are presented in Table 7.

Table 7 shows that the Nagelkerke R Square column indicated that a value of 0.837, which means that 83.7% of the breeder's attitude variable (X_1), farmer's subjective norm (X_2), and farmer's behavior control (X_3) jointly affect the variable farmer's decision to adopt beef cattle business economic cooperation (P). Meanwhile, there are 16.3% of other factors that can affect the P variable.

Partial influence test of independent variables

To determine the effect of farmer attitude variables (X_1), farmer subjective norms (X_2), and farmer behavior control

(X_3) on the variable farmers opportunity to partially adopt beef cattle business economic cooperation (P), it can be seen in Table 8.

In Table 8, it can be seen that the significant value (sig.) of each independent variable. Significant value is a number that shows a significant level through partial testing. Based on Table 8, the influence of farmer attitude variables (X_1), farmer subjective norms (X_2), and farmer behavior control (X_3) will be discussed on the opportunity for farmers to adopt economic cooperation in beef cattle business (P) as follows:

1. The farmer attitude variable (X_1) has a significant value (sig.) of 0.035. This significant value is smaller when compared to $\alpha = 0.05$ ($0.035 < 0.05$), this means that the variable farmers attitude affects the opportunity for farmers to adopt economic cooperation in beef cattle business. The odd ratio (Exp.B) value of 1.458 means that the good attitude of farmers will adopt the economic cooperation in beef cattle business as much as 1.458 times better. The greater the odds ratio, the greater the chance for farmers to adopt economic cooperation through attitude. The results of this study indicate that the attitude of the farmers towards the system of economic cooperation in beef cattle business in Libureng District, Bone Regency is good. Therefore, to improve the attitude of farmers in adopting economic cooperation, a better understanding is needed regarding the mechanism of the economic cooperation system, because attitudes play a role in shaping farmers behavior to carry out economic cooperation in beef cattle business. According to Latief (2011), attitudes are mental and neural conditions obtained from experience, which dynamically influence individual responses to all related objects and situations. Ramdhani (2008) states that the idea which is a predisposition is related to emotion. Meanwhile, according to Luthfi (2009) the attitude domain can be understood as a dimension or elements of attitude. This element makes it easier for someone to understand or measure attitudes. Rahma (2011) argues that there are two groups in the formation of attitudes, namely: (a) behavioral beliefs are beliefs that a person has about behavior and are beliefs that will encourage the formation of attitudes; (b) evaluation of behavioral belief is an individuals positive or negative evaluation of certain behaviors based on their beliefs. Borges, et al. (2016) stated that the good attitude of farmers towards their livestock farming which is marked by the number of livestock being raised is able to increase farmer adoption in animal feed crops. The attitude of farmers to dare to take risks on their farming will improve the production performance of their cattle business thereby increasing the entrepreneurial spirit of cattle farmers.

Table 6: Estimation of parameters on dependent variables

	Observed	Predicted			
			Opportunities for Farmers to Adopt Economic Cooperation (P)		Percentage Correct
			0.00	1.00	
Step 1	Opportunities for Farmers to Adopt Economic Cooperation (P)	.00	27	33	45.7
		1.00	23	67	84.1
Overall Percentage					70.4

Table 7: Summery model

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	19.751 ^a	0.623	0.837

Table 8: Variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	X ₁	.471	.254	3.146	1	.035	1.458
	X ₂	.432	.216	2.813	1	.041	1.216
	X ₃	.548	.287	3.645	1	.027	1.689
	Constant	-2.417	3.125	.587	1	.432	.063

2. The farmer subjective norm variable (X₂) has a significant value (sig.) of 0.041. When compared with $\alpha = 0.05$, this significant value is smaller than the value of $\alpha = 0.05$ ($0.041 < 0.05$), this means that the subjective farmers norm variable has an effect on the variable opportunities for farmers to adopt economic cooperation in beef cattle business. The odd ratio (Exp.B) value of 1.216 means that the subjective norm value of good farmers will adopt economic cooperation in beef cattle business as much as 1.216 times better. The greater the odds ratio, the greater the chance for farmers to adopt economic cooperation through subjective norms that apply to farmers territory. The results of this study indicate that based on the subjective norms of farmers, the economic cooperation system for beef cattle business in Libureng District, Bone Regency has been carried out well by the farmers. Therefore, in order to increase the subjective norms of farmers in adopting economic cooperation, it is necessary to encourage confidence from the family, leaders and administrators of farmer groups, community leaders as well as information received by farmers so that they want to carry out economic cooperation. Subjective norms can be seen as dynamics perceived by individuals from the people around them with the motivation to follow their views (motivation to comply) in adopting or not adopting the behavior. Beliefs about other people's expectations of him which become a reference for displaying behavior or not. Beliefs related to the opinion of figures or other people who are important and influential for the individual or role model, whether the subject should do or not have a certain behavior (Ajzen, 2006). Subjective norm is a farmer's perception or view of the beliefs of other parties that will affect the interest in doing or not doing the behavior being considered (Jogiyanto, 2007). Decisions to be made by a farmer are made on their own and on the basis of other people's considerations that are considered important.

3. The farmer behavior control variable (X₃) has a significant level (sig.) of 0.027 with $\alpha = 0.05$. This significant value is smaller than the value of $\alpha = 0.05$ ($0.027 < 0.05$), this means that the control variable of farmer behavior has an effect on the opportunity variable for farmers to adopt economic cooperation in beef cattle business. The odd ratio (Exp.B) 1.689 means that the control value of a good breeder's behavior will adopt economic cooperation in beef cattle business as much as 1.689 times better. The greater the value of the odd ratio, the greater the opportunity for farmers to adopt economic cooperation through behavioral control carried out by farmers. This study shows that the results that based on the behavioral control of farmers, the economic cooperation system for beef cattle business in Libureng District, Bone Regency is determined by how much confidence there is in the presence of factors that can facilitate or complicate the decision of farmers to conduct economic cooperation in beef cattle business. Affordability is part of behavior control. Affordability is a concern of being able to bear costs without serious losses in capacity for farmers. Behavior control is determined by a number of beliefs about the presence of factors that can facilitate or complicate the

performance of the displayed behavior. In order to measure a person's ability to obtain something in taking an activity, it is necessary to control the behavior.

The regression coefficient (B) of the farmer attitude variable (X₁), farmer subjective norm (X₂), and farmer behavior control (X₃) in Table 7 can be made a binary logistic regression equation with the logit model as follows:

$$P = -2.417 + 0.471X_1 + 0.432X_2 + 0.548X_3$$

From the results of the logistic regression equation it can be interpreted that the parameter coefficient on the farmer attitude variable (X₁), farmer subjective norm (X₂), and farmer behavior control (X₃) is positive. This means that farmers attitudes, farmers subjective norms, and good farmer behavior control tend to have great opportunities for farmers to carry out economic cooperation in beef cattle business. The opportunity for farmers to conduct economic cooperation is a form of adoption process to accept or reject the system of economic cooperation.

Acceptance of innovation adoption goes through several stages, starting from the stage of knowledge, persuasion, decision, implementation and confirmation. The five innovation decision processes can be explained as follows: the first stage, knowledge occurs when a person is exposed to information about the existence of an innovation and obtains an understanding of how the innovation functions. The second stage is persuasion, where certain communication channels influence the target for adopting innovation. The third stage is the decision-making process, which occurs when a person carries out activities that lead to a choice to adopt or reject innovation. The fourth stage is implementation, which is the time when someone uses or implements the innovation in real activities. The fifth stage is confirmation, which is the stage where a person looks for reaffirmation of the innovation decisions that have been made which may change the decisions that have been made if he is exposed to information contrary to innovation (Rogers, 2003; Pumaningsih et al. 2006; Mulyandari, 2011).

There are five characteristics of innovation according to Rogers (2003). First, the relative advantage, which is the degree to which a new idea is considered better than existing ideas. This relative profit rate is often expressed in the form of economic benefits (lower or higher costs, lower or higher profits than previous technologies), technical (productivity, resistance to the risk of failure and disruption that causes failure), and socio-psychological needs. physiological, psychological and sociological. The second characteristic of innovation is compatibility, which is the level of conformity of an innovation with needs, past experiences, beliefs, value systems and recipient norms. Innovations incompatible with the characteristics of the social system will not be adopted as quickly as appropriate innovation. Third, namely complexity, is the level of an innovation that is considered relatively difficult to understand and use when compared to previous innovations. The more complex an innovation is for a person, the slower the adoption process will be. The fourth characteristic is that it can be

tried (trialability), which is the degree to which an innovation can be tried on a small scale. Innovations that can be tried are usually adopted more quickly than those that cannot be tried first, because these small-scale trials will reduce the risk of failure for adopters.

Conclusion

From the research results following conclusion can be drawn (1) farmers behavior consisting of attitudes, subjective norms, behavior control provides a good response to the economic cooperation in beef cattle business; and (2) Attitude, subjective norms, farmers behavior control have an effect on the opportunity for farmers to adopt the economic cooperation of beef cattle business in Libureng District, Bone Regency, both simultaneously and partially.

Acknowledgment

I would like to extend my thanks to the Directorate of Research and Community Service of the Ministry of Research and Technology / the National Innovation Research Agency of the Republic of Indonesia who have provided research funding assistance with the Higher Education Leading Basic Research scheme. The Chancellor, Chair of the Institute for Research and Community Service and the Dean of the Faculty of Animal Science, Hasanuddin University who have given confidence to carry out this research.

References

- Aizen I (2006) Construction of A Standard Questionnaire for Conceptual and Methodological Considerations the Theory of Planned Behavior. <http://www.unix.oit.umass.edu/~aizen>. Diakses 10 Desember 2018.
- Borges JA, Rossi, Tauera LW, Alfons GJM and Lansink O (2016) Using the Theory of Planned Behavior to Identify Key Beliefs Underlying Brazilian Cattle Farmers Intention to Use Improved Natural Grassland: A MIMIC Modelling Approach. *Land Use Policy* 55: 193-203.
- Burhanuddin (2007) "Feedback and Performance of Technology Application at P4MI". Inside, Correctional Technology Appropriate and Empowerment of Farmers Support Increased Income in Marginal Land. Palu National Seminar. 24-25 July 2007. Palu; BPTP Palu. Agricultural Research and Development Agency, Ministry of Agriculture.
- Dwiyanto KS, Rusdiana and B Wibowo (2010) Beef Cattle Agribusiness Development in an Integrated Coconut Farming System. *Wartazoa* 20(1): 21-42.
- Jogiyanto (2007) Behavioral Information Systems. Yogyakarta: Publisher Andi.
- Latief WA (2011) Analysis of Consumer Psychological Factors and Their Effects on Purchasing Decisions. *Indonesian J. Adminis.* 1:1.
- Luthfi I (2009) Social Psychology. Jakarta: UIN Jakarta Research Institute.
- Mulyandari RSH (2011) Cyber Extension as a Communication Media in Empowering Vegetable Farmers. [Dissertation]. IPB Bogor Postgraduate School.
- Nurjaman Ujang S and Kirbrandoko (2015) Business Behavior in Adopting Agricultural Innovations. *Res. J. Bus. Manag.* 16(1): 29-37.
- Prager K, Posthumus H (2010) Adopting Sustainable Soil management the Role of Socio-Economic Factors. In: Paper for the 16th Annual International Sustainable Development Research Conference. Track "Sustainable Agriculture". [Internet]. [Time and place of meeting: Hong Kong, 30 May - 1 June, 2010].
- Purnaningsih N, Sugihen BG, Slamet M, Saefuddin A and Padmowiharjo S (2006) Factors Affecting Adoption of Vegetable Agribusiness Partnership Innovation Patterns in West Java. *J. Ext.* 2(2).
- Rahab (2009) The Relationship between Technology Characteristics and the Likelihood of Small Businesses in Adopting IT. *Journal of Economics and Business* Vol.6 No.12.
- Rahma (2011) The Influence of Attitudes, Subjective Norms and Perceived Behavioral Control on Intention to Buy Reference Books for Illegal Lecture Books on Students of UIN Syarif Hidayatullah Jakarta, Syarif Hidayatullah Islamic University.
- Ramadiani (2008) Structural Equation Model for Multivariate Analysis Using LISREL. Mulawarman University, Samarinda.
- Ramdhani N (2010) Attitudes and Some Definitions to Understand Them. Gajah Mada University, Yogyakarta.
- Rogers M (2003) Diffusion of Innovation. 5th ed., New York.
- Rusdiana S, B Wibowo and L Praharani (2010) Absorption of Human Resources in Analysis of Rural Beef Cattle Fattening Business. Proceedings of the National Seminar on Animal Husbandry and Veterinary, Bogor Research and Development Center. p. 453-460.
- Salim E (2013) Business Success and Beef Cattle Breeding. Lily Publisher, Yogyakarta.
- Sugiyono (2014) Statistics for Research. 24th Printing. Publisher CV. Alfabeta, Bandung.
- Tjahjono HK (2005) Study of Management Student Intention of Muhammadiyah Yogyakarta University to Become Entrepreneurs. Muhammadiyah University, Yogyakarta.

Application of Logistic Regression Affecting Behavior of Farmers in Adopting Economic Cooperation in Beef Cattle Business

ORIGINALITY REPORT

14%	%	14%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

- 1** ST Rohani, A R Siregar, T G Rasyid, M Darwis. "Motivation of farmers to participate in beef cattle business with profit sharing system", IOP Conference Series: Earth and Environmental Science, 2021
Publication 4%
- 2** St Rohani, A R Siregar, T G Rasyid, I M Saleh, M Darwis, P Astaman. "Socio-economic factors of farmers in implementing the profit-sharing system in beef cattle business", IOP Conference Series: Earth and Environmental Science, 2021
Publication 3%
- 3** T G Rasyid, S T Rohani, M Aminawar, M Darwis. "Motivation of farmers to increase goats production", IOP Conference Series: Earth and Environmental Science, 2020
Publication 2%

4 Nureni Olawale Adeboye, Olawale Victor Abimbola, Sakinat Oluwabukola Folorunso. "Malaria patients in Nigeria: Data exploration approach", Data in Brief, 2020

Publication

1 %

5 Sheylla Septina Margareta, Ely Isnaeni. "Instructional Leadership Based On Theory Of Planned Behaviors In Improving Nuring Students 'Commulative Achievement Index", STRADA Jurnal Ilmiah Kesehatan, 2020

Publication

1 %

6 Sevenpri Candra, Steffani Steffani, Klaudiya Klaudiya, Iva Sutiana. "chapter 31 The Actual Use of Social Media in Indonesia", IGI Global, 2021

Publication

<1 %

7 Y Fahmidani, E Rohaeti. "Attitude toward chemistry: Student's perception based on learning experience", Journal of Physics: Conference Series, 2020

Publication

<1 %

8 Dede Kardaya, Ristika Handarini, Wini Nahraeni, Elis Dihansih, Deden Sudrajat. "CHARACTERISTICS OF BEEF CATTLE FARMERS AT SOUTHERN WEST JAVA", Indonesian Journal of Applied Research (IJAR), 2020

Publication

<1 %

9 St Rohani, M Aminawar, AR Siregar, M Darwis, ME Kurniawan. "Farmers satisfaction level on broiler partnership system in Tompobulu District, Maros Regency, South Sulawesi Province, Indonesia", IOP Conference Series: Earth and Environmental Science, 2019
Publication

10 Mardianah, Ikhsan Fuady, Moch. Armien Syifaa Sutarjo. "Factors affecting the intention of organic agricultural behavior in Tidore City", E3S Web of Conferences, 2021
Publication

11 Senger, Igor, João Augusto Rossi Borges, and João Armando Dessimon Machado. "Using the theory of planned behavior to understand the intention of small farmers in diversifying their agricultural production", Journal of Rural Studies, 2017.
Publication

12 Alek Ibrahim, Deny Setyo Wibowo, I Gede Suparta Budisatria, Rini Widayanti, Wayan Tunas Artama. "Relationship Between Sheep Farmer's Characteristics with the Animal and Environmental Health Management Practices in Batur Village, Banjarnegara, Indonesia", BIO Web of Conferences, 2021
Publication

13 Tolmie, Andy, Muijs, Daniel, McAteer, Erica. "EBOOK: Quantitative Methods In Educational And Social Research Using Spss", EBOOK: Quantitative Methods In Educational And Social Research Using Spss, 2011

Publication

<1 %

14 David Chella Baskar, Kavitha, Senthil kumarvel, Sundar Pal. "An Economic Analysis on Willingness to Pay for Jhansi Fort: An Evidence from Uttar Pradesh", Research Square Platform LLC, 2022

Publication

<1 %

15 Hye-ryeon Lee, Amy S. Ebesu Hubbard, Cailin Kulp O'Riordan, Min-Sun Kim. "Incorporating Culture into the Theory of Planned Behavior: Predicting Smoking Cessation Intentions among College Students", Asian Journal of Communication, 2006

Publication

<1 %

16 T G Rasyid, St Rohani, M Hatta, M Darwis. "Poverty alleviation of beef cattle farmers through empowerment approach critical awareness-based", IOP Conference Series: Earth and Environmental Science, 2021

Publication

<1 %

Exclude quotes On

Exclude matches < 5 words

Exclude bibliography On