The attitude of beef cattle farmers to biosecurity adoption

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Abstract. The aim of this research is to know beef cattle farmers' attitude toward biosecurity in Lamasi Subdistrict, Luwu Regency, South Sulawesi Province. Total samples were 32 beef cattle farmers who were chosen purposively. The data were collected through observation and interview using questionnaire. There were 9 questions. Every question has three answers. Likert scale was used: 1 for disagree, 2 for less agree, and 3 for agree. The data were analysed descriptively using mean and frequency distribution. The research revealed that beef cattle farmers less agree on the application of biosecurity. In other words, beef cattle farmers have a negative attitude toward biosecurity adoption. The implication of this research is the need for cooperation between government, privates, and farmers' participation to apply biosecurity to produce healthy meat.

Introduction

The success of control programs can be improved when producers' attitudes towards these programs are positive. Implementation of control programs for chronic diseases is because of the absence of the "cues-to-action" that are associated with acute diseases [1]. Biosecurity is management to prevent disease transmission from livestock to humans through vaccination, sanitation, and traffic management. Biosecurity policies are established by the Indonesian government in an effort to increase livestock productivity. Even though there are or no cases of infectious diseases, biosecurity should be applied to types of livestock business. However, the breeders have not all implemented biosecurity because of lack of time, lack of capital, lack of land, and less motivation. According to [2] only 47.4% of beef cattle farmers in Barru Regency, South Sulawesi province, Indonesia has adopted biosecurity on their farms and was categorized as a "partial adopter". Anthrax disease case was once found in Luwu Regency 10 years ago. This kind of diseases is very dangerous because it is zoonotic. The objective of this research was to know beef cattle farmers' attitude to biosecurity adoption.

2. Materials and Methods

The design of this study is a survey. The type of research used in this study is quantitative descriptive. The population in this research is the whole household of beef cattle farmers in Lamasi Sub-district of Luwu Regency. The total population was 46 beef cattle farmers. The sampling technique uses formulas from Taro Jamane in [3] as follows:

$$n = \frac{N}{Nd^2+1} \quad (1)$$

where:
n = number of samples
N = number of populations
d^2 = precision

$$n = \frac{46}{46(0.1)^2+1} = 31.5 ==> 32 \quad (2)$$

The sample of 32 people was chosen by purposive sampling. The characteristic of the application of biosecurity consisted: a. The relative advantage; b. Conformity with local custom or culture; c. Compatibility with local environmental conditions; d. Compliance with the needs of farmers; e. Complexity; f. Observability; g. Reliability; h. Productivity; and i. Quality. The data collected in the research consisted of primary data and secondary data. The primary data were collected by observation and interview using questionnaires. Interviews with these respondents consisted of attitudes defined as individual perceptions of the application of biosecurity.

Attitude is a part of behavior. The behaviour of breeders toward biosecurity can be approached with the behavioural theory that is the Theory of Planned Behaviour (TPB). Theory of Planned Behaviour consists of two antecedents that are intention-behaviour and perceived behavioural control. The intention to behave indicates how hard a person has a desire to try, how big his business is to plan so that it can display a behaviour. The intention to behave is a function of attitudes toward behaviour and subjective norms of behaviour [4]. According to [5], attitudes of English dairy farmers toward production technologies played an important role in their behaviour intent, which was reflected in their actual adoption behavior.

In this research, to measure attitudes, opinions, and perceptions of a person or group about social events or symptoms can be classified as not agree given score 1, less agree given score 2 and agree given score 3. Analysis of research data will be done with quantitative descriptive analysis by using statistic average (mean), percentage, and frequency distribution table.

3. Results and Discussion

Table 1 showed that respondents were dominated by men (84.38%). To maintain beef cattle, many activities were needed to cut for grass, clean the cage, and bath the cow. Women have already burdened with domestic work such as caring for children, cooking, washing, and cleaning the house, so the percentage of women was small (16.62%). According to the age of respondents, which is on average was 47.55 years, the majority of respondents (96.88%) were at a productive age. It indicates that the existing human resources strongly support the business of beef cattle. On average, respondents spent 13.44 years at the school. More than 50% of respondents graduated from Elementary school. It indicated that their education was low. Low education will hinder the implementation of innovation. Farm experience of respondents was good because on average it was more than 5 years. More than 50% of respondents (53.13%) have farm experience for more than 10 years. On average, the number of beef cattle was small (3.7 heads). Majority of respondents (96.88%) have beef cattle less than 10 heads.

Biosecurity focuses on maintaining or improving the health status of animals and preventing the entry of new disease pathogens by assessing all possible risks for animal health [6]. Biosecurity is applied to the entire production chain. Many risk management practices are continuously conducted regardless of whether there is an outbreak or not [7]. According to [8], biosecurity indicators consist of written biosecurity plans, isolation, newly arrived cattle treatment, animal health, equipment hygiene, traffic control, waste management, dead animal carcasses, breeder control of other animals such as rats and birds and sanitation.

Adoption is the decision to continue the full use of innovation once the individual has passed a certain mental process. Adoption is the continued acceptance of using innovation once the individual or group has gone through a certain mental process [9]. Adoption is a process of receiving an innovation. Hopefully, there is a change in cognitive, affective, and psychomotor to anybody who gets innovation

from extension worker [10]. Adoption, according to [11] is the decision to make full use of technology as the best course of action available. Farmers may decide to use the technology continuously from time to time. The period taken for adoption varies with the nature of the technology, the channel communication used, and the characteristics of the social system. According to [12], there were five stages in the adoption process as follows: the awareness stage, the interest stage, the evaluation stage, the trial stage, and the adoption stage.

Table 1. Characteristic of beef cattle farmers

No	Characteristics	Percentage	Average
	Gender		
1	Men	84.38	
	Women	15.62	
	Age (year)		
2	< 65 (productive age)	96.88	47.55
	≥ 65 (unproductive age)	3.12	
	Education (year)		
3	Elementary School	56.25	13.44
	Junior High School	28.13	
	Senior High School	15.62	
	Farm experience (year)		
4	1 – 10	46.87	8.40
	> 10	53.13	
	Number of beef cattle (animal)		
5	< 10	96.88	3.70
	> 10	3.12	

There are five main characteristics of innovations that determine how innovation will be responded to by a potential farmer/end-user: Relative Advantage – The degree to which an innovation is seen as better than the idea, program, or product it replaces; Compatibility – How consistent the innovation is with the values, experiences, and needs of the potential adopters; Complexity – How difficult the innovation is to understand and/or use; Trial ability – The extent to which the innovation can be tested or experimented with before a commitment to adopt is made; Observability – The extent to which the innovation provides tangible results.

Table 2 showed that application of biosecurity benefits farmers: More than 50% (68.96%) disagree that the application of biosecurity benefits farmers. The benefits obtained from biosecurity adoption were not discussed in many kinds of literature.

1. Application of biosecurity in accordance with local custom or culture: More than 50% (51.72%) of respondents did not agree if the application of biosecurity in accordance with local custom or culture. In practice, beef cattle farmers release cattle on rice fields for grassing, while the application of biosecurity suggests beef cattle should be stacked.
2. Application of biosecurity in accordance with the environmental conditions of local communities: More than 50% (53.28%) of respondents do not agree if the application of biosecurity in accordance with the environmental conditions of local communities. An example is the location of the cage that is too close to the house because of the safety factor of the theft of livestock. Whereas according to the requirements, a good cage location at least 250 meters away from home.
3. Application of biosecurity in accordance with the needs of breeders: More than 50% of respondents (62.06%) less agree if the application of biosecurity in accordance with the needs of farmers. In fact, breeders want a high price of livestock and market it, while the application of biosecurity does not guarantee the high price of livestock.

4. The application of biosecurity is complicated: More than 50% (62.02%) of respondents agree that the application of biosecurity is complicated, whereas in fact breeders have been preoccupied with their main activity in the paddy field.
5. Application of biosecurity is easily observed: More than 50% (55.17%) of respondents disagree that the application of biosecurity is easily observed.
6. Biosecurity applications can be tried on a small scale: More than 50% (55.17%) of respondents agree that the application of biosecurity can be tested on a small scale because the risk is also small.
7. Application of biosecurity may increase meat production: More than 50% (89.65%) of respondents disagree if the application of biosecurity can increase beef production. According to respondents, biosecurity application of beef cattle already exists but still minimal, but the livestock is safe and productive.
8. Application of biosecurity can improve the quality of beef: More than 50% (62.07%) disagree if the application of biosecurity can improve the quality of beef.

Table 2. The attitude of beef cattle farmers to biosecurity

Statement	% Agree	% Less Agree	% Disagree
Application of biosecurity benefits farmers	10.36	68.96	20.68
Application of biosecurity in accordance with local custom or culture	44.83	51.72	3.45
Application of biosecurity in accordance with the environmental conditions of local communities	36.38	53.28	10.34
Application of biosecurity in accordance with the needs of breeders	24.15	62.06	13.79
The application of biosecurity is complicated	62.03	24.83	14.13
Application of biosecurity is easily observed	24.14	55.17	20.69
Biosecurity applications can be tried on a small scale	55.17	41.38	3.45
Application of biosecurity may increase meat production	0.00	89.65	10.35
Application of biosecurity can improve the quality of beef	20.69	62.07	17.24

In general respondents have a negative attitude to biosecurity adoption. The results of this study are in accordance with the opinion of [13] who said most producers felt the nominated biosecurity practices were in some way useful. However, there was not always match between the usefulness of practice and the practice undertaken and vice versa.

4. Conclusions

Based on the result of the research, it can be concluded that in general beef cattle farmers less agree with biosecurity adoption. Regarding the results, it can be suggested that it is important to motivate beef cattle farmers to adopt biosecurity in order to get healthy meat.

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