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Knowledge and Attitudes of Farmer Regarding The Use of Antibiotic and Its Resistance in Broiler Chicken at Aceh Besar Farm

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Abstract

This study aims to assess farmers' knowledge and attitudes towards the use of antibiotics in broiler chickens in Aceh Besar Farm. The respondents' population was obtained from 13 farmers who were interviewed, and the results obtained were 13 samples with a margin of error of 5%. Data were collected by interview using an open questionnaire that had been validated. The validity test results of farmers' knowledge and attitudes have a value of r> 0.5529, which means that they are declared valid. The reliability test results of knowledge and attitudes of animal husbandry have a value of> 0.60, so both are declared reliable. Data were analyzed using independent t-test. Based on the interview results, 80% of the farmer respondents in Aceh Besar had good knowledge of the use of antibiotics, 93.33% of respondents gave antibiotics according to clinical symptoms. Farmers' knowledge and attitudes towards the use of antibiotics based on business experience (<5 years and ≥ 5 years) showed significantly different results ($p<0.05$). The farmer's knowledge and attitudes towards the use of antibiotics based on the number of broilers raised on the farm showed no significant difference ($p>0.05$). Based on gender and age, farmers' knowledge and attitudes showed no significant difference ($p> 0.05$ in all comparisons). The knowledge and attitudes of 13 farmers were good towards the use and resistance of antibiotics in Aceh Besar District.

Keywords: Antibiotics, Attitude, Broiler Chickens, Knowledge, Resistance.

Background

Currently, the need for food of animal origin in Indonesia is very high. One of the most popular products for consumers is broiler chicken. This poultry contains high animal protein. The broiler production process is relatively fast and the market price is relatively cheap compared to other livestock. Therefore, many broiler chicken farms are currently developed by the community (Muharlien et al., 2011; Umam et al., 2014 and Quniawan et al., 2016).

The increase in consumer demand for broiler chicken triggered farmers to increase their production numbers rapidly. However, sometimes there are farmer who takes various ways to increase this production (Loisa et al., 2016). One of them is by mixing antibiotics in livestock feed or drinking water either intentionally or not. The use of antibiotics to help broiler chickens' growth has a beneficial effect when given wisely and according to the rules. Conversely, the use of antibiotics that are not according to the rules can decrease these antibiotics' effectiveness. The use of antibiotics that do not follow the rules can lead to residue remaining in animal tissues and organs (Ardhany et al., 2016).

In addition to impacting food product of animal origin, antibiotic resistance can also endanger consumers (Etikaningrum and Iwantoro, 2017). The impact of antibiotic residues on consumers' food products includes toxicological, microbiological and immunopathological hazards (Dewi et al., 2014).

Based on such situations, education to farmers and farm workers about antibiotics is needed to increase their knowledge and awareness (Sadiq et al., 2018). To find out how deep the farmer's

understanding of antibiotics, information from related parties is needed, which is then examined as material for consideration in compiling educational materials according to needs (Hartayu et al., 2013).

In Aceh Province, especially in Aceh Besar District, many broiler farms are maintained intensively (Aceh Animal Husbandry Service, 2017). Based on this background, the researchers were interested in studying farmers' knowledge and attitudes in the use of antibiotics and its resistance in broilers on farms in Aceh Besar District.

Materials and Method

This research was conducted on several broiler chicken farms in Montasik, Kuta Baro and Blang Bintang subdistricts in Aceh Besar in May 2020. The tools and materials used in this study were pens, road boards, notebooks, cameras, questionnaire sheets and laptops were used. to process data. This research was conducted in the form of a field survey using questionnaire. Data collection was carried out by interviewing broiler farmers who were selected as research respondents. In this survey, broiler chicken farms in Montasik, Kuta Baro and Blang Bintang sub-districts were visited. The farmers who were visited were asked their willingness to be interviewed using a structured questionnaire according to this study's topic. The type of data used in this research is qualitative data and quantitative data.

The data sources used are:

a. Primary data is data that comes from respondents' answers
b. Secondary data is data that comes from previous research data

The population of respondents in this study was obtained from the calculation of the Slovin formula.

Slovin formula:

$n = \frac{N}{1 + N\,e^2}$ or $n = N/ (1 + (Nxe^2))$ (Notoatmodjo, 2010).

Note:
n: the number of samples
N: total population (Number of broiler farms in Montasik, Kuta Baro and Blang Bintang Districts)
E: error tolerance (0.01-0.06)

In this study, from the initial calculation, it is known that the number of broiler farms in the districts of Montasik, Kuta Baro and Blang Bintang is 13 farms. Based on these data, the number of farms to be interviewed is calculated using the Slovin formula as follows:

$$N = \frac{N}{1 + N\,e^2} \rightarrow N = \frac{13}{1 + 13\,X\,0{,}05^2} \rightarrow N = \frac{13}{1{,}0325} = 12{,}59$$

The minimum sample size obtained from 13 farms at a 5% margin of error is 12.59 and rounded to 13 after being calculated using the Slovin formula.

Data Retrieval

Data were collected by interview using an open questionnaire that has been validated by the researcher.

Validity and Reliability Test of the Questionnaire

A validity test was conducted to measure whether a questionnaire was valid or not (Kusumastuti and Susilo, 2014).

Validity Formula

$$r = \frac{n\,(\sum XY) - (\sum X \sum Y)}{\sqrt{[n\sum X^2 - (\sum X)][n\sum Y^2 - (\sum Y)^2]}}$$

Where:
r = the correlation coefficient which states valid
X = Sum of X scores
Y = Sum of Y scores
N = number of sample data (Hastono, 2017).

In the reliability test, the One-shot formula is used (measured only once). Measurements are only carried out once and then the results are compared with other questions (Hastono, 2017).

Questionnaire

The questionnaire was created to obtain data about the knowledge and attitudes of farmers towards antibiotic resistance. Filling out the questionnaire and interviewing the respondents in 2 forms of discussion.

Data analysis

The data obtained from the results of this study will be analyzed descriptively. The data was processed using SPSS version 25 software.

Results and Discussion

Validity and Reliability Test of the Questionnaire

In this study, the questionnaire used had been tested for validity and reliability in relation to respondents' questions. The test results are shown in Table 1.

Tabel 1. The results of the validity and reliability tests on the list of questions in the questionnaire.

No	List of questions	validity test	realibility test
		r table (0,5529)	crombach alpha ≥ 0,6
	Knowledge		
1.	Given according to instructions	0.727	
2.	The appropriate dosage is exact	0.727	0.629s
	Attitude		
1.	Buy antibiotics in livestock drug stores	0.645	
2.	Given according to illness	0.993	0.829
3.	Given as clinical symptoms	0.993	

The questionnaire variable is valid if each variable has a result r value> 0.5529. The questionnaire variable is declared reliable if the coefficient is> 0.60 (Crombach alpha). In the knowledge section before being tested there are 9 questions. However, from the test results, only 2 questions are valid and reliable. Furthermore, in the attitude section, initially there were 16 questions. However, after being tested only 3 questions are valid and reliable as shown in Table 1. In Table 1, it can be seen that the results of the validity test of farmers 'knowledge of the questions in the questionnaire have a value of r ≥ 0.70 and the validity test of farmers' attitudes towards the questions in the questionnaire has a value of ≥ 0.60 so that the questions in the questionnaire related to the level of knowledge and attitudes of farmers towards antibiotics were declared valid (good). This study's results are in line with research conducted by Fitria (2019), which states that the knowledge and attitudes of 15 farmers towards the use and resistance of antibiotics in Simpang Tiga District, Aceh Besar District are good. Table 1 shows that the results of the reliability test of farmers' knowledge section of the questionnaire were 0.629 and the results of the reliability test of farmers' attitudes section of the questionnaire were 0.829 so that both variables are declared reliable.

After the two variables in the questionnaire were declared valid and reliable, the questionnaire was used to interview the selected farmers in Aceh Besar District. The results of the questionnaire and farmer interviews were then analyzed using the Independent T-test.

Demographic characteristics, Knowledge and Attitudes Levels of Respondents

In interviews conducted with 13 respondents, an overview of the diversity of knowledge and attitudes of existing farmers in Aceh Besar District can be seen in Table 2. Most of the study respondents were male (92.30%), while female respondents were only 8.70%. Differences in social roles between men and women are often justified in biological differences, thus giving birth to different roles in society. Livestock is a job that involves physical work, so it is more suitable for men than women (Sari et al., 2009). According to Dilla et al (2017), experience will affect a farmer's ability in the maintenance process. The more or longer the farmer experiences, the greater his ability to breed.

Apart from gender, the diversity of respondent characteristics can be seen by age. Table 2 shows that respondents aged ≤20-30 years are 46.15%, respondents aged ≤31-40 years are 46.15%, while respondents aged over 40 years are 7.69%. According to Soekartawi (2005), a person's age is one of

an individual's characteristics that affects the biological and psychological functions of the individual. The ability of farmers to work will increase if they are still in their productive age. According to Anggraini and Putra (2017), age is an indicator of a person's physical ability; young farmers tend to be physically stronger than older farmers.

Table 2. Characteristics of the diversity of respondents on several farms in Aceh Besar District.

Characteristic	Category	Number (person)	Percentage (%)
Gender	Male	12	92,30
	Female	1	8,70
Age	20 – 30 years old	6	46,15
	31 – 40 years old	6	46,15
	41 – 50 years old	1	7,69
Length of farming	≤ 5 years	6	46,15
	> 5 years	7	53,84
Number of Chickens Raised	≤5.000	3	23,08
	> 5.000	10	76,92

From this study, most farmers above 50% in Aceh Besar District had more than 5 years of farming experience, while only 30% had breeding experience under 5 years. Based on the scale of the number of chickens being kept, 70% of the farmers had more than 5,000 chickens and the remaining 30% of the farmers had less than 5,000 chickens. In addition to respondents' diversity characteristics, this study also looked at the respondent's knowledge of the use of antibiotics suitable for animal husbandry, as shown in Table 3.

Table 3. Respondents' knowledge about the use of antibiotics by farmers in Aceh Besar District Farm.

No	Question	Respondents Answer (%)			
		Yes	%	No	%
1	Should antibiotics be given to chickens as directed?	10	76,92	3	23,07
2	Is the administration of antibiotics in the dosage according to the instructions appropriate?	10	76,92	3	23,07

The results obtained in the survey regarding the level of respondent's knowledge of farmers showed that 76.92% of the respondents gave antibiotics according to the directions for broiler chicken. While the remaining 23.07% gave different answers. Regarding giving antibiotic doses, 76.92% of respondents answered that giving antibiotics must be following the instructions, while 23.07% of respondents answered otherwise.

Table 3 shows that, on average, respondents above 75% in Aceh Besar District have good knowledge of the instructions for using antibiotics and antibiotic doses. In comparison, the remaining above 20% of respondents still lack knowledge about the instructions for using antibiotics and antibiotic doses. To increase farmers' knowledge and abilities, farmers' role and education from related parties in the poultry sector are vital in increasing understanding of these antibiotics (Prasetyo and Awaluddin, 2016). After knowing the farmer's level of knowledge about the instructions for using antibiotics and the dosage of antibiotics, this study also looked at the percentage differences in respondents' attitudes towards antibiotic use which can be seen in Table 4.

Table 4. Respondents' attitudes towards the use of antibiotics by farmers in Aceh Besar District.

No	Question	Respondent answer (%)			
		Yes	%	No	%
1	Did you buy antibiotics from livestock drugstores?	10	76,92	3	23,07
2	Did you give antibiotics according to the pain/disease seen in chickens?	11	84,61	2	15,38
3	Did you give antibiotics according to the clinical symptoms seen in chickens?	11	84,61	2	15,38

Based on the data in Table 4, it can be seen that 76.92% of respondents buy antibiotics at livestock drugstores and 23.07% of respondents buy antibiotics at other places. Furthermore, most of the respondents 84.61% gave antibiotics

according to the pain/diseases seen in chickens and only 15.38% of respondents did not pay attention to this. Next, most of the respondents 84.61% answered that giving antibiotics was in accordance with the clinical symptoms seen in chickens, while the remaining 15.38% stated that they did not provide antibiotics in accordance with the clinical symptoms seen in chickens. The use of antibiotics in poultry is used for treatment, growth promoters and increasing feed efficiency (Noor and Poeloengan, 2001). Administration of antibiotics in chicken farms is closely related to unstable season conditions which allow chickens to be more susceptible to disease, so antibiotics are given for disease prevention and treatment (Saniwanti et al., 2015). The difference in knowledge of farmer attitudes towards antibiotic use based on business experience can be seen in Table 5.

Table 5. Differences in farmers' knowledge and attitudes towards antibiotic use based on business experience (<5 years and ≥5 years) in Aceh Besar District.

Length of Farming	Mean	SD	p-value
Knowledge 1	1.66	0.516	0.148
	1.85	0.377	
Knowledge 2	1.66	0.516	0.148
	1.85	0.377	
Attitude 1	1.83	0.408	0.349
	1.71	0.487	
Attitude 2	1.83	0.408	0.831
	1.85	0.377	
Attitude 3	1.83	0.577	0.831
	1.85	0.377	

In Table 5, the Independent T test results showed that differences in farmer knowledge and attitudes towards the use of antibiotics based on their business experience in raising broiler chickens gave significantly different results (p <0.05). This shows that more than 5 years of farming experience has better knowledge and a wiser attitude in using antibiotics because the experience is significant in field practice. The more experienced, the wiser will be in seeing the effects of using antibiotics on broiler chickens (Anggraini and Putra, 2017). In addition to seeing from business practice, differences in knowledge and attitudes towards the use of antibiotics can also be seen from the number of broiler chickens being raised (Table 6).

Table 6. Differences in farmer knowledge and attitudes towards antibiotic use based on the number of broilers kept (≤5,000 and> 5,000) in Aceh Besar District.

The number of broilers raised	Mean	SD	P Value
Knowledge 1	1.33	0.577	0.127
	1.90	0.316	
Knowledge 2	1.66	0.577	0.453
	1.80	0.421	
Attitude 1	1.66	0.577	0.453
	1.80	0.421	
Attitude 2	1.66	0577	0.127
	1.90	0.316	
Attitude 3	1.66	0,577	0.127
	1.90	0.316	

From Table 6, it can be seen that the results of the Independent T test for the knowledge and attitudes of farmers towards the use of antibiotics based on the number of broilers raised on the farms of Aceh Besar District show results that are not significantly different (p>0.05). The possibility of this happening is because the use of antibiotics is not seen from the number of broilers being kept. After all, the treatment of antibiotic use depends on the farmer himself.

Table 7. Differences in farmer knowledge and attitudes towards antibiotic use based on farmer age (≤ 30 years and> 30 years) in Aceh Besar District.

Age	Mean	SD	p-value
Knowledge 1	1.66	0.516	0.148
	1.85	0.377	
Knowledge 2	1.83	0.408	0.349
	1.71	0.487	
Attitude 1	1.83	0.408	0.349
	1.71	0.487	
Attitude 2	1.83	0.408	0.831
	1.85	0.377	
Attitude 3	1.83	0.408	0.831
	1.85	0.377	

Table 7 shows the results of farmers' knowledge and attitudes towards using antibiotics based on the age of the farmers

did not give significantly different results ($p>0.05$). This may occur because the farmer's knowledge and attitude towards the use of antibiotics is not seen from the farmer's age but from the farmer's knowledge, experience, and observations of the broiler chickens he raises.

Conclusion

Based on the results of research conducted from 13 farmers, the farmers' knowledge and attitudes were classified as good towards the use of antibiotics and its resistance in Aceh Besar District and the length of experience in the farmer's business gave a difference in attitudes but did not differ from the level of knowledge. Meanwhile, differences in gender and age of farmers and the farm business scale based on the number of broilers being raised did not make any difference to farmers' knowledge and attitudes regarding the use of antibiotics in their domestic poultry.

Suggestion

It is necessary to disseminate information to farmers regarding the use of antibiotics in accordance with applicable regulations and always consult with animal health officials.

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