

Farmer Technical Knowledge of Reproductive Technology and Training Interventions

Tanri Giling Rasyid^{1*}, Muhammad Darwis², Andi Suarda³

¹ Faculty of Animal Science, Hasanuddin University, Indonesia.

² Center for Research and Development of Democracy, Conflict, Culture and Humanities Institute for Research and Community Service, Hasanuddin University, Indonesia.

³ Faculty of Science and Technology, Makassar State Islamic University, Indonesia.

* Correspondent email: tanri.giling@gmail.com

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ABSTRACT

This study contributes to the improvement of knowledge of farmers based on reproductive technology training interventions in terms of knowing that signs of lust, how to administer hormones to cause uniformity of lust or estrus or prostaglandin, and to know the exterior shape of productive female beef cattle. This study uses a pre-test and post-test model approach through training interventions. Also using mixed method research is a methodology that combines qualitative and quantitative methods. This method allows researchers to present qualitative studies through descriptive explanations and also quantitatively through numbers, tables, graphs, charts and statistical data. For the measurement scale to quantify qualitative data, the measurement scale is Likert 3 levels. The results show that training interventions can improve the knowledge or skills and expertise of beef cattle farmers in terms of reproductive technology and minimize the dependence of farmers on extension workers.

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Keywords:

Technical knowledge; beef cattle farmers; reproductive technology training intervention

1. Introduction

Inductive facts show that beef cattle that are cultivated by farmers from year to year have not shown the development, namely the ownership of beef cattle is only 2 to 3 per farmer, and the method of maintenance is still traditional or grazing or cattle grazing in the field or known as the extensive system, as well reproductive treatment is natural marriage or untouched by technology. And also beef cattle farmers have received assistance from both extension agents and the private sector but have not produced results for farmers who are skilled or proficient in terms of beef cattle reproduction. The government program on beef cattle is budgeted every year both on the State expenditure budget as well as the regional expenditure budget and in it includes training activities on the reproduction of beef cattle. This budgeting is based on the need for training in technical knowledge in terms of reproduction and must be owned by beef cattle farmers, because with reproduction the acceleration of population development can be achieved immediately and have an impact on beef self-sufficiency

and reduce the dependence of beef cattle imports and prospective into the future of exporting beef cattle. The livestock sector plays a vital role in the national economy of developing countries (Kouidri *et al.*, 2017). Based on observations and field experience, the researchers showed that rural Indonesian farmers have not been able to develop beef cattle populations quickly because the knowledge of beef cattle farmers is a science of dependence on livestock extension workers, so sometimes the cycle of heat often over time and consequently failure in marrying beef cattle and with this condition more farmers or tend to marry their cows naturally, and this also means that farmers are not experts in livestock reproduction. A key factor in cattle breeding is breeding value. The breeding values are predominately affected by the bull and thus greater or lesser spread of relevant genes (alleles) in the population. In calculating the breeding values however, highly valued meat cuts are not taken into consideration. In this study we focused on evaluating the relations between breeding values of meat production and specific cut parameters in bull carcasses. Negative correlations can reveal deterioration in economically important meat parts of carcasses in one-way breeding in concrete breeding values (Řiha and Bezdiček, 2016). Therefore, this study focused on the establishment of a model for accelerating the development of technical knowledge for beef cattle farmers based on reproductive technology through training interventions.

Deductively many have been revealed by the theory and results of research that can solve field or inductive problems as expressed by Rasyid (2016) states that farmers who are successful in conducting cattle breeding are farmers who have the ability to reproduce technical knowledge. Mardikanto (2012) states that technical knowledge can be obtained if farmers have a network of extension workers, research centers and universities as sources and owners of technology. The average beef cattle farmers have low technical knowledge, low technology, low market access so that they tend to raise livestock only as part-time business, and due to the odd effort, the economic conditions of income are also low and have an impact on the poverty of beef cattle farmers. In order for farmers to have high technical knowledge, according to them Rasyid (2018) and Rasyid (2016) from the results of his research conducted on beef cattle farmers, the low technical knowledge of farmers can be improved through the mentoring approach and training interventions with Learning by doing method and continued with evaluation monitoring, which was exemplified during the pre-test. for cattle, it turns out that after the training intervention, 25 farmers have been able to make fermented feeds that are economically profitable.

Pakpaham (2009) stating the occurrence of attitude changes caused by a combination of experience and knowledge. Then it was stated that people who have a positive attitude towards an object psychology if the perpetrator likes is known as favorable, but if the offender dislikes an object, then the actor refuses to treatment of the object or commonly called unfavorable. This means that attitude is a tool that functions as a regulator of behavior and experience regulator. Stating attitude is regularity in terms of feeling (affection), thinking (cognitive), and predisposition of one's actions towards an aspect and the surrounding environment. Pakpaham (2009) stated the need for knowledge to get a stimulus in the form of information because with knowledge can recognize the existing environment, and with knowledge one can know about the product, the benefits of the product so as to produce a level of satisfaction. Further stated that behavior is an action that is related to decision making. Syafaat (1995) states that the higher the level of education and knowledge of a person, the higher the quality of the resources possessed by that person, which in turn increases the productivity of

the work done. Therefore, the more often the training is done, the person is expected to be skilled and proficient and have a performance that can develop the business they are doing. Edwina (2006) stated that the relatively high level of education and knowledge enabled farmers to be able to adopt innovations which were given by instructors and could increase their cattle business. Cottle (2006) stated that with a low level of education, the level of skills and skills of farmers must be increased through partnership with industry farmers. Kwasi (2014) reported from the results of his research revealed that to increase livestock production required technical knowledge for farmers through a partnership pattern.

From inductive and deductive facts, the main problem of this research is reproductive technical knowledge owned by beef cattle farmers. And the target of the research is the variable reproduction technical knowledge with indicators of success proposed is that after the beef cattle farmers can implement the method of: (1) carrying out artificial insemination; (2) doing estrus detection; (3) prostaglandin; and (4) get to know the exterior signs of productive female beef cattle.

2. Method

The way this research works is to find a portrait or description of the field about the category of cattle farmers in terms of technical knowledge of cattle reproduction technology based on human resources, formal and non-formal education levels. This research is qualitative in character that is quantitated so that it uses a measurement scale of 3 levels of likert, namely High/proficient, moderate/skilled and low/limited to know (Riduwan, 2013; Slamet, 2011 and Rianse, 2012). Then this study continued with the operational model pre-test and post-test through training interventions to see the expertise of farmers (Rasyid, et al., 2016). So that the output of this research is to produce cattle farmers who are experts or skilled in reproductive technology. This study begins with recruiting beef cattle farmers who are ready to be made experts and meet the selection criteria, and netted as many as 35 beef cattle farmers. The initial approach to research is to use mixed method research, a methodology that combines qualitative and quantitative methods. This method allows researchers to present the study qualitatively through descriptive explanations and also quantitatively through numbers, tables, graphs, charts and statistical data (Cresswell, 1999). Data collection techniques were carried out through questionnaires or questionnaires before and after the training, also obtained from the results of focused group discussions, then data obtained and tabulated and analyzed. Data sources are from 35 cattle farmers or respondents whose data is collected by filling in the prepared questionnaire. Whereas secondary data obtained from institutions related to this research and also this study summarizes the results of the material selection results of the research and desk study.

3. Results and Discussion

3.1. Aspects of reproductive technical knowledge in the case of artificial insemination (AI)

Artificial insemination (AI) is one way to marry female beef cattle with human intervention, and technically, the cost and time are very efficient and effective because the rate of pregnancy is greater than 80%. Sirajuddin *et al.* (2018) Indonesia's problems in the field of animal husbandry remain low productivity and the genetic quality of cattle. The implementation of AI is aided by the application of appropriate technology. Reproductive technical knowledge in terms AI carried out by the respondent can be

known through indicator measurement, i.e if it has been inseminated in adult female cattle and the cows successfully ≥ 3 times then it is categorized as proficient and given a score of 3, and if you have ever done insemination in beef cattle, adult females and their cows successfully bind 1-2 times then categorized as skilled given a score of 2, and if they have never made artificial insemination in adult female cattle, but know that by artificial insemination, female cows can be pregnant then categorized knowing given a score of 1. From these three categories, the research activity was continued pre-test, then after that it carried out the training intervention and continued with the post-test.

The results of research on reproduction technical knowledge in terms of artificial insemination of 35 farmers can be categorized in Table 1.

Table 1. Classification of class levels of reproductive technical knowledge in terms of AI pre-test conditions.

Reproductive Technical Knowledge in the case of AI			
Knowledge Level Class Category	Score	Frequency	Total
Proficient (High)	3	0	0
Skilled (Medium)	2	1	2
Knowing (Low)	1	34	34
Total		35	36

Table 2. Classification of class levels of reproductive technical knowledge in terms of AI pre-test and post-test conditions

Reproductive Technical Knowledge in the case of AI			
Knowledge Level Class Category	Pre-test	Post-test	Interpretation
Proficient (High)	0	4	+ 80%
Skilled (Medium)	1	1	+ 20%
Knowing (Low)	4	0	+ 0.0%
Total	5	5	100%

Table 1 shows that partially the level of reproductive technical knowledge in terms of artificial insemination by 35 respondents contained the category of advanced class 0 people (0.00%), the category of skilled class there was 1 person (2.85%), and the category class only knew without doing There are 34 artificial insemination activities (97.14%). This means that beef cattle farmers in the rural areas on average reproduction technical knowledge in terms of artificial insemination is low, but if reviewed in continuum, their knowledge can still be increased to a minimum level of skilled class categories because it has a value of 36, meaning that they still have hope to increase their knowledge through training interventions. through learning by doing, this is reasonable because based on 34 people out of 35 respondents still have the attitude of wanting to go forward because they have never attended non-formal education about how to do AI. And for more details on the continuum value that farmers still have hope to be fostered as shown in Figure 1.

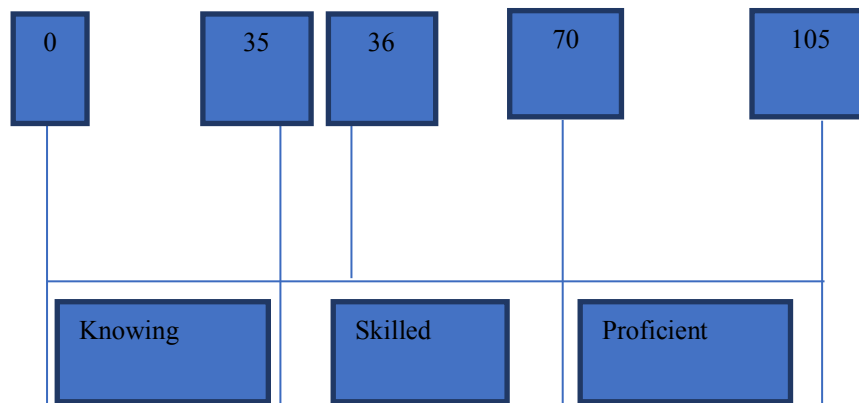


Figure 1. Continuous value of average beef cattle farmers in terms of AI knowledge

Figure 1 show that 5 farmers were selected with high school education and age between 35 years and 45 years to be provided with AI training interventions and the results of the post-test study Table 2.

Table 2 show that the effect of the treatment of artificial insemination training intervention on beef cattle conducted by 5 farmers shows that the original knowledge during the pre-test there were 4 farmers of the category only limited to knowing or included in the low category, and 1 person included a skilled class or category moderate, and advanced category there are 0 people. After being given a training intervention and post-test treatment, there was an increase in knowledge and occupying a class that is 4 advanced class farmers or up 80%, and occupying a skilled class of 1 person or up 20%, and no more class knows or 0 people (0.00%) low grade. The meaning that can be obtained from the results of this study is that the training intervention can increase the knowledge of beef cattle farmers in terms of AI, and with this increased knowledge, this research contributes to producing inseminator cadres in beef cattle farmers and can reduce dependence on extension workers. Recommendations that can be given through this study are the skills and skills of farmers in making artificial insemination in beef cattle that can be obtained through mentoring and treatment of artificial insemination training interventions by learning by doing.

3.2. Aspects of the level of reproductive technical knowledge in the case of occult detection in beef cattle

Success as a farmer in developing beef cattle population if raising adult cows or broods and understanding in making AI, which is certainly before the insemination is done, it is expected that the farmer will know the signs of lust or estrus shown by the cows that are cultivated ready to mate, because if this knowledge is not owned by the farmer is a loss for him in breeding his cattle. This showed that the first insemination is postponed quite a long after the second estrus for different reasons-health problems and treatment of cows after calving or subjective decisions in farms. Furthermore, an average of more than 3 insemination for conception. The estrus signs that must be known by beef cattle farmers are the clear mucus from the cervix that flows through the vagina and vulva, the cow looks restless and wants to get out of the cage, often moaning, trying to ride another cow, the base of the tail raised slightly, appetite and drink decreases, the vulva is swollen, warm and changes color slightly reddish. Knowledge of the lust signs

possessed by farmers and knowing that cattle are ready to be mated, the high percentage of pregnancy from a number of mated cattle will be high or the conception rate achieved is high. The normal range of service per conception (S / C) values is 1.6 - 2.0 based on marriage naturally. Service preconception (S / C) is the ratio of the number of pregnant women to the number of marriages. Conception rate is the ratio of the number of females who are married to the number of pregnant females who marry first multiplied by 100%. The low occurrence of pregnancy in beef cattle is caused by farmers late detecting when lust or late reporting their lust to inseminator, and facilitating limited insemination services (Penev, et al., 2017; Partodihardjo, 1980; Pohontu et al., 2018; Wahyuningsih, 2011; Hafez, 2000; and Widiyaningrum, 2008).

Referring to the theory and research results above, this study wants to get an overview and contribute to the level of technical knowledge of farmers in terms of detecting the lust of beef cattle that are ready to be mated AI. As an indicator that the farmer is given a score of 3 if he knows how to do lust detection that is at least 3 signs of estrus that must be known beef cattle farmers consist of (1) out of clear mucus from the cervix that flows through the vagina and vulva, (2) restless and want to get out of the cage, (3) try to ride another cow, (4) the base of the tail is raised slightly, (5) appetite and drink are reduced, and (6) the veins are swollen, warm and turn a little reddish. Given a score of 2 if only knowing 2 signs of lust, and given a score of 1 if only knowing 1 sign of lust in adult female cattle (Table 3).

Table 3. Categories of classes of technical knowledge level of farmers in the case of broken detection of beef ready to be married AI

Reproductive Technical Knowledge in the Case of Heat Detection			
Knowledge Level Class Category	Score	Frequency	Total
Proficient (High)	3	8	24
Skilled (Medium)	2	12	24
Knowing (Low)	1	15	15
Total		35	63

Table 3 show that, out of 35 respondents there were 8 people (22.85%) beef cattle farmers included in the category of proficient class in detecting lust and if lust only married their cattle naturally because knowledge of artificial insemination was still limited and limited facilities they had. There were also 12 respondents (34.28%) of beef cattle farmers who were in the class category with a level of skilled knowledge in detecting lust in beef cattle. This means that knowledge of lust detection is already owned by farmers, but farmers sometimes do not believe in themselves, so that dependence on inseminators or extension workers is still quite high, because sometimes in detecting lust is only based on anxiety and decreased appetite, and sometimes detects it so that the cycle time is missed. Then there were 15 respondents (42.85%) of beef cattle farmers who had not been able to detect signs of lust in beef cattle and were emotionally dependent on inseminators or extension workers in terms of their level of confidence that their cattle were in heat or not.

Partially the categorization of the level of lust detection technical knowledge has been described above that in a row the class categories from low to high scores are 15 farmers, followed by 12 skilled categories of farmers and only 8 farmers who are in the advanced category, meaning variations in the category of farmers in terms of lust detection is still spread in three categories of categories, not all of them are in the advanced class category so that the solution is needed to treat training

interventions. And to see the description of the spread of ownership of the level of knowledge of farmers in terms of detection of lust, it will be carried out in a continuum calculation. And the calculation results in continuum are shown in Figure 2.

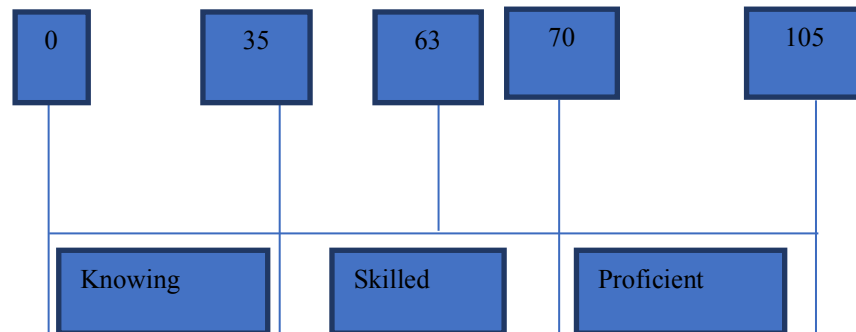


Figure 2. Continuous value of the average farmers in the knowledge of beef cattle detection

Figure 2 indicates that the average farmer in detecting the lust of beef cattle has a value of 63 including the skilled class category in the range of 35 and 70 means that the level of knowledge of farmers in detecting lust still needs to be increased to get the number of farmers who are truly proficient in detecting lust in beef cattle, so that for their sustainability in cultivation to increase the beef cattle population at the level of rural farmers is not entirely dependent anymore on the instructions from inseminators or livestock extension workers, training interventions are needed.

3.3. Model for improving reproductive technical knowledge in the case of lust for injection on cattle cut adult females

The results of the research on the category of reproduction technical knowledge class level for farmers in terms of detecting the lust of beef cattle after receiving a training intervention, which was preceded by a pre-test, then after getting the training intervention treatment then a post-test was conducted. This is intended to see an increase in the class category achieved by the respondent farmers. Table 4 shows that there was a change in class category due to the treatment intervention of lust detection for beef cattle for farmers in succession at the beginning of the pre-test there were 15 farmers in the tofu class category, and after the training intervention and post-test there were 0 farmers in this category. Then in the skilled class category at the time of pre-test there were 12 farmers, and after the training intervention and post-test results there were 7 farmers, meaning that the role of training on the level of progress of farmers technical knowledge in terms of lust detection in beef cattle was needed. Likewise, in the advanced class category, there were 8 farmers who were skilled at detecting lust for beef cattle in the pre-test category, and after the training intervention treatment, there was an increase in the knowledge of farmers who were in the advanced class category to 28 respondents. The meaning of this research is the assistance method and training in estrus detection that is needed by farmers and provides benefits for beef cattle farmers because dependence on inseminators and livestock extension workers can be minimized in terms of knowledge of lust detection in beef cattle.

Table 4. Level of technical knowledge of reproduction in terms of lust detection

Aspects of the Level of Reproductive Knowledge in terms of Passion Detection						
Class Category Value	Pre-Test	Intervention	Post-Test	%	Class	
0.00 - 33.33	15	0	0	0.00	Knowing	
33.34 - 66.67	12	7	7	20.00	Skilled	
66.68 - 100.00	8	28	28	80.00	Proficient	
Total	35	35	35	100.00	-	

3.4. Aspects of reproductive technical knowledge in prostaglandin F2 α (PGF 2) in beef cattle

One of the problems in increasing beef cattle population is about reproduction as a result of long and uneven births in childbirth, as a result of this phenomenon so that the increase in beef cattle population is slow to reach, and further impact is meat self-sufficiency difficult to achieve. Livestock genetic resources include a remarkable variety of domestic animal breeds and their populations, which have developed and adapted to the various environmental conditions for centuries (Tanchev, 2015). The lag behind farmers in developing their cattle as a result of the knowledge of prostaglandin administration in adult female beef cattle has not been friendly with farmers, which they should have because this is a mainstay for the self-sufficiency of lean meat on people's farms. Fauzat (1994) states that prostaglandin F2 α is one of the hormones that can be used in estrus synchronization in beef cattle or other ruminant animals. Golf (2004) states that the speed of estrus emergence is after two injections of prostaglandin F2 α at a dose of 2 ml/tail until 72 hours later. Ismail (2009) and Handayani (2018), stated that the average velocity of estrus in 3 parity of Balinese cattle, namely heifers, one-time calves and calves twice after obtaining twice the treatment of prostaglandin F2 α showed a significant difference in the occurrence of estrus, which is the average for heifers 44,15 hours, then one-time calves with 48.89 hours, and twice-calving calves with 22.33 hours. Maliawan (2002) stated that the estrus duration of cattle after Prostaglandin F2 α administration ranged from 16.00 - 18.70 hours. Fricke and Shaver (2007) states the emergence of estrus is caused by an increase in estrogen in the body produced by ovum. Toelihere (1981) states that estrogen hormones are female sex hormones that function to cause estrus. King (1981) states that the work of estrogen hormone is to increase the sensitivity of female genital organs which is characterized by changes in the vulva, and the release of transparent mucus from the female vulva which was treated with Prostaglandin F2 α .

Referring to the theory and research results that have been disclosed, and observing and collecting data on 35 beef cattle farmers in terms of the treatment of Prostaglandin F2 α , and the indicators proposed to determine the farmers knowledge is if they have treated as many female beef cattle as Prostaglandin F2 α 2 times then given a score of 3 or proficient class category. And if you have ever given treatment 1 time given a score of 2 or a skilled class category, but if you have never done or did not know the treatment of Prostaglandin F2 α then given a score of 1 or low-class category. The results of the study showed that out of 35 farmers the respondents did not know and had never used it. And for more details the results of the study as shown in Table 5.

Table 5. Category of farmers technical knowledge level class in the case of prostaglandin F2 α treatment

Reproductive Technical Knowledge in Prostaglandin F2 α Giving on Adult Female Cows			
Knowledge Level Class Category	Score	Frequency	Total
Proficient (High)	3	0	0
Skilled (Medium)	2	0	0
Knowing (Low)	1	35	35
Total		35	35

Table 5 shows that on average, the continuum of the average farmer is in the lowest class category or does not know the score 1, and is worth 35. This means that due to farmers knowledge about giving F2 α prostaglandin to adult female beef cattle for the purpose of uniforming lust in beef cattle is low, to get uniformity of birth, population development is difficult to achieve, and if the effects are not transmitted to farmers, then hope to get feed cattle to meet meat self-sufficiency and breeding of superior cows is slowly achieved. For more details on the class category and the continuum value achieved by farmers as shown in Figure 3.

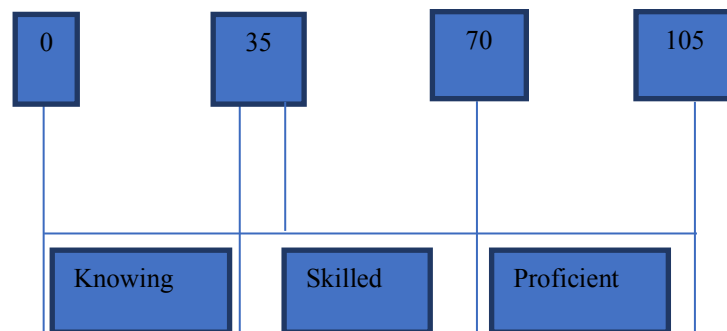


Figure 3. Continuous value of average farmers in knowledge of prostaglandin F2 α treatment in adult female cows

Figure 3 shows that the average farmer in the knowledge of prostaglandin F2 α treatment in adult female beef cattle has a value of 35 including the unknown category in the range of 0 and 35 means that the level of knowledge of farmers in terms of prostaglandin F2 α treatment in adult female cows it is still very low so it needs to be improved in order to get the number of farmers who are truly proficient in the treatment of prostaglandin F2 α in adult female cows. This is intended to accelerate the increase of beef cattle population at the level of rural farmers and expect farmers to become independent and reduce their dependence on field officers such as livestock farmers and animal health workers, and to achieve farmer independence, training interventions are needed.

3.5. Reproductive technical knowledge improvement model in the treatment of prostaglandin F2 α giving in adult female cows

The results of the research on the category of reproduction technical grade level for farmers in terms of prostaglandin F2 α treatment for adult female cows, after getting the training intervention preceded by the pre-test, then after getting the training intervention, a post-test was conducted. This is intended to see an increase in the class category achieved by the respondent farmers. Table 6 shows that there was a change in the category of farmers knowledge class due to training interventions treatment of prostaglandin F2 α giving to adult female beef cattle, which were consecutively at the time of pre-test, there were 35 farmers in the category of unknown or low class, and after the training intervention and post-test were conducted, there were 35 farmers each in the 16th class of the skilled class category, and there were 19 farmers in the advanced class or high class category or proficient. This means that with the treatment intervention training on prostaglandin F2 α giving to adult female beef cattle, farmers understand and can implement F2 α prostaglandin on Adult female beef cattle or positively correlate to raising farmers' knowledge from tofu classes into skilled and proficient class categories.

Table 6. Level of technical knowledge of reproduction in terms of treatment of prostaglandin F2 α

Aspects of the Level of Reproductive Knowledge in the Treatment of Prostaglandin F2 α in Adult Female Cows						
Class Category Value	Pre-Test	Intervention	Post-Test	%	Class	
0.00 - 33.33	35	0	0	0.00	Knowing	
33.34 - 66.67	0	16	16	45.71	Skilled	
66.68 - 100.00	0	19	19	54.29	Proficient	
Total	35	35	35	100.00	-	

3.6. Aspects of the level of reproductive technical knowledge in the assessment of the productive exterior form of female beef cattle

In order to obtain high fertility beef cattle in producing calves, one factor that must be owned by farmers is the knowledge of how to evaluate the exterior shape of a female cow that will be used as a profitable parent. Hasan and Rasyid (2017) stated that beef cattle production is closely related to appearance such as body weight, body size, body composition and livestock conditions. Referring to the theory and research results that have been disclosed, and observing and collecting data on 35 beef cattle farmers in terms of assessing the exterior shape of productive female beef cattle, with the indicator proposed namely udder cow is symmetrical, healthy and agile cattle, cattle not infected with reproductive disorders, and genealogies include superior cattle, not defective in the body. If the farmer has a minimum knowledge of 3 about the exterior signs of a productive female cow then given a score of 3 or advanced class category, and if only 2 signs of the exterior shape of the productive female cow known to the farmer then given a score of 2 or included in the skilled class category. But if only one sign of the exterior shape of the productive female is known to the farmer then given a score of 1 or included in the low-class category or limited to know. The results of the study showed that out of 35 respondents, there were varying levels of knowledge about how to answer the exterior signs of productive female cattle. And for more details about the results of the study as shown in Table 7.

Table 7. Level of Technical Knowledge of Farmers in terms of Assessment of the productive form of females

Level of Reproductive Technical Knowledge in the Assessment of Productive Female Exterior Forms.			
Knowledge Level Class Category	Score	Frequency	Total
Proficient (High)	3	6	18
Skilled (Medium)	2	9	18
Knowing (Low)	1	20	20
Total		35	56

Table 7 shows that on average both partially and continuously the farmers are in the lowest class category or do not know the score 1, and the value is 20. This means that due to farmers' knowledge of an exaggerated assessment of productive female cattle is low, it is very difficult to obtain superior feeder cattle and reproduction slowly to obtain tillers and correlates with the low development of beef cattle population. Also hopes to get feed cattle to meet meat self-sufficiency and breeding of superior cattle are slowly achieved. But on a continuum the level of knowledge can still be improved through training because the value obtained is 56 meaning that it is still categorized as skilled or medium. This is because there are still 9 farmers including the skilled class and there are also 6 farmers including advanced class categories. For more details on the class category and the continuum value achieved by farmers as shown in Figure 4.

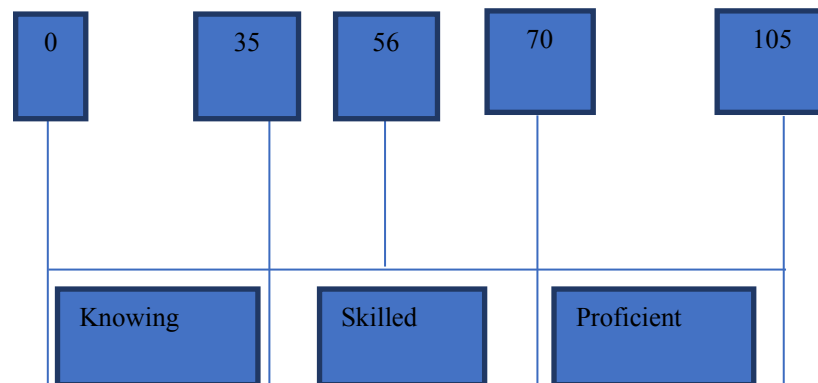


Figure 4. Continuous value of average farmers in terms of knowledge about the assessment of productive female exterior forms

Figure 4 shows that the average farmer in the knowledge of the assessment of the exterior female form of productive has a value of 56 including the skilled class category in the range of values of 35 and 70 means that the level of knowledge of farmers in terms of evaluating the productive exterior female form is quite good so it needs to be improved through training interventions to get the number of farmers who are truly proficient in the treatment of evaluating the exterior shape of productive females. This is so that farmers are proficient in selecting productive cows that want to be cultivated and of course have an impact on high productivity levels in producing superior calves and the eventual impact is an accelerated increase in beef cattle population and meat self-sufficiency.

The results of the research on the category of reproduction technical grade level for farmers in terms of evaluating the exterior shape of productive females, after getting training intervention preceded by pre-test, then continued with the post-test. As shown

in Table 8, there is a change in the category of farmers' knowledge due to the training intervention of the assessment of productive female exterior forms, ie consecutively at the time of pre-test, there were 20 farmers in the tofu or low class category, and after the training intervention and post-test carried out there were 0 farmers in the low class or tofu (0.00%). Similarly in the skilled class at the pre-test there were 9 farmers and after the training intervention and post-test there were 2 farmers (5.71%), while in the advanced class category there were 6 farmers, and after training interventions and followed by posttest there were 33 farmers (94.29%). This means that with the training intervention treatment of the assessment of the exterior shape of the productive female, the farmer becomes aware of and can implement the method of selecting productive females in terms of the exterior assessment method or positively correlated to raising the farmers knowledge from the knowing class category to a skilled and proficient class category.

Table 8. The level of technical knowledge of reproduction in terms of evaluating the productive form of female females

Aspects of the Level of Reproductive Knowledge in the Assessment of Productive Female Exterior Forms						
Class Category Value	Pre-Test	Intervention	Post-Test	%	Class	
0.00 - 33.33	20	0	0	0.00	Knowing	
33.34 - 66.67	9	2	2	5.71	Skilled	
66.68 - 100.00	6	33	33	94.29	Proficient	
Total	35	35	35	100.00	-	

4. Conclusion

Farmers independence in implementing beef cattle reproduction knowledge includes how to do artificial insemination, lust detection of female cattle, treatment of prostaglandin F2 α treatment, assessment of productive cows viewed from the exterior form can be achieved through mentoring techniques and training interventions, and can have an impact on increasing cattle population at the rural level, it can also reduce farmers dependence on field workers such as inseminators, field extension workers and animal health workers.

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