Effect Of Additional Probiotic In Cattle Feed On Cattle's Consumption And Growth Rate

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Abstract
This study aimed to determine the level of feed consumption, weight gain of cattle, and to calculate the population of lactic acid bacteria (LAB) and pathogenic bacteria Escherichia coli and Salmonella in cattle feces in order to determine the effect of giving probiotics on the digestive system of cattle. The research object used was 10 bali cattle with a weight of about 90-120 kg. The data in this study were analyzed by experimental design using analysis of variance to determine the effect of giving probiotics to cattle feed on cattle weight gain. The treatment in question includes G0 with treatment in the form of feeding with a composition of 60% forage, 15% palm cake, 25% cassava, and 100 ml molasses. Meanwhile, G1 was treated with the same feed as G0, but added with 100 ml of probiotic Probio_FM. Based on the results of the study, it is known that probiotics given to cattle feed showed no significant effect on the level of feed consumption and body weight of cattle where cattle with non-probiotic feed had a higher average consumption level than cattle on probiotic feed. Furthermore, this causeed the average weight gain of non-probiotic cattle to be higher than that of probiotic cattle. In addition, it was known that the population of Lactic Acid Bacteria in the feces of probiotic cattle showed a higher number of LAB colonies compared to non-probiotic cattle with numeric values of $3.6x10^8$, $3.3x10^9$, and $2.7x10^{10}$. This proved that giving probiotics to bali cattle with a concentration of 100 ml / 100 kg of feed was able to increase the concentration of lactic acid bacteria in the digestive system.

Keywords: *Probiotics in cattle, Consumption rate, Weight gain, Lactic acid bacteria population*.

I. INTRODUCTION

Bangka Belitung is one of the archipelagic provinces in Indonesia with a variety of cultures, ethnicities, languages, beliefs, and others. In addition to its abundant natural resources, the cultural customs of the community are also one of the heritages that must be preserved. The province, which is affectionately known as "Bumi Serumpun Sebalai", has a value of tolerance that is no longer in doubt. Various customs and cultures typical of the Bangka Belitung region are also still intertwined today. Some of the routine commemorations that are held every year are the nganggung culture, the ruwahan tradition, the rebut prayer tradition, peh cun, mass circumcision, as well as various celebrations of major holidays such as Eid al-Fitr, Eid al-Adha, Christmas, commemoration of the Prophet's birthday, and others. One of the customs in commemorating major holidays that has been entrenched from generation to generation by the people of Bangka Belitung is to cook large amounts of dishes. In addition to being served with family, these special preparations will usually also be served to guests who visit the house or distributed to neighbors. Various menus are served with the intention of being grateful for the blessings of God Almighty for the sustenance that He has given.The many commemorations of major holidays and commemorations of cultural customs in Bangka Belitung have resulted in a large amount of food needed to meet the needs of the community. One of the staple ingredients that has become like an obligation to become a dish for every home during the commemoration of major holidays is processed cattle. Quoted from m.medcom.id, the Governor of Bangka Belitung, Erzaldi Rosman Djohan said that at least the current demand for cattle in Bangka Belitung is 10 thousand tons/month and it is still not being met for public consumption. This causes the process of importing cattle from outside regions to continue to fulfill the need for cattle food. Whereas, Bangka Belitung is an area that has the potential for cattle farming with the hope that the number of cattle imports

from outside the country will decrease. Several programs implemented by the government to help meet the cattle needs of the community are the cattle-palm integration program and the cattle fattening program (Kementan RI 2021).

Along with advances in science and technology, efforts to meet the needs of the people of Bangka Belitung for cattle through cattle fattening programs and cattle-palm integration can also be encouraged with good and correct Biotechnology programs. The biotechnology referred to in this case is the addition of probiotics which are considered useful in helping the digestive process, increasing immunity, alternative antibiotics, producing bacteriocins to fight pathogens, and helping to overcome various syndromes and digestive tract disorders (Aritonang et al. 2019). In addition, several studies conducted on farm animals prove that probiotics are able to gain weight and increase consumption (Astuti et al. 2015 & Candra and Magfiroh 2018).One of the microorganisms that have the potential to be used as probiotics is lactic acid bacteria. Lactic acid bacteria are microorganismsewhich is able to inhibit the growth of other microorganisms such as pathogens through the mechanism of carbohydrate fermentation which produces lactic acid bacteria which are able to lower the pH so that the growth of pathogens is inhibited (Harimurti et al. 2005). In addition, several studies have stated that the use of lactic acid bacteria as probiotics can optimize nutrient absorption so that body weight can increase (Azizah et al. 2020). If it is proven that the provision of probiotics with lactic acid bacteria in cattle feed is able to increase body weight and consumption of cattle, then this can be beneficial for the economic sector and food security of Bangka Belitung. Furthermore, it is hoped that the number of cattle imports to Bangka Belitung can continue to decrease and it can even become one of the importers of cattle in Indonesia. This study aims to determineconsumption rate feed, weight gain of cattle, as well as calculating the population of lactic acid bacteria and pathogenic bacteria *E.coli* and *Salmonella thyphi* in cattle feces in order to determine the effect of giving probiotics on the digestive system of cattle.

II. METHODS

2.1 Location and time of the research

This research was conducted from October to December 2021 at CV DAM Petaling's cattle ranch. Probiotic manufacture and calculation of bacterial population done in Bangka Belitung University Microbiology Laboratory and Laboratory CV DAM Petaling.

2.2 Materials

The tools used in this research are aluminum foil, autoclave, cotton, counter numbers, triangular glass, incubator, label paper, laminar air flow, micropipette, ose, petri dishes, rubbing alcohol, test tube, thermometer, analytical balance, tip micropipette, tissue, and vortex.The materials used in this research are aquades, peptonee, cattle feces probiotic treatment and control, EMBA media, MRSA media, SSA media, cattle feed consisting of cake, forage, molasses, hemp, and probio_FM.

2.3 Experimental design

The design in this study was listed in Table 1. The duration of treatment was maintained until 60 days for G0 and G1.

Table 1. Experimental group description

Treatment	Group
Animal feed	G0
Animal feed + Probiotics	G1

The feed given to G0 treatment or control treatment was feed with a composition of forage grass 60%, palm oil cake 15%, cassava 25%, and 100 ml molasses. Meanwhile, the feed given to the G1 treatment was feed with a composition of 60% forage grass, 15% palm oil cake, 25% cassava, 100 ml of molasses, and 100 ml of probiotic brand Probio_FM.

2.4 Calculation of the level of consumption of cattle

Calculation of the level of consumption of cattle is obtained by reducing the total amount of feed given every day with the remaining feed that is not eaten by the cattle.

Feed consumption = the amount of feed given (kg) – leftover feed (kg)

2.5 Calculation of changes in cattle's weight

Feeding the cattle is given 2 times a day in the morning and evening as much as 5 kg each during October - December. The treatment was given in the form of giving probiotics to 5 cattle and without giving probiotics to 5 other cattle as a control study to compare the difference between changes in the weight of cattle that were given prodbiotics and without probiotics. The initial weighing of cattle was carried out in October and then the calculation of changes in weight was carried out by re-weighing the weight of cattle in November and December.The weight gain of the cattle is obtained by calculating the difference between the weight of the final cattle minus the weight of the initial cattle with the formula:

Monthly weight gain of cattle (Kg/head/month) =

$$\frac{final\ weight - initial\ weight}{weighing\ interval}$$

2.6 Calculation of the Population of Lactic Acid Bacteria

There were six samples of feces observed, namely three from non-probiotic cattle and three from probiotic cattle. the method used in culturing lactic acid bacteria with the dilution technique and the spread plate method. The technique of diluting cattle feces samples was carried out to a level of 10^{-10} on peptone media, the medium used for bacterial growth was MRS agar with a composition of 34.1 g dissolved in 500 ml of distilled water. In the spread plate method, the MRS media was poured into a 20 ml petri dish and then waited for it to solidify. The bacterial suspension taken was 01 ml with a dilution rate of 10^{-7}, 10^{-8}, and 10^{-9} then incubated for 48 hours.

2.7 Calculation of the Population of Pathogenic Bacteria E.coli and Salmonella thyphi

There are six samples of cattle feces that will be used, namely three samples from non-probiotic cattle feces and three samples from probiotic cattle feces. *E.coli* and *Salmonella typhi* bacteria can be cultured using SSA (Salmonella Shigella Agar) and EMBA (Eosin Methylene Blue Agar) media. The dilution technique was carried out up to a dilution level of 10^{-10} on peptone media. The method used for bacterial growth is spread plate. The bacterial suspension taken was 0.1 ml at dilution levels of 10^{-7}, 10^{-8}, and 10^{-9}. The growth of *Salmonella typhi* bacteria uses AAS media with an agar composition of 17.5 g which is dissolved in 500 ml of water in an Erlenmeyer, then the media is poured into a Petri dish as much as 20 ml which is then waited for it to solidify, after the media solidifies the bacterial suspension is 0, 1 ml is spread evenly using a triangular glass rod. For *E.coli* bacteria, bacteria were cultured using EMBA media with an agar composition of 18.75 g which was dissolved in 500 ml of water in an erlenmeyer then 20 ml was poured into a Petri dish until solidified, after solidifying, the bacteria were at a dilution level of 10^{-7}, 10^{-8}, and 10^{-9} were taken as much as 0.1 ml and spread outwardly using a glass triangle rod which was then incubated for 2 days.

2.8. Data analysis

Data analysis is carried out with experimental design used analysis of variance in order to determine the effect of giving probiotics to cattle feed on cattle weight gain.

III. RESULT AND DISCUSSION

3.1 Measurement cattle consumption rate

Based on the research that has been done, the results obtained for feed consumption in cattle with the treatment that have been given are presented in the graph below.

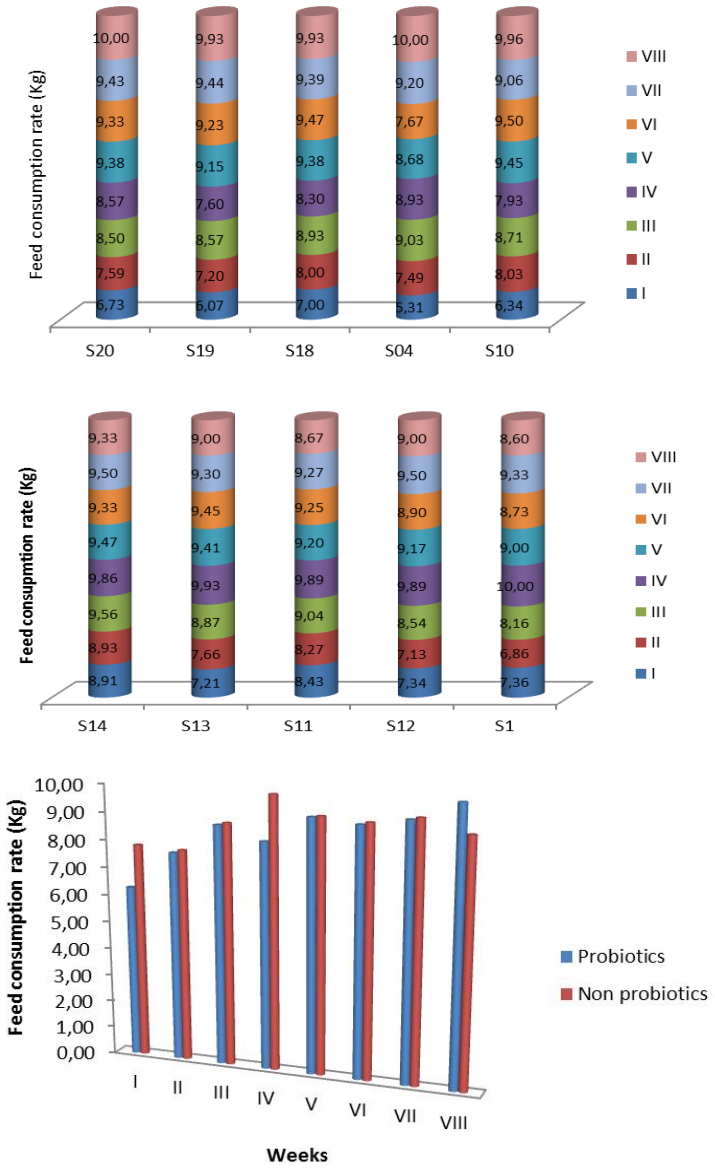

Fig 1. Consumption rate feed for probiotic and non-probiotic cattle

The graph shows that the average level of non-probio consumption is higher than the average level of probio consumption. In the first two weeks of the study, there was a decrease in the level of feed consumption in probio cattle compared to non-probio cattle. The decrease in the level of feed consumption is assumed to be due to the adaptation process in cattle. This is relevant to the research conducted by Purwanti et al. (2014) which states that the first 10 days is an adaptation period for cattle to probiotics. After the first two weeks, there was an increase in the level of consumption of probiotic cattle which was in line with the increase in the level of consumption of non-probiotic cattle. This is presumably because non-probiotic cattle have been able to adapt themselves to new foods and environments.However, in the last week of the study, analysis of variance showed that the treatment had no significant or non-significant effect ($P > 0.05$) on consumption. It is known that the average value of the amount of feed consumed in the control is 8.83 kg/day and the average amount of feed consumption in the treatment is 8.43 kg/day. This shows that the provision of probiotics in cattle feed has not been able to increase the level of daily feed consumption. Several previous studies with results that were also not significantly different stated that some of the differences in the level of consumption were too few probiotic compositions, the same dry weight content of the feed, and the presence of metabolized energy content in the feed. Adriani (2009), stated that the insignificant effect on the level of livestock consumption could occur because the percentage of probiotics given was too small so that it had not had a good effect on the level of feed consumption and body weight of cattle. The equation of the amount

of feed consumed every day, the nutritional content of the feed, and the composition of the feed given to livestock are also considered to be able to influence the level of consumption of cattle. The content of crude protein (PK), total digestible nutrient (TDN), dry fiber (SK) and dry matter (BK) which were relatively the same between the two treatments caused no significant difference in the level of consumption (Marhaeniyanto and Susanti (2021), Ambari et al. al (2018)).

Another factor that is considered to affect the level of consumption is the content of metabolic energy in the ration. Consumption of livestock for rations will stop when the energy needs of livestock for body metabolism are judged to be sufficient. According to Anggorodi (1994), the energy level in the ration affects the level of feed consumption according to the metabolic needs of the animal's body. If the energy level in the ration is high, then livestock consumption of feed will decrease because energy needs have been met. Conversely, if the energy in the ration is low, the consumption of animal feed will increase to meet energy needs. The addition of probiotics to cattle feed is considered to be able to optimize the role of beneficial microorganisms in the digestive tract so that livestock consumption of feed and absorption of nutrients in animal feed can take place optimally (Scott et al, 1982). The energy level in the ration affects the level of feed consumption according to the metabolic needs of the animal's body. If the energy level in the ration is high, then livestock consumption of feed will decrease because energy needs have been met. Conversely, if the energy in the ration is low, the consumption of animal feed will increase to meet energy needs. The addition of probiotics to cattle feed is considered to be able to optimize the role of beneficial microorganisms in the digestive tract so that livestock consumption of feed and absorption of nutrients in animal feed can take place optimally (Scott et al, 1982). The energy level in the ration affects the level of feed consumption according to the metabolic needs of the animal's body. If the energy level in the ration is high, then livestock consumption of feed will decrease because energy needs have been met. Conversely, if the energy in the ration is low, the consumption of animal feed will increase to meet energy needs. The addition of probiotics to cattle feed is considered to be able to optimize the role of beneficial microorganisms in the digestive tract so that livestock consumption of feed and absorption of nutrients in animal feed can take place optimally (Scott et al, 1982). Conversely, if the energy in the ration is low, the consumption of animal feed will increase to meet energy needs.

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3.2. Calculation of changes in cattle's weight

Based on the research that has been done, the results of the increase in body weight of cattle in October - December are presented in the table below.

Table 2. Weight Addition of Probio and Non-Probio Cattle

No.	Cattle Weight In – (Kg)			Total Cattle Weight Gain (Kg)
	October	November	December	
Animal Feeds + Probiotics				
1.	109.5	116	126	16.5
2.	118	141	137	19
3.	112	127	133	21
4.	108.5	115.5	121	12.5
5.	102.5	111.5	118	15.5
Average weight gain of cattle				16.9
Animal Feeds (Control)				
6.	103	115.5	129	26
7.	125.5	133	132	6.5

8.	115	127.5	133	18
9.	101	110.5	117	16
10.	124	139	148	24
Average weight gain of cattle				18.1

Analysis of variance showed that the addition of probiotics in general was not significantly different (P > 0.05) in the growth of body weight of cattle, but there was an increase in body weight gain from before. The average body weight gain of control cattle was greater than the average body weight gain of cattle treated with probiotics. This condition is thought to be because the administration of probiotics has not been able to increase feed consumption. Several previous studies with results that were also not significantly different stated that the administration of probiotics had no significant effect on body weight gain because the role of probiotics was less active in the digestive tract so that it could not increase the digestibility of feed protein. The role of probiotics that are less active can be caused by too little percentage of probiotics so that they cannot work optimally. This is in accordance with the opinion of Adriani (2009) which states that an insignificant effect on the level of livestock consumption can occur because the percentage of probiotics may be too small so that it has not had a good effect on the level of feed consumption and body weight of cattle. Based on his research on goat body weight, the effect was not significant because the role of probiotics to help digestion of crude fiber in goats had not been seen. This is because the goat's rumen has microbes that digest crude fiber so that the administration of probiotics becomes less useful. According to Novel and Safitri (2009), probiotic bacteria are able to reduce the pH in the intestine, capable of producing digestive enzymes and vitamins so as to facilitate digestion, as well as being able to produce antibacterial substances. The advantage of using probiotics in feed can improve livestock growth, feed efficiency and animal health (Gunawan and Sunandari, 2003).

3.3 Population calculation lactic acid bacteria

Isolation of lactic acid bacteria (LAB) from cattle feces samples with control treatment and the provision of probiotics in feed was carried out using selective lactic acid bacteria media, namely MRS media. Feces that was cultured into MRSA media was previously diluted 10^{-1} to 10^{-10}. Counting the number of colonies of lactic acid bacteria was carried out starting from a dilution of 10^{-7} to 10^{-9}. The results of calculating the number of lactic acid bacteria colonies from the two samples of cattle feces with different treatments can be seen in the table below.

Table 3. Number of Lactic Acid Bacterial Colonies in Test and Control Cattle Feces

Description	**Probiotic Cattle**			**Non-Probiotic Cattle**		
Animal samples	S20	S19	S18	S14	S13	S11
LAB Popoulation (CFU/g)	3.6×10^{8}	3.3×10^{9}	2.7×10^{10}	2.2×10^{4}	2×10^{4}	1.8×10^{4}

The number of lactic acid bacteria in the digestive tract describes the balance of normal flora in it. Lambert and Hull (1996) stated that the imbalance between good bacteria and pathogenic bacteria will affect the number of lactic acid bacteria in the digestive tract. Based on the observations in table 3 above, it is known that the number of LAB colonies in probiotic cattle feces was higher than LAB in non-probiotic cattle numerically, but this result did not provide a significant difference. In general, this illustrates that the provision of probiotics as much as 100 ml/100 kg of feed can increase the number of LAB colonies in cattle. The high concentration of LAB in the digestive tract is thought to be related to a decrease in pH. The probio_FM product used in this study had an average pH of 4. This decrease in pH in the digestive system results in lactic acid bacteria having the ability to microbial activity. The higher the number of LAB in the digestive system of livestock, the higher the ability of these lactic acid bacteria to inhibit the growth of other pathogenic bacteria such as *E.coli (*Zain and Harahap, 2015).

3.4. Calculation of the population of pathogenic bacteria E. coli and Salmonella typhi

Isolation of pathogenic bacteria in the form of *E. coli* and *Salmonella typhi* bacteria with control treatment and probiotic administration was carried out using SSA media for *Salmonella* and EMBA for *E. coli*. The feces that were cultured into the media had previously been diluted to 10^{-10} and the number of pathogenic bacterial colonies was calculated starting from a dilution of 10^{-7} to 10^{-9}. The results of the

calculation of the number of colonies of pathogenic bacteria from the two samples of cattle feces with different treatments can be seen in the table below.

Table 4. Number of Pathogenic Bacterial Colonies in Test and Control Cattle Feces

Description	Probiotic Cattle			Non-Probiotic Cattle		
Animal Samples	S20	S19	S18	S14	S13	S11
E. coli population (CFU/g)	2.1×10^4	1.3×10^4	2×10^4	1.8×10^5	2.7×10^5	1.2×10^6
Salmonella Population (CFU/g)	2.2×10^2	2×10^2	1.8×10^2	3.6×10^2	3.3×10^2	2.7×10^2

The increase in the number of lactic acid bacteria in probiotic cattle feces is assumed to be able to suppress the growth of pathogenic bacteria in the digestive system of cattles. This is evidenced by an increase in the number of lactic acid bacteria in cattle feces accompanied by a decrease in the number of pathogenic bacteria in probiotic cattle feces. The number of *E. coli* colonies contained in this study can be categorized as safe because it does not exceed the threshold for *E. coli* content in the digestive tract which has been calculated through feces, which is as high as 10^8 – 10^9 *E. coli*/g (Suwito, 2009). Based on the observations in the table above, it is known that the number of *Salmonella* bacteria colonies in probiotic cattle feces was numerically less than that in non-probiotic cattle, but these results did not provide a significant difference compared to the population of *E. coli* in cattle feces. The high or low decline in the population of pathogenic bacteria is assessed to be related to the concentration and ability of lactic acid bacteria to inhibit the growth of pathogenic bacteria. The low decrease in the ability of lactic acid bacteria to inhibit pathogenic bacteria is thought to be due to the low concentration of probiotic products used, which has implications for the decreased ability of lactic acid bacteria to inhibit pathogens. Zain and Harahap (2015) reported that high concentrations of lactic acid bacteria will cause a faster decrease in pH so that microbial activity can take place optimally. Based on the results of the decrease in pathogenic microbes contained in the probiotic cattle feces, it can be said that giving Probio_FM probiotics as much as 100 ml/100 kg of feed can reduce the number of colonies pathogenic bacteria in cattle, although it is not yet significant sp that the product is useful in improvement of the digestive system of cattle by reducing the population of pathogenic microbes.

REFERENCES

[1] Adriani. 2009. Pengaruh Pemberian Probiotik dalam Pakan terhadap Pertambahan Bobot Badan Kambing Kacang. ***Jurnal ilmiah ilmu-ilmu peternakan***. XII (1).

[2] Ambari, M. Z., Surono dan Sutrisno. 2018. Pengaruh pakan komplit dengan level NDF berbeda yang mengandung probiotik isi rumen kerbau pada domba terhadap nilai kecernaan dan TDN. Prosiding Simposium Nasional "Inovasi Teknologi Peternakann Menyong-song Era Industri 4.0". Yogyakarta, 5 November 2018. Universitas Gadjah Mada, Yogyakarta. Hal. 40 – 44.

[3] Anggorodi, R. 1994. Ilmu Makanan Ternak Umum. PT Gramedia, Jakarta.

[4] Antara. 2021. Babel Dorong Penggemukan Sapi di Belitung. Artikel. Dikutip pada 22 Desember 2021 dari: https://www.google.com/amp/s/m.medcom.id/amp/MkMdZmvb-babeldorong-penggemukan-sapi-di-belitung?espv=1

[5] Aritonang, S.N., Roza Elly., dan Rossi Evy. 2019. Probiotik dan Prebiotik : Dari Kedelai untuk Pangan Fungsional. Indomedia Pusaka : Sidoarjo.

[6] Astuti F. K., Busono W., dan Sjofjan O. 2015. Pengaruh Penambahan Probiotik Cair dalam Pakan Terhadap Penampilan Produksi Ayam Pedaging. *J-PAL*. 6 (2) : 99-104.

[7] Azizah N. K. *et al.*, 2020. Pengaruh Probiotik Bakteri Asam Laktat dalam Air Minum Terhadap Konversi Pakan Ayam Boiler. ***Journal of Basic Medicak Veterinity.*** 9 (2) : 86-91.

[8] Candra A. A dan Magfiroh K. 2018. Meningkatkan Penampilan Broiler dengan Pemacu Pertumbuhan Alami. ***Jurnal Peternakan Terapan***. 1 (1) : 11-15.

[9] Harimurti, S; E. S. rahayu., Nasroedin, Kurniasih. 2005. Bakteri asam laktat dari intestin ayam sebagai agensia probiotik. *Animal Production*. 9 (2) : 82-91.

[10] Kementerian Pertanian RI. 2021. Kementan Apresiasi Program Integrasi SapiSawit Provinsi Bangka Belitung. Dikutip pada 22 Desember 2021 dari : https://www.pertanian.go.id/home/?show=news&act=view&id=3952

[11] Lambert, J. and R. Hull. 1996. Upper gastrointestinal tract disease and probiotics. ***Asia Pacific J Clin Nutr***. 5(1): 31-35.

[12] Marhaeniyanto, E. dan S. Susanti. 2011. Strategi suplementasi leguminosa untuk meningkatkan penampilan domba. Buana Sains. 11 (1): 7–16.

[13] Scott, M. L., M. C. Nesheim, dan R. J. Young. 1982. Nutrition of The Chicken. 3rd ed. Ithaca, N.Y. : M. L. Scott.

[14] Suwito, W. 2009. Dampak verotoksigenik dan enterohemoragik Escherichia coli (VTEC dan EHEC) pada hewan, manusia dan makanan. *Wartazoa*. 19 (2) : 7.

[15] Gunawan dan M.M.S. Sundari. 2003. Pengaruh Penggunaan Probiotik dalam Ransum terhadap Produktivitas Ayam. Wartazoa. 13(3): 92-98.

[16] Novel , S. S. dan R. Safitri. 2009. Manfaat Bakteri Probiotik untuk Kesehatan Manusia. Medicinus. 22(3): 122-124.

[17] Purwanti, D., Suryahadi, D., Evvyernie. 2014. Performa Sapi Potong Sebagai Respon Dari Suplementasi Probiotik Padat dan Cair. *Buletin Makanan Ternak*. 101 (1) : 13 – 24.

[18] Zain, N.W.H., dan Harahap, A.E. 2015. Kuantitas dan Kualitas Bakteri Asam Laktat yang Diisolasi dari Cairan Rumen sebagai Sumber Probiotik. Prosiding Seminar Nasional Teknologi Peternakan daan Veteriner. 157 – 163.