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Effect of Injection Vitamin B-Complex on Diet for Consumption, Feed Rate Conversion and Average Daily Weight Gain of Bali Cattle in the Growing Phase

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INFO ARTICLE

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ABSTRACT

Penggunaan Vitamin B-Kompleks pada sapi dinilai lebih praktis, murah dan lebih mudah dalam proses pelaksanaan penyuntikannya. Peranan Vitamin B-Kompleks sebagai kofaktor dalam proses metabolisme dan merangsang konsumsi secara sukarela. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh penyuntikan Vitamin B-Kompleks yang berbeda terhadap konsumsi ransum, konversi ransum dan rataan pertambahan berat badan harian sapi bali fase *grower*. Penelitian ini dilakukan di Kotamadya Bobonaro, selama 81 hari. Digunakan metode eksperimen dengan statistik uji T. Digunakan dua kelompok independen dan masing-masing kelompok terdiri dari 5 ekor sapi jantan. Kelompok A mendapat suntikan Vitamin B- Kompleks sesuai dengan bobot awal masing-masing, dan kelompok B tanpa suntikan Vitamin B-kompleks. Kedua kelompok mendapat pakan yang sama yaitu terdiri dari *Leucaena leucocephala*, *Gliricydia spium*, *Panicum maximum* dan jerami padi (*Oryza sativa* Lin). Hasil analisis statistik menunjukkan bahwa tidak ada perbedaan yang nyata (P>0,05) diantara kedua kelompok terhadap konsumsi bahan kering, konversi pakan dan rataan pertambahan berat badan harian. Dengan demikian maka diasumsikan bahwa injeksi Vitamin B-Kompleks seharusnya kurang diperlukan untuk membantu meningkatkan pertumbuhan ternak ruminansia, terutama sapi, dengan adanya proses degradasi vitamin yang terjadi dalam rumen, selain vitamin juga bertindak dengan penghambatan kompetitif pada titik yang berbeda dalam proses metabolisme, dan partisipasinya, juga sangat mendasar dalam oksidasi substrat dan suplai energi dalam proses metabolisme hewan.

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ABSTRACT

The use of Vitamin B-Complex injection is considered more practical, low cost and easier in the implementation process, and the role of Vitamin B-Complex is as a cofactor in the metabolic process and stimulates voluntary consumption. The aim of this study is to find out the effect of injecting different cc (ml) of B-Complex vitamins on diet intake, feed conversion and average daily weight gain of Bali cattle in the growing phase. This study was carried out in the municipality of Bobonaro, with duration of 81 days. The experimental method was used with T test statistics. The independent groups represent two groups of male cattle and each group composed of 5 male cattle. The groups called A, and B, therefore, group A receives injection of Vitamin B-Complex according to the initial weight of each animal, and group B as a control without Vitamin-B-Complex injection. Both groups received the same diet which is composed of Leucaena leucocephala, Gliricydia spium, Panicum maximum and rice straw (Oryza sativa Lin). The results of the statistical analysis revealed that there was no difference (P>0.05) between the two groups, mainly in dry matter intake, feed conversion and average daily weight gain. Therefore, the injection of Vitamin B-Complex should be less necessary to promote the growth of ruminant animals, mainly cattle, due to the degradation of the vitamins in the rumen, in addition to the fact that the vitamin acts by competitive inhibition at different points in the metabolism process, in addition to its participation, it is also fundamental in the oxidation of substrates and energy supply in the animal's metabolism process.

INTRODUCTION

Bali cattle is classified as a strong ruminant that farmers raise with the aim of providing food especially high nutrient beef to consumers as a source of animal protein. In order to achieve meat production, the animals must be treated with rigorous treatments linked to the context of high quality of the food provided and must guarantee the sustainability of these actions in the creation process (Code et al., 2021). On the other hand, farmers like to raise Bali beef due to its high economic value in the context of securing the family economy and to be sold when they need to finance the family's basic needs, including participation in cultural ceremonies and also the production of various primary products used in industries. According to Sastrosmidjojo & Soerradi (1990), Bali cattle has the ability to adapt to any environmental situation and food quality menus. Most farmers use low-quality agricultural by-products to feed animals when there is a decline in feed, especially in the dry period. One of the by-products most used by producers is rice straw, which contains low nutritional substances, mainly crude protein, which is one of the interesting nutrients to improve the growth of animals in the growing phase. In this situation, producers needed other types of high quality food in the formulation of animal feed, however, they always face various difficulties in the acquisition process due to the lack of sustainability in the production of animal feed, we cite as an example, the sustainability of *Leucaena* and *Gliricidia* production which are best known by producers in rural areas as high quality feed for ruminant animals (Code et al., 2021). For this, it is necessary to seek alternative options to stimulate the animal's desire to consume, through the use of Vitamin B-Complex injection with the intention of improving the voluntary desire for consumption in the animals, especially in the consumption of rice straw, which is considered as a low quality

agricultural by-product. The use of Vitamin-B-Complex intramuscular injection based on the veterinarian's recommendation is considered more practical, low cost and easier in the implementation process. The function of vitamin B-Complex is as a cofactor in the metabolic process and to stimulate voluntary consumption (Sandjaja & Atmarita, 2009), in addition to stimulating the digestion and absorption capacity of the digestive organs of animals. However, Vitamin-B-Complex is considered as an essential organic compound where an organism needs in smaller amounts to normalize the functioning of the metabolic process. The study aims to find out the effect of injecting different cc (ml) of B-Complex on the productive performance of male Bali cattle in the growth phase.

METHODOLOGY

Place of Study

The study was carried out in the municipality of Bobonaro, for 81 days, from July 7 to September 25, 2020. Municipality of Bobonaro located in the west of the country's capital, with 90 LS and 125.220 BT, Bobonaro is bordered by the northern part with the municipality of Liquiça, the south with the municipality of Covalima, the east with the municipalities of Ermera and Covalima and the western part with Atambua, Indonesia (Bobonaro in Number, 2019).

Research method

The experimental method was used with T-test statistics. The independent groups represent two groups of male cattle and each group is composed of 5 cattle with an average initial weight of 214.5 ± 42.3 kg and aged between 1.5 and 2.5 years. The groups named A, and B, therefore, group A receives Vitamin-B-Complex injection according to the initial weight of each animal and group B as a control or comparison group and has been tested and the results state that all Bali cattle used are free from internal parasites. Diet consumption, feed conversion, average daily weight gain were observed as the main variables of this research. The diet intake obtained by calculating the total feed offered decreased the remaining feed in 24 hours (total feed offered (g) - remaining feed not consumed). Feed conversion obtained through total feed intake divided by weight gain in the given period (g/g). However, increase the average daily weight using the formula: animal last weight minus (-) initial weight to be divided by the survey period. The food raw materials used in the animal feed formulation consist of 75% Leucaena leucocephala, 15% of rice straw (*Oryza sativa* Lin), and 5% of Panicum maximum.

Vitamin B-Complex Injection Method

The Vitamin-B-Complex injection method through intramuscular injection is based on the initial weight of each animal according to the formula recommended by Subroto (2003), the composition of the B-Complex used in this research is as follows: vitamin B1 (2.5 mg), vitamin B 2 (1.6 mg), vitamin B6 (12.5 mg), Nicotinamide (12.5 mg), D-panthenol (2.5 mg). Total (ml) injection per animal as showing in Table 1.

Table 1. Injection Vitamin B-Complex Based on the Initial Weight of the Animals

	Group A		Group B	
Repetition	Initial weight (kg)	Injection (ml)	Initial weight (kg)	Injection (ml)
A1	235.0	11.8	B1 252.0	-
A2	277.0	13.9	B2 174.0	-
A3	127.5	6.4	B3 223.0	-
A4	230.0	11.5	B4 231.0	-
A5	196.5	9.8	B5 198.5	-
Mean	213.2	10.7	215.7	-

Obs: A1-A5 group 1 animals receiving Vitamin B-Complex injection, B1-B5: Animals of group 2 without Injection Vitamin B-Complex

Data analysis

The data obtained in the study were tabulated, coded and submitted to T test analysis, using the SPSS version 24 to compare the average value of the productive performance of the animals allocated in the two independent groups according to the recommendation of (Sampurna & Nindhya, 2008).

RESULTS AND DISCUSSION

The data obtained in this research were submitted to statistical analysis of the T test as shown in Table 2. The results of the analysis revealed that there was no difference (P> 0.05) between the group A that received the Vitamin B Complex injection during the research period and the group B that did not receive the Vitamin B Complex injection in productive performance, mainly. Generally, the capacity of the animals to consume the diet, feed conversion, and average daily weight gain are considered as three main indicators in the evaluation of the productive performance of an animal.

Table 2. Mean consumption value DMC, FC and ADG of Animals

Animal (repeat)	Observed Variables					
	DMC (kg)		FC		ADG (g)	
	Group A	Group B	Group A	Group B	Group A	Group B
Group A (Vitamin B-Complex Injection)						
1	4.02	-	7.27	-	580.25	-
2	4.31	-	8.84	-	481.48	-
3	3.39	-	5.15	-	679.01	-
4	4.69	-	9.02	-	530.86	-
5	4.91	-	7.10	-	709.88	-
Group B (No Vitamin B-Complex injection)						
1	-	4.63	-	6.93	-	679.01
2	-	3.71	-	5.69	-	654.32
3	-	4.1	-	6.24	-	666.67
4	-	5.33	-	6.14	-	888.89
5	-	4.76	-	7.67	-	648.15
SEM:	4.3 ± 0.60	4.5 ± 0.62	7.5±1.56	6.5±0.77	596.3±75.40	707.41±90.30

Note: DMC: Dry Materia Consumption ; FC : Feed Conversion; ADG: Average Daily Gain

The results of the t-test statistical analysis revealed that there was no significant difference (P> 0.05) in the diet consumption, average daily weight increase and feed conversion of the animals in the two independent groups. The average value of the diet intake of cattle from group A that received the injection of Vitamin-B-Complex was 4.3 ± 0.60 kg of dry material (DM)/day. In the trial, the average value of dietary intake of cattle in group B that did not receive Vitamin B-Complex injection was 4.5 ± 0.62 kg of DM/day. The results showed that the injection of Vitamin-B-Complex in group A cattle did not manage to stimulate consumption volatility and the ability of the digestive organs to convert food and absorb food. Nutritional supplements that provide amino acids, calcium, phosphorus and some B-Complex Vitamins, such as choline and Vitamin B12, can improve the performance of feedlot cattle (NRC, 2001). He also pointed out that the requirements for B-Complex Vitamins are normally met by ruminal microbial synthesis and from some dietary sources that are not degraded in the rumen. However, some studies demonstrate benefits in production or health for dairy cows when they are supplemented with B-Complex vitamins. According to Wijono et al. (2001), Feed is one of the factors that greatly influence the development of the body weight of the cattle being kept, if there is a shortage of animal feed it results in weight loss mainly due to loss of body fat. Amino acids are the pillars for the production of proteins and the 20 necessary, 10 are considered essential, that is, the body cannot produce them, and the other 10 are called non-essential because the body can synthesize them from other amino acids. The feed conversion of animals in group A that received Vitamin - B-Complex injection is about 7.50±1.56 kg. However, the animals in group B as a control showed the average value of feed conversion about 6.5±0.77 kg.

The results indicate that the injection of vitamin B complex in cattle is less efficient in increasing the capacity of the digestive tract, mainly in the process of feed conversion. The feed conversion results obtained in this study were better compared with the results reported by Siregar (2008) that normally the feed conversion of Bali cattle between 8.56 to 13.29 kg and according to Tahuk & Dethan (2010), the feed conversion of Bali cattle around 7.5kg is enough for good growth. The mean value of average daily gain obtained in this study for group A was around 596.30±75.40g and for group B around 707.41±90.30g per day, respectively. The results obtained are not different when compared with results reported by Kearl (1982); Pane (1991) and Oematan (2000), that the ideal growth of Bali cattle is around 500g; 700g and 900g per day respectively. According to Dorland & Newman (2006), Vitamin B-Complex is needed by rumen microbes to facilitate the food degradation process. According to Mc Dowell (2013) the function of Vitamin B-Complex is to facilitate the metabolic process, especially as a catalyst in the conversion of nutritional

substances into meat. According to Félix (2019), Vitamins are a group of organic compounds that do not fit the classification of macronutrients and they are not chemically related to each other, being distributed in the kingdoms of vegetable and animal.

CONCLUSION

Based on the result of the study concluding that there was no difference between group A that received Vitamin B-Complex injection around 10% of the initial live weight in the research period and group B that did not receive Vitamin B-Complex injection, both on diet consumption, feed conversion and average daily weight gain of animals in both groups. Therefore, Vitamin B-Complex injection is less necessary to stimulate growth in ruminant animals, so it must stimulate growth with high quality feed to achieve the maximum possible.

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CONTRIBUTION STATEMENT

In this article, Carlito de Araújo Mali Code acts as the main contributor, while Armando B.M. Afonso & Ana Maria da Costa G. Noronha acts as a member contributor, Graciano Soares Gomes act as a member and correspondence contributor.

REFERENCES

Bobonaro in Number. (2019). *Statistics of the Municipality of Bobonaro*. 7th Edition. Head of the Bobonaro Municipal Statistics Service, Domingos Manuel Baptista. 2019. Unpublished.

Code, C. D. A. M., Gomes, G. S., & da Costa Joao, A. A. P. (2021). Effects of the Combination of Rice By-Products (Fermented Straw and Bran) and Legumes (Leucaena and Gliricidia Leaves) on the Growth Rate of Male Bali Cattle. *Journal of Animal Science and Technology*, *5*(2), 38-41.

Dorland, W., & Newman, A. (2006). *Dorland Veterinary Dictionary*, 29th ed. Jakarta: EGC. (In Indonesia).

Félix, H. D. González, Sérgio, Ceroni da Silva (2019). *Minerals and vitamins in animal metabolism*. Laboratory of Clinical Analysis, Faculty of Veterinary Medicine, Universidade Federal do Rio Grande do Sul, Brasil.

Kearl, L. C. (1982). *Nutrient requirements of ruminants in developing countries*. International Feedstuffs Institute.

Mc Dowell, L. (2013). *Vitamin history, the early years*. First Edition Design Pub.

Oematan, J. S. (2000). Growth compensation of Bali cattle in various energy balances: protein ration and its effect on carcass traits. *Thesis*. Bogor (ID): Institut Pertanian Bogor (IPB), Jakarta. (In Indonesia). Unpublished.

Pane, I. (1991). Productivity and cattle breeding Bali. *Proceedings of the Bali National Cattle Seminar*. September 2-3, 1991. Faculty of Livestock, Hassanudin University. Ujung Pandang. (In Indonesia). Unpublished.

Sampurna, I. P., & Nindhia, T.S. (2008). *Data Analysis with SPSS in Design Experimental, First impression*. Udayana University Press, Bali. (In Indonesia).

Sandjaja, & Atmarita (2009). Nutrition Dictionary. EN. *Kompas Media Nusantara* Jakarta.

Sastroamidjojo, M. S., & Soeradji (1990). Yasaguna *Public Farm.* Jakarta. Indonesia. Unpublished.

Siregar, S. B. (2008). *Bali cattle fattening*. Independent Publisher, Jakarta. Indonesia. Unpublished.

Subroto. (2003). *Livestock Mammal Disease Science* I. Gadjah Mada University Press. Yogyakarta.

Tahuk, P. K., & Dethan, A. A. (2010). Performance of Bali bull in greenlot fattening by farmers when rainy season in Timor island. *Journal of the Indonesian Tropical Animal Agriculture, 35*(4), 257-261.

Wijono, B. D., Aryogi, & Rasyid, A. (2001). *The Effect of Initial Body Weight on Yield Achievement in Fattening Beef Cattle in People's Farms*. Animal Husbandry Research and Development Center. Department of Agriculture, Bogor, Indonesia. Unpublished.