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Performance of Nelore calves receiving Biocelerator

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Technical Report

Introduction

One of the most successful sectors of Brazilian agriculture, at both the domestic and international level, is beef cattle, an activity experiencing continuous growth, mainly due to high beef prices.

The main breeding strategy used by cattle breeders in Brazil is the pasture system, where animals spend all day in an area of pasture, gathering forage directly from the field. It is an inexpensive system, with low costs, but is also time consuming, as the weight gain of animals in this type of system is lower than that of confined animals.

The confinement system, in contrast, demands greater investment and immobilisation of capital due to the need for facilities and the production of roughage, while supplying this roughage in troughs requires more labor.

Even with the need for greater investment, the confinement system is increasingly common, mainly due to the increase in market prices of beef and the growth in the import of meat and even live cattle.

In order to optimize this system, several technologies have sought to provide greater efficiency and greater profitability for the producer. One of these is the use of products that aim to increase the efficiency of the nutrients present in food, resulting in greater gains in body weight, reduced confinement time and allowing a lower slaughter age. The initial proposal described here is for the use of Biocelerator in the drinking water of animals.

Biocelerator is stated as a “state-of-the-art biostimulator, produced using cutting-edge technology in the area of molecular processes, naturally stimulating the microbiological activity of the environment in which it is applied”.

“With a chemical composition similar to that of drinking water, Biocelerator consists of an aqueous solution of inorganic nano particles, which change the speed with which substances dispersed in the aqueous medium (oxygen, nutrients, organic matter, etc.) pass through the cellular and intracellular walls, resulting in greater energy and metabolic conversion in

bacteria. As a consequence, there is a natural increase in microbiological activity within the rumen fermentation process, leading to a number of economic benefits for the nutrition of ruminants."

Given this information, the objective of this research was to evaluate the effect of Biocelerator on the performance of Nelore calves.

Methodology

The study was performed at the Fazenda Ribeirão (the Ribeirão Farm), in the municipal region of Brejo Santo, in the state of Ceará. Initially, 33 (thirty-three) uncastrated male Nelore cattle, with an average age of ten months, were used.

The animals were divided into two groups, the first of which consisted of 20 (twenty) animals which did not receive Biocelerator, and was considered the control group, with an average initial body weight of 214.45 ± 32.65 kg.

The other group was composed of 13 (thirteen) animals, with an average initial body weight of 205.69 ± 19.37 kg, considered the test group as they ingested Biocelerator, with the product administered directly in the drinking trough at an amount of 100 ml/animal/day. This division into groups was proposed by the farm itself, with the aim of not interfering with the breeding system of the property.

The animals were kept in collective stalls (Figure 1), and provided with collective troughs and drinkers. Their feed was exclusively composed of corn silage, and was provided daily at 07:00. Mineral supplementation was provided *ad libitum* through a commercial mineral mixture.

Figure 1: Collective stall of animals in the test group.

Biocelerator was added on a daily basis to the water supply in the drinkers in the test group stall, using an automatic float system.

To assess the performance of the animals evaluated, weekly weighings were performed, and body weights were obtained throughout the experiment.

The data were subjected to analysis of variance and test of means, considering the treatments, using the GLM procedure of the System of Statistical and Genetic Analysis (or SAEG) (UFV, 2001). A 5% level of probability was adopted.

Results and Discussion

When evaluating the initial weight of the control and test groups, the values of the heaviest animals were excluded, giving an average initial body weight of 201.00 ± 28.30 kg for the control group and 200.50 ± 18.71 for the test group, with such figures providing a better statistical parameter for assessing the data sets.

Table 1 shows the initial and final body weight values, the gain in the initial and final weight and the daily supply of corn silage.

Table 1: Average initial and final weights, gain in average initial and final weights and silage supply.

Treatments	Initial weight (kg)	Final Weight (kg)	Initial weight gain (g/d)	Final weight gain (g/d)	Supply of silage (kg/day)
Without Biocelerator	201.00	222.23 b	501.25a	307.69b	18.00
With Biocelerator	200.50	230.10 a	361.00b	462.50a	18.62
CV(%)					
P-value					

Based on the values shown in Table 1, it can be seen that when the values of the heaviest animals in both groups (control and test) were excluded, the mean body weights were very similar. When evaluating the final body weight, however, that of the animals receiving Biocelerator was 3.5% greater than that of the animals in the control group.

This result is due to the beneficial effect that Biocelerator has on ruminal bacteria, causing these microorganisms to increase their capacity to ferment the fibrous carbohydrates present in the bovine diet, resulting in an increased production of volatile fatty acids, which provide energy for the metabolism of animals.

Similarly, the increase in the rumen fermentation rate leads to an increase in the microbial protein available in the intestine.

Thus, with the availability of energy and protein for the metabolism of the animal, there is an increase in weight gain, as observed in the results shown in Figures 2 and 3.

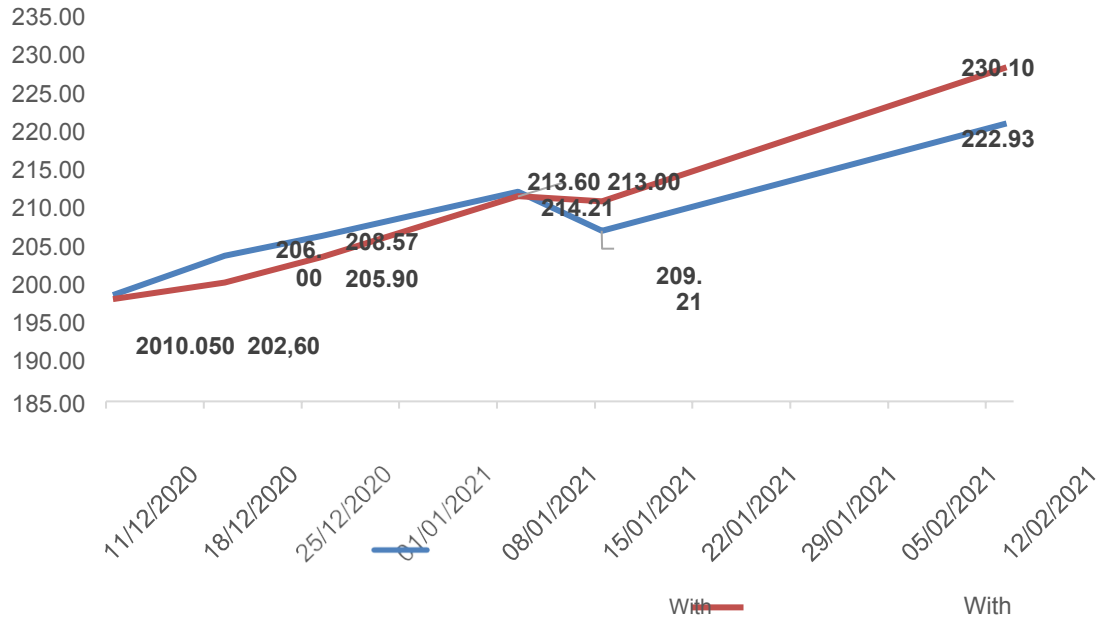

Figure 2: Evolution of body weight over the experimental period.

Figure 2 shows the evolution of the average body weight of the animals. In the first weighings, the animals in the control group were superior to the test group, but over the experimental period, the animals receiving Biocelerator outperformed those in the control group, a result of the effect of the biostimulant.

In terms of profitability, Table 2 presents a simulation for the differences in the sale value of the calves.

Table 2: Simulation 1 – sale of calves.

Treatment	Final Weight	Value R$/kg	Value per calf (R$)
Without Biocelerator	222.23	10.00	2,222.30
With Biocelerator	230.10	10.00	2,301.00
		Difference (kg)	78.70

When the average final body weight was compared, that of the test group was 7.87 kg greater than that of the control group. In current values, where the price per kilo of body weight for calves is R$10.00, the difference in final weight represents a monetary gain of R$78.70 per animal when Biocelerator is used.

As can be seen in Figure 3, the use of Biocelerator had a noticeable positive effect on the daily weight gain of Nelore calves. At the beginning of the experimental period, the control group had a greater gain than the test group. Following the administration of Biocelerator, however, this difference was reversed, with the average daily weight gain of the test group being 28.12% greater than that of the control group.

The greater weight gain observed in the group of calves that received Biocelerator, in terms of profitability for the producer, means that the period required for the animal to reach the ideal weight for slaughter is shorter. In a confinement system this represents a significant reduction in production costs.

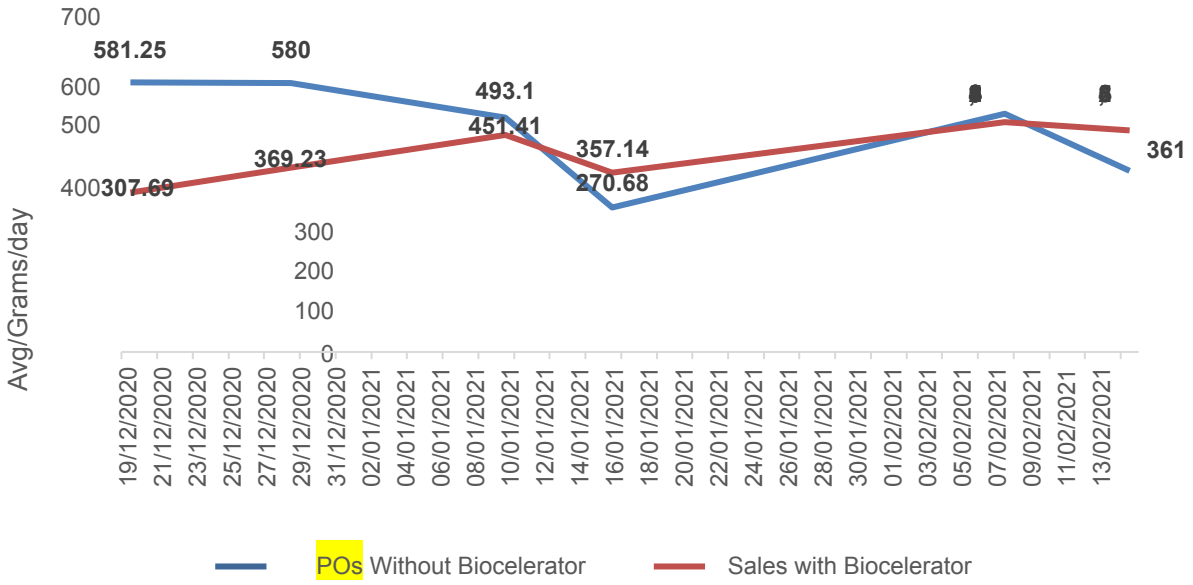

Figure 3: Average daily body weight gains (g/day) observed during the experiment

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Based on the data obtained in this study, when regression was performed for the body weight and age of the animals, the following equations were obtained: y = 0.4597x + 61.089, R^2 = 0.98 for the test group and y = 0.307x + 110.24, R^2 = 0.89 for the control group.

Based on these regression equations, it was simulated that the time required to reach a weight of 540 kg (slaughter weight, 18@) would be 1,041.8 days, or 34.7 months, or 2.9 years for the group receiving Biocelerator, and 1,399.9 days or 46.7 months or 3.89 years for the control group.

Considering a difference in the time required to reach slaughter weight of 358.1 days, and based on a silage supply of 8% of body weight throughout confinement, giving an average supply of 30.64 kg/day, and a value per kilo of silage of R$0.12 per kilo, a saving of R$1,316.66 per animal could be achieved.

Table 3: Simulation - sale of live cattle.

Treatment	D540	Silage supply.	Quant. Sila.	Silo kg value. (R$)	Total (R$)
Without Biocelerator	1,399.9	30.64	42,892.94	0.12	5,147.15
With Biocelerator	1,041.8	30.64	31,920.75	0.12	3,830.49
			Difference		1,316.66

* The amount of silage provided was based on a supply of 8% of body weight, with body weight considered as the average estimated final weight (540 kg) and the average final weight of all the animals evaluated (226.51 kg).

Conclusion

The use of Biocelerator in the drinking water of Nelore calves at an amount of 100 ml/animal/day resulted in an significant improvement in the performance of the animals evaluated, leading to greater profitability both in the sale of calves and in the sale of animals for slaughter.