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ABSTRACT

The study was conducted at Nursery, Oyao, Dupax del Norte, Nueva Vizcaya, from April 16 to June 10, 2009 to determine the effect of rhizobacteria on the growth performance of Sunshine chicken.

One hundred twenty day old Sunshine chicks were used. They were divided into three treatments and each was replicated four times with ten birds per replicate. Analysis of variance for Complete Randomized Design was used to compare treatments and Duncan's Multiple Range Test was used to compare the significance of differences among means. The treatments were control, 10 g rhizobacteria powder per 40 litters water, and 10 g rhizobacteria powder per 50 litters water.

Statistical analysis revealed no significant differences among the treatments in terms of initial weight, feed consumption, slaughter weight, carcass weight, dressing percentage, major cuts and morbidity rate. On the other hand, final weight, total gain in weight, water consumption, feed conversion ratio and feed cost to produce a kilogram gain in weight were significantly better.

In the return on investment, Sunshine Chicken given 10 g rhizobacteria powder per 50 liters and 40 liters water obtained 23.50 percent and 20.17 percent, respectively. The Sunshine Chicken not given rhizobacteria obtained 17.11 percent.

Based on the results of the study, 10 grams rhizobacteria powder per 50 litters of water gave the best performance among the treatments. With these findings, it is concluded that giving of rhizobacteria in the drinking water can enhance the growth performance of Sunshine chicken. It can lessen the feed cost to produce a kilogram gain in weight, and can obtain higher return on investment.

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INTRODUCTION

In the first several years, Sasso chicken from France was very popular with a lot of local growers especially the smaller raisers that included backyard raisers. It also appealed to those with commercial intentions. Sasso chickens are praised by raisers for their plump body, fast growth, sturdiness, and taste that resemble that of native chicken.

However, for succeeding years, many growers have become disgruntled. The Sasso chickens did not grow as big as before until these were no longer available in the market. According to Dr. Rey Itchon, this was because the replacement of parent stocks was not done regularly. He explained that the first generation chickens that were sold in the beginning should not have been used as breeders to produce chicks for sale or for growing.

For now, with a new partnership, the country is producing a new strain called Sunshine. Sunshine chicks are produced using parent stocks from the Sasso Company in France. These are imported colored chicken from France. This type of chicken is for meat production and for egg production as well. Every six months, a new batch of parent stocks will be imported to ensure a stable supply of quality Sunshine chicks for meat and egg production (Itchon and Ramos, 2007). Sunshine chicken is becoming increasingly popular in many parts of the country. Thousands of Sunshine chicken eggs everyday is sold in Metro Manila, particularly in the upscale specialty food stores and restaurants.

In the other hand, Solraya (2008), suggested the using of probiotics in the drinking water for the first 21 days of free range Sunshine chicken prior to ranging.

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Probiotics are live microbial food ingredient that when ingested in sufficient quantities exert health benefits on the consumer. According to Doron and Gorbach (2006), probiotics exert their benefits through several mechanisms: they prevent colonization, cellular adhesion and invasion by pathogenic organisms, they have direct antimicrobial activity and they modulate the host immune response. Probiotics are good bacteria that can boost the level of beneficial bacteria in the gut, whereas antibiotics attack and kill infections and unwanted bacteria. Further, the natural balance of beneficial bacteria in the digestive system is disrupted under certain conditions and one of which is the antibiotic treatment. The number of pathogens increases while the number of beneficial microorganisms decreases causing digestion upsets and discomfort to animals. For animals, probiotics are more commonly referred to as Direct Fed Microbes (DFM's). DFM's can restore the normal balance of the gut and improve the overall health of the animal.

Meanwhile, the Exquisite Focus Philippines Incorporation, an Agricultural based Company, offers a simple, direct and practical approach to Agriculture, Aquaculture, and Livestock including the environment. With an aim of maximizing the income for farmers at the same time reducing farm inputs by 50 percent through its excellent features and benefits, the Company is promoting BD Soil Conditioner/ Inoculants, BD Bio Organic Fertilizer, BD Probiotics for Aquaculture and Livestock. It further aims to promote better health through Bio Food Production Technology.

One of the contents of Probiotics is called rhizobacteria. It is a selection of specific dormant active bacterial product made from strains through advance fermenting and concentrating technology. It is a powdered live bacteria commercially prepared as

plant growth enhancer that contains non-toxic effective live bacteria numbering to 1 billion per gram. The product is suited to enable reproduction of beneficial microbial bacteria, reduce populations of pathogenic bacteria, regulate rhizosphere nutrient environment and restore soil original embiosis. It is primarily used in agricultural crops, plantations and fisheries and it maximizes income for farmers at the same time reducing farm inputs.

Poultry production is considered as one of the common and practical agricultural enterprises nowadays because of its short production period. However, poultry raisers today are faced with some constraints. One major problem is the prevalence of infectious diseases. Losses from high cost of production and the increasing problem of antibiotic resistance brought about by the use of antibiotics that has led to the increased interest of using probiotics in animal production. Hence, this study was designed to utilize rhizobacteria solutions in chickens without the use of synthetic antibiotics.

The result of the study may provide helpful information in improving the growth performance of sunshine chickens and may also of help to other researchers, to people engaged in poultry production as well as to the community by providing knowledge on Sunshine chicken production.

The findings of this study may provided significant information which is relevant to poultry production. Whereas, to the people engaged in poultry production, the study provided them with helpful data that may guide them in improving the growth performance of sunshine chicken. More importantly, the results of the study were of assistance in improving the poultry industry not only in Nueva Vizcaya but in other areas as well.

Furthermore, it was hoped that this study inspired other researchers to conduct similar studies to help improve the poultry industry as a whole. This study may also serve as a guide and reference to future researchers.

Generally, the study aimed to determine the growth performance of sunshine chickens supplemented with rhizobacteria in Dupax del Norte, Nueva Vizcaya.

Specifically, this study aims to:

1. measure the growth rate of sunshine chickens supplemented with rhizobacteria.

2. determine the feed consumption of sunshine chickens supplemented with rhizobacteria.

3. compare the feed conversion ratio of sunshine chickens supplemented with rhizobacteria.

4. determine the effect of rhizobacteria on the health status of birds as reflected by morbidity and mortality rate.

5. identify the level of rhizobacteria that gives the best growth performance of Sunshine chickens.

6. find out the profitability of raising sunshine chickens supplemented with rhizobacteria in terms of ROI and cost to produce a kilogram gain in weight.

The study was conducted at Nursery, Oyao, Dupax del Norte, Nueva Vizcaya from April 16 to June 10, 2009.

REVIEW OF LITERATURE

Ever since the commercial broiler industry was introduced in the early eighties, urban consumers had been exposed to these antibiotics-laden chickens and their eggs, thereby resulting in more incidents of cancer and other debilitating human sicknesses (Exquisite Focus Philippines, 2005).

Various theories have been proposed to explain the mechanisms by which avian indigenous gut microorganisms protect their host against invading enteropathogens. Sluis (2003) stated that in the early nineties, Japanese researchers discovered that probiotics such as *Lactobacillus acidophilus* and *Streptococcus faecium* were able to reduce the severity of necrotic enteritis. Further, probiotics were able to inhibit the growth of potentially pathogenic microorganisms by lowering the pH through production of lactate, lactic acid and volatile facts.

Chong (2006) on the other hand made use of probiotics rhizobacteria in aquaculture. Accordingly, with the use of probiotics rhizobacteria, water stays clean, requiring change only after four months or upon harvest. Fish kills could record as high as 90 percent mortality in warm months and could wipe out the entire stock in just a few days.

In addition, Pontiveros (2001) of Lubao, Pampanga who raises tiger prawns, milkfish, tilapia and crabs confirms that probiotics is proven effective in arresting continuous deaths even in limited span (Manila Bulletin, 2001).

Further, Banciles (2004), Ph.D of Quirino State College wrote in her journal that the QSC was alarmed with the high mortality of chicks in the poultry farm due to the cool weather condition associated with other factors. The university conducted an experiment

by mixing ten grams of rhizobacteria with 40 liters of water. The solution was given to the chicks throughout the experiment. The result was remarkable since the death among the chicks has finally stopped. From then on, the solution was continuously administered to all birds in the farm. It was observed that the birds became resistant to diseases and finally regained their agility as shown in their improved growth rate.

With this experience, according to Banciles (2004), a group of researchers was motivated to try rhizobacteria to broilers. At first, they were hesitant since they know that the broilers are not as sturdy as the Sasso breeds but they took the risk. The result was unbelievable because the birds treated with rhizobacteria registered an average of 1.69 kilograms in barely 36 days compared to 1.2 kilograms mean weight of birds that were not treated with rhizobacteria.

The curiosities lead other researchers to try rhizobacteria in the tilapia farm of Quirino State College. Accordingly, the result was remarkable. The muddy water in the pond became clear and greenish. Planktons and algae were observed to be growing thickly in the pond. The fish from the treated pond appeared dark blue-gray in color with pinkish fins. They are generally bigger and heavier in weight than those fish taken in untreated pond which are whitish in color and smaller in size.

Faria et al, (2006) as cited by Polig (2008) studied probiotics for broiler chickens in Brazil: systematic review and meta analysis concluded the probiotics are a technical viable alternative to antimicrobial growth promoters in broiler feeding.

The effects of different levels of probiotics (*Lactobaccilus acidophilus*, *Streptococcus faecium* and Yeasacc 10260) supplementation on the performance of broiler chickens were evaluated using 144 commercial broiler chicks, 1-day-old, for a

period of 8 weeks. The feed intake, feed efficiency and protein efficiency were statistically insignificant at 6 and 8 weeks of age among the treatment groups. Cost production of broilers was lower in the 0.025 and 0.05 percent probiotics supplemented groups at 6 to 8 weeks of age, respectively. It was concluded that probiotics supplementation in standard boiler ration at a lower level is beneficial in the early stages o f growth (Elizabeth, V. et al, 2005).

Administration of probiotics via the drinking water had beneficial on broiler performance. In the field trials, probiotic treatment significantly improved feed conversion. In each field trial total final body weight was increase by supplemental probiotics, ranging from 0.74 to 1.64 percent. Mortality was reduced by the addition of probiotics to the drinking water (Timmerman H. M. et al, 2006).

METHODOLOGY

The materials used in the study were 120 heads of day old sunshine chicks, rhizobacteria powder, poultry feeds, brooding cages , weighing scale, electric bulbs, feeding and drinking troughs, pails, record book, empty sacks carton sheets and cleaning materials.

The stocks were purchased from one of the reliable Sunshine chicken dealer in Maharlika Highway, Solano, Nueva Vizcaya.

All equipments including the brooding pens were thoroughly cleaned and disinfected a week before the arrival of the chicks. The brooding pens were divided into twelve compartments measuring three (3) feet by four (4) feet each which was enough to contain ten (10) sample birds. The sides of the pens were made of bamboo covered with clean empty feed sacks and carton sheets inside to help conserve heat. The brooders were preheated an hour before the arrival of the chicks to attain uniform warmth inside the cages.

Upon arrival, the chicks were weighed to obtain their initial weights and were distributed at random following the completely randomized design (CRD). There were three treatments and each was replicated four times with ten birds per replicate making a total of forty birds per treatment.

The different treatments were as follows:

T_0 = control

T_1 = 20 g rhizobacteria powder per 40 liters water.

T_2 = 20 g rhizobacteria powder per 50 liters water.

Ad libitum feeding was employed from the start until the end of the study. Chick booster were given to the chicks up to two (2) weeks of age then were gradually shifted to starter ration on the 15th day and finisher ration on the 35th day until the end of the study. Shifting of feeds were done by mixing 25 percent of the new feed on the first day, 50 percent on the second day and 75 percent on the third day and the fourth day the birds were totally with the new type of feeds. The feeders were placed inside the compartments from the start of the study until 20th day and were placed along the walls outside the pen on 21st day adjusted to the breast level of the birds. The rhizobacteria solutions were made available to the birds from the first day and throughout the duration of the experiment.

The data gathered were the following:

1. Initial weight (kg). This was obtained by weighing the birds individually at the start of the study.
2. Final weight (kg). This was obtained by taking the weight of the birds at the end of the study.
3. Feed offered (kg). This was obtained by weighing the amount of feeds given to the birds.
4. Feed left-over (kg).This was obtained by weighing the amount of feeds not consumed by the birds from the feed offered.
5. Mortality count. This was obtained by taking the number of birds that have died during the experimental period.
6. Morbidity rate. This was obtained by taking the number of sick birds during the study period.

7. Production cost. This includes the cost of stocks, feeds, probiotics, labor, electricity, equipment and materials that were used in the study.

8. Slaughter weight (kg). This refers to the body weight of the fasted animal prior to slaughter.

9. Dressed weight (kg). This was obtained by weighing the carcass of the chickens after evisceration, head and feet off.

10. Weight of the major cuts (kg). This refers to the weight of the legs, thighs, wings, breast and back of the birds.

The data that were computed:

1. Total gain in weight (kg). This was computed by subtracting the initial weight from the final weight of birds.

2. Total feed consumption (kg). This was obtained by taking the difference between the offered and the left over.

3. Dressing percentage (%). This was obtained by dividing the carcass weight with the slaughter weight multiplied by 100.

4. Feed conversion ratio (FCR). This was obtained by dividing the total feed consumed by the total gain in weight of the birds.

5. Feed cost to produce a kilogram gain in weight (Php). This was taken by multiplying the feed conversion ratio by the cost of feed per kilogram.

6. Net profit (Php). This was obtained by subtracting the cost of production (inputs) from the sales of the produced sunshine chickens (outputs).

7. Return on investment (ROI). This was computed by taking the net income divided by the total cost and multiplied by 100.

Data Analysis

Analysis of Variance for CRD was used to compare treatment means while the Duncan's Multiple Range Test (DMRT) was used to compare the significance of differences among means.

RESULTS AND DISCUSSION

Initial and Final Weight

The mean initial weight of the birds in the different treatments taken at the start of the study when the birds were one day of age is shown in Table 1. Statistical analysis revealed that there were no significant differences observed among the treatments. This shows that the birds were more or less of the same weight at the start of the study.

The table further shows the mean final weight of the birds in the different treatments taken at 56 days of age. Statistical analysis revealed significant differences among the treatments. The birds not given rhizobacteria solution registered the lowest mean of 1.673 kg as compared to the other treatments provided with the same 10 g rhizobacteria powder per 40 liters water and 50 liters water with 1.749 kg and 1.782 kg respectively, which are not significantly different.

The result agrees with the statement of Timmerman (2006) that probiotic supplements increases the total final body weight by 0.74 to 1.64 percent.

Table 1.Initial and final weight of Sunshine chicken (kg)

TREATMENT	INITIAL WEIGHT (kg)	FINAL WEIGHT (kg)
Control	0.02375[a]	1.673[b]
10 g rhizobacteria powder per 40 liters water	0.02375[a]	1.749[a]
10 g rhizobacteria powder per 50 liters water	0.02425[a]	1.782[a]

Means with the same letter superscript are not significantly different at 5% DMRT

Total Gain in Weight

Table 2 shows the mean total gain in weight of the birds which were taken by subtracting the initial weight from the final weight.

Statistical analysis revealed that there were significant differences among the treatments. The birds given 10 g rhizobacteria powder per 50 liters water obtained the highest mean of 1.758 kg which is not significantly different to the birds given 10 g rhizobacteria powder per 40 liters water with 1.725 kg mean gain in weight. On the other hand, the birds not given rhizobacteria solution gained the lowest mean of 1.649 kg. This result may be attributed to the differences in final weight and implies that rhizobacteria can increase the gain in weight of Sunshine chicken.

Water consumption

The table 3 shows the mean water consumption of the birds which were taken from the start to the end of the study. Statistical analysis revealed that there significant differences among treatments. The birds given 10 g rhizobacteria per 50 liters water obtained the highest mean water consumption of 70.54 liters which is not significantly different from the birds given 10 g rhizobacteria per 40 liters with 70.49 liters.

Table 2. Total gain in weight (kg)

TREATMENT	MEAN (kg)
Control	1.649[b]
10 g rhizobacteria powder per 40 liters water	1.725[a]
10 g rhizobacteria powder per 50 liters water	1.758[a]

Means with the same letter superscript are not significantly different at 5% DMRT

In contrast, the birds not given rhizobacteria solution consumed the lowest mean of 70.26 liters. The result may be attributed to the differences in water consumption and implies that rhizobacteria can increase the water consumption of Sunshine chicken.

Feed Consumption

The mean feed consumption of the birds is shown in Table 4. The data shown that the birds given 10 g rhizobacteria per 50 liters water listed the highest feed consumption of 3.417 kg, followed by the birds given 10 g rhizobacteria per 40 g liters water with 3.417 kg and the control with 3.375 kg. However, differences in the feed consumption between the treatments were not significant. This implies that the additional of 10 g rhizobacteria to the 40 and 50 liters drinking water of the birds did not affect the feed consumption of the birds.

Table 3. Water consumption (L)

TREATMENT	MEAN (liters)
Control	70.26[b]
10 g rhizobacteria powder per 40 liters water	70.49[a]
10 g rhizobacteria powder per 50 liters water	70.54[a]

Means with the same letter superscript are not significantly different at 5% DMRT

Table 4. Feed consumption (kg)

TREATMENT	MEAN (kg)
Control	3.375[a]
10 g rhizobacteria powder per 40 liters water	3.417[a]
10 g rhizobacteria powder per 50 liters water	3.437[a]

Means with the same letter superscript are not significantly different at 5% DMRT

Feed Conversion Ratio (FCR)

The mean feed conversion ratio of the birds which was computed by dividing the feed consumption by the total gain in weight is presented in Table 5. This represents the efficiency of the birds to convert feed into meat or body gain in weight. The birds given 10 g rhizobacteria per 50 liters water had a better FCR which significantly different from the rest of the treatments. The control with 2.049 and the birds given 10 g rhizobacteria per 40 liters water with 1.982 feed conversion ratios are not significantly different from each other.

The result implies that addition of 10 g rhizobacteria powder per 50 liters to the drinking water of the birds required lesser amount of feed to produce a kilogram gain in weight. Timmerman (2006) stated that probiotic treatment significantly improved feed conversion.

Feed Cost to Produce a Kilogram Gain (Php)

Table 6 shows the feed cost to produce a kilogram gain in weight which was obtained by multiplying the feed conversion ratio with the mean cost of feed per kilogram.

Table 5. Feed conversion ratio

TREATMENT	MEAN (kg)
Control	2.049[a]
10 g rhizobacteria powder per 40 liters water	1.982[a]
10 g rhizobacteria powder per 50 liters water	1.956[b]

Means with the same letter superscript are not significantly different at 5% DMRT

Table 6. Feed cost to produce a kilogram gain (PhP)

TREATMENT	MEAN (PhP)
Control	53.448[a]
10 g rhizobacteria powder per 40 liters water	51.736[b]
10 g rhizobacteria powder per 50 liters water	51.045[b]

Means with the same letter superscript are not significantly different at 5% DMRT

Statistical analysis revealed significantly differences among the treatments. The control garnered a cost of feed of Php 53.448 per kilogram gain which is significantly higher than the means of the treatments given rhizobacteria solution. Conversely, the differences of the treatments given rhizobacteria solution were not significant.

The result implies that mixing of 10 g rhizobacteria powder per 40 and 50 liters on the drinking water of the birds lowered the cost of feeds to produce a kilogram gain in weight.

Dressing percentage

The slaughter weight, carcass weight and dressing percentage are shown in Table 7. Dressing percentage was obtained by dividing the carcass weight by the slaughter weight multiplied by 100. Statistical analysis revealed no significant differences between the treatments for all the data. The slaughter and carcass weights of the sample birds were taken at 57th day of the study.

Average weight of main cuts

Table 8 presented the mean weight of main cuts. Statistical analysis revealed no significant differences among the weight of legs, thighs, wings, breast and back in the different treatments.

Table 7. Slaughter weight (kg), carcass weight (kg) and dressing percentage (%)

TREATMENT	SLAUGHTER WEIGHT (kg)	CARCASS WEIGHT (kg)	DRESSING PERCENTAGE (%)
Control	1.850	1.300	70.255
10 g rhizobacteria powder /40 L water	1.855	1.305	70.313
10 g rhizobacteria powder /40 L water	1.855	1.305	70.480

Means in the same row with no letter superscript are not significantly different at 0.05 level of DMRT

Table 8. Average weight of main cuts (kg)

TREATMENT	BREAST	BACK	LEGS	THIGHS	WINGS
To	0.315	0.349	0.220	0.205	0.204
T1	0.315	0.353	0.221	0.205	0.205
T2	0.316	0.354	0.224	0.206	0.205

Means in the same row with no letter superscript are not significantly different at 0.05 level of DMRT

Morbidity Rate

Table 9 shows the mean number of the birds injured because of feather pecking. It was observed during the 4th weeks to 6th weeks of the study. Statistical analysis revealed no significant differences between the treatments.

According to Huber (1998), feather pecking is a serious problem in poultry housing as it may lead to feather damage, injuries and even mortality. Feather pecking should thus be considered as redirected foraging behavior.

Further, in 1997, Huber stated that the presence of sand as a dust bathing does not prevent domestic chicks from developing feather pecking. On the other hand, housing conditions that promote foraging behavior like provision of straw are effective in reducing and preventing feather pecking.

Even Schwarz (2002), pointed out that the misdirection of foraging behavior toward nonspecific represents an inadequacy in the housing system, a deficiency of opportunity to forage, and not a deficiency in a nutritional aspect of foraging.

In addition, according to Davis (2001), pecking is a precise, high-tech activity, requiring good coordination with the eye. In natural conditions chickens spend between

half and 90% of their time foraging, making up to 15,000 pecks a day. Feather pecking and cannibalism occur in environments that frustrate the behavioral needs of foraging birds. In cages, feather pecking occurs particularly in the afternoon when hens have finished feeding and laying eggs, and have little else to do. One chick was recorded died in the control.

Return on Investment

The return on investment is shown in table 10. It was computed by subtracting the total cost from the total sales divided by the total cost and multiplied by 100. The data shows that birds given rhizobacteria solution accounted higher cost of production than that of control. However, highest Return on Investment (ROI) with 23.50 percent was then found out on the birds given 10 g rhizobacteria powder per 50 liters water, followed by birds given 10g rhizobactria powder per 40 liters water with 20.17 percent and the lowest Return on Investment was observed to be in the control with 17.11 percent.

TABLE 9. Morbidity rate

TREATMENT	MORBIDITY RATE (%)
Control	10[a]
10 g rhizobacteria powder per 40 liters water	7.5[a]
10 g rhizobacteria powder per 50 liters water	5[a]

Means with the same letter superscript are not significantly different at 5% DMRT

TABLE 10. Return on Investment (%)

TREATMENT	COST OF PRODUCTION (Php)	TOTAL GROSS SALE (Php)	TOTAL NET GAIN (Php)	ROI (%)
Control	6,685.50	7,829.50	1,144.00	17.11
10 g rhizobacteria powder /40 L water	6,985.50	8,395.25	1,409.50	20.17
10 g rhizobacteria powder /40 L water	6,925.50	8,553.50	1,628.00	23.50

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study was conducted to determine the effect of rhizobacteria on the growth performance of Sunshine Chicken under Nursery, Oyao, Dupax del Norte Nueva Vizcaya condition.

One hundred of day old Sunshine chicks were used. They were divided into three treatments and each was replicated four times with ten birds per replicate. Analysis of variance for Complete Randomized Design was used to compare treatments and Duncan's Multiple Range Test was used to compare the significance of differences among means. The treatments were control, 10 g rhizobacteria powder per 40 liters water, and 10 g rhizobacteria powder per 50 litters water.

Statistical analysis revealed no significant differences among the treatments in terms of initial weight, feed consumption, slaughter weight, carcass weight, dressing percentage, major cuts and morbidity rate. On the other hand, significant differences were observed between the treatments in terms of final weight, total gain in weight, water intake, feed conversion ratio and feed cost to produce a kilogram gain in weight.

On the return on investment, Sunshine Chicken given 10 g rhizobacteria powder per 50 liters and 40 liters water obtained 23.50 percent and 20.17 percent, respectively. The Sunshine Chicken not given rhizobacteria obtained 17.11 percent.

Conclusions

Based on the results of the study, 10 grams rhizobacteria powder per 50 liters of water is better than 10 grams rhizobacteria powder per 40 liters water. With these

findings, it is concluded that giving right amount of rhizobacteria in the drinking water can enhance the growth performance of Sunshine chicken. It can lessen the feed cost to produce a kilogram gain in weight, and can produce higher return on investment.

Recommendations

For the above reason, the researcher strongly recommends the use of rhizobacteria not only to Sunshine chicken but also in other animals as it was proven to be very efficient as growth enhancers and proficient in lessening the feed cost to produce gain in weight. Further studies are recommended using rhizobacteria powder to Sunshine chicken in free range type and on the carcass analysis of Sunshine chicken.

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APPENDICES

APPENDIX TABLE 1.Initial Weight (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	0.025	0.023	0.025	0.022	0.095	0.02375
T1	0.025	0.025	0.023	0.022	0.095	0.02375
T2	0.023	0.025	0.025	0.024	0.097	0.02425
GRAND TOTAL					0.287	
GRAND MEAN						0.02392

ANALYSIS OF VARIANCE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	0.01
Treatment	2	0.666667	0.3333335	0.18^{ns}	4.26	8.02
Error	9	16.249997	1.805555222			
TOTAL	11	16.916667				

ns-not significant Coefficient for variance=5.62%

APPENDIX TABLE 2. Final Weight (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	1.736	1.685	1.655	1.615	6.691	1.673
T_1	1.805	1.790	1.730	1.670	6.995	1.749
T_2	1.735	1.825	1.807	1.760	7.127	1.782
GRAND TOTAL					20.813	
GRAND MEAN						1.734

ANALYSIS OF VARIANCE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARES	COMPUTE F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.02499467	0.012497335	4.61*	4.26	8.02
Error	9	0.02438625	0.002709583			
TOTAL	11	0.04938092				

*- significant Coefficient for variance= 3%

APPENDIX TABLE 3. Total Gain in Weight (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	1.711	1.662	1.630	1.593	6.596	1.649
T1	1.780	1.765	1.707	1.648	6.900	1.725
T2	1.712	1.800	1.783	1.736	7.031	1.758
GRAND TOTAL					20.527	
GRAND MEAN						1.711

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.02490017	0.012450085	4.79*	4.26	8.02
Error	9	0.02337675	0.002597417			
TOTAL	11	0.04827692				

*- significant Coefficient for variance=2.98%

APPENDIX TABLE 4. Water Consumption (liters)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	70.50	70.35	70.25	69.95	281.05	70.26
T_1	70.53	70.50	70.49	70.45	281.97	70.49
T_2	70.50	70.73	70.60	70.54	282.37	70.54
GRAND TOTAL					845.39	
GRAND MEAN						70.45

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.229065	0.1145325	5.28*	4.26	8.02
Error	9	0.195385	0.021709444			
TOTAL	11	0.42445				

*-significant Coefficient for variance= 0.21%

APPENDIX TABLE 5. Feed Consumption (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	3.415	3.380	3.375	3.330	13.500	3.375
T_1	3.46	3.450	3.405	3.355	13.670	3.418
T_2	3.385	3.480	3.465	3.420	13.750	3.4375
GRAND TOTAL					40.920	
GRAND MEAN						3.410

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	0.01
Treatment	2	0.00815	0.004075	2.26^{ns}	4.26	8.02
Error	9	0.0162	0.0018			
TOTAL	11	0.02435				

ns-not significant Coefficient for variance=1.24%

APPENDIX TABLE 6. Feed Conversion Ratio (FCR)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	2.000	2.034	2.071	2.090	8.195	2.049
T_1	1.943	1.955	1.995	1.995	7.929	1.982
T_2	1.977	1.933	1.943	1.970	7.823	1.956
GRAND TOTAL					23.947	
GRAND MEAN						1.996

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	0.01
Treatment	2	0.01836467	0.009182335	7.21*	4.26	8.02
Error	9	0.01146025	0.001273361			
TOTAL	11	0.02982492				

*-significant Coefficient for variance= 1.79%

APPENDIX TABLE 7. Feed Cost to Produce a Kilogram Gain (Php)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	52.100	53.087	54.053	54.55	213.79	53.4475
T_1	50.710	51.026	52.069	53.14	206.945	51.73625
T_2	51.600	50.451	50.712	51.417	204.18	51.045
GRAND TOTAL					624.915	
GRAND MEAN						52.07625

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	12.2376113	6.11880565	6.82*	4.26	8.02
Error	9	8.0768727	0.8974303			
TOTAL	11	20.314484				

*-significant Coefficient for variance= 1.82%

APPENDIX TABLE 8. Weight of Slaughtered Animals (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	1.920	1.820	1.860	1.800	7.400	1.850
T_1	1.890	1.910	1.860	1.760	7.420	1.855
T_2	1.910	1.880	1.850	1.780	7.420	1.855
GRAND TOTAL					22.240	
GRAND MEAN						1.853

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.00006667	0.000033335	0.0098^{ns}	4.26	8.02
Error	9	0.031	0.003444444			
TOTAL	11	0.03106667				

ns-not significant Coefficient for variance= 3.17%

APPENDIX TABLE 9.Carcass Weight (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	1.370	1.280	1.300	1.250	5.200	1.300
T_1	1.350	1.350	1.320	1.200	5.220	1.305
T_2	1.350	1.330	1.300	1.250	5.230	1.307
GRAND TOTAL					15.65	
GRAND MEAN						1.304

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.00011667	0.000058335	0.018^{ns}	4.26	8.02
Error	9	0.029175	0.003241667			
TOTAL	11	0.02929167				

ns-not significant Coefficient for variance= 4.37%

APPENDIX TABLE 10. Dressing Percentage (%)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	71.354	70.33	69.892	69.444	281.02	70.255
T_1	71.423	70.681	70.968	68.181	281.253	70.313
T_2	70.681	70.745	70.27	70.225	281.921	70.480
GRAND TOTAL					844.194	
GRAND MEAN						70.350

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.1093625	0.05468125	0.058^{ns}	4.26	8.02
Error	9	8.5646485	0.95162761			
TOTAL	11	8.674011				

ns-not significant Coefficient for variance= 1.39%

APPENDIX TABLE 11. Weight of the Legs (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	0.235	0.210	0.225	0.210	0.880	0.220
T_1	0.230	0.230	0.225	0.200	0.885	0.221
T_2	0.230	0.230	0.225	0.210	0.895	0.224
GRAND TOTAL					2.660	
GRAND MEAN						0.222

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.000029167	0.0000145835	0.098^{ns}	4.26	8.02
Error	9	0.0013375				
TOTAL	11	0.001366667				

ns-not significant Coefficient for variance=5.49%

APPENDIX TABLE 12.Weght of the Thighs (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	0.215	0.200	0.205	0.200	0.820	0.205
T_1	0.210	0.210	0.205	0.195	0.820	0.205
T_2	0.210	0.210	0.205	0.200	0.825	0.206
GRAND TOTAL					2.465	
GRAND MEAN						0.205

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.000004167	0.0000020835	0.051^{ns}	4.26	8.02
Error	9	0.00036875	0.000040972			
TOTAL	11	0.000372917				

ns-not significant Coefficient for variance=3.21%

APPENDIX TABLE 13. Weight of the Back (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	0.380	0.340	0.350	0.325	1.395	0.349
T_1	0.375	0.375	0.360	0.300	1.41	0.353
T_2	0.375	0.360	0.350	0.330	1.415	0.354
GRAND TOTAL					4.22	
GRAND MEAN						0.352

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.000054167	0.000027085	0.043^{ns}	4.26	8.02
Error	9	0.0057125	0.00063472			
TOTAL	11	0.005766667				

ns-not significant Coefficient for variance=7.16%

APPENDIX TABLE 14. Weight of the Wings (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	0.210	0.200	0.205	0.200	0.815	0.2013
T_1	0.210	0.210	0.205	0.195	0.820	0.2025
T_2	0.200	0.205	0.205	0.200	0.820	0.2025
GRAND TOTAL					2.455	
GRAND MEAN						0.2021

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.000004167	0.0000020835	0.070^{ns}	4.26	8.02
Error	9	0.00026875	0.000029861			
TOTAL	11	0.000272917				

ns-not significant

Coefficient for variance= 8%

APPENDIX TABLE 15. Weight of the breast (kg)

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	0.330	0.305	0.315	0.310	1.260	0.32
T1	0.325	0.320	0.315	0.300	1.260	0.32
T2	0.325	0.315	0.315	0.310	1.265	0.32
GRAND TOTAL					3.785	
GRAND MEAN						0.315

ANALYSIS OF VARIANCE TABLE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	TABULAR F 0.01
Treatment	2	0.000004167	0.0000020835	0.023^{ns}	4.26	8.02
Error	9	0.00081875	0.000090972			
TOTAL	11	0.000822917				

ns-not significant Coefficient for variance=3.03%

APPENDIX TABLE 16. Morbidity Rate

TREATMENT	REPLICATON				TOTAL	MEAN
	I	II	III	IV		
To	0	10	10	20	40	10
T_1	10	0	10	10	30	7.5
T_2	0	10	10	0	20	5
GRAND TOTAL					90	
GRAND MEAN						7.5

ANALYSIS OF VARIANCE TABLE

=SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARES	COMPUTED F-VALUE	TABULAR F 0.05	0.01
Treatment	2	50	25	0.6^{ns}	4.26	8.02
Error	9	375	41.67			
TOTAL	11	425				

ns-not significant Coefficient for variance=86.07%

APPENDIX TABLE 17. Cost and Return Analysis

ITEM	T1	T2	T3
A. Cost of Production			
1. Cost of chicks	1,400.00	1,400.00	1,400.00
2. Cost of feeds	3,523.50	3,567.50	3,588.25
3. Housing	987.00	987.00	987.00
4. Cost of bills			
Light	95.00	95.00	95.00
Water	10.00	10.00	10.00
5. Rhizobacteria	__	300.00	240.00
6. Transportation	50.00	50.00	50.00
7. Labor	100.00	100.00	100.00
8. Others			
Bulb	90.00	90.00	90.00
Feeders	130.00	130.00	130.00
Waterers	120.00	120.00	120.00
Pails	90.00	90.00	90.00
Cartons	20.00	20.00	20.00
Sacks	70.00	70.00	70.00
TOTAL	6,685.50	6,985.50	6,925.50
B. GROSS SALE	7,829.50	8,395.25	8,553.50
C. NET GAIN	1,144.00	1,409.50	1,628.00
D. RETURN ON INVESTMENT (%)	17.11	20.17	23.50