

BIBLIOGRAPHY

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ABSTRACT

The study was conducted at the BSU Experimental Station, La Trinidad, Benguet from May to June 2011 to determine the effect of Atovi supplementation on the growth performance of Cobb broilers.

A total of 80 day-old chicks were randomly distributed into two treatments and each treatment was replicated four times with ten birds per replicate to make a total of 40 birds per treatment. The two treatments were pure water or no Atovi supplementation and 2.5 g of Atovi per liter of water. The Atovi supplementation was introduced to the birds at day 7 to 14 days but the end of the study is at 40 days old.

Results showed that there were no significant differences in the initial weight, gain in weight, feed conversion ratio and feed cost to produce a kilogram gain in weight. The average daily gain in weight of the birds has a mean of 0.029 kg. It is revealed that the birds given 2.5 g of Atovi per liter of water had the same performance as those of the control group in terms of final weight, water and feed consumption. In terms of feed conversion ratio, it is revealed that birds given Atovi and the control group had the same efficiency in converting feeds into flesh. The mean feed conversion ratio of birds is 1.754

No incidence of mortality nor morbidity was incurred in all treatments which could possibly mean that Atovi was efficient in improving the immune system of the birds that made them to have a greater stamina to combat diseases caused by bacteria and viruses compared to the birds in the control group given veteracin. In terms of the return on investment birds given Atovi had the higher return.



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INTRODUCTION

Broiler production is one of the most developed animal industries. It is not only a means of solving meat inadequacy, being an excellent source of protein, but it is also one of the major sources of livelihood for some farmers because it generates profit in a short period of time. Nowadays, most poultry raisers use feed additives to increase production of poultry products. However, poultry raisers should choose a feed supplement or additive containing better nutritive value suited to their animals which may be given in small amount but functions greatly in the growth development of the animal body. One of the newly introduced feed additives which, according to the manufacturer, improve the performance of the livestock and poultry when added into their feed and/or water intake is the Atovi and this is what the researcher would like to find out in this study i.e. the effect of Atovi on the growth performance of broilers.

Atovi, according to the Vim-Vertex & Company, Inc. (2007), the manufacturer, is a Filipino invented product based on molecular alteration, nuclear reaction and nanotechnology. It is a feed premix powder made from vitamins and minerals.

The Vim-Vertex & Company, Inc. as cited in www.atovianimalg2.com(2007), also claimed that the Atovi's high micro potential energy charges the cells mitochondria and immediately initiates the ATP pumps to run the Krebs cycle (cells whole mechanism) that is all cells of all organs i.e. liver, kidneys, heart. Intestinal tract, muscles, bones, etc. at all levels of the animal, making normal cells efficient while the deteriorating and sickly cells revitalized, rejuvenated and restored ultimately making them efficient too. Once the body cells are efficient; they automatically regenerate and increase the immune system and anti-bodies.



Also it was cited that Atovi corrects and maintains the digestive system properly. Though this all nutritional and medication inputs are absorbed and utilized properly and efficiently. Proof of this is the almost total absence of undigested proteins in the manure and very low ammonia fumes which produce the foul odor ending up into a non-pathogenic and organic fecal and further decomposition is not needed.

With metabolism performing properly, the genetic potentials and performance, like that of the immune system are strengthened. The animals have greater stamina. They do not easily contract disease caused by bacteria and viruses. In cases where medications have to be administered such medicines are readily absorbed and utilized ensuring faster recovery.

The result of the study will benefit both the researcher and the broiler raiser in particular and also the broiler industry as a whole. If the result is found feasible, broiler user may use Atovi as a feed supplement to improve the performance of the birds. The result may also serve as reference materials for other students and researchers to come up with follow-up researches.

The study was conducted at the BSU Experimental Station, La Trinidad, Benguet using a total of 80 Cobb broiler subjected to 40 days of feeding period from May to June 2011. Generally, the study was conducted to determine the effect of Atovi supplementation on the growth performance of broilers under upland condition. Specifically, it aimed to determine the performance of broilers given Atovi in terms of gain in weight, feed and water consumptions, feed conversion ratio, morbidity and mortality rates, and net profit.



REVIEW OF LITERATURE

West (1977) defined feed additive as a substance added to compound ration or protein concentrate in the course of manufacturing, for some specific functions such as, stimulates growth and improves the efficiency of feed utilization.

Gillespie (1979) cited that feed additives are drug like materials added to basic feed mix. Feed additives are not nutrients; they are added to feed mix to cause animals to grow faster or to control some diseases. Similarly, Fronda (1972) mentioned that using feed additive does not only make production of animals economical but also helps in the control of diseases.

Card and Nesheim (1972) said that the addition of additives in poultry feeds will often improve the rate of weight gain and feed efficiency of growing chicks and provide the entire essential in adequate amount.

Lassiter and Edwards (1982) mentioned that additives are substances added to feeds that are not included for their nutritional value but in one way or the other will improve animal performance or efficiency of animal production.

Acker (1983) cited that wide acceptance of feed additives in poultry and swine ration is attributed to their well-established benefit in improving growth rate, improving feed conversion and reducing mortality and morbidity. He also stated that materials serve as catalyst in digestion and metabolism in very small amount. Furthermore, he also mentioned that the rearing of animals such as broilers in confinement increases the need of vitamins in rations.

Atovi, according to the Vim-Vertex & Company, Inc. (2007) is made from vitamins and minerals feed premix that improves the performance and efficiency of a cell



of the animal's (land, air and aquatic) body constantly and continuously charge the mitochondria of all the cell of the Krebs cycle. Its composition is as follows:

<u>Ingredient:</u>	<u>Amount per 10lb</u>
Vitamin a	12,000,000iu
Vitamin d	2,000.000iu
Vitamin e	6,000,000iu
Vitamin b1	3,000mg
Vitamin b6	4,000mg
Vitamin b12	4,000mg
Calcium panthothenate	22,000mg
Choline	250,000mg
Lysine	7,500mg
Copper	1,300mg
Potassium	42,500mg
Iodine	750mg
Iron	20,000mg
Zinc	27,000mg
Calcium	30,000mg
Magnesium	2,300mg
Sodium	30,000mg
Calcium carbonate	10lb



Atovi induces natural detoxification or expulsion of harmful compounds or xenobiotics such as drugs, natural poisons and antibiotics on the cellular level. The benefits attained in using Atovi feed premix are as follows: increase output & productivity, reduces feed intake, reduces redundant nutritional supplements and medication, reduces consumption of water and power, eco-friendly manures and wastes because it does that not emit foul odor and does not pollute the land, air & water. www.alibaba.com (2007).



MATERIALS AND METHOD

The materials and equipment used were: 80 day old broiler chicks (Cobb), weighing scale, measuring cups, spoon, stick brooms, disinfectant, incandescent bulbs, old newspaper sheets, brooding and rearing cages, record book, feeding and drinking troughs, Atovi and commercial feeds (purina).

All the brooding and rearing cages were thoroughly cleaned with laundry soaps and disinfected a week before the arrival of the chicks. Newspaper sheets were placed on the floor to minimize the escape of heat inside the brooder and to serve as mattings. Also, it served as receptacle for feeds for the first few days. In addition, waterers were well secured on the floor to minimize spillage and these were covered with wire screen to prevent the birds from stepping inside the waterer. Furthermore, the brooders were heated two hours before the arrival of the chicks.

Upon arrival, the 80 birds were divided into two treatments following the T-Test. Each treatment had four replications with 10 birds per replicate, making a total of 40 birds per treatment group. The two treatments were:

T_0 = pure water/ no Atovi

T_1 = 2.5g Atovi per liter of water

All birds were subjected to the same management except on the drinking water offered to them. Birds in the control group (T_0) were given pure water with vetracin for the first two weeks but with no supplementation of Atovi. Birds in treatment (T_1) were given Atovi supplementation at the level of 2.5 g per liter of water but without vetracin for the first two weeks. The Atovi supplementation was introduced to the birds at day 7 until they were 40 days old.



Feeding was done 4 times a day, at 6 and 10 o'clock in the morning and 2 and 6 o'clock in the afternoon. During the first two weeks of brooding, the chicks were fed with chick booster containing 24% of crude protein. This was followed by broiler starter mash for the next two weeks (15th-30th) containing 21% crude protein, and then finisher ration containing 18% crude protein on the remaining weeks until the end of the study or at 40 days old.

Birds in all treatment were also subjected to the same lighting management. Brooding cages were lighted day and night. However, lights were turned off for a period of one hour daily at 5-6:00 pm for the birds to be accustomed to the dark surrounding in case of brown outs. But during the conduct of the study, there were no brown outs incurred.

To help maintain the good health of the birds, hygiene and sanitation were maintained to avoid the occurrence of diseases. Manures of the birds were scrapped daily. Also, the birds were vaccinated against avian pest on the 10th day of brooding.

Data Gathered:

1. Initial weight (kg). This refers to the weight of the birds at the start of the study.
2. Final weight (kg). This refers to the weight of broilers at 40 days old or at the end of the study.
3. Feed offered (kg). This refers to the amount of feeds given to the birds daily.
4. Water offered (l). This refers to the amount of water offered to the birds daily.
5. Feed left-over (kg). This refers to the weight of the feed not consumed by the birds in a day and this was taken every morning before feeding.



6. Water left-over (l). This refers to the amount of water not consumed by the birds. This was taken every morning and late in the evening.

7. Morbidity. This refers to the number of birds that got sick during the study period.

8. Mortality. This refers to the number of birds that died during the conduct of the study.

9. Production cost. This refers to the cost of each of the materials used in the study.

From the above data, the following were computed:

1. Gain in weight (kg). This was obtained by subtracting the initial weight from the final weight of the birds.

2. Feed consumption (kg). This refers to the amount of feed given to each experimental bird throughout the experiment.

3. Water consumption (ml). This refers to the amount of water given to each experimental bird throughout the experiment.

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

5. Morbidity rate (%). This was obtained by dividing the number of birds that got sick by the total number of birds at the start of the study multiplied by 100 %.

6. Mortality rate (%). This was obtained by dividing the number of birds that died during the conduct of the study by the total number of birds at the start of the study multiplied by 100 %.



7. Net profit (Php). This was obtained by deducting the total cost of production from the total sales.

8. Return on investment (ROI). This was obtained by dividing the net profit by the total cost of production multiplied by 100 %.

Data Analysis

All the data gathered were consolidated, tabulated and analyzed using the T-Test.



RESULTS AND DISCUSSION

Body Weights

Table 1 presents the mean initial and final weights of the birds in the two treatments. Statistical analysis revealed that the initial weights of the birds in the two treatments were not significantly different. This implies that the birds were more or less of the same weight at the start of the study. The birds had an overall mean initial weight of 0.453 kg.

In terms of final weight, statistical analysis revealed a highly significant difference between treatment means. The mean final weight of birds given Atovi were heavier with a mean of 1.67 kg compared to the mean final weight of birds given pure water or no Atovi supplementation which was 1.546 kg.

Total Gain in Weight

The total gains in weight of the birds in the two treatments are presented in Table 2. Statistical analysis revealed that the gains in weight of the birds in the two treatments were not significantly different. The birds given Atovi had a mean gain in weight of 1.220 kg and the birds given pure water or no Atovi supplementation had a mean of 1.091 kg. This implies that adding Atovi into the water of birds did not stimulate the growth of the birds. This finding is different from the claim of the

Table 1. Initial weight at 7 days old and final weights of birds at 40 days old (kg)

TREATMENT	BODY WEIGHTS(kg)	
	INITIAL	FINAL
Pure water	0.455	1.546
W/ 2.5 g of Atovi per liter of water	0.450	1.670



manufacturer, the Vim-Vertex & Company, Inc., that Atovi premix, when given to the birds, improves their growth rate.

Feed and Water Consumption

The mean feed and water consumptions of the birds in the two treatments are presented in Table 3. True to both feed and water consumptions, significant differences were observed between the two treatments. Birds given Atovi supplementation consumed more feeds and water with means of 2.154 kg and 1.537 l, respectively. On the other hand, the birds in the control group or those not given Atovi supplementation had a mean feed consumption of 1.885 kg and a mean water consumption of 1.535 l. The result implies that giving Atovi to the birds increases their feed and water consumptions. Perhaps the Atovi had made the feed and water palatable, hence, the increase on their consumptions.

Table 2. Total gain in weight of birds from 7 days to 40 days of age (kg)

TREATMENT	MEAN
Pure water	1.091
W/ 2.5 g of Atovi per liter of water	1.220

Table 3. Feed and water consumptions of the birds from 7-40 days.

TREATMENT	MEAN	
	FEED	WATER
Pure water	1.885	1.535
W/ 2.5 g of Atovi per liter of water	2.154	1.537



Feed Conversion Ratio (FCR)

The mean feed conversion ratios of the birds in the two treatments are presented in Table 4. Statistical analysis revealed that there was no significant difference between the two treatment means indicating that giving Atovi to the birds did not affect their feed conversion ratio. The overall mean feed conversion ratio obtained was 1.754.

Morbidity and Mortality

There was no incidence of mortality or morbidity among the birds from the start up to the end of the study. Even if the treated birds were just given Atovi and were not given commercial vetracin as done to the control birds, these were able to maintain good health despite the fluctuation of the environmental temperature that could have made the birds prone to respiratory diseases during the conduct of the study. These could possibly mean that Atovi given to the treated bird was efficient in enhancing the immune system of the birds or it had made them to have a greater stamina to combat diseases caused by bacteria and viruses. The result agrees with Acker (1983) who stated that giving additives to birds reduces mortality and morbidity.

Feed Cost per Kilogram of Broiler Produced

Table 5 presents the feed cost to produce a kilogram gain in weight. Statistical analysis revealed no significant difference between the two treatment means. It is shown that birds given Atovi incurred had a higher cost of feed compared to the birds given no Atovi. However, the difference which Php 0.42 is still considered small to cause a significant effect. The mean feed cost was P57.086.



Returns on Investment (ROI)

The returns on investment are presented in Table 6. The itemized expenditures are presented in the appendix Table 8. Though the returns on investment was not subjected to statistical analysis, the results revealed that birds given Atovi obtained higher returns on investment (ROI) of 20.40 %. The birds given no Atovi, on the other hand had an ROI of 19.68 %. Higher returns were obtained from birds given Atovi because the birds had higher final weights compared to birds given no Atovi.

Table 4. Feed conversion ratio of the birds from 7 days to 40 days old

TREATMENT	MEAN
Pure water	1.740
W/ 2.5 g of Atovi per liter of water	1.767

Table 5. Feed cost per kg of broiler produced in the two treatments (Php)

TREATMENT	TOTAL SALES (Php)	NET INCOME (Php)	ROI (%)
Pure water	6,494.25	1,068.10	19.68
W/ 2.5 g of Atovi per liter of water	7,014	1,188.51	20.4

Table 6. Return on Investment (ROI)

TREATMENT	TOTAL SALES (Php)	NET INCOME (Php)	ROI (%)
Pure water	6,494.25	1,068.10	19.68
W/ 2.5 g of Atovi per liter of water	7,014	1,188.51	20.4



SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was conducted to determine the effect of Atovi supplementation on the growth performance of Cobb broilers. Eighty (80) day old broiler chicks were divided into two treatments following the T-Test. Each treatment was replicated four times with ten (10) birds per replication, making a total of forty (40) birds per treatment. The treatments were T₀-control/ pure water or no Atovi and T₁-2.5g of Atovi per liter of water.

This experiment was conducted at Benguet State University Poultry Experimental Station, La Trinidad, Benguet from May to June 2011.

Statistical analysis revealed that there were no significant differences between the two treatment means in terms of initial weight, gain in weight, feed conversion ratio and feed cost to produce a unit gain in weight. This means that the birds in the two treatments were more or less comparable to each other in the above parameters. The overall mean initial weight of the birds was 0.453 kg, the overall mean gain in weight was 1.220 kg for the birds given Atovi and 1.091 kg for the birds given no Atovi. The overall mean feed conversion ratio was 1.754 and the overall mean feed cost was Php 57.086.

Significant differences were obtained in terms of final weight and the feed and water consumptions. The birds given Atovi had heavier final weights with a mean of 1.67 kg and 1.546 kg for the birds given no Atovi. For the feed and water consumptions, the birds given Atovi had a mean feed and water consumptions of 2.154 kg and 1.537 l respectively. The birds given no Atovi on the other hand, had a mean feed and water consumptions of 1.885 kg and 1.535 l, respectively.



Also, it is reflected in the results of the study that the Atovi was as efficient as the vetracin as evidenced by the no incidence of mortalities nor morbidities in the birds given Atovi in place of vetracin.

However, in terms of the returns on investment (ROI), birds given Atovi obtained higher ROI of 20.40%, and birds given pure water or no Atovi supplementation had an ROI of 19.68%.

Conclusion

Based on the result of the study, it is concluded that the addition of Atovi at the level of 2.5 g/l of water given to the broilers results to heavier weights and also to take the place of vetracin in preventing diseases and therefore higher return on investment.

Recommendation

Based on the result of the study the researcher recommends that Atovi can be administered or can be added as water supplement at the level of 2.5 g/l of water for broilers for better performance. However, it is also recommended that a further study be conducted to include the effect of Atovi on the carcass quality.



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APPENDICES

Appendix Table 1. Mean initial weight of the birds in the two treatments (kg)

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T ₀	0.502	0.405	0.403	0.510	1.820	0.455
T ₁	0.402	0.470	0.405	0.520	1.80	0.450
GRAND TOTAL					3.620	
GRAND MEAN						0.453

T-TEST TABLE

Computed T	Tabular T	
	0.05	0.01
0.141	2.447	3.707



Appendix Table 2. Mean final weight of the birds at 40 days old (kg)

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T ₀	1.51	1.57	1.535	1.57	6.185	1.564
T ₁	1.675	1.68	1.655	1.67	6.68	1.67
GRAND TOTAL					12.865	
GRAND MEAN						1.608

T-TEST TABLE

Computed T	Tabular T	
	0.05	0.01
7.935	2.447	3.707



Appendix Table 3. Mean gain in weight of the birds from 7-40 days of age (kg)

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T ₀	1.008	1.165	1.132	1.060	4.365	1.091
T ₁	1.270	1.120	1.250	1.150	4.880	1.220
GRAND TOTAL					9.245	
GRAND MEAN						1.156

T-TEST TABLE

Computed T	Tabular T	
	0.05	0.01
2.081	2.447	3.707



Appendix Table 4. Mean feed consumption of the birds from 7-40 days of age (kg)

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T ₀	2.085	1.885	1.821	1.748	7.539	1.885
T ₁	2.266	2.160	2.112	2.079	8.617	2.154
GRAND TOTAL					16.156	
GRAND MEAN						2.020

T-TEST TABLE

Computed T	Tabular T	
	0.05	0.01
3.244	2.447	3.707



Appendix Table 5. Water consumption of the birds from 7-40 days of age (l)

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T ₀	1.532	1.535	1.536	1.536	6.139	1.535
T ₁	1.537	1.538	1.537	1.537	6.149	1.537
GRAND TOTAL					12.288	
GRAND MEAN						1.536

T-TEST TABLE

Computed T	Tabular T	
	0.05	0.01
2.554	2.447	3.707



Appendix Table 6. Feed conversion ratio (FCR) of the birds from 7-40 days of age

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T ₀	2.068	1.618	1.625	1.649	6.960	1.740
T ₁	1.784	1.785	1.690	1.808	7.067	1.767
GRAND TOTAL					14.027	
GRAND MEAN						1.754

T-TEST TABLE

Computed T	Tabular T	
	0.05	0.01
0.238	2.447	3.707



Appendix Table 7. Feed cost per kg of broiler produced in the two treatments (Php)

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T ₀	67.003	54.423	52.650	53.428	227.504	56.876
T ₁	57.802	57.834	54.756	58.579	229.184	57.296
GRAND TOTAL					456.184	
GRAND MEAN						57.086

T-TEST TABLE

Computed T	Tabular T	
	0.05	0.01
0.964	2.447	3.707



Appendix Table 8. Total cost of production by treatment

ITEMS	TREATMENT	
	Treatment 1	Treatment 2
Cost of production (Php)*		
Cost of stocks	1,523.68	1,523.68
Feeds	2442.474	2,791.81
Vaccines	75	75
Vetracin	200	
Atovi		250
Disinfectant	50	50
Labor	990	990
Materials and equipment	145	145
Total	5,426.15	5,825.49
Total sales**	6,494.25	7,014
Net income (Php)	1,068.10	1,188.51
Return on investment	19.68%	20.40%

*cost of birds at 7 days old

**birds were sold at
Php105/kg live weight

