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AGRICULTURAL POTENTIALS OF MORINGA (*MORINGA OLEIFERA*) AND OREGANO (*ORIGANUM VULGARE*) AS AN AD LIBITUM IN BROILERS

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This study is designed to determine the Moringa oleifera and Oreganum vulgare extract as growth promoters in broilers. A total of 120 one-day-old Cobb broiler chicks of mixed sex were randomly allocated to four treatments in three replications. The Oregano-Malunggay Extract (OME) was collected and prepared from Cabarroguis, Quirino. The harvested leaves were prepared using mortar and pestle and extracted using some other improvised materials. The prepared extracts were added to water in different concentrations and supplied to the different treatments. Four experimental units were formulated and a number of three replications such that one group served as control (T0 fed only with feeds and vetracin) and three groups served as Oregano and Malunggay treated groups. T1: 10%; 5% Oregano extract and 5% Malunggay extract, T2: 20%; 10% Oregano extract and 10% Malunggay extract and T3: 30%; 15% Oregano extract and 15% Malunggay extract. In this project, all treatments were supplemented with feeds. The vetracin and the OME were added to water ad libitum and water was used to replenish the broilers from 3-6 pm daily until 32 days of experimental period was reached. Results showed that birds supplemented with OME gained significantly higher weight than that of the broilers in the control group. It was concluded that the supplementation of OME posted positive effect on the broilers thus; it can be used as an alternative for antibiotics.

Keywords: Ad libitum, Moringa (Moringa oleifera) and Oregano (Origanum vulgare).

Introduction

Broiler production has been in demand in the Philippines. Many people are attracted to this business as it offers good source of chicken meat for food consumption. However, the high cost of feeds and antibiotics has caused poultry production to become a losing venture because it hinders producers' profit. In overcoming such problem, there is a need for poultry growers to use alternatives to antibiotics that may lessen the impact of its high costs at the same time producing good quality of meat. This is especially the case concerning alternative growth enhancers.

The utilization of antibiotic properties of plants is one way of reducing the high cost of the production. Researchers proved that *Moringa oleifera* and *Oreganum vulgare* are both having antibiotic properties which give positive effects once given to broilers.

The *M. oleifera* plant has beneficial properties such as fodder, herbal medicine, spices, food, natural coagulants, and nectar for bees, fuel and fertilizer. The pods are considered as an important source of the essential amino acids - alternative source of protein. The leaves, flowers and pods are used as good sources of vitamins A, B and C, riboflavin, nicotinic acid, folic acid, pyridoxine, ascorbic acid, beta-carotene, calcium, iron, and alpha-tocopherol. On the other hand, Oregano (*Origanum vulgare*), an aromatic herbal product, which, because of its highly potent chemical nature, has been used as a functional herbal product, mainly for preserving food quality, for inhibiting microbial proliferation on ready-to-cook poultry meat, and, more recently, as an alternative growth promoter in swine and poultry nutrition [1] [2]. Moreover, Oregano is an aromatic herb containing abundant active chemical compounds which has been used to replace chemical antibiotics in poultry and livestock [3].

The effect of *M. oleifera* is to enhance immune responses and improve intestinal health of broiler chicken. Yang, et al (2006) [4], reported that the dehydrated leaves of *M. oleifera* in the diets of broiler chicken significantly enhanced immune responses and reduced Escherichia coli*(E. coli*) and increased Lactobacillus counts in ileum. Hence, *M. oleifera* has a great potential in improving nutrition and strengthening immune functions of broiler chicken.

Moreover, many studies have been carried out on using additives, including herbs - Based on several studies conducted to investigate the influence of oregano products (oil extract or its dried leaf) on broiler performance, researchers have concluded that oregano has the potential to promote broiler performance [1] [2] [5] [6] and reduce bacterial inhabitants of the gastrointestinal tract such as Clostridium perfringens and *E. coli* [7] [8].

This study, therefore, considers the synergistic effect of both plants on the growth performance of broilers. The bans on the application of antibiotic growth promoters in animal feeds give rise to some alternatives to eliminate the risk as to human health and probable bacterial resistance in animals. Many studies conducted by different researchers proved that there are alternatives; additives to be specific, which can improve immune response, the growth performance, improve intestinal microflora (acemannan) and which can control particular diseases. Herbs and herbal products are incorporated in poultry diets to replace synthetic products in order to stimulate or promote the effective use of feed nutrients which may subsequently result in more

rapid body weight gain, higher production rates and improved feed efficiency. Moreover, active components of herbs may improve digestion and stimulate the immune function in broilers [9]. Great amounts of these active components can also be found in essential oils (EO) of the associated plant or herb. Oregano (*O. vulgare*) and Malunggay (*M. oleifera*); herb and plant samples which are potential poultry feed supplements.

Oregano (*O. vulgare*) essential oil is one of the many plant extracts that are used at present as supplements in animal's diets. It contains mainly carvacrol, thymol and their precursors, (-terpinene and p-cypene and it possesses intense in vitro antimicrobial [10], and antioxidant [11] properties, making it an appropriate candidate as a replacement for antibiotic growth promoters and also a promising food additive in order to prevent meat lipid oxidation. So far, it has demonstrated some encouraging experimental results in broilers [7].

On the other hand, *M. oleifera* has many medicinal uses [12] and is regarded to be a "miracle tree" because it has been used to treat numerous diseases; [13] [14]. It is also a good source of vitamins and amino acids [15]. According to different researchers, its leaves are good source of protein, vitamins A, B and C and minerals such as calcium and iron [16] [17]. M. oleifera was claimed to boost immune systems [18].

Malunggay was analyzed through phytochemical analysis conducted by Ogbe and Affiku [19] [20] and showed presence of tannins, phytates, trypsin inhibitors, saponins, oxalates, and cyanide content. The presence of these essential nutrients and minerals implies M. oleifera leaves could be utilized as a source of feed supplement to improve growth performance and health status of poultry. In addition, as concluded in the experiment conducted by [15], the broilers gained higher body weight because of the inclusion of M. oleifera to the meal of broilers.

Numerous studies were conducted to evaluate the effect of Malunggay and Oregano on the growth performance and the immune response of broilers. Those studies conducted by different researchers proved that these plants positively affects the broilers in gaining weight, immunity response, growth performance, feed conversion ratio as well as it reduces mortality of the chicken broilers.

Various studies conducted by different researchers revealed that *M. oleifera* and *O. vulgare* positively affects the broilers in gaining weight and on the growth performance of the chicks. In this regard, this study was pursued to determine the synergistic effect of *M. oleifera* and *O. vulgare* leaf extract on the growth performance of chick broilers. Alongside, this study paved a way in recognizing the potentiality of *M. oleifera* and *O.*

vulgare leaf extract as growth enhancer and a substitute for the commercial probiotics (Vetracin).

1. METHODOLOGY

The experiment was conducted at San Marcos, Cabarroguis, and Quirino.

Source and processing of Oregano and Malunggay Extract (OME)

The OME was collected and prepared from Cabarroguis, Quirino. The harvested leaves were prepared using mortar and pestle andextracted using some other improvised materials. The prepared extracts were added to water in different concentrations and supplied to the different treatments.

Experimental Diets

Four experimental units were formulated and a number of three replications such that one group served as control (T0 fed only with feeds and vetracin) and three groups served as Oregano and Malunggay treated groups. T1: 10%; 5% Oregano extract and 5% Malunggay extract, T2: 20%; 10% Oregano extract and 10% Malunggay extract and T3: 30%; 15% Oregano extract and 15% Malunggay extract. In this project, all treatments were supplemented with feeds. The vetracin and the OME were added to water *ad libitum* and water was used to replenish the broilers from *3-6* pm daily until 32 days of experimental period was reached.

Experimental Birds and Management

A total number of 120-day old, unsexed broiler chicks belonging to a single hatch of cob strain obtained from local commercial hatchery were used for the study. The chicks were weighed, wing banded, randomly allotted to four treatment groups with three replicates of ten chicks each. The birds were weighed at the beginning of the study to obtain their initial body weights and thereafter they were individually weighed to the nearest gram at weekly intervals during the experimental period.

Statistical Analysis

The data that was collected on various parameters were analyzed and the difference in treatment means were separated using Duncan's New Multiple Range Test.

2. RESULTS AND DISCUSSION

The results of this experiment towards thegoal to evaluate the synergistic effect of malunggay and oregano extract on broiler performances in terms of body weight and height. The research on the effects of these extracts has revealed aseries of results to be presented as follows. Mean bodyweight gain (BWG) and height of broilers during the experimental period are summarized andpresented in the following tables.

Table 1

The initial weight of broilers

	0	1	2	3
Weight	45.22^{A}	46.003^{A}	47.587^{A}	45.740^{A}
	F-value 0.706	p-value 0.522		

(Means of the same letters within rows are comparable at 0.5 level of significance (ANOVA))

The foregoing table presents the initial body weight of broilers. As can be gleaned in the table, there is comparable result in the weight of broilers. Insignificant difference was revealed as the broilers were hatched all together.

Table 2

The effect of different concentrations of Malunggay and Oregano extract on the body weight gain in 7 days

	0	1	2	3
Weight	127.660^{A}	138.72^{A}	130.96^{A}	137.753^{A}
	F-value 1.174 p-value 0.328			

(Means of the same letters within rows are comparable at 0.5 level of significance (ANOVA))

The table presents the effect of different concentrations of Malunggay and Oregano extract on the body weight gain in 7 days of experimental period. It revealed comparable result in all the experimental treatments thus it can be said that there is no significant difference in the gained weight of broilers within 7 days experimental period. Insignificant result was revealed as the broilers were still undergoing acclimatization process. However, as indicated from the table above, treatment 1 has attained the highest average body weight.

Table 3

The effect of different concentrations of Malunggay and Oregano extract on the body weight gain and height in 14 days

	0	1	2	3
Weight	374.24^{A}	377.067^{A}	390.56^{A}	399.307^{A}
	F-value 0.453 p-value 0.716			

(Means of the same letters within rows are comparable at 0.5 level of significance (ANOVA))

Results in the table revealed that there is no significant difference in the broiler's body weights within 2 weeks because of the adjustment period these broilers have undergone. However, the average body weight attained in treatment 3 is higher than the body weight attained in other treatments and among treated groups there is increasing body weight; T1, T2, & T3: 377.067, 390.56, & 399.307, respectively.

Table 4

The effect of different concentrations of Malunggay and Oregano extract on the body weight gain in 21 days

	0	1	2	3
Weight	661.133^{A}	713.00^{B}	711.800^{B}	766.429^{B}
	F-value 3.439 p-value 0.023			

(Means of the same letters within rows are comparable at 0.5 level of significance (ANOVA))

The table shows the effect of different concentrations of Malunggay and Oregano extract on the body weight of broilers within 3 weeks. It is noticeable in the table that the effect of the treatmentswas different from that of the control group because of the gained weight which is incomparable from the control group.

Oregano and Malunggay extract had an impact on this since these are considered as herbs and spices which are used as appetizing and digestion stimulating [4] [21]. Hence, there is an abrupt increase in their body weight except for the control group or untreated group. However, scientists said that the response of broiler chickens to the

inclusion of oregano essential oil is not clear [22] which might be the reason of the decreased average body weight of broilers in treatment 2.

Table 5

The effect of different concentrations of Malunggay and Oregano extract on the body weight gain in 28 days

	0	1	2	3
Weight	858.20^{A}	996.40^{B}	959.33^{B}	1007.29^{B}
	F-value 4.176p-value 0.010			

(Means of the same letters within rows are comparable at 0.5 level of significance (ANOVA))

In the results presented above, significant difference was found among the treated groups. All the treated groups demonstrated incomparable average body weight when compared to the control group. Also, it can be seen that treatment 3 gained the highest average body weight among all the groups (control and treated). The addition of oil extracts promotes growth performance among broilers and posted positive effect on growth performance and health of broiler chickens [7]. The differing response of broilers to the inclusion of oregano essential oil among the treated groups showed an effect to treatment 2 only. It can be said that broilers from treatments 1 and 3 positively respond to the inclusion of the oregano extract and so, there is an increased average body weight.

Table 6

The effect of different concentrations of Malunggay and Oregano extract on the body weight gain and height in 32 days

	0	1	2	3
Weight	1104.267^{A}	1245.6^{BC}	1196.733^{AB}	1330.571^{C}
	F-value 6.047 p-value 0.001			
Height	19.133^{A}	19.067^{A}	19.4^{A}	19.786^{A}
	F-value 1.072p-value 0.369			

(Means of the same letters within rows are comparable at 0.5 level of significance (ANOVA))

The table shows the effect of different concentrations of Malunggay and Oregano extract on the body weight gain and height in 32 days. Incomparable result was found

in terms of gained body weight of broilers whereas insignificant difference was revealed in terms of their height. In addition, results revealed that treatments 0 (control group) and 2 posted comparable result in their average body weight, 1 & 3, and 1 & 2, as well.

The supplementation of Oregano and Malunggay extract is be an alternative for probiotics as it promotes broiler's growth performance. However, the inclusion of OME in treatment 2 was not that effective on the other hand, the total gained body weight has somehow increased and possessed bright yellowish feet color compared to the control group.

3. CONCLUSION

Based on the findings of this study, the following conclusions were drawn:

1. *M. oleifera* and *O. vulgare L.* extracts showed a significant effect on the growth performance of broilers;
2. *M. oleifera* and *O. vulgare L.* extracts posted positive effect on the body weight gain thus, it can be used as an alternative for antibiotics.
3. There is no significant difference in terms of total gain in height of the broilers.

5. RECOMMENDATIONS

From the results of the study, the researchers recommend the following:

1. Identify the carcass quality of chick broilers compared to the control group;
2. Before applying the treatments, the broilers should undergo acclimatization process.
3. Since the present study utilized class B Cobb-strain broilers, the next researchers should consider the higher class of chick broilers to be used.
4. Design more treatment of graded concentration level of leaf extracts for broilers.

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