



RESEARCH PAPER

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Response of oregano (*Origanum vulgare*) powder on the growth performance of broilers

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Abstract

Phyto additives like oregano in poultry production have attracted attention as potential natural alternatives to antibiotic growth promoters containing microbial activities and nutrient digestibility that can improve the performance of broilers. Thus, the study aimed to determine the response of oregano powder as a feed supplement for broilers. A total of one-hundred sixty head day-old broiler chicks were distributed at random in four treatments replicated five times following the Randomized Complete Block Design. The oregano leaves powder is incorporated into the commercial feeds at a rate of 1%, 2%, and 3% powder per kilogram of commercial feeds for 35 days of age. Supplementation of different levels of oregano powder significantly affected the growth performance of broilers in terms of feed consumption and feed conversion ratio but comparable performance in terms of final weight, gain in weight, dressing percentage, and mortality rate. The profit above feed, medicine, and stock cost of broilers was found no significant differences. Supplementation of oregano in broilers can be used as an alternative to commercial antibiotics as a growth promoter.

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Introduction

Globally, the poultry industry today is increasing the product demand and health problems. So, researchers now find possible remedies that are safe, locally available, and can overcome the demerits of large-scale allopathic drugs. According to Kuralkar and Kuralkar (2021), herbal plants are used as health promoters, to treat disease and to increase livestock production. Their extract known as phytobiotics or phytochemicals is widely used in animal production and as alternative medicines. They represent safety and security as compared to synthetic drugs and have a significant role in the health system for both humans and animals.

In veterinary medicine, the use of antibiotics is used to fight infectious diseases and some are used as antimicrobial growth promoters (Vieco-Saiz *et al.*, 2019). However, the use of growth promotants in livestock particularly in poultry production has been banned due to the resistance of bacteria and residues in animal tissues, which is why researchers now find natural alternatives that promote growth performance at a high level to ensure a healthy diet, quality, and safe food that is affordable for everyone. Phyto additives in poultry production have attracted attention as potential natural alternatives to antibiotic growth promoters like oregano which contain microbial activities and nutrient digestibility that can improve the performance of broilers. The microbial activities and nutrient digestibility present in oregano can improve the performance of broilers (Demitris *et al.*, 2010).

Oregano (*Origanum vulgare*) is an herb of the mint family (Lamiaceae) and a common species of *Origanum*. When compared to other synthetic ingredients, the residue is a free feed supplement specifically in poultry. *Origanum vulgare* as a feed supplement for poultry has antimicrobial activity, antioxidant, antiviral, immunomodulatory, and antiparasitic effects (Karimi *et al.*, 2010) and is used as an alternative growth promotant in poultry nutrition.

Carvacrol, thymol, *γ*-terpinene, and *p*-cymene are the most important active components of oregano essential oil involved in the functional properties of oregano. Worrell *et al.* (2010) reported that oregano contains over 30 compounds including rosmarinic acid, a compound that has anti-oxidant properties. It also contains amounts of trace minerals, alkaloids, flavonoids, tannins and saponin (Phyto chemical testing results of LORMA Colleges, San Fernando City, La Union, Philippines).

This study was conducted to evaluate the growth performance of broilers supplemented with oregano powder at a rate of 1, 2 and 3% per kilogram of commercial feeds.

Materials and methods

A total of one-hundred sixty head day-old broiler chicks were distributed at random in four treatments replicated five times following the Randomized Complete Block Design. The treatments are as follows:

T₀ - Pure Commercial feeds + Electrolytes, commercial antibiotic (Control)

T₁- 1% oregano powder

T₂- 2% oregano powder

T₃- 3% oregano powder

Materials and procedures

a. Preparation of oregano powder: Oregano leaves were gathered at Herbarium of barangay Sapilang, and at the Poultry project of DMMMSU-NLUC, Bacnotan, La Union, Philippines. Fresh oregano was air dried for 15-20 days. After drying, oregano was powdered using the electric powdering machine at Bio-N project of the university. The powdered oregano was manually weighed and mixed into commercial feeds following the amount corresponding to different treatments. The experimental rations were given to the birds from brooding period to 35 days. Birds in the control group were provided with pure commercial ration for 35 days + commercial antibiotics (containing antibiotic- Doxycycline and Tiamulin) for 7 days and additional electrolytes (containing

niacinamide, magnesium chloride, potassium chloride, sodium acetate, sodium chloride, and glucose) for 14 days in the drinking water.

Ad libitum feeding was employed in all treatments from brooding to 35 days old. Chick booster was given to the birds during the brooding period and were shifted to starter ration thereafter. Mortality rate was noted from brooding to growing period.

Data analysis

Data gathered were analyzed using Analysis of Variance in Randomized Complete Block Design and significantly differences among treatments means were further tested using the Tukeys's Honest Significant Difference (HSD) Test.

Results and discussion

Growth performance

The final weight of broilers as affected by oregano powder at different levels is presented in Table 1. It is noted that the final weight of broilers supplemented with oregano powder was better compared to birds

given commercial ration. Although, analysis of variance revealed insignificant result indicating that supplementation of oregano powder did not influence the final weight of broilers. The foregoing study is in agreement to the findings of Giannenas *et al.* (2016) showed that broilers received oregano supplements in the diet had better body weight compared to those birds given basal corn-soybean diet (control).

The gain in weight of broilers as affected by oregano powder ranged from 1.40 kg to 1.47 kg (Table 1). Analysis of variance showed no significant effect. Phytobiotic presents in oregano do not exert positive response on the gain in weight of broilers. The present study concurs to the findings of Basmacioğlu *et al.* (2010), and Cross *et al.* (2007) that supplementation of dietary oregano essential oil (50 and 100 mg/kg of feed) exerted no growth promoting effect on the gain in weight of broilers. Also, Abdel-Wareth *et al.* (2012) found that using thyme and oregano supplementation at 15 or 29 g/kg in the feeds diet may use as feed additives to enhance growth performance.

Table 1. Final weight and gain in weight of broilers as affected by different levels of oregano powder as feed supplement (kg)

Treatment	Final weight (kg)	Gain in weight (kg)
Commercial antibiotic + electrolytes	1.45	1.40
1% oregano powder	1.46	1.42
2% oregano powder	1.47	1.43
3% oregano powder	1.51	1.47
Significance	ns	ns
cv	3.29 %	2.87 %

Table 2. Feed consumption and feed conversion ratio of broilers of oregano powder at different levels as feed supplement

Treatment	Feed consumption (kg)	FCR
Commercial antibiotic + electrolytes	2.50 ^a	1.73 ^a
1% oregano powder	2.46 ^{ab}	1.71 ^{ab}
2% oregano powder	2.44 ^{ab}	1.65 ^{ab}
3% oregano powder	2.41 ^b	1.61 ^b
Significance	*	*
cv	1.37%	3.10%

Table 2 presents the data on feed consumption of broilers. Result shows that those birds given pure commercial feeds consumed most (2.50 kg) while those birds supplemented with 3% oregano powder

consumed the least (2.41 kg). The analysis of variance disclosed significant differences. Comparison among treatment means showed that broilers fed commercial feeds + provide commercial antibiotic + electrolytes

in the drinking water significantly consumed the highest which is comparable to those birds supplemented with 1-2% oregano powder. The result implies that supplementation of oregano powder at 3% influenced the appetite of broilers, hence, reduced feed consumption as cited by Vasquez *et al.* (2015) that the performance of broiler supplemented with oregano oil in the diet significantly affect the feed consumption of broilers. Wareth *et al.* (2012) also mentioned that supplementation of oregano and its component on the growth performance of broilers reduced the feed intake thus improving the feed efficiency of broilers.

The feed conversion ratio of broilers as affected by oregano powder at different levels is shown in Table 2. Birds given a ration of 3% level of oregano powder were the most efficient with a mean feed conversion ratio of 1.61 and the poorest was obtained by birds in the control (1.73).

Analysis of variance revealed significant results. Comparison among treatment means shows that birds given at 3% level were significantly better than birds fed with commercial feeds but comparable to

birds supplemented with 1-2% oregano powder. This indicates that the amount to produce a kilogram gain in weight of broilers could be attributed to the claim that non-antibiotic growth promoters (phytobiotics) used as feed supplements, derived from herbal plants improved feed conversion ratio. A better feed conversion ratio may be due to the improved nutrient digestibility since herbs can manage and leap the growth and colonization of several infectious and non-infectious species of bacteria in the gut of chicken that may take better efficiency in the feed consumption thus improving feed efficiency (Qamar *et al.*, 2015). Also, supplementation of oregano oil improved the feed conversion ratio and oregano can be used as a natural alternative to commercial antibiotics and drugs thus no residues and no side effects (Alagawary *et al.*, 2018).

Table 3 shows the mortality rate of broilers which ranged from 0 to 1.25%. Analysis of variance revealed no significant differences. Result of the present study suits to the findings of Bozkurt *et al.* (2009), that mortality rate was not affected by herbal feed supplements (essential oil of oregano/Herb-Mos Oregano, HMO) as antibiotic growth promoters.

Table 3. Mortality rate and dressing percentage of broilers as affected by oregano powder at different levels as feed supplement (%)

Treatment	Mortality rate (%)	Dressing percentage (%)
Commercial antibiotic + electrolytes	1.25	67.71
1% oregano powder	1.25	68.61
2% oregano powder	0	68.54
3% oregano powder	0	70.09
Significance	ns	ns
cv	8.14%	1.73%

The dressing percentage of broilers ranged from 67.71% to 70.09% (Table 3). Broilers supplemented with oregano powder in the diet are better compared to the control, yet, analysis of variance failed to show significant differences. The result implies that supplementation of 1-3% oregano powder did not affect the dressing percentage of broilers. Present study concurs to the findings of Peng *et al.* (2016) that dietary supplementation of oregano improved the dressing percentage and eviscerated rate of broilers as compared to those birds given a corn-soybean basal diet.

Profit above feed, medicine and stock costs of broilers

Table 4 shows the profit above feed, medicine and stock cost of broilers which ranged from P15.32 to P20.64. Broilers fed with 1-3% oregano powder was numerically higher in profit compared to control group (commercial ration + electrolytes), but analysis of variance revealed no significant result. The result implies that the production of broilers given different levels of oregano powder resulted to comparable mean profit based on dressed weight of broilers.

Table 4. Profit above feed, medicine and stock cost of broilers as affected by different levels of oregano powder as supplement (PhP)

Treatment	Profit (PhP)
Commercial antibiotic + electrolytes	15.32
1% oregano powder	16.61
2% oregano powder	18.54
3% oregano powder	20.64
Significance	ns
cv	23.77%

Conclusion

Supplementation of different levels of oregano powder significantly affected the growth performance of broilers in terms of feed consumption and feed conversion ratio of broilers but comparable performance in terms of final weight, gain in weight, mortality rate, and dressing percentage. The profit above feed, medicine and stock cost of broilers was found comparable given oregano powder and oregano decoction.

Recommendation(s)

Addition of oregano powder at a rate of 1, 2 and 3% per kilogram of commercial feeds can be used as supplement on the growth performance of broilers as substitute to commercial antibiotic.

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