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***Research Article***

# EFFECT OF USE OF CONEFLOWER AND VIRGINIAMYCINE ON PERFORMNACE, SOME BLOOD PARAMETERS AND ANTIBODY TITER AGAINST NEW CASTLE VIRUS VACCINE ON BROILER CHICKS

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## ABSTRACT
This study was conducted to investigate the effect of use of coneflower and virginiamycine on performance of broiler chicks. A total 240 one day broilers chicks (Ross 308) were divided into 4 groups of 20 birds each and assigned to 3 treatment diets. Chicks were fed by basal diet as control diet, 2% cornflower ($T_1$), 2% virginiamycine ($T_2$). At the end of trial for carcass evaluation 4 birds form each group were slaughtered. In addition some parameters such as feed intake (FI), body weight gain (BW), and feed conversion ratio (FCR) were calculated and compared together. Some blood parameters such as Cholesterol and Triglyceride of blood were determined. Sample of blood were taken for antibody titer against new castle vaccine evaluation on 28, 36 and 42 days old chicks. Data showed no significant difference for feed intake in experimental groups. Chicks were fed with $T_2$ diet was higher weight gain compared to others. This result showed that all treatments have better final result in compared to control. Liver percentage was significantly decreased ($p<0.05$) were broilers fed with $T_1$, T2. There were no significant differences in for Heart percentage between treatments. The use of $T_1$, T2 lead to reduce abdominal fat percentage statistically ($p<0.05$). Drumstick percentage was increased where broilers were fed with $T_1$, $T_2$ ($p<0.05$). As per the result from Table 3, breast meat percentage was higher for $T_2$ than others, but there were no significant effects observed. Triglyceride, cholesterol and LDL were induced when chicks used $T_1$and $T_2$. In turn increasing of HDL levels was observed. Data showed that by using coneflower and virginiamycine on broilers diet antibody titers against New Castle diseases virus (NDV) were significantly increased($p<0.05$).In conclusion it seem that inclusion of coneflower And virginiamycine in broiler chicks diet at level of 2% can be useful and have significantly benefits on performance, blood biochemical and immunity parameters.

***Keywords:*** *Coneflower, Virginiamycine, Performance, Blood parameters, Broilers*

## INTRODUCION
There is increasing interest in using alternatives to antibiotics for poultry husbandry and using probiotics is an approach that has potential to reduce enteric disease in poultry and subsequent contamination of poultry products (Vahdatpour *et al.,* 2011; Sarica *et al.,* 2005). Antibiotic growth promoters were supposed to increase growth rate as a result of improved gut health, resulting in better nutrients utilization and improved feed conversion (Demir *et al.,* 2003; Toghyani *et al.,* 2011). Virginiamycine was also used in agriculture, specifically in livestock, to accelerate the growth of the animals and to prevent and treat infections (Teymourizadeh *et al.,* 2009). Today, the non prescription use of antibiotics in poultry feeds has been eliminated or severely limited in many countries because of the potential risks associated with their use and development of resistant strains of bacteria, mainly in humans. A complete ban on antibiotics in poultry feeds was brought into force on January 1st by European Union; thus, all of the antibiotics used at sub-therapeutic doses for growth promotion were withdrawn (Nollet, 2005).

Phytogenic feed additives are plant derived products that used in animal feeding to improve performance of animals through amelioration of feed properties, promotion of production performance, and improving the quality of their food (Gill, 1999: Great, 2003; Windich *et al.,* 2008). Coneflower *(Echinacea purpurea)* is belonging to the group of phytogenic immune stimulants that help in establishment and strengthening of paraimmunity and is reported to possess a number of pharmacologically active substances (Nasir *et al.,* 2010; Weiner, 1994). *Echinacea purpurea* contain a variety of active substances like alkamides, glycoproteins, polysaccharides, phenolic compounds, cichoric acid, cinnamic acids, essential oils and flavonoids. *Echinacea purpurea* was effective treatment in human acute respiratory infection (Narimaniana *et al.,* 2005). The objective of this study was to explore the potential uses of coneflower as growth promoters in comparison to virginiamycine antibiotic on broilers performance.

## MATERIALS AND METHODS

For determine the effect of use coneflower and virginiamycine on performance of broiler chicks a total 240 one day broilers chicks (Ross 308) were divided into 3 groups of 20 birds each and assigned to 4 replicate. The experiment was carried out at the poultry farm of Veterinary College, Islamic Azad University, Shahrekord branch, Iran for 42 days. Coneflower was purchased from local market and grounded separately to a fine powder and then mixed with the basal diet (Table 1). In addition feed and fresh water were providing adlibitum during the experiment. Treatments were basal diet as control diet, 2% coneflower ($T_1$), 2% virginiamycine ($T_2$), that they were balanced according to their requirement as shown in(NRC,1994) for poultry. The live body weight gains of birds were measured individually and feed consumption and feed conversion efficiency were measured weekly. At the end of experimental plan 2 birds form each groups (totally 24 birds) were slaughtered and to compare body parts were separated and weighted. blood samples from each bird were collected and stored at refrigerator at +4°C for 24 h, the blood samples were subjected to biochemical for determine their cholesterol, triglycerides by Pars Azmoon commercial kits. Serum antibody titer against Newcastle Disease Virus (NDV) was determined by the hem agglutination inhibition test (HI). HI antibodies were then converted into log2 (Cunningham, 1971).Then data were collected and analyzed by using the general, linear model procedure of (SAS, 2001) and different means Duncan's multiple ranges test was used to detect the differences at level ($p<0.05$).

**Table 1: Composition of the experimental diets for broiler chicks**

| **Ingredients %** | **0-14 (days old)** | **15-29 (days old)** | **29-42 (days old)** |
|---|---|---|---|
| Corn grain | 51.64 | 56.61 | 60.37 |
| Soybean meal | 37.74 | 32.30 | 27.81 |
| Wheat grain | 5 | 5 | 5 |
| Oil | 1.40 | 2.03 | 2.84 |
| DCP | 1.56 | 1.47 | 1.39 |
| Oyster shells | 1.17 | 1.13 | 1.08 |
| Methionine D-L | 0.30 | 0.29 | 0.27 |
| Lysine-L | 0.13 | 0.13 | 0.30 |
| Nacl | 0.26 | 0.24 | 0.14 |
| Vitamin Premix* | 0.3 | 0.3 | 0.3 |
| Mineral Premix* | 0.3 | 0.3 | 0.3 |
| Coneflower/Virginiamycine | 0.2 | 0.2 | 0.2 |
| **Calculated nutrient content** | | | |
| ME(Kcal/Kgr) | 2.850 | 2.950 | 3.050 |
| CP (%) | 22 | 20 | 18.5 |
| Ca (%) | 0.90 | 0.85 | 0.80 |
| Available Phosphorus (%) | 0.45 | 0.42 | 0.40 |
| Lysine (%) | 1.35 | 1.20 | 1.16 |
| Na (%) | 0.16 | 0.15 | 0.15 |
| Methionine+ Cystine (%) | 0.97 | 0.87 | 0.85 |

Supplied per kilogram of feed: 7.500 IU of vitamin A, 2000IU vitamin D3, 30 Mg vitamin E, 1.5 µg vitamin B12, 2Mg B6, 5 Mg Vitamin K, 5 Mg vitamin B2, 1 Mg vitamin B1, 40 Mg nicotinic acide, 160µg vitamin Biothine, 12 Mg Calcium pantothenate, 1Mg Folic acid 20 Mg Fe, 71 Mg Mn, 100µg Se, 37Mg Zn, 6 Mg Cu, 1.14 Mg I, 400 µg Cu.

## RESULTS AND DISCUSSION

### *Results*

Data of feed intake, broiler weight and feed conversion ration are in (Table 2). Data showed no significant difference for feed intake in experimental groups. Chicks were fed with $T_2$ diet was higher weight gain compared to others. This result showed that all treatments have better final result in compared to control.

**Table 2: The effect of coneflower and virginiamycine on broilers performance**

| Treatments* | FI(g/d) | BW(g/d) | FCR | FI(kg) | Pre-slaughter weigh(g) |
|---|---|---|---|---|---|
| Control | 87.43$^{b**}$ | 40.12$^{b}$ | 2.27 | 3654.30$^{b}$ | 1710.17$^{b}$ |
| $T_1$ | 89.49$^{a}$ | 41.23$^{a}$ | 2.12 | 3735.26$^{b}$ | 1734.45$^{a}$ |
| $T_2$ | 90.10$^{a}$ | 41.14$^{a}$ | 2.10 | 3782.10$^{a}$ | 1743.62$^{a}$ |
| MSE | 0.071 | 0.42 | 0.07 | 275.4 | 11.44 |

**Control = basal diet, T1= Basal diet with 2% coneflower, T2= Basal diet with 2% Virginiamycine. **Means within row with no common on letter are significantly different (p<0.05).*

Data from Table 3 showed that liver percentage was significantly decreased (p<0.05) were broilers fed with $T_1$, T2. There were no significant differences in for Heart percentage between treatments. The use of $T_1$, $T_2$ lead to reduce abdominal fat percentage statistically (p<0.05). Also drumstick percentage was increased were broilers fed with $T_1$, $T_2$ (p<0.05).As result relevant form Table 3, breast meat percentage was higher for $T_2$ than others, but there were no significant effects observed. Data showed that percentage of gizzard was higher in the $T_1$ groups and it was at the lowest in control groups (p<0.05).

**Table 3: The effect of coneflower and virginiamycine on percentage some part of chicks' bodies**

| Treatments* | Liver (%) | Abdominal Fat (%) | Drumstick (%) | Breast Meat (%) | Gizzard (%) | Heart (%) |
|---|---|---|---|---|---|---|
| Control | 2.83$^{a**}$ | 3.26$^{a}$ | 20.31$^{b}$ | 24.74 | 2.13$^{b}$ | 0.20 |
| $T_1$ | 2.67$^{b}$ | 2.88$^{b}$ | 23.92$^{a}$ | 25.52 | 2.86$^{a}$ | 0.21 |
| $T_2$ | 2.59$^{b}$ | 2.76$^{b}$ | 24.04$^{a}$ | 25.76 | 2.76$^{a}$ | 0.21 |
| MSE | 0.45 | 0.19 | 0.724 | 1.67 | 0.011 | 0.194 |

**Control = basal diet, T1= Basal diet with 2% coneflower, T2= Basal diet with 2% Virginiamycine. **Means within row with no common on letter are significantly different (p<0.05).*

Data from this study showed that the triglyceride, HDL and LDL were changed with experimental diets (Table 4). Triglyceride, cholesterol and LDL were induced when chicks used $T_1$and $T_2$, In turn increasing of HDL levels was observed.

**Table 4: The effect of coneflower and virginiamycine on some blood parameters**

| Treatments* | Triglyceride (Mg/dl) | Cholesterol (Mg/dl) | HDL (Mg/dl) | LDL (Mg/dl) |
|---|---|---|---|---|
| Control | 82.43$^{a**}$ | 125.44$^{a}$ | 57.21$^{a}$ | 73.85$^{a}$ |
| $T_1$ | 76.54$^{b}$ | 120.23$^{b}$ | 59.48$^{b}$ | 71.29$^{b}$ |
| $T_2$ | 74.21$^{b}$ | 118.47$^{b}$ | 60.18$^{b}$ | 70.42$^{b}$ |
| MSE | 4.17 | 5.45 | 0.792 | 0.847 |

**Control = basal diet, T1= Basal diet with 2% coneflower, T2= Basal diet with 2% Virginiamycine. **Means within row with no common on letter are significantly different (p<0.05).*

Data from antibody titers against New Castle diseases virus (NDV) as shown on Table 6 showed that antibody titers were significantly increased($p<0.05$) when broilers were fed by $T_1$,$T_2$.

**Table 5: The effect of coneflower and virginiamycine on antibody titers against New Castle disease virus**

| **Treatments*** | **28 days** (log2) | **35 days** (log2) | **42 days** (log2) |
|---|---|---|---|
| Control | 2.51$^{c**}$ | 3.10$^{c}$ | 3.99$^{c}$ |
| $T_1$ | 2.81$^{b}$ | 3.65$^{b}$ | 4.16$^{b}$ |
| $T_2$ | 2.93$^{b}$ | 3.87$^{ab}$ | 4.46$^{b}$ |
| MSE | 0.065 | 0.31 | 0.87* |

**Control = basal diet, T1= Basal diet with 2% Coneflower, T2= Basal diet with 2% Virginiamycine. **Means within row with no common on letter are significantly different (p<0.05).*

***Discussion***

In the present study, coneflower and virginiamycine supplementation had beneficial effects ($P<0.05$) on the measured values in growing broiler chicks. Although the usage of the coneflower and virginiamycine wasn't significant influences on feed conversion ratio in broiler chicks but also decreased it. Result of Lee *et al.,* (2012) studies about coneflower on broilers showed that the body weight gain and feed intake of the broilers were not significantly different by treatment in the starter or grower period. In the grower period, the feed conversion of the coneflower groups was significantly decreased compared with that of the control group. Some scientists showed that beneficial effects of herbal or active substances in animal nutrition may include the stimulation of appetite and feed intake, the improvement of endogenous digestive enzyme secretion, activation of immune response and antibacterial, antiviral, antioxidant and anti helminthes actions (Janssen, 1989; Manzanilla *et al.,* 2001; Jamroz *et al.,* 2003). Landy *et al.,* (2011) showed that the body weight obtained in broilers fed diet containing 5g/kg diet coneflower continuously was highest than all treatments in the 14 and 28 days, but the height was not significant. The result of their study showed that the use of 10 g/kg diet dried aerial part powder of coneflower intermittently had significant effect on daily weight gain and feed conversion ratio. The herb coneflower is commonly known as an immune stimulating substance, so the application of immune stimulating substances to increase the immune status can result in increased performance (Iren, 2000, Ahmadi, 2011). Some studies showed that treatment with virginiamycine at suggested dosages has a beneficial effect on body weight gain and feed conversion efficiency in poultry (Dumonceaux *et al.,* 2006; Rahimi *et al.,* 2009; Mayahi *et al.,* 2011). In the present study a positive effect of coneflower on cholesterol concentration in the blood plasma of broiler chicks was observed. Similar results were reported by (Ghalamkari *et al.,* 2011) who demonstrated that inclusion in the diet of coneflower powder from the dried aerial part (10 g/kg) could improve the total antioxidant activity in the serum of broiler chicks. Feizi *et al.,* (2012) showed that use of E. purpurea in each of the foregoing doses had increasing effects on antibody titers, and this fact is significant between the control group and treatment groups. Ghaedi *et al.,* (2014) showed that serum cholesterol profile and antibody titer against (NDV) improved in groups that they used herbal and virginiamycine ($P<0.05$). Faghani *et al.,* (2014) showed that the use of virginiamycine on broilers diet could increase feed intake and body weight gain and decreased the level of cholesterol and triglyceride in their serum. Ghaedi *et al.,* (2014) also suggested that virginiamycine controls microbial growth by acting on the mircoflora's biochemical processes such as protein synthesis or inhibiting the elongation of Methono bacterium and Echerchiacoli it can improve the anti body titer. Allen (2003) showed that coneflower may potentiate the immune response to live vaccination and may provide protective immune stimulation in the presence of natural coccidia population in the litter. In other studies conducted in Swiss mice. Frieier *et al.,* (2002) showed that coneflower may increase the humoral immune response.

***Conclusion***

We could be explained some benefit acts by using coneflower and virginiamycine on performance for broilers chicks. This improvement on growth and health may be due to the biological functions of coneflower to improve growth or that may be due to its role as stimulant, enhanced digestibility, antioxidant, anti-microbial and anti-fungal activities and properties and the prevention of gastric toxicity. The herb coneflower is commonly known as an immune stimulating substance, whilst the performance of animals is influenced mainly by the health and immune status, a stressed or weak immune system with a load of infectious diseases causes low body weight gain. On the other hand, an enhanced immune system allows maximum performance. Also Further tests are needed to explore and more detail explanation.

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