Ginger powder effect on the immune system in broilers exposed to Salmonella infection

Monireh Tavakol[1], Hamidreza Khodaei[2] and Javad Nasr[1]

[1]Department of Animal Science, Faculty of Agriculture, Saveh Branch, Islamic Azad University, Saveh, Iran
[2]Department of Animal Science, Golpayegan Branch, Islamic Azad University, Golpayegan, Isfahan, Iran

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ABSTRACT

Genetic improvement in broiler speeding but weakened immune system and increased susceptibility to disease is Because of the very low levels of antibiotics as growth in poultry diets As well as prophylactic agents are used. The aim of this study was to evaluate the effect of ginger on the immune system of broilers were exposed to Salmonella infection. A total of 160 one-day-old Ross 308 broiler chicks were randomly selected. Chicks were trained over a period of 42 days. Blood was performed. Blood for determination of white blood cells and serum cholesterol concentrations were measured at days 21 and 42. For the statistical analysis software SAS and statistical methods were used in a completely randomized design. Powdered ginger significantly reduces cholesterol and increased white blood cell (P>0/05). Some chicken blood immune parameters that have been exposed to Salmonella infection is increased, which indicates the immune system.

Keywords: ginger, Salmonella, immune system, broilers
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INTRODUCTION

Medicinal plants are one of the main sources of drugs, the plant extracts or active ingredients they use. Medicinal plants for antibacterial properties can be considered as an alternative to antibiotics. Mechanisms to improve the performance of these compounds are: Antimicrobial, powerful antioxidants, stimulate the production of digestive enzymes, Reduce the production of ammonia in the intestinal absorption of nitrogen [1, 2, 3]. The active ingredients in herbs Bitter substances which cause the palatability of the diet, the immune response can be improved. The benefits of plant extracts to antibiotic growth promoters can be noted that the positive effect of these compounds on the blood factor. Ginger is a spice and medicinal plant known to show strong antioxidant activity. This plant sore throat, headache and some types of pain cures, its function as an anti-inflammatory, antioxidant, anti-bacterial, anti-viral and immune system has been demonstrated [4]. Salmonella is a large group of gram-negative bacilli which is widely spread in the environment and is responsible for many diseases in humans and animals. The aim of this study was to evaluate the effect of ginger on the immune system of broilers were exposed to Salmonella infection [5].

MATERIALS AND METHODS

A total of 160 one-day-old Ross 308 broiler chicks were randomly selected. Chicks were trained over a period of 42 days. Blood was performed. Blood for determination of white blood cells and serum cholesterol concentrations were measured at days 21 and 42. The resulting data in Excel and other accounting records of the feed conversion ratio was calculated for each period. Bacteria, fungi and bacteria collection of the Institute Revolution to add to the water supply and were cultured in the laboratory. Breeding period, Starter (on the eighth day breeding period until the twenty-fifth day), Grower (From 26 to 42 days of the closing period of breeding), finisher the chicken was. The experimental groups were as follows: Ginger-free diet, Oral administration of saline (negative control), Oral

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administration of saline contaminated with Salmonella (positive control), Ration with ginger, Oral administration of saline (negative ginger), Ration with ginger, Oral administration of saline contaminated with Salmonella (positive ginger). Two solid medium was used. Nutrient agar, shigella – salmonella agar.

- **Blood and vaccination:**
On the tenth day of the period of breeding birds from each replicate were randomly selected from a venous blood was taken under the wing of a bird. The blood was taken before the vaccine and Salmonella. Within fifteen days from the time of breeding birds in each repetition of Newcastle disease vaccine received Tuesday. Blood variables include measurement of white blood cells, cholesterol, triglycerides, HDL, respectively.

- **Statically Analysis:**
The experimental design was a completely randomized design. Data were analyzed by SAS 98 software.

RESULTS AND DISCUSSION

Feed Conversion Ratio among the experimental groups showed no significant difference (P>0.05). The effect of ginger, Salmonella and their interaction on feed conversion ratio in broilers not significantly. In the absence of contamination, not significantly differences between the experimental groups (P>0.05) . In terms of pollution, there was no significant difference between the experimental groups. The comparison between the experimental groups no significant differences were found ginger in the diet. The comparison between the experimental groups did not differ significantly with diet ginger (table 1).

Table 1: Effect of experimental groups on FCR of broilers in the initial period of starter, Grower, Finisher

Treatment	Starter	Grower	Finisher
Negative control	1.42	1.70	1.99
Positive control	1.45	1.82	2.14
Negative ginger	1.39	1.64	1.86
Positive ginger	1.40	1.70	1.97
SEM	0.02	0.06	0.11
The effect of ginger	n.s	*	*
The effect of salmonella	n.s	*	n.s
Interaction	n.s	n.s	n.s
Model	n.s	*	n.s

mean difference is significant.

Table 2: Effect of experimental groups and subtracts the total number of white blood cells in 21 days (data for all the traits expressed in percent)

Treatment	Total (m l)	Heterophil / Lymphocyte	Heterophil	Lymphocyte	Eosinophil	Monocyte
Negative control	24833	0.30	22.66	73.33	0.33	1.00
Positive control	27067	0.38	27.33	71.66	0.33	2.00
Negative ginger	26733	0.34	25.66	75.33	1.00	1.33
Positive ginger	27600	0.36	27.00	74.33	1.00	2.66
SEM	17663	0.02	1.41	2.41	1.08	1.29
The effect of ginger	n.s	n.s	n.s	n.s	n.s	n.s
The effect of salmonella	n.s			n.s	n.s	n.s
Interaction	n.s	n.s	n.s	n.s	n.s	n.s
Model	n.s	n.s		n.s	n.s	n.s

mean difference is significant.

Table 3: Effect of experimental groups and subtracts the total number of white blood cells in 42 days (data for all the traits expressed in percentage)

Treatment	Total (m l)	Heterophil / Lymphocyte	Heterophil	Lymphocyte	Eosinophil	Monocyte
Negative control	25200	0.26	20.33	76.66	0.00	3.00
Positive control	21166	0.30	21.00	69.33	0.00	3.66
Negative ginger	21833	0.29	22.33	76.33	0.66	3.00
Positive ginger	27766	0.31	23.00	72.66	0.66	3.66
SEM	870	0.03	2.16	3.91	0.40	1.08
The effect of ginger	**	n.s	n.s	n.s	*	n.s
The effect of salmonella	n.s	n.s	n.s	*	n.s	n.s
Interaction	***	n.s	n.s	n.s	n.s	n.s
Model	***	n.s	n.s	n.s	n.s	n.s

mean difference is significant.

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Table 4: Effect of experimental cholesterol, triglycerides and HDL cholesterol in 21 days

Treatment	Cholesterol	Triglycerides	HDL
Negative control	205.6	1.93	649.0
Positive control	252.0	2.33	351.0
Negative ginger	160.6	1.86	853.6
Positive ginger	188.6	1.93	383.0
SEM	14.933	0.152	34.428
The effect of ginger	***	n.s	**
The effect of salmonella	***	n.s	**
Interaction	n.s	n.s	**
Model	***	n.s	**

* mean difference is significant.

Table 5: Effect of experimental cholesterol, triglycerides and HDL cholesterol in 42 days

Treatment	Cholesterol	Triglycerides	HDL
Negative control	128.00	1.83	369.3
Positive control	166.33	1.86	342.6
Negative ginger	116.66	1.73	386.3
Positive ginger	136.66	1.83	352.6
SEM	7.158	0.152	54.654
The effect of ginger	***	n.s	n.s
The effect of salmonella	***	n.s	n.s
Interaction	*	n.s	n.s
Model	***	n.s	n.s

* mean difference is significant.

The significant difference between the experimental groups and subtract the number of white blood cells in the blood plasma was observed (P<0.05). Count differences between the experimental groups were not significant. In comparing the experimental groups was significant difference in terms of the pollution. In comparing the experimental groups showed no significant difference in terms of pollution. The comparison between the experimental groups without ginger in the diet was no significant difference in the number of frequency. In considering these parameters between the experimental groups but Ginger had no significant effect on Salmonella has a significant effect. The interaction between the two levels tested (ginger and Salmonella) were not significant. Overall there was no significant difference in the number of white blood cells. Ginger, Salmonella and their interactions also had no effect on these parameters (Table 2).

Among the types of white blood cells to investigate the effect of ginger was significant only in eosinophils and lymphocytes in the blood plasma of Salmonella significant effect; the interaction between the two at any significant level. The comparison between the experimental groups in the number of white blood cells and plasma was no significant difference. In comparing the experimental groups were significantly different in terms of the absence of infection. The comparison between the experimental groups in terms of pollution in the number of white blood cell counts was significantly different. The comparison between the experimental groups without ginger in the diet showed a significant difference in the number of white blood cells and plasma. The comparison between the experimental groups with ginger in the diet showed a significant difference in the number of white blood cells (table3).

The effect of the experimental group showed a significant reduction in serum cholesterol (P<0.05). In comparing the experimental groups that were infected in the absence of significant differences in serum cholesterol were observed. In comparing the experimental groups were significantly different in terms of infection was observed in the serum cholesterol. In comparing the experimental groups with no ginger in the diet of broilers lowest cholesterol was negatively related to the control group. The agreement between the experimental groups was significantly different compared to broiler serum triglycerides were observed at 42 days.

HDL cholesterol levels in the blood did not show significant differences between the experimental groups. In comparing these parameters between groups effect of ginger, Salmonella tested the interaction effect was not significant (Table 4).

Improved feed conversion in negative ginger total growing period the effect of adding to the diet ginger chick rearing period from the beginning to the end of the hall . The additives used in the diet may have a negative effect on Salmonella in chicken feed conversion ratio is somewhat defused [4]. The results showed that at 21 days of the breeding the white blood cells, blood plasma frequency difference was significant only. Salmonella significant effect on the frequency it seems to be provocative and Salmonella has been increasing. The total number of cells in the blood plasma of positive ginger group showed a greater increase it is also likely that the stimulatory effect on the

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immune system associated with Salmonella and ginger. The number of white blood cells in the blood plasma was a significant positive Ginger this is due to the stimulatory effect on the immune system is through the intestinal absorption and share all types of white blood cells in an overall increase of the same, The whole system had received immunity in the absence of ginger was more irritated. Sims et al (2000) find Oligosaccharides cause aggregation or accumulation of pathogenic cells in its guidance to the outside of the body. Fukata et al (1999) adhesion and aggregation strains of Salmonella and Escherichia coli strains expressed mannose. The results in the reduction of serum cholesterol and increase HDL cholesterol in the blood showed and analysis of bile acids in the intestine because of the change in the beneficial bacteria that cause the wheel to stop acids (from the intestine to the liver and the liver to the intestine) are. Liver for synthesis of bile acids from cholesterol harvests, for this reason, the amount of cholesterol in the blood serum is reduced. Also considering that lactobacilli can be small intestine, cholesterol metabolism and absorption and reduce its absorption by the blood. Liver for synthesis of bile acids from cholesterol harvests, why cholesterol is reduced. Cholesterol lowering mechanism was attributed to digest and modernization [6]. Cholesterol to bile acids, which may be due to decomposition, followed by the construction of the act will prevent cholesterol [7,8].

CONCLUSION

Powdered ginger significantly reduces cholesterol and increased white blood cells. Some chicken blood immune parameters that have been exposed to Salmonella infection increased all these point to strengthen the immune system.

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