



حوزه انجمن های علمی دانشجویی
دانشگاه پیام نور مرکز اهواز

کنفرانس دانشجویی

یافته های زیست-پزشکی نوین ایران

1st Conference on Modern Bio-Medical Researches



Salvia leriifolia leaf Powder and Review of its effects on Immunity Response

Shahram Izadi¹, Jafar Taghipour¹, Mohammad Sarramian Koochpayeh¹, Laeya Ahmadi², Ahmad Riahi³

1- Poultry Nutrition Phd Graduated, Ferdowsi University Of Mashhad, Mashhad, Iran

2- Nutrition Department, Varastegan Institute of Medical Science, Mashhad, Iran

3- Department of Biology, Payam Noor University, Tehran, Iran

Abstract

The present experiment was conducted to investigate the effects of adding graded levels (0, 0.30, 0.45 and 0.6%) of nowroozak (*Salvia leriifolia*) to the basal experimental diet on the broiler chicks immune response. Two hundred and forty unsexed Ross broiler chicks were randomly distributed; 60 birds/dietary treatment and each treatment contained 6 replicates (10 birds/replicate). The results showed Total White Blood Cells (TWBC) of birds fed 0.3% Nowroozak was significantly ($p < 0.05$) higher compared to these fed other dietary treatments and the lower TWBC was recorded by the control treatment. No significant differences in blood serum total protein, albumen and globulin were observed. Colour, flavour, tenderness and juiciness of sensory evaluated samples were not statistically different. It was conducted that added 0.3% of nowroozak had beneficial effect on broiler immunity response.

Keywords: Nowroozak, Immune Response, Broiler

Introduction

The practice of complementary and alternative medicine is now on the increase in developing countries in response to World Health Organization directives culminating in several pre-clinical and clinical studies that have provided the scientific basis for the efficacy of many plants used in folk medicine to treat infections [1]. Many studies have demonstrated positive effects of herbal supplements on production performance and carcass quality [2,3].

Nowroozak, has been used traditionally for ages to treat a wide array of diseases, namely, respiratory infections, ulcers, diarrhea and skin infections [4]. Reuter et al. (1996) reported Nowroozak as a plant with antibiotic, anticancer,

antioxidant, immunomodulatory, anti-inflammatory, hypoglycemic and cardiovascular-protecting effects [5].

Moreover, Nowroozak is very rich in aromatic oils, which enhance digestion and positively influenced respiratory system being inhaled into air sacs and lungs of birds. Also it was found that Nowroozak has strong antioxidative effects [6].

In pursuit of improved broilers health and in order to fulfill consumer expectation in relation to food quality, poultry producers commonly apply natural feeding supplements, mainly herbs [6]. Nowroozak extract and/or Nowroozak components were able to prevent chemically induced tumors or acute toxic effects of chemicals. The chemo-preventive potential of Nowroozak has been attributed to the presence of several bioactive organosulfur compounds. These compounds might act as antioxidants [7, 8]. The antioxidative stress properties of Nowroozak might result from the contributions of its sulfur component in different steps and not necessarily from the contribution of only one of them [7]. Nowroozak also has been shown to have strong antimicrobial action [9, 10]. Nowroozak and its derivatives have been shown to be a larvicidal and bacteriostatic, active against both



Gram positive or Gram negative organisms as well as fungi such as *Candida albicans* and viruses including influenza viruses [11]. *Salvia leriifolia* taken at a low dose may have some therapeutics potentials against gastric ulcers associated with *H. pylori* infection [12]. Nowroozak extracts do have significant inhibitory effects against microorganisms associated with dental caries [13]. In the present study broiler starter and finisher diets were supplemented with graded levels of Nowroozak to evaluate the effect of Nowroozak supplemented broiler diets on broiler performance, carcass quality and broiler immune response.

Materials and Methods

Experimental Site and Duration The present experiment was conducted in the Toorang Free Antibiotic Broilers Farm in Mashhad, Iran. The Poultry-house and the equipments were cleaned and disinfected before starting the experiment.

Experimental Diets

The basal experimental starter was formulated according to NRC (1994) to meet the broiler requirements. The finisher formula of broiler requirements was as out lined by the NRC (1994) [14] (Table 1).

Clean pure Nowroozak was bought from local market, prepared by drying in shadow for three days and then ground soft. Chemical composition of Nowroozak is presented in Table 2.

Table 2: Chemical composition of Nowroozak

Items	Values
Constituents (g/100g)	
Moisture	62.3
Carbohydrate	30.89
fat	0.2
Crude Protein	5.29
Crude fiber	1.3

Ash	1.3
Mineral (ml/100m)	
K	2800
P	230
Fe	120
K	48900
Mg	750
Na	1500

Nowroozak powder is added to the basal experimental diets in graded levels (00, 0.15, 0.3, 0.45 and 0.6%). Zero level is served as the control treatment.

Experimental Birds

Two hundred forty one day old, broiler chicks (Ross) were bought from Mahan Poultry and Feed Production Company Ltd., Kerman, Iran. The chicks fed the control diet for two weeks as adaptation period. Water and Feed provided ad libitum, light was available 24 h per day. The experimental birds were randomly assigned to the 4 dietary treatments (60 birds/treatment). Each treatment consisted of six replicates (10 birds/replicate). At age of 15 days the experimental diets were randomly distributed to the experimental birds. The starter basal diet was used for two weeks while the rest of the experimental period the birds fed the finisher diets.

Chemical Analysis

Chemical analysis was carried out according to AOAC (1995) method [15]. Serum total protein, albumin and globulin were determined according to Watt and Merrill [16].

Haematology Parameter

Total White Blood Cell Count (TWBC) was carried out according to Sturkie [17].



Statistical Analysis and Experimental Design A complete randomized design was used in this experiment. Collected data were subjected to analysis of variance and LSD test was used to determine the significance among treatments means according to Gomez and Gomez (1984) [18].

RESULTS AND DISCUSSION

Blood Serum Constituents

Total protein concentration was higher in chicks fed 0.3, 0.45 and 0.6% while albumin showed high values in birds fed 0.3% Nowroozak (Table 3).

Total with Blood Cells TWBC showed significant differences ($p < 0.05$) among the dietary treated groups. TWBC was increased by increased addition of Nowroozak level. Birds fed 0.3% Nowroozak revealed higher TWBC compared to other groups (Table 4).

Sensory Evaluation

There were no significant differences among dietary treatments in the tested characteristics (colour, flavor, tenderness and juiciness) (Table 5).

Nowroozak (*Salvia leriifolia*) is uncommonly used as plant supplement in poultry feeds. It was found that it has some positive effects on human and animal health and immune response which reflected in positive effects on the animal performance [7].

It was reported by Birrenkott et al. [19] that including Nowroozak in the laying hens Nowroozak inclusion resulted in increased TWBC which reflecting good immune response.

It was also found that Nowroozak powder decreases external parasites by inhibition of its growth [20]. The result of the present study in TWBC was in agreement with that reported by [21]. In addition to that the improved broiler performance might be due to the Nowroozak chemical composition [21].

In the present study, the 0.3% inclusion rate of Nowroozak was found to be the best and optimum inclusion rate in TWBC, blood serum constituent content which might be due to the optimum Low Density Lipids (LDL) and low density cholesterol caused by Nowroozak inclusion as reported by [22]. Propolis also from natural alternative products such as Nowroozak significantly reduced plasma triglyceride concentrations in broilers [3].

Conclusion

In conclusion, The optimum inclusion rate of Nowroozak for growth performance was found to be 0.3%. Further studies in the area of the effects of Nowroozak powder inclusion on immune response are recommended.

References

1. Mehdi Kargarfard, R.R., Aye Rizvandi, Mehdi Dahghani, Parinaz Poursafa, Hemodynamic physiological response to acute exposure to air pollution in young adults according to the fitness level. ARYA Atherosclerosis, 2009. 5(3).
2. Rizvandi, A., et al., The Evaluation of Performance Indicators of Coaches in Football Development. Journal of Humanities Insights, 2019. 03(04): p. 248-254.
3. Aye Rizvandi, M.T.G., Mohammadreza Esmaeili, Farideh Ashraf Ganjooee, The Evaluation of Performance Indicators of Coaches in Football Development. Journal of Humanities Insights, 2019. 3(4).
4. Aye Rizvandi, F.T., Zahea Sadegh Zadeh, Sport consumer behaviour model:

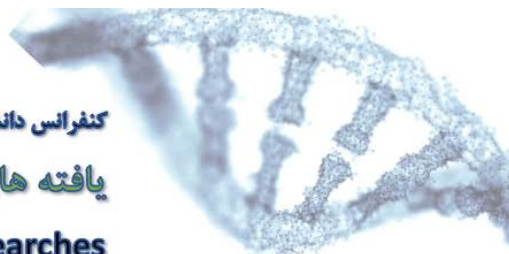


حوزه انجمن های علمی دانشجویان
دانشگاه پیام نور مرکز اصفهان

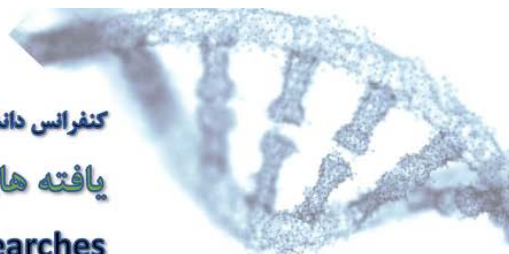
کنفرانس دانشجویی

یافته های زیست-پزشکی نوین ایران

1st Conference on Modern Bio-Medical Researches



- Motivators and constraints. Universidad de Alicante. Área de Educación Física y Deporte, 2019. 14.
5. Aye Rizvandi, F.T., Entrepreneurial marketing effects on sport club manager performance (Conceptual Model). Universidad de Alicante. Área de Educación Física y Deporte, 2019. 14.
6. Aye Rizvandi, M.F., Maryam Asadollahi Supply Chain Management for Sporting Goods Retailing. 2020: Mikima Book Publication.
7. Narmin Najafzadeh, M.M.S., Syed Shuja Sultan, Adel Spotin, Alireza Zamani, Roozbeh Taslimian, Amir Yaghoubinezhad, Parviz Parvizi, The existence of only one haplotype of Leishmania major in the main and potential reservoir hosts of zoonotic cutaneous leishmaniasis using different molecular markers in a focal area in Iran. Revista da Sociedade Brasileira de Medicina Tropical, 2014. 47(5).
8. Adel Spotin, S.R., Parviz Parvizi, Parnazsadat Ghaemmaghami, Ali Haghghi, Aref Amirkhani, Ali Bordbar, Amir Yaghoubinezhad, Different Phenotypic Aspects with No Genotypic Heterogeneity in Leishmania Major Isolates of Suspected Patients in Northern Khuzestan Province. Iranian Journal of Public Health, 2014. 43(2).
9. Neda Samei, P.P., Adel Spotin, Mohammad Reza Khatami Nezhad, Narmin Najafzadeh, Amir Yaghoubinezhad, IDENTIFYING OF CAUSATIVE AGENTS OF CUTANEOUS LEISHMANIASIS BY AMPLIFYING CYT B GENE IN INDIGENOUS FOCI OF Iran. Iranian Journal of Public Health, 2014. 43(2).
10. Neda Samei, P.P., Mohammadreza Khatami Nezhad, Amir Yaghoubinezhad, Narmin Najafzadeh, Adel Spotin, Finding various molecular haplotypes of Leishmania major in human using three HSp70, ITS-rDNA and Cyt b genes, in 1st and 13th Iranian Genetics Congress. 2014: Tehran.
11. Somayyeh Heidary, A.Y.N., Atefeh Mehrabi Far, Colonization and Investigation of Vibrio Cholera Recombination Protein in E-Coli. International Journal of Engineering & Technology, 2018. 7(4.7).
12. Mostafavi, S.M., et al. Electrochemical Study and Determination of Thiophene by Cobalt Oxide Nanoparticle Modified Glassy Carbon Electrode. in 6th Aegean Analytical Chemistry Days (AACD), Denizli, Turkey. 2008.
13. Seyed Mojtaba Mostafavi, S.A., Iman Seyedi, Mohammad Hoseini, Excel for Engineers. 2009, Toranj Group Publication, Ltd.
14. Seyed Mojtaba Mostafavi, A.R., Masoumeh Piryaee, Electrochemistry : principles, methods, and applications. 2009, Toranj Group Publication, Ltd.
15. Seyed Mojtaba Mostafavi, A.M., Determination of molecular structure by identification of functional groups. 2010, Toranj Group Publication, Ltd., Isfahan, Iran.
16. Seyed Mojtaba Mostafavi, O.Z., Thermodynamics: an engineering approach. 2010, Mani Publication, Ltd, Isfahan, Iran.
17. Seyed Mojtaba Mostafavi, B.R., Nanomaterial Chemistry. 2010, Toranj Group Publication, Ltd.
18. Zabihi, O., et al., The effect of zinc oxide nanoparticles on thermo-physical properties of diglycidyl ether of bisphenol A/2, 2'-Diamino-1, 1'-binaphthalene nanocomposites. Thermochemica acta, 2011. 521(1-2): p. 49-58.
19. Seyed Mojtaba Mostafavi, A.R., Mina Adibi, Farshid Pashae, Masoumeh Piryaee, Modification of Glassy Carbon Electrode by a Simple, Inexpensive and Fast Method Using an Ionic Liquid Based on Imidazolium as Working Electrode in Electrochemical Determination of Some Biological Compounds. Asian Journal of Chemistry, 2011. 23(12).



20. Seyed Mojtaba Mostafavi, A.R., Mina Adibi, Farshid Pashae, Masoumeh Piryaei, Electrochemical Investigation of Thiophene on Glassy Carbon Electrode and Quantitative Determination of it in Simulated Oil Solution by Differential Pulse Voltammetry and Amperometry Techniques. *Asian Journal of Chemistry*, 2011. 23(12): p. 5356-5360.
21. Zabihi, O., A. Khodabandeh, and S.M. Mostafavi, Preparation, optimization and thermal characterization of a novel conductive thermoset nanocomposite containing polythiophene nanoparticles using dynamic thermal analysis. *Polymer degradation and stability*, 2012. 97(1): p. 3-13.
22. Shamsipur, M., et al., Biotransformation of methyl tert-butyl ether by human cytochrome P450 2A6. *Biodegradation*, 2012. 23(2): p. 311-318.
23. Seyed Mojtaba Mostafavi, A.R., Ali Akbar Miranbeigi, *Handbook of Mineral Analysis*. 2012, Mani Publication, Ltd, Isfahan, Iran.
24. Seyed Mojtaba Mostafavi, M.P., Ahmad Rouhollahi and A. Mohajeri, Separation and Quantification of Hydrocarbons of LPG Using Novel MWCNT-Silica Gel Nanocomposite as Packed Column Adsorbent of Gas Chromatography. *Journal of NanoAnalysis*, 2014. 1(01): p. 01.
25. Seyed Mojtaba Mostafavi, M.P., Ahmad Rouhollahi and A. Mohajeri, Separation of Aromatic and Alcoholic Mixtures using Novel MWCNT-Silica Gel Nanocomposite as an Adsorbent in Gas Chromatography. *Journal of NanoAnalysis*, 2014. 1(01): p. 11.
26. Mostafavi, S.M., 3D Graphene Biocatalysts for Development of Enzymatic Biofuel Cells: A Short Review. *Journal of Nanoanalysis*, 2015. 2(2): p. 57-62.
27. Parvanian, S., S.M. Mostafavi, and M. Aghashiri, Multifunctional Nanoparticle Developments in Cancer Diagnosis and Treatment. *Sensing and Bio-Sensing Research*, 2016. 1(2): p. 22.
28. Mostafavi, S.M. Enhancement of mechanical performance of polymer nanocomposites using ZnO nanoparticles. in *5th International Conference on Composites: Characterization, Fabrication and Application (CCFA-5)*. 2016. Iran University of Science and Technology.
29. Abolfazl Davoudiroknabadi, S.M.M., Seyed Sajad Sajadikhah, *An Introduction to Nanotechnology*. 2016, Mikima Book.
30. Abolfazl Davoudiroknabadi, S.M.M., Ali Asghar Pasban, *Fundamentals of Nanostructure and Nanomaterial*. 2016, Mikima Book.
31. Pasban, A., et al., Quantitative Determination of LPG Hydrocarbons by Modified Packed Column Adsorbent of Gas Chromatography Via Full Factorial Design. *Journal of Nanoanalysis*, 2017. 4(1): p. 31-40.
32. Somayyeh Heidari, M.I., Seyed Mojtaba Mostafavi, , A Validated and Rapid HPLC Method for Quantification of Human Serum Albumin in Interferon beta-1a Biopharmaceutical Formulation. *MedBioTech Journal*, 2017. 1(01): p. 29.
33. Mostafavi, S.M., K. Bagherzadeh, and M. Amanlou, A new attempt to introduce efficient inhibitors for Caspas-9 according to structure-based Pharmacophore Screening strategy and Molecular Dynamics Simulations. *Medbiotech Journal*, 2017. 01(01): p. 1-8.
34. Amanlou, M. and S.M. Mostafavi, In silico screening to aim computational efficient inhibitors of caspase-9 by ligand-based pharmacophore modeling. *Medbiotech Journal*, 2017. 01(01): p. 34-41.
35. Mostafavi, S.M., et al., Acidity removal of Iranian heavy crude oils by nanofluid demulsifier: An experimental investigation. *Journal of Nanoanalysis*, 2017: p. 10-17.



36. Aida Badamchi Shabestari, B.A.A., Maryam Shekarchi, Seyed Mojtaba Mostafavi, Development of Environmental Analysis for Determination of Total Mercury in Fish Oil Pearls by Microwave Closed Vessels Digestion Coupled with ICP-OES. *Ekoloji*, 2018. 27(106): p. 1935.
37. Bayat, M. and S.M. Mostafavi, Investigation of Interleukin 2 as Signaling Molecule in Human Serum Albumin. *The Pharmaceutical and Chemical Journal*, 2018. 5(02): p. 183-189.
38. Samira Eissazadeh, S.M.M., Masoumeh Piryaee, and M.S. Taskhiri, Application Of Polyaniline Nanostructure Based Biosensor For Glucose And Cholesterol Detection. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 2019. 10(1): p. 150.
39. Samira Eissazadeh, M.P., Mohammad Sadegh Taskhiri and S.M. Mostafavi, Improvement of Sensitivity of Antigen-Antibody Detection of Semen Through Gold Nanoparticle. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 2019. 10(1): p. 144.
40. Samira Eissazadeh, M.P. and S.M. Mostafavi, Measurement of Some Amino Acid Using Biosensors Based on Silicon-Based Carbon Nanotubes. *Journal of Computational and Theoretical Nanoscience*, 2019. 16: p. 1.
41. Aida Badamchi Shabestari, S.M.M., Hanieh Malekzadeh, Force Degradation Comparative Study on Biosimilar Adalimumab and Humira. *Revista Latinoamericana de Hipertensión*, 2019. 13(06): p. 496-509.
42. Mostafavi, S.M., S. Eissazadeh, and M. Piryaee, Comparison of Polymer and Ceramic Membrane in the Separation of Proteins in Aqueous Solution Through Liquid Chromatography. *Journal of Computational and Theoretical Nanoscience*, 2019. 16(1): p. 157-164.
43. Ahmadipour, A., P. Shaibani, and S.A. Mostafavi, Assessment of empirical methods for estimating potential evapotranspiration in Zabol Synoptic Station by REF-ET model. *Medbiotech Journal*, 2019. 03(01): p. 1-4.
44. Jafari, S. and S.A. Mostafavi, Investigation of nitrogen contamination of important subterranean water in the plain. *Medbiotech Journal*, 2019. 03(01): p. 10-12.
45. Z. Man, A.G.E., S. M. Mostafavi, A. Surendar, Fuel oil characteristics and applications: economic and technological aspects. *Petroleum Science and Technology*, 2019.
46. Seyed Mojtaba Mostafavi¹, H.M. and M.S. Taskhiri, In Silico Prediction of Gas Chromatographic Retention Time of Some Organic Compounds on the Modified Carbon Nanotube Capillary Column. *Journal of Computational and Theoretical Nanoscience*, 2019. 16(01): p. 151-156.
47. Mostafavi, S.M. and A. Ebrahimi, Mercury determination in work place air and human biological samples based on dispersive liquid-liquid micro-extraction coupled with cold vapor atomic absorption spectrometry. *Analytical Methods in Environmental Chemistry Journal*, 2019. 2(04): p. 49-58.
48. Anbia, M., et al., Employing a new modified nanoporous carbon for extraction and determination of 1,10-phenanthroline and 2,2'-bipyridine by SPE and use of the Taguchi optimization method. *Analytical Methods*, 2012. 4(12): p. 4220-4229.
49. Ghasemian, M.B., et al., Lattice evolution and enhanced piezoelectric properties of hydrothermally synthesised 0.94(Bi_{0.5}Na_{0.5})TiO₃-0.06BaTiO₃ nanofibers. *Journal of Materials Chemistry C*, 2017. 5(42): p. 10976-10984.
50. Ghasemian, M.B., et al., Morphology control and large piezoresponse of hydrothermally synthesized lead-free piezoelectric (Bi_{0.5}Na_{0.5})TiO₃ nanofibres. *RSC Advances*, 2017. 7(25): p. 15020-15026.



حوزه انجمن های علمی دانشجویی
دانشگاه پیام نور مرکز اصفهان

کنفرانس دانشجویی

یافته های زیست-پزشکی نوین ایران

1st Conference on Modern Bio-Medical Researches



51. Ghasemian, M.B., et al., Approaching Piezoelectric Response of Pb-Piezoelectrics in Hydrothermally Synthesized $\text{Bi}_{0.5}(\text{Na}_{1-x}\text{K}_x)\text{TiO}_3$ Nanotubes. *ACS Applied Materials & Interfaces*, 2018. 10(24): p. 20816-20825.
52. Heidari, M., S. Ghasemi, and R. Heidari, The Effects of Leadership and Employment in Technical Capabilities of Sport Teams. *Journal of Humanities Insights*, 2019. 3(02): p. 75-80.
53. Ghasemian, M.B., et al., Self-Limiting Galvanic Growth of MnO_2 Monolayers on a Liquid Metal—Applied to Photocatalysis. *Advanced Functional Materials*, 2019. 29(36): p. 1901649.
54. Ghasemian, M.B., et al., Evidence of phase coexistence in hydrothermally synthesized $\text{K}_{0.5}\text{Na}_{0.5}\text{NbO}_3$ nanofibers. *Journal of Materials Chemistry A*, 2020.
55. Ghasemian, M.B., et al., Peculiar piezoelectricity of atomically thin planar structures. *Nanoscale*, 2020. 12(5): p. 2875-2901.