

The effect of combination of probiotic, lactase enzyme and special antibodies on humoral immunity and histomorphology of lymphoid organs in broiler chickens

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The aim of this research has been to determine the effect compound of probiotics, lactase enzyme and antibodies on improving the histomorphology characters of lymphoid organs and improving growth humoral immunity of broiler chickens. For this purpose, 96 broilers (W- Ross 308) have been randomly divided into two groups of 48 with 4 replicates. For evaluation of humoral immunity, samples were selected from each replication randomly at 3rd, 23th and 42th day of production, and 2 cc blood was got from wing vein and HI was tested. For evaluation of histomorphology of lymphoid organs at the end of period, randomly two slaughter samples were selected from each replication has been sent to the histology lab. The results of statistical analysis were shown that rate of antibodies was non significant at 9-day old ($p > 0.05$) and it was significant at 23 days and 42 days ($p < 0.01$). Microscopic studies of lymphoid organs (Bursa of fabricius, spleen and thymus) were shown significant statistical difference ($p < 0.05$) but non significant at other parameters. According to the results of using of the combination can improved humoral immune system and has no medicinal residue in poultry meat, it can be an appropriate substitute for growth stimulating antibiotics.

Keywords: *Probiotics, Special immunoglobulins, Lymphoid organs, Humoral immunity, Broiler chickens*

Biochemical structure and antibacterial activity of hemolymph in male and female of fresh water prawn (*Macrobrachium nipponense*)

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The aim of this study was to characterize the biochemical structure and bactericidal activity of hemolymph *Macrobrachium* in different doses on several human bacterial pathogen. First 80 individual (40 for male and 40 for female) of prawn (*M. nipponense*) with an average length of 8.1 ± 0.12 were collected from Anzali wetland. After separation of males and female from each other, hemolymph of samples were taken from ventral sinus of the prawn and structure of collected hemolymph was determined through an electrophoresis and FTIR analysis. The antibacterial activity of *M. nipponense* hemolymph was investigated against five pathogenic bacteria (*Vibrio cholera*, *Klebsiella pneumonia*, *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli*) in doses of 25 to 100 micrograms per liter by disk diffusion method. The electrophoretic pattern of males and females hemolymph revealed presence of proteins with molecular weights between 22-100 Kda. Hemolymph structure contained both secondary regular and irregular protein structures by FTIR analysis. Different doses of hemolymph, indicated inhibitory activity against different bacterial strains. Also significant difference was observed between male and female hemolymph in case of antibacterial activity ($p < 0.05$). Highest inhibitory effect of hemolymph was shown against *Staphylococcus aureus*, *Bacillus subtilis* and *Vibrio cholera* in male. While the lowest level of antibacterial activity was recorded in female against *Bacillus subtilis* and *Escherichia coli* with zone of inhibition 5.9 ± 0.12 and 6.5 ± 0.08 mm. Results of this study indicated that fresh water prawn hemolymph was shown well bactericidal activity and can be a substitute for antibiotic-based chemical drugs.

Keywords: Antibacterial activity, Hemolymph, *Macrobrachium nipponense*, Electrophoresis, Disk diffusion

Effects of thymol on atheroma plaque, concentration of blood lipids and atherogenic indices serum in male NMRI mice fed with a high-cholesterol diet
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Atherosclerosis is characterized by the accumulation of fat and inflammatory response in the artery intima and can cause narrowing or complete blockage of the artery. Thymol is a phenolic monoterpene with antioxidant and anti-inflammatory properties. The aim of this study was to evaluate the effects of thymol on blood lipids, atherogenic indices and atheroma plaque of NMRI mice fed a high-cholesterol diet (HCD). 45 NMRI male mice were divided into 5 groups (n=9): Animals of the control group received a normal diet. Whiles in the HCD group received a diet containing 2% cholesterol for 18 weeks. Animals of the sham group received HCD for 12 weeks and then normal diet for 6 weeks with a thymol solvent (oil). The experimental groups 1 and 2 received HCD for 12 weeks and then received a normal diet with thymol at doses of 12 mg/kg and 24 mg/kg for 6 weeks, respectively. At the end of study, concentration of serum lipids and atherogenic indices were measured. Also aorta was measured microscopically. In the present study, consumption of HCD resulted in the formation of atheroma plaque, increased serum triglycerides, total cholesterol concentration, atherogenic indices and significantly decreased high density lipoprotein cholesterol (HDL-C). Treatment with both doses of thymol significantly reduced these changes and improves blood lipids, atherogenic indices was normal and atheroma plaques. The results of this study suggest that thymol can be used for treatment of increased total cholesterol and triglycerides and to improve the atheroma plaque.

Keywords: *Atherogenic index, Atherosclerosis, Cholesterol, Serum lipids, Thymol*

Evaluation of histopathological and histomorphometerical changes of testicular tissue following consumption of busulfan in cat

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In order to successfully transplant spermatogonial cells need to be defined a suitable model for producing azoospermia animals. Several methods are available for made azoospermic animals, include systemic injection of busulfan, radiation, cold ischemia and increased testicular temperature. The aim of the study is development of a method for producing azoospermic cats in order to prepare them for spermatogonial stem cells transplantation. In this study, 15 domestic short hair cats at the age of 3 to 5 month were divided in 3 groups. After first injection, at 5, 9, 13 and 17 weeks, doses of zero, four and ten mg/kg of busulfan intravenously were injected to the control and treatment groups, respectively. Two months after the injections testicles surgically removed and evaluated. The mean diameter of the seminiferous tubules and germinal epithelium thickness was calculated. Sertoli and leydig cells were also evaluated. Histological evaluation of treating groups with 4 and 10 mg/kg busulfan shows different degrees of degradation of seminiferous tubules. The thickness of germinal epithelium significantly decreased. Busulfan through its effect on germ cells and somatic cells can disrupt spermatogenesis and induced azoospermia.

Keywords: *Busulfan, Spermatogenesis, Cat, Testis*

Determining the antibiotic resistance patterns of isolated *Salmonella* from broiler flocks to 28 antimicrobial agents used in Iran

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The purpose of this study was to determine the serogroups of isolated *Salmonella* spp from broiler flocks and their drug resistance patterns to 28 antimicrobial agents commonly used in medicine and veterinary of Iran. One-hundred and eighty-nine samples were collected from liver, heart and intestine of slaughtered broiler flocks in Ardabil province for identification of salmonella. The antibiotic resistance rate of isolates was determined using Kirby-Bauer method. Out of 189 samples examined, *Salmonella* was isolated from 22 samples (11.6%). Out of 22 *salmonella* isolates, fourteen (63.7%), seven (31.8%) and one (4.5%) isolates belonged to serogroups D, C and B, respectively. Multiple resistance was observed among isolates. The highest resistance was to tetracycline (100%), chlortetracycline (91%), streptomycin (91%), doxycycline (86.5%), nalidixic acid (81.8%), neomycin (77.3%), kanamycin (68.3%), furazolidone (63.7%), lincospectin (59.1%), flumequine (54.6%), penicillin (45.5%) and sulfamethoxazole+ trimethoprim (40.9%). Ten resistance patterns to ten antimicrobial agents commonly used in Iranian poultry industry were found in 22 *Salmonella* isolates 81.82% of isolates were resistant to more than two antibacterials. The results of this study showed that the frequency of resistance to the antimicrobial agents among avian *salmonella* isolates is a major public health concern.

Keywords: *Salmonella, Antibiotic resistance pattern, Broiler flocks*

Histopathological comparison of the effect of *Salvia sharifi* and *Salvia virgata* extracts on hyperlipidemia in adult male rat

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This study was aimed to compare the effects of *Salvia Sharifi* and *Salvia Virgata* on serum lipids and histopathology of liver in hyperlipidemic rats. Forty male adult Wistar rats were distributed into four groups as follow: (1) control, (2) hyperlipidemic rats, (3) hyperlipidemic rats received hydroalcoholic extract of *S. Virgata* (200 mg/kg bw) and (4) hyperlipidemic rats received hydroalcoholic extract of *S. Sharifi* (200 mg/kg bw). A high-fat diet was administered to rats for one month. Then, two rats were selected from each diet group and hyperlipidemia was confirmed by measurement of serum triglyceride and serum cholesterol levels. Groups 3&4 were orally treated by *S. Virgata* and *S. Sharifi* respectively for 21 days. At the end of the experiment, blood samples were obtained by heart puncture and used to determine serum triglyceride, cholesterol, HDL and LDL levels and liver specimens were obtained for histopathological investigations. The data were analyzed by one-way ANOVA and Tukey's post hoc test. The results showed that *S. Sharifi* extract significantly reduced serum triglyceride, cholesterol and LDL levels and increased serum HDL compared to untreated hyperlipidemic rats. Treatment with *S. Virgata* reduced serum triglyceride, cholesterol and LDL levels but serum HDL of rats in this group had no significant effect in comparison to hyperlipidemic group. In addition, *S. Sharifi* extract decreased hepatic lesions in comparison to hyperlipidemic rats received *S. virgata*. These results showed the protective effect of *S. Sharifi* and *S. Virgata* extracts on hyperlipidemia-induced liver injury and this protection was more pronounced in the group received *S. Sharifi*.

Keywords: *Salvia sharifi*, *Salvia virgata*, Hyperlipidemia

Evaluation of anti-bacterial property of modified Nano silver packaging with Photocatalyst TiO₂ in sheep's head and trotters

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Head and trotters sheep is traditional food in Iran. This product has very microbial load then for first time determine to done it. The current study was designed to evaluate application of silver nanoparticles, as an antimicrobial agent. Effect of Nano silver packaging in reduce microbial load in head and trotters compare with Control sample in the Refrigerator for 4°C for 1,2,3,4 days. Minced Head and trotters sheep (100g of product has 15 g fat, 90 ml^{gr} Cholesterol). this product has bought at Shahrvand mall. Nano - silver coating based on titanium dioxide was used to reduce the microbial load of the product. some Nano-coating of silver on titanium dioxide at a concentration of ppm 1000, 2000, 3000, 3500 and 4000 used at this study. For measurement nanoparticles size used Field Emission Scanning Electron Microscope (fesem) and to know Chemical bond used. The results showed The concentrations of silver nanoparticles ppm 4000 ppm 3500 on Escherichia coli maintaining the relative amounts of byproducts in four days of testing on impact (p<0.05). Average of nanoparticle was.

Keywords: *Head and Trotters sheep, titanium dioxide, silver nanoparticles*

Histopathological study of the effect of pentoxifylline on experimental chronic non-bacterial prostatitis induced by carrageenan in rat

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Determination of histopathological criteria of chronic non-bacterial prostatitis (CNP), as the most common type of prostatitis syndrome, is highly effective to better understanding of pathophysiology and finding therapeutic strategies of this disease. Interest in pentoxifylline (PTX) has been renewed because of the anti-inflammatory and antioxidant potential of this drug. The aim of this study was to evaluate histopathological criteria of CNP in rat and to investigate the effectiveness of pentoxifylline on these criteria. Thirty male adult Wistar rats were divided into negative control, CNP control, standard and treatment groups. The negative control group received orally 1 ml saline normal for 21 consecutive days CNP was induced by single intraprostatic injection of 1% carrageenan (100 μ l) in CNP control, standard and treatment groups. CNP control, standard and treatment groups received orally 1 ml saline normal, cernilton 100 mg/kg and PTX at 50 and 100 mg/kg 1 week after CNP induction for 21 consecutive days. Results showed that in the CNP control group, the PI was significantly increased as compared to negative control group ($P < 0.01$). A significant reduction in the PI was observed in standard and treatment groups, especially PTX 50 mg/kg, in comparison with the CNP control group ($P < 0.05$). Histopathological studies have shown a considerable improvement in the prostatic histoarchitecture in standard and treatment groups, especially PTX 50 mg/kg, in comparison with the CNP control group.

Keywords: *Chronic non-bacterial prostatitis, Histopathological criteria, Pentoxifylline, Rat*