Research Paper

Genome Analysis of Antimicrobial Resistance Genes and Virulence Factors in Multidrug-Resistant Campylobacter fetus Subspecies Isolated from Sheath Wash.

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Campylobacter fetus subspecies are mostly characterized by reproductions problems in cattle and sheep. This study aimed to study the genetic profile and assess the genes mechanism of resistance and their virulence factors using genome sequence analysis. A total of 59 confirmed Campylobacter fetus subspecies based on molecular assays and DNA sequencing were subjected to antimicrobial susceptibility test against 14 antibiotic agents representing the five classes of antibiotics using the disc diffusion method. In addition, sequencing the genome of all strains induced complete resistance against all tested antibiotics. The results of the antimicrobial test indicated that 54.4% had a resistance profile, 26.3% were intermediate, while 19.3% were observed to be susceptible. The Whole Genome Sequencing (WGS) result revealed the presence of different genes, such as Broad-specificity multidrug efflux pump and 16S rRNA (guanine \[^{527}\N\]^7)-methyltransferase (gidB), efflux pump conferring antibiotic resistance (MacA and MacB), protein-altering cell wall charge conferring antibiotic resistance (PgsA), which have never been reported in Campylobacter fetus subspecies. The WGS also revealed the presence of genes that involved in colonization, adhesion, motility, and invasion, such as type IV secretion system protein (VirD4), S-Layer, cytotoxic distending toxin (A, B, and C), Campylobacter invasion antigen (CiaB), and fic domain protein (fic) were among important CDS. The presence of these uncommon genes explains the resistance of Campylobacter fetus subspecies against different tested antibiotics. The results of this study can be used to implement molecular surveillance of Campylobacter fetus subspecies and conduct further studies on the resistance mechanism in these subspecies.

**Keywords:** Broad-specificity multidrug efflux pump, Campylobacter fetus subspecies, Genome analysis, Methyltransferase gidB, Multidrug resistance.
Research Paper

Impact of In-Ovo Injection of Folic Acid and Glucose on Hatchability and Post-Hatching Performance of Broiler Chicken.

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ABSTRACT
The present study was designed to investigate the impact of in-ovo injection of folic acid and glucose on hatching eggs from 55 weeks old broiler breeders. A total number of 900 hatching eggs were collected from Arbor Acres broiler breeders, then, eggs were divided into 6 groups including 1) Negative Control (non-injected, NC), 2) Dry Punch Control (pricked without injecting any solution, DPC), 3) Positive Control (eggs were injected with 0.5 mL normal saline, PC), 4) Folic Acid group (eggs were injected with 0.2 mg/ egg folic acid, FA), 5) Glucose group (eggs were injected with 125 mg/ egg glucose, Glu), and 6) Folic Acid with Glucose group (eggs were injected with 0.2 mg folic acid with 125 mg/ egg glucose, FA+Glu). Each treatment was divided into five replicates of 30 eggs each. Eggs were injected into the albumen under the air sac. After in-ovo injection, the eggs were stored for four days before hatching. After hatching, the chickens were reared in groups according to the treatments. All treatments were divided into 10 replications of 9 chickens in each. In-ovo injection with folic acid decreased the albumen pH significantly to 9.19 after 4 days of injection, while the negative control was 9.43. Hatching quality was severely affected by all in-ovo injection treatments, but no significant differences were found between the treatment groups concerning the hatchability of fertile eggs. Injection treatments had no significant effect on the growth rate or the production number in any of the weeks. Injection of folic acid and (FA+Glu) significantly increased chickens’ body weight at two and four weeks of age. Also, the dressing percentage when using folic acid and (FA+Glu) was significantly increased to 72.1% and 72.5%, respectively, compared to the positive control group (68.3%). In conclusion, our data suggested that in-ovo injection with a mixture of folic acid and glucose (0.2 mg folic acid+ 125 mg/ egg glucose) could be used to enhance carcass characteristics. Further studies should be conducted to find the effects of in-ovo injection folic acid and glucose on different incubation days and at different sites of injection.

**Keywords:** Broilers, Folic Acid, Glucose, Hatchability, In-Ovo injection, Old breeders, Post-hatch
spp. were confirmed as ESBL producing. Silver nanoparticles indicated a promising antibacterial activity and could be considered an applicable alternative for the treatment of ESBL-producing bacteria.

Despite the presence of modern antibacterial drugs, bacterial infections are still a major threatening problem due to the enormous increase in multi-drug-resistant bacteria. Moreover, the effect of silver nanoparticles on the expression of antibiotic resistance genes (i.e., ESBL-producing pathogens) was assessed as well as their effect on the structural integrity of the bacterial cells using scanning electron microscopy (SEM) and transmission electron microscopy (TEM).

Khalil OA, Enbaawy MI, Salah T, Mahmoud H and Ragab E. (2020). The present study aimed to explore the inhibitory effect of silver nanoparticles on Extended Spectrum Beta-Lactamase (ESBL) producing Escherichia coli and Klebsiella pneumoniae. Silver nanoparticles have been extensively used as an applicable and safe alternative to antibiotics. The results showed that silver nanoparticles have a significant effect on the growth of ESBL-producing bacteria. The minimum inhibitory concentration (MIC) of ESBL-producing E. coli spp. was 29% in sampled birds. The highest antibiotic resistance was observed against kanamycin (48.3%). 96.6% of sampled pigeons were resistant to ciprofloxacin, followed by colistin (62.1%), kanamycin (55.2%), and gentamicin (48.3%). In conclusion, pigeons as carriers of antibiotic-resistant bacteria in live bird markets should be considered a public health concern.

Stepanova IA, Nazarov AA and Arisov MV. (2020). Peculiarities of Mineral Metabolism of Holstein Heifers Fed Copper Nanopowder. The current study aimed to investigate the effect of copper nanopowder on physiological and hematological characteristics of Holstein heifers. Copper nanopowder, Cattle, Mineral metabolism, Physiological characteristics.
Macroscopic Sarcocysts of Domestic Sheep and Goats in Soran City, Erbil, Iraq. A cross-sectional study was carried out from December 2018 to February 2020 to investigate the seroprevalence of brucellosis in humans and livestock residing in two regions located in New Valley Governorate, Egypt. A total of 1254 animals (673 cattle, 348 sheep, and 233 goats) and 523 human serum samples were examined for brucellosis using Rose Bengal test (RBT). The prevalence of this infection was also at a higher level among individuals aged 35-44 years (42.6%). The prevalence in women was higher (28.2%) compared to men (22.9%). Considering the human occupation, farmers (31.25%) and animal keepers (20.6%) were at a higher risk of infection. The prevalence of human brucellosis in the New Valley Governorate was 33.6%. The prevalence of brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans. The prevalence of brucellosis was lower among men compared to women (22.5%). Considering the human occupation, there was a higher percentage of infection in EL Kharga farmers (31.25%) and animal keepers (20.6%) while the lowest prevalence was demonstrated in housewives where the prevalence was 18.8%. As a result, risk factors of the age range, locality, time of infection, contact with animals, and occupational groups could significantly affect the prevalence of human brucellosis in the New Valley Governorate. In conclusion, brucellosis is an alarming problem among residents of the New Valley Governorate. Thus, reducing the prevalence of brucellosis was proposed to include restriction of the marketing the raw milk and enhancing public health awareness.
Canine parvovirus (CPV) infection is a global infectious and contagious viral disease of canine, affecting dogs of all ages and breeds. The research study aimed to investigate the prevalence and associated risk factors of CPV infection in dogs from March 2012 to February 2013 in Egypt. A total of 122 dogs suffering from vomiting and diarrhea were screened by antigen rapid CPV/Canine parvovirus test. The highest prevalence of CPV infection was observed in young, unvaccinated puppies and exotic breeds. Regarding the season, the higher prevalence was noticed in summer (77.1%) followed by spring (55.5%), while the lowest prevalence was reported in dogs above 6 months of age (16.6%).

The study highlighted the importance of age and season as risk factors in the prevalence of CPV infection. The identification of the potential risk factors associated with the disease may be helpful to construct the ideal preventive measures. Further studies are recommended to understand the mechanisms of their activity and to develop natural alternatives instead of synthetic antibiotics.
In an extensive study carried out in the Central Zone, more cases of CBPP were reported between August to December. Additionally, 56, 426, and 11,147 cases were reported as deaths, and the cattle at risk were 3, 13, and 0.5%, respectively. Therefore, the CBPP prevalence, case fatality rate, and mortality rate were 3.8%, 13%, and 0.5%, respectively. It was also revealed that there was a clear temporal pattern of CBPP occurrence, with more cases being reported in the last three months of the year. The present study found that out of the 14 Local Government Authorities (LGAs) in the Central Zone, 10 reported the disease in the past five years. However, only 27% (3) of the LGAs submitted reports on a weekly basis, 4% (1) submitted reports on a monthly basis, and 1% (0) submitted reports on a slaughterhouse basis. In order to assess the actual burden of the disease on-site, the authors aimed to evaluate the effect of L-carnitine and Yeast chromium supplementation on productive performance in Pekin and Sudani duckling breeds. A total of 50 individuals of each herb species and 150 juvenile Nile tilapias were distributed in the aquaponic system. The results indicated that growing duckling fed diets supplemented with LC and Cr were significantly improved in live body weight, body weight gain, feed intake, and feed conversion ratio. The relative weight of carcass quality and weight of lymphoid organs significantly increased with supplemented diets. Therefore, both Pekin and Sudani duckling breeds fed on diets supplemented with 450 mg LC/kg resulted in better performance without any adverse effect on carcass quality as well as economic efficiency.
Identifying the Virulent Factors of Clostridium perfringens Locally Isolated from Different Species


Association of seropositivity with potential risk factors related to animals (e.g., age, gender, vaccination) has been demonstrated in ruminants (p=0.004) and dromedaries (p=0.002) as well as in those living near a water source (p=0.001). The Q fever is a worldwide zoonotic disease caused by Coxiella burnetii (intracellular bacterium). This pathogen affects humans, ruminants, equines, carnivores, rodents, and birds. A cross-sectional study was carried out from March 2017 to May 2018 to assess the seroprevalence demonstrated higher seropositivity in horses that had contact with small ruminants (RR: 15.6). There is an increasing interest in the application of natural antimicrobials instead of chemical preservatives, 


The antimicrobial agents (nisin, lysozyme, natamycin) had a significant effect on aerobic spore-forming bacteria, compared to control and other treatments. The application of a protective culture (Lactobacillus rhamnosus) and combination of protective culture and natamycin (40 mg kg\(^{-1}\)) were studied on the growth of Aerobic spore-forming bacteria, Lysozyme, Nisin, Natamycin, Protective culture.
Appendicular bone fractures in small animal practice constitute a major challenge facing veterinarians. From the collected data, it could be concluded that there was a high incidence of the appendicular long bones concerning the different bone fractures with significantly higher records in dogs, compared to cats. The highest records of fracture were in mongrel dogs, and cats as rescued individuals. Excluding mongrel dogs and cats, the highest incidence of fracture-cases in dogs was recorded in Miniature breeds and svelte breeds for cats. Male dogs and cats showed a higher incidence than females. The bone fracture mostly occurred in dogs younger than one-year-old, among dogs and cats referred to the veterinary teaching hospital, Cairo University and some private clinics in Egypt. The fracture-cases were classified according to the specific limb (forelimbs / hind limbs), specific bone fractures (Humerus, radius / ulna, femur, tibia and fibula, and the other bones), extent of tissue damage (open or closed), and the direction of the fracture line (transverse, oblique or spiral). From the collected data, it could be concluded that there was a high incidence of the appendicular long bones concerning the different bone fractures with significantly higher records in dogs, compared to cats. The highest records of fracture were in mongrel dogs, and cats as rescued individuals. Excluding mongrel dogs and cats, the highest incidence of fracture-cases in dogs was recorded in Miniature breeds and svelte breeds for cats. Male dogs and cats showed a higher incidence than females. The bone fracture mostly occurred in dogs younger than one-year-old, among dogs and cats referred to the veterinary teaching hospital, Cairo University and some private clinics in Egypt. The fracture-cases were classified according to the specific limb (forelimbs / hind limbs), specific bone fractures (Humerus, radius / ulna, femur, tibia and fibula, and the other bones), extent of tissue damage (open or closed), and the direction of the fracture line (transverse, oblique or spiral).

Keywords: Lactobacillus plantarum, Lactobacillus brevis, Orthopedic, Cat, Dog, Femur, Fracture, Antimicrobial activity.
The Effect of Dietary Supplementation of Cod Liver Oil on Ratio of Saturated and Unsaturated Fatty Acids in Giant Prawn

The content of pangasius fatty acids is higher than in marine fish, so this study aimed to determine the effects of adding lysine essential amino acid to commercial feed on fatty acid contents of pangasius fish. The treatment was done by adding lysine with different doses including P0 (0%), P1 (1.2%), P2 (2.2%), and P3 (3.2%). Each treatment was repeated five times. The main parameters studied were water quality and the fatty acid contents of pangasius. The use of lysine in commercial feed indicated significant differences in the content of saturated fatty acids, Monounsaturated Fatty Acids (MUFA) and Polyunsaturated Fatty Acids (PUFA) in pangasius meat; a decrease in the saturated fatty acids content was found in P3 with 3.2% (3.5882 mg/dl). In P2, an increase in the MUFA content of 2.2% (5.9630 mg/dl) was found. An increase in the PUFA content was found in P3 treatment with 3.2% Lysin (23.1082 mg/dl). P1, P2 and P3 indicated lower results since marine fish have a lower saturated fatty acid composition than freshwater fish. The present research aimed to determine the effects of adding lysine essential amino acid to commercial feed related to fatty acids.

In fact, the provision of fatty acids, one of which is not in the meat, has an important influence. So, this study aims to determine the effect of adding cod liver oil to commercial feed does not affect the decreasing content of saturated fatty acids in giant prawn meat. On the other hand, the results also showed that the best ratio was found in treatment 4 at a dose of 12%. Therefore, it is concluded that the provision of nutrients for feed related to fatty acids, one of which is not in the meat, has an important influence. The results also showed that the best ratio was found in treatment 4 at a dose of 12%.

The existence of feed plays an important role in aquaculture activities. This is due to the dominant influence on fish feed growth. Feeding with the right nutritional components can influence. So, this study aims to determine the effect of adding cod liver oil to commercial feed does not affect the decreasing content of saturated fatty acids in giant prawn meat. On the other hand, the results also showed that the best ratio was found in treatment 4 at a dose of 12%.

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The deleterious effect of heat stress on cumulus-oocytes complexes (COCs) competence is well known. In this study, Ashour et al. examined the effect of heat stress on the developmental competence of in vitro matured COCs of Camelus dromedaries with different qualities. The groups were named K1 and K2 representing good and low-quality COCs incubated at 38.5 C significantly decreased the Pb (polar body) extrusion rate in K4 and K6, compared to other groups. Additionally, the embryo cleavage rate was significantly lower for good and low-quality COCs exposed to 41 C for 30 hours. While K3 and k4 represent good and low-quality COCs exposed to 41 C.

The groups were named K1 and K2 representing good and low-quality COCs incubated at 38.5 C. The cleavage rate was lower for low quality (K2; 63 ± 1.28) than good quality oocytes (K1; 80 ± 1.28), and this ratio resulted by the greatest growth rate in the present study.

The results of this study indicated that heat stress at 41 C significantly decreased the Pb (polar body) extrusion rate in K4 and K6, compared to other groups. Additionally, the embryo cleavage rate was significantly lower for good and low-quality COCs exposed to 41 C for 30 hours. While K3 and K4 represent good and low-quality COCs exposed to 41 C.

The results of this study indicated that heat stress at 41 C significantly decreased the Pb (polar body) extrusion rate in K4 and K6, compared to other groups. Additionally, the embryo cleavage rate was significantly lower for good and low-quality COCs exposed to 41 C for 30 hours. While K3 and K4 represent good and low-quality COCs exposed to 41 C.
ABSTRACT

The contamination of goat milk with pathogenic fungi can cause health hazards for the consumers either they consume it raw or even in the processed form. Since there are few studies concerning yeasts in raw goat milk, the present study aimed to determine the prevalence of yeasts and isolate *Candida albicans* from raw goat milk samples. Also, this study determined the distribution of virulence genes and the antifungal susceptibility profile of *Candida albicans* isolates. A total of 30 goat milk samples (collected from free-grazing goats) were mycologically examined. The confirmed *Candida albicans* isolates were subjected to PCR assay to detect the virulence genes (SAP4, RAS1, ALS1, HWP1, and PLB1). Also, antifungal sensitivity testing was performed against the commercially available antifungal agents and probiotics (*Lactobacillus acidophilus* and *Lactobacillus plantarum*). The mycological examination revealed that 14 out of 30 (46.7%) goat milk samples were positive for yeasts and only 4 (13.3%) isolates were confirmed as *Candida albicans*. The results from the PCR assay showed that RAS1 and ALS1 were found in 4 (100%) isolates, HWP1 and SAP4 were found in 2 (50%) isolates, while PLB1 was not detected in tested *Candida albicans* isolates (0%). Antifungal sensitivity testing results showed that ketoconazole gave the best activity against *Candida albicans* isolates, followed by fluconazole, nystatin, and itraconazole. All isolates were resistant to terbinafine. Moreover, both *Lactobacillus acidophilus* and *Lactobacillus plantarum* showed antifungal effects against *Candida albicans*, but *Lactobacillus plantarum* was more effective than *Lactobacillus acidophilus*. Antifungal resistance is a major problem that can lead to failure of candidiasis treatment. Regular antifungal sensitivity testing and searching for an alternative bio-eco-friendly approach for proper control and treatment of candidiasis are strongly needed to prevent treatment failure and emergence of resistant isolates.

Keywords: Antifungal sensitivity testing, *Candida albicans*, Goat milk, Virulence genes, Probiotics.