Research Paper

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

Tshipamba ME, Lubanza N and Mwanza M.

ABSTRACT

_Campylobacter fetus_ subspecies are mostly characterized by reproduction 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 5'-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, cytolethal 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.

Abdel-Halim A, Mohamed FR, Elmenawey MA, Gharib HB.


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

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In Vitro Investigation of the Antibacterial Effect of Silver Nanoparticles on ESBL Producing E. coli

Keywords: Silver nanoparticles, ESBL producing E. coli, Antibacterial effect, Nanoparticles.
Ultrastructural and Molecular Characterization of Sarcocystis Species Derived from Domestic Sheep and Goats in Soran City, Erbil, Iraq.

ABSTRACT

This study aimed to identify hosts for Sarcocystis species isolated from macroscopic sarcocysts from naturally infected domestic sheep and goats using the molecular method, as well as investigating the morphological and the ultrastructural characteristics of the ultrastructure of the sarcocysts was investigated by both scanning and transmission electron microscopy. The macroscopic sarcocysts were detected in 9.1% (91/1000) of the esophagi. The results of electron microscopy indicated the characteristic features of the macroscopic sarcocysts. Goats and sheep can be proposed as alternative intermediate hosts for Sarcocystis species, and S. gigantea, S. moulei, S. medusiformis species were most closely related to S. eyselethi. A total of 1000 esophagi were collected from sheep and goats and examined for the presence of sarcocysts. Macroscopic sarcocysts were isolated from the infected esophagi, and Sarcocystis species were identified molecularly by 18S rRNA gene sequence analysis. Moreover, the species isolated from macroscopic sarcocysts from goats were identified as S. eyselethi and S. medusiformis. The specificity of the methods was evaluated and found to be over 90%.

Keywords: Sarcocystis, Ultrastructure, Molecular, Domestic Sheep, Goats.

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Brucellosis is a worldwide zoonotic disease which is now considered endemic in most parts of the world. The prevalence in humans and animals in the region of study may include restriction of the marketing the raw milk and enhancing public health awareness.

ABSTRACT

Diab MS, Zidan ShAA, Hassan NAA, Elaadli H and Bayoumi AM.

The objective of this study was to investigate the seroprevalence of brucellosis in humans and livestock residing in two regions of the 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). Concerning humans, there was a higher percentage of infection in EL Kharga area (25.3%) compared to women (22.5%) with no significant difference. Considering the human occupation, farmers (48.2%) and animal keepers (33.6%) were more likely to be infected. The prevalence of this infection was also at a higher level among individuals aged above 40 years (28.57%). Furthermore, men (26.11%) were more inclined to be inflicted, while women (28.37%) were more likely to be infected. The results of the study indicated that brucellosis is an alarming problem among residents of the New Valley Governorate. Thus, reducing the prevalence of this disease is mandatory.

Keywords: Brucellosis, Cattle, Complement fixation test, ELISA, Human, Rose Bengal test, New Valley Governorate, Egypt.

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Research Paper

Polymorphism Association of Pituitary Positive Transcription Factor-1 Gene with Bodyweight of New Backcross Hybrid Chickens.

ABSTRACT

Retnosari D, Kilatsih R, Maulidi IS, Trijoko and Daryono BS.

This research was conducted to detect Single Nucleotide Polymorphism in the Pituitary Positive Transcription Factor-1 gene and its association with the bodyweight of New Backcross Hybrid Chickens. Procedures of the research included crossbreeding Breeding between Female F1 Broiler and Male Pelung. PCR products of partial 18S rRNA were used to amplify the exon 6 Pituitary Positive Transcription Factor-1 gene. The DNA band was visualized utilizing agarose gel electrophoresis. The sequence was aligned using Clustal omega software to gain Single Nucleotide Polymorphism. The conclusion was that the bodyweight of the first backcross hybrid chicken was higher than the Pelung chicken but lower than the first filial broiler chicken. Single Nucleotide Polymorphism was not found on the exon 6 Pituitary Positive Transcription Factor-1 gene in the first backcross hybrid female first filial broiler chicken with male Pelung chicken to obtain first backcross hybrid.

Keywords: Hybrid chickens, PIT-1 gene, SNP, New Backcross Hybrid Chickens, Bodyweight.
Canine parvovirus (CPV) infection is a global infectious and contagious viral disease of canine, especially in dogs infected by three variants of CPV type. This study aimed to investigate the prevalence and potential risk factors of parvovirus infection in dogs residing in Egypt. A total of 122 dogs suffering from vomiting and diarrhea were screened by antigen rapid CPV/Canine Coronavirus Ag test kit for the diagnosis of CPV infection from March 2012 to February 2013. Age and seasonal variations are risk factors in the prevalence of CPV infection. Identification of the potential risk factors associated with the disease may be helpful to construct the ideal preventive measures.

Regarding age, young, unvaccinated puppies and exotic breeds were more prone to CPV infection. Regarding breed, German shepherds (26.7%), Doberman (23.07%), and Griffon (16.6%) were the most common breeds among CPV infected dogs. Among different risk factors, age, breed, season, and vaccination of each dog were recorded to study the prevalence of CPV infection. The overall prevalence of CPV infection in dogs was reported as 59.7%. Dogs between 0 and 3 months of age indicated the highest prevalence of 68% followed by 4-6 months of age (25%) and 7-9 months of age (16.6%). Thus, CPV is an infectious and highly contagious viral disease of dogs. Age and seasonal variations are risk factors in the prevalence of CPV infection. Identification of the potential risk factors associated with the disease may be helpful to construct the ideal preventive measures.

Microbiological Studies on Naturally Present Bacteria in Camel and Buffalo Milk. A total number of seven samples isolated from buffalo milk, camel milk, and also camel urine presented variable degrees of diversity in bacterial community. Lactobacilli strains isolated from buffalo milk, camel milk, and camel urine to investigate their susceptibility to antibiotics. Further studies should be conducted with more samples to gain more information in the field of antibacterial activity of probiotic Lactobacilli isolates. Hopefully, they can be used as natural alternatives instead of synthetic antibiotics.

Antibacterial, Antibiotics, Lactobacilli, Probiotics.


Thiobencarb which is a carbamate herbicide is used for managing undesirable weeds during rice cultivation in Egypt. This study was designed to investigate the adverse effects of a field dose of thiobencarb on Nile tilapia and ameliorating the role of the low dose of S-methyl cysteine (SMC) as a potential protective agent.

Genotoxic effect of thiobencarb and SMC on treated fish was investigated in erythrocytes, gills, brain and liver tissues using micronucleus and comet assay. Histopathological examination of livers, gills, and brain was also carried out. The results indicated that fish exposed to thiobencarb showed a significant difference in antioxidant biomarkers as well as nuclear abnormalities and comet parameters compared to control values. Moreover, histopathological findings were in line with other results. Thiobencarb resulted in DNA damage, oxidative stress and histopathological changes.


A retrospective study was conducted to determine the epidemiology of Contagious Bovine Pleuropneumonia (CBPP) in the Central Zone of Tanzania. The present study used data from various sources, including reports submitted to the zone, archives of the Central Zone Veterinary Centre (CZVC), and the Event Mobile Application (EMA-i) reports submitted to the zone. The study found that CBPP was a seasonal problem in Central Tanzania, with a clear temporal pattern of occurrence, with more cases being reported between August to December. In conclusion, CBPP was a seasonal problem in Central Tanzania. Therefore, the present study found that out of 14 Local Government Authorities (LGAs) in the Central Zone, 10 reported the disease in the past five years. Moreover, 56, 426, and 11147 cases were reported as deaths, and the cattle at risk were 3.8%, 13%, and 0.5% respectively. Therefore, 3.8%, 13%, and 0.5% were reported as CBPP prevalence, case fatality rate, and mortality rate, respectively. It was also revealed that there was a clear temporal pattern of CBPP occurrence, with more cases being reported between August to December. In order to be able to assess the actual burden of the disease on-site, this extensive study must be carried out, since the parameters obtained during the study were lower compared to the situation on-site.
Clostridium perfringens to its ability to produce many virulence factors. In the current study, 135 intestinal samples were collected from different animal species of different localities in Egypt. Samples were subjected to isolation and identification (morphologically and biochemically) for obtaining CPA, Net B, and CPE genes as virulence factors. Consequently, those isolates are highly recommended to be used in the preparation of enterotoxemia and necrotic enteritis vaccines as they are more virulent strains.

**Keywords:** Clostridium perfringens, enterotoxin (CPE gene), CPA gene, Net B gene, PCR.

**Methods:** The isolation and identification of Clostridium perfringens from different animal species were carried out. The PCR was used to determine the presence of CPA, Net B, and CPE genes. The results indicated that all the 26 isolates had CPA gene and Clostridium perfringens enterotoxin (CPE gene), whereas 23% of isolates of chicken and cattle intestinal samples indicated that the risk of C. burnetii infection was significantly higher in horses that were in contact with small ruminants (RR: 15.6). The multivariate logistic regression analysis demonstrated that the risk of C. burnetii infection was also higher in horses that had contact with animals and in El-Bayadh district (p=0.005). The risk of C. burnetii infection was significantly higher in horses that had contact with small ruminants (RR: 15.6).

**Results:** The seroprevalence of C. burnetii in horses was assessed. An overall seroprevalence of 9.9% (18/182) was obtained. The univariate analysis of risk factors for C. burnetii infection in horses showed a significant association with contact with small ruminants, contact with animals, geographical localization, and presence of ticks. The multivariate logistic regression analysis indicated that the risk of C. burnetii infection in horses was significantly higher in horses that had contact with small ruminants (RR: 15.6).

**Conclusions:** The results of this study highlight the importance of preventing the transmission of C. burnetii to animals and humans. Prophylactic measures must be taken to reduce the seroprevalence of C. burnetii in horses. Further studies are needed to investigate the role of different risk factors in the transmission of C. burnetii.
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, with females having a higher incidence than males. In males, the forelimbs were the most affected, particularly the humerus, radius, and ulna, while in females, the appendicular bones were affected more, including the femur, tibia, and fibula. Male dogs showed a higher percentage of open fractures compared to cats. The highest records of fracture were in mongrel dogs, and cats as rescued animals. 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, with females having a higher incidence than males. In males, the forelimbs were the most affected, particularly the humerus, radius, and ulna, while in females, the appendicular bones were affected more, including the femur, tibia, and fibula. Male dogs showed a higher percentage of open fractures compared to cats. The highest records of fracture were in mongrel dogs, and cats as rescued animals.
On the other hand, in the data analysis stage, the researchers used ANOVA and continued with further statistical analysis to determine the effect of adding cod liver oil to commercial feed. This study aims to determine the effect of adding cod liver oil to commercial feed on producing healthy and high-quality fish products. One of the nutrients needed by fish is fatty acids. In fact, the provision of fatty acids, one of which is not in the meat, has an important influence on fish feed growth. Feeding with the right nutritional components can help in the production of high-quality prawn meat. On the other hand, the results also showed that the best ratio was found in treatment 4 at a dose of cod liver oil 0% (control), and treatments 1-4 use 3% dose addition to each treatment. As well, the best ratio of saturated and unsaturated fatty acids to the meat of giant prawn was achieved in the pole with 1.21:1 with cholesterol content of 88.34 ppm. The existence of feed plays an important role in aquaculture activities. This is due to the dominance influence on fish feed growth. Feeding with the right nutritional components can help in the production of high-quality prawn meat. 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 or 42°C. The deleterious effect of heat stress on cumulus-oocytes complexes (COCs) competence is well recognized in different livestock species. Therefore, the present study aimed to investigate the effect of physiologically relevant heat stress on the developmental competence of in vitro matured oocytes of Camelus dromedaries with different qualities. World Vet. J. 2020; pii:S232245682000079-10; https://dx.doi.org/10.2925/2/scil.2020.wvj79

The Effects of Adding Lysin Essential Amino Acid to Commercial Feed on Fatty Acid Contents of Pangasius Fish

ABSTRACT

The present research aimed to determine the effects of adding lysine essential amino acid to commercial feeds on the saturated and unsaturated fatty acids contents of pangasius fish. In this study, the Pangasius were fed with commercial feeds with high economic value. The content of pangasius fatty acids is higher than in marine fish, since marine fish have a lower saturated fatty acid composition than freshwater 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 the content of saturated and unsaturated fatty acids, Monounsaturated Fatty Acids (MUFA), and Polyunsaturated Fatty Acids (PUFA). The doses of P2 and P3 indicated lower results since marine fish have a lower saturated fatty acid content than freshwater fish. The observed effects of adding lysine to commercial feed indicated significant differences in the content of saturated fatty acids, Monounsaturated Fatty Acids (MUFA), and Polyunsaturated Fatty Acids (PUFA). The use of lysine in commercial feed indicated significant effects on the fatty acid content of pangasius fish. The observed effects of adding lysine to commercial feed indicated significant differences in the content of saturated fatty acids, Monounsaturated Fatty Acids (MUFA), and Polyunsaturated Fatty Acids (PUFA). P3 treatment with 3.2% Lysin (23.1082 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.


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.