Surgical Treatment of Canine Femoral Fractures – a Review.

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Femoral fractures in dogs and cats account for 20-25% of all fractures for which surgical treatment is a method of choice. Surgical treatment is based upon biological principle of open anatomic reduction and osteosynthesis. Arbeitsgemeinschaft für Osteosynthesefragen (AO) classification of fractures has a widespread use in general. Present study discusses different methods of osteosynthesis and healing process based on special cases managed in a certain small animal clinic in Hollabrunn, Austria, in 2016. The level of femoral fracture and the chosen method of osteosynthesis are shown respectively. According to available literature and author’s personal observations during externship period, the best results have been achieved using minimally invasive surgery. The surgical method choice depends on type, level and complexity of fracture, surgical skills and equipment of the team providing care respectively.

Key words: Dog, Femur, Fracture, Osteosynthesis.

Research Paper

Effects of Curcumin Supplementation on Viability and Antioxidant Capacity of Buffalo Granulosa Cells under In Vitro Culture Conditions.

The current study was conducted to investigate the possible protective effect of curcumin supplementation on buffalo granulosa cells (GCs) under in vitro culture condition. Buffalo ovaries were collected from local abattoir in physiological saline solution and transported directly to laboratory. Follicular fluid containing GCs and cumulus-oocyte-complexes were aspirated from antral follicles with diameter 2-8 mm. The collected GCs were seeded (Approximately 375,000 viable cells) in an 8-well culture plate containing tissue culture medium-199 (TCM-199) and kept at 37 °C in a humidified atmosphere of 5% CO₂. The curcumin was supplemented to TCM media at levels of 1, 2.5, 5 and 10 μM for 24 and 48 h at 37 °C or kept without treatment as control group. The viability of cells was determined using the trypan blue test. Intracellular reactive oxygen species (ROS) level was assessed by measuring the fluorescent intensity of 6-carboxy-2’,7’-dichlorodihydro fluorescein diacetate (H₂DCFDA). In addition, mitochondrial activity of GCs was determined. The results of the present study indicated that the viability of GCs under culture conditions was significantly decreased in groups treated with 1, 2.5, 5 and 10 μM curcumin (86.0%, 86.26%, 83.0% and 74.0%, respectively) compared to control group (93.60 %). The two groups of granulosa cells cultured with 2.5 and 5 μM curcumin recorded greater level of mitochondrial activity than the groups cultured with 1 μM and 10 μM curcumin. Moreover, there was a significant increase in ROS level in group cultured with 10 μM curcumin, compared to control and other experimental groups. The enzyme activity of catalase (CAT), superoxide dismutase (SOD), glutathione (GSH) and 1, 1-diphenyl-2-picrylhydrazyl (DPPH) was increased after treating...
*in vitro* cultured granulosa cells with 5 µM of curcumin. However, the enzymatic activity of CAT, SOD, GSH and DPPH was declined significantly 48 h post-curcumin treatment. In conclusion, supplementation of curcumin at low concentration (2.5 µM) for 24 h to *in vitro* cultured GCs improved intracellular metabolic activity and antioxidant protective system, whereas it could not sustain this action for 48 h. Moreover, supplementation of curcumin at high concentration and for long duration may negatively affect viability of GCs under *in vitro* culture condition via induction of oxidative stress.

**Key words:** Antioxidant, Buffalo, Granulosa cells, Oxidative stress, Viability.

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ABSTRACT

This research aimed to study the efficacy of two different ivermectin-based drugs against ectoparasites of chickens. In total 1200 Highsex brown chickens aged 1-1.5 years were examined to determine the prevalence of ectoparasites among chickens. The diagnosis of ectoparasites in chickens was established using clinical and entomological methods. For studying drug efficacy, 20 chickens were selected and divided into two groups (experimental and control) of 10 birds each according to the principle of analogs. A prepared ivermectin-based drug consisting of active substance ivermectin and the auxiliary substances including jojoba Resplanta, diethylene glycol monoethyl ether, Tween-80, benzyl alcohol, and purified water, was administered to the experimental group at a dose of 0.4 ml/L of drinking water (400 μg ivermectin per 1 kg of body weight) twice with a 24-hour interval. The treatment was repeated after 14 days. The control group was administered another drug based on ivermectin in the same dose and manner as the drug given in the experimental group. The efficacy of the drugs was determined by counting the number of ectoparasites per chicken before and after treatment. The clinical condition of the birds was monitored from day 1 to day 28 of the experiment. To evaluate the physiological state of chickens, blood and biochemical tests were performed on day 28 of the experiment. The results revealed that the prevalence of infection with *Menacanthus stramineus*, *Menopon gallinae*, and *Dermanyssus gallinae* in chickens was 34.5%, 21.5%, and 12%, respectively. The number of parasites/chicken after treatment between the experimental and the control group was significantly different. The efficacy of the drugs against ectoparasites in the experimental and control group was 95.6-99.0% and 85.1-91.1%, respectively. The blood tests showed that hematological and biochemical parameters were within physiological norms for both groups. Also, a pharmacokinetic study was performed on 18 ISA cross, 40-day-old chickens administered orally with the test drug at the same dose. The results revealed that ivermectin reached maximum concentration at 30-60 minutes after administration to the bird. After 1 hour, the concentration of the active substance of the drug in the blood serum of chickens decreased sharply and reached the limit of quantification by 12-24 hours. In conclusion, this drug can be recommended for use in poultry as an effective and safe drug for the treatment of arachnoentomosis in birds.

**Key words:** Chickens, Ectoparasites, Ivermectin.
Sensitivity of Lateral Flow technique for Evaluation of Inactivated Rift Valley Fever Virus Vaccine in Comparison with Serum Neutralization Test.

Abousenna MS, Sayed RH, Darwish DM and Saad MA.


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ABSTRACT
Rift Valley Fever (RVF) is a zoonotic mosquito-borne bunyaviral disease associated with high abortion rate, neonatal death, fetal malformations in ruminants, and mild to severe disease in human. The vaccination has significantly reduced the abortion of ewes and mortality of newborn lambs during an outbreak, and induced immunity in cattle. The evaluation of inactivated RVF vaccine required in vivo and in vitro techniques. The present research aimed to evaluate the sensitivity of the Lateral Flow Device (LFD) in comparison with Serum Neutralization Test (SNT) by reference sera to determine the humoral immune response of the sheep vaccinated with an inactivated RVF vaccine. Three batches of inactivated RVF vaccine were inoculated in three sheep groups. Then samples of their sera were collected weekly, and tested by SNT and LFD. It was found that the sensitivity of LFD at a serum dilution of 1:128 was 95%, while SNT carried out at the fourth week after the vaccination showed that antibody titers was 32, 64 and 32. On the other hand, LFD had positive results at dilutions of 1:32, 1:128 and 1:64 for the vaccine batches 1, 2 and 3 respectively. These findings suggest the possibility of using LFD for detection of the immune response of vaccinated sheep to the inactivated Rift Valley Fever Virus vaccine, and it could be improved to be more quantitative in future.

Key words: Lateral flow device, Rift valley fever virus, RVFV inactivated vaccine, Vaccine evaluation

Molecular Evidence of *Spirometra erinaceieuropaei* in Asian Wild Frogs (*Rana rugulosa*) from Banyuwangi City, Indonesia.
ABSTRACT

The tapeworm *Spirometra erinaceieuropaei* is the most frequently species which found in wild frog and causing a serious parasitic zoonosis known as sparganosis. This study aimed to provide molecular evidences of spargana collected from wild frogs which used as food and contribute to provide important implication for preven-tion and control of sparganosis. A total of 185 Asian wild frog (*Rana rugulosa*) samples were selected from food markets in Banyuwangi City, Indonesia. Molecular identification based on spargana that were collected and coding gene of mitochondrial cytochrome c oxidase 1 (*cox1*) using Polymerase Chain Reaction (PCR) method. Spargana were found in 9.1% (17/185) of the frogs and PCR analysis results identified all specimens belonging to the species *S. erinaceieuropaei*, therefore indicated that *S. erinaceieuropaei* is the major causative agent of sparganosis from frogs which sold as food in markets. These findings can be useful to the molecular diagnosis and control of *Spirometra* infections in humans and animals.

**Key words:** Asian wild frog, *Rana rugulosa*, Sparganosis, *Spirometra erinaceieuropaei*.
Bromelain within the Gastrointestinal Tract of Small East African Goats.

**ABSTRACT**

Indigenous male goats were divided into four groups containing three goats in each group. The strongyle fecal egg count was evaluated weekly using a modified McMaster technique. To determine the proteolytic activity of the drug, three goats were sacrificed and the proteolytic activity of the drug was determined in the different organs of the GIT. Significant differences were observed between the mean PCV of treated and control goats did not significantly differ during the experiment period. Also, no significant difference was observed between the mean alanine aminotransferase level of treated and untreated goats 28 days post-treatment. The administration of encapsulated bromelain was not associated with any clinical sign and mortality. The reduction in fecal egg count in G1 and G2 at days 21 and 28 post-treatment were not significantly different from that of the positive control group. In conclusion, encapsulated bromelain is safe, but have low efficacy against GIT strongyle nematodes when given as a single dose. Future studies should evaluate higher and repeated doses of encapsulated bromelain for controlling GIT nematodes.

**Key words:** Bromelain, Chitosan, Efficacy, Goats, Nanoencapsulation, Proteolytic activity.

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**Figure:**

- **64 V-line Fed 6 weeks**
- **Replacing clover hay**

- **Microscopic view of Intestinal parasites in laboratory mice**

**Table:**

<table>
<thead>
<tr>
<th>Organ</th>
<th>Enzyme activity after drug administration (Units)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pancreas</td>
<td>0.124±0.006</td>
<td>0.408</td>
</tr>
<tr>
<td>Liver</td>
<td>0.66±0.38</td>
<td>0.900</td>
</tr>
<tr>
<td>Intestines</td>
<td>0.40±0.50</td>
<td>0.990</td>
</tr>
<tr>
<td>Cecum</td>
<td>0.19±0.18</td>
<td>0.990</td>
</tr>
<tr>
<td>Intestines</td>
<td>0.39±0.51</td>
<td>0.990</td>
</tr>
<tr>
<td>Cecum</td>
<td>0.60±0.01</td>
<td>0.001</td>
</tr>
<tr>
<td>Intestines</td>
<td>0.60±0.02</td>
<td>0.001</td>
</tr>
<tr>
<td>Cecum</td>
<td>0.60±0.03</td>
<td>0.001</td>
</tr>
<tr>
<td>Intestines</td>
<td>0.60±0.04</td>
<td>0.001</td>
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</tbody>
</table>

**References:**

The African four-toed hedgehog is a small nocturnal mammal, characterized by a short-grooved brown or grey spine covering the dorsum of the body with a band of whitish fur running across their forehead, little is known about the reproductive biology of this animal. The present study aimed to investigate the immunoreactivities to α-SMA and S-100 Proteins in the testis of the African four-toed hedgehog. Paraffin-embedded sections of testicular tissue from African four-toed hedgehogs captured from the wild animals in Ibadan, Nigeria were used. Primary antibodies against alpha smooth muscle actin (α-SMA) and S-100 were applied on paraffin sections. The spermatogenic cells, Sertoli and Leydig cells, peritubular myoid cells, the testicular capsule and vascular endothelium expressed strong immunostaining for α-SMA. The spermatogenic cells, Sertoli and Leydig cells, peritubular myoid cells, the testicular capsule and vascular endothelium expressed strong immunostaining for S-100. α-SMA and S-100 proteins play active roles in the cytoskeletal structure of testis and physiology of the African four-toed hedgehog while S-100 protein plays an additional role in the structural formation and maintenance of the blood-testis barrier during the process of spermatogenesis in the animal. It is concluded that α-SMA and S-100 proteins have active roles in the cytoskeletal structure and physiology of testis of the African four-toed hedgehog while S-100 protein plays an additional role in the structural formation and maintenance of the blood-testis barrier during the process of spermatogenesis in the animal.
ABSTRACT
For bacteriological parameters (Total bacterial count, Proteolytic bacterial count, Lipolytic bacterial count), quality parameters (pH, total volatile basic nitrogen (TVB-N), and thiobarbituric acid reactive substances, TBARS) and sensory features. Results showed that 2% chitosan and 2% chitosan nanoparticle solutions were the optimal concentrations for improving the quality of tilapia fish fillets until 10 days of refrigerated storage. Such research investigated the antimicrobial and antioxidant effects of chitosan and chitosan nanoparticle coating during refrigerated storage. In the present investigation solutions of chitosan (1 and 2%) and nanochitosan (1 and 2%) were applied for the casing of tilapia fish slices thereafter stored at 4°C for 15 days. Uncoated (control) and coated fish fillets pieces were examined intermittently during the storage period. Therefore, 2% chitosan nanoparticles as a natural preservative can be utilized for the conservation of quality properties and expanding the shelf life of tilapia fish slices through chilled storage.

Key words: Quality Evaluation of Nile Tilapia Fish (Oreochromis niloticus) Fillets by Using Chitosan and Nanochitosan Coating during Refrigerated Storage.

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Developmental Competence of Buffalo Oocytes Cultured Under Different Oxygen Tensions after Selection with Brilliant Cresyl Blue.

Abd-El Rahman Ahmed D, Ghanem N, Dessouki ShM, Faheem MS, Gad AY and Barkawi AH.


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ABSTRACT

The aim of this investigation was to follow up in vitro preimplantation development of buffalo cumulus-oocyte complexes (COCs) after BCB test and followed by in vitro maturation under two different levels of oxygen tension. Cumulus-oocyte complexes (n=1045) were selected with BCB staining (oocytes with any degree of blue color in cytoplasm was defined as BCB+, oocytes without any degree of blue color in cytoplasm was defined as BCB-) in addition to a third control group. The previous experimental groups (BCB+, BCB-, control) were matured in vitro under low (5%) and high oxygen tension (20%), followed by in vitro fertilization and in vitro culture of presumptive zygotes. There were no differences (P ≤ 0.05) in cleavage, morula and transferable embryos rates among BCB+, BCB- and control group. However, blastocyst rate was greater significantly in control group (14.4 ± 2.0) than BCB- COCs (8.4 ± 1.9). According to the oxygen tension effect, the rate of morula and transferable embryos was increased (P ≤ 0.05) in buffalo COCs developed under low oxygen tension (11.6 ± 1.4 and 23.8 ± 1.9) compared to high oxygen tension group (7.4 ± 1.4 and 17.9 ± 2.1). In addition, cleavage, morula, blastocyst and transferable embryos rates were greater in BCB+ under low (43.6 ± 3.9, 14.9 ± 2.5, 14.1 ± 2.9 and 28.4 ± 3.6) than high oxygen tension group (33.5 ± 3.9, 7.1 ± 2.5, 11.6 ± 2.9 and 18.8 ± 3.6) which may reflect enhanced biological processes controlling early development. Moreover, blastocyst rate was significantly higher in control group cultured under high (12.0 ± 2.9) and low (16.9 ± 2.8) oxygen level than their counterparts of BCB- group (9.3 ± 2.9 and 7.6 ± 2.6, respectively). In conclusion, there was no differences in embryo development between BCB+ and BCB-, COCs; therefore, oocyte selection based on BCB staining is not an effective tool to select developmental competent buffalo COCs. Buffalo morula and transferable embryos prefer low oxygen tension for early development, which should be applied during in vitro embryo production of this species.

Keywords: Brilliant cresyl-blue staining, Cumulus-oocyte complex, Morula, Preimplantation.

Butanol Fraction of Kelussia odoratissima Mozaff Inhibits the Growth of Leishmania major Promastigote and Amastigote.


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ABSTRACT

Naturally derived compounds have been used to treat several infectious diseases including leishmaniasis. The study aimed to investigate the in vitro effects of Kelussia odoratissima Mozaf extract on Leishmania major promastigote and amastigote. Dried leaves of K. odoratissima were fractionated by 3 solvents including aqueous, butanol, and ethyl acetate. The results showed that the butanol fraction of K. odoratissima showed the highest anti-Leishmania effects against L. major promastigotes. Ninety four percent growth inhibition of the promastigote was observed when cells were treated with the 1,280 µg/mL butanol fractions. Moreover, 100% inhibition of amastigotes was detected after treatment with the butanol fraction. Half maximal inhibitory concentration (IC₅₀) of the butanol fraction in promastigotes and amastigotes was 264.1 and 154.1 µg/mL, respectively. The obtained results suggested the potential medicinal benefits of K. odoratissima butanol fraction as an alternative treatment for leishmaniasis caused by L. major infections.

Key words: Amastigotes, Butanol fraction, Leishmania major, Kelussia odoratissima Mozaff, Promastigotes