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Research Papers

**MONITORING OF EARLY PREGNANCY FETOMETRY IN EGYPTIAN
BUFFALOES USING HIGH FREQUENCY TRANSRECTAL B-MODE AND
COLOR DOPPLER ULTRASONOGRAPHY**

**¹Haney Samir, ²Mohamed M. Kandiel, ³Amal M. Abo El-Maaty, ⁴Mohamed H.
El-Eldawy, ⁴Lasheen, M.E., ⁴Badr, H.M., ⁴Mohamed Farouk**

¹Department of Theriogenology, Faculty of Veterinary Medicine, Cairo University, Giza

²Department of Theriogenology, Faculty of Veterinary Medicine, Benha University

³Animal Reproduction and AI Dept., Veterinary Division, NRC, Dokki, Giza

⁴Department of Animal Production, Faculty of Agriculture, Al-Azhar University,

ABSTRACT

The current study aimed to screen the fetometry and viability of embryonic and fetal development during early pregnancy (from D21 to D56 post-breeding) in Egyptian buffaloes. Twenty buffaloes were synchronized and examined serially by means of real-time B-mode ultrasound equipped with 12 MHz endorectal transducer. The developing fetuses were measured for the gestation sac diameter (GSD), crown rump length (CRL), head diameter (HD), trunk diameter (TD), and eye ball diameter (EBD). The heart rate and blood flow were sequentially examined to verify the fetal viability using color Doppler mode. Data showed the feasibility of GSD, CRL, HD, TD and EBD detection from 24.33 ± 0.67 , 27.00 ± 1.73 , 34.67 ± 1.76 , 34.67 ± 0.88 and 33.67 ± 0.88 days post-breeding, respectively. The fetal heart rate was 232.00 ± 12.35 beat/min at the day of first detection (day 24.50 ± 1.30) after breeding. The heart blood flow was seen from day 27 onwards. A highly significant ($p < 0.0001$) correlations were recorded between the GSD ($r^2=0.55$), CRL ($r^2=0.85$), HD ($r^2=0.85$), TD ($r^2=0.93$) and EED ($r^2=0.85$) and fetal age in buffaloes. It could be concluded that the high-frequency ultrasonography is a valuable diagnostic tool for pregnancy detection from Day 24-26 post-breeding in Egyptian buffaloes. Verification of fetal heart beating (from Day 24-26) and blood flow (from Day 26-27) provide a reliable non-invasive promising technique for the fetal viability evaluation. The high correlation between TD and fetal age signified its clinical value, over other estimated fetometric parameters, in determining gestation period in Egyptian buffaloes during early pregnancy.

Keywords: Buffalo, Doppler ultrasound, Fetometry, High frequency B-mode ultrasound, Pregnancy

INVESTIGATION OF DNA CHANGES IN MICE INDUCED BY CADMIUM AND ZINC USING RANDOM AMPLIFIED POLYMORPHIC DNA (RAPD) ANALYSIS

Fouda¹, M.M;Hemeda², SH.A; Abou-Isml¹, U.A; Awad³,A. and Elemam¹, H.A.

¹ Department of Husbandry and Development of Animal Wealth, Faculty of Veterinary Medicine, Mansoura University, Gomhoria St., Mansoura, P.O. box 35516, Egypt.

² Department of Husbandry and Development of Animal Wealth, Faculty of Veterinary Medicine, Alexandria University.

³ Department of Development of Animal Wealth, Faculty of Veterinary Medicine, Zagazig University.

ABSTRACT

Random Amplified Polymorphic DNA (RAPD) marker was used to detect genotoxicity caused by chronic exposure to CdCl₂ and ZnCl₂ in mice. Twenty Swiss albino mice ageing 8-10 weeks and weighing 20-25 gm were used in this experiment, and were administered CdCl₂ alone or in combination with ZnCl₂ at a dose of 5 mg/kg b.wt. (1/20 LD₅₀) for 3 months. ZnCl₂ was used at a dose of 70 mg/ kg b.wt. DNA was extracted from bone marrow samples. A random amplification of polymorphic DNA (RAPD) analysis from the extracted DNA was carried out using ten 10-base pair random primers. 5 primers only amplified the DNA and the other 5 primers could not amplify the DNA. Five primers produced 34 bands ranged between 225-1594 base pair in gel electrophoresis. DNA damage became evident regarding the presence and/or absence of DNA fragments in the treated samples compared to the control groups. Results showed that Primer 1 (OPA1) was useful in identifying control and ZnCl₂ treated group. Primer 2 (OPA6) was a good marker for identifying the control group. Primer 3 (OPA9) was a good indicator for ZnCl₂ treated group. Primer 4 (OPC2) was a good marker for identifying CdCl₂ and ZnCl₂ treated groups. Whereas primer 5 (OPC8) was a good marker for identifying the control group. The results showed that the lowest distance was observed between cadmium chloride and zinc chloride, and between cadmium chloride + zinc chloride and zinc chloride and it was 1.00. RAPD analysis could therefore be a useful tool for detection of genotoxic effects of cadmium toxicity in mice.

Keywords: Amplification , cadmium chloride , genotoxicity , Polymorphic DNA, Primer

**HEPATOPROTECTIVE AND HEPATOTHERAPEUTIC EFFECTS OF
TRANILAST AGAINST THIOACETAMIDE-INDUCED LIVER FIBROSIS IN RATS**

**Ramadan, A.¹, Nehal A. Afifi¹, Nemat Z. Yassin², Rehab F. Abdel-Rahman²
and Hany M. Fayed²**

¹Pharmacology Department, Faculty of Veterinary Medicine, Cairo University, Egypt

²Pharmacology Department, Medical Division, National Research Center, Egypt

ABSTRACT

The aim of the present study was to investigate the potential hepatoprotective and hepatotherapeutic activities of tranilast against thioacetamide (TAA)-induced liver fibrosis in rats. Liver fibrosis was induced in rats by intra peritoneal injection of TAA (200 mg/kg). In the hepatoprotection experiment, tranilast was administered orally for 30 days before induction of liver fibrosis. In another experiment (hepatotherapy), tranilast was dosed after induction of liver fibrosis. Injection of TAA to rats induced hepatic damage that was manifested by a significant increase in the activities of aminotransferases, total bilirubin, total protein and albumin in serum. Liver homogenate of intoxicated animals had the lower content of reduced glutathione and superoxide dismutase with increased levels of the hepatic malondialdehyde, osteopontin, transforming growth factor- β , tumor necrosis factor alpha and smooth muscle actin (α -SMA). Histological data presented marked damage in liver sections of intoxicated rats. Oral dosing of tranilast before or after liver fibrosis induction reversed these altered parameters near to normal values. Liver apoptotic events such as increased caspase-3 activity observed during intoxication were prevented by pre and post- tranilast treatment. These results suggest that tranilast could afford significant protection and therapy in alleviation of liver fibrosis.

Keywords: Hepatic fibrosis, Rat, Thioacetamide, Tranilast.

EPIDEMIOLOGICAL AND THERAPEUTICAL STUDIES ON GOAT DERMATOPHYTOSIS

Fayez A. Salib^{1*} and Christine A. Mikhael²

¹Department of Medicine and Infectious Diseases, Faculty of Veterinary Medicine, Cairo University, Egypt.

²Pox department, Veterinary Serum and Vaccine Research Institute, Abbassia, Cairo

* Corresponding author contact: Post code: 12211, Giza, Egypt and E-Mail: fayez_vetmed@hotmail.com

ABSTRACT

Fungal infection is common in both goats and human and it is caused by different species that infect superficial layer of skin and hairs. The skin scrapings examinations, fungal culture characters and fungal biochemical reactions were used to identify fungus in skin scraping samples of the examined goats. The isolated fungus from ringworm infected goats was *Trichophyton verrucosum*. The prevalence of Ringworm in (589) goats was (16.97%) and in Baladi and Zaribi goats separately was (15.26%) and (22.62%) respectively. The predisposing factors of caprine dermatophytosis were recorded as Season (Winter), Age (Senile and young), Sex (Female), Parasitic infestation (Internal and external parasitism) and Nutritional status (Starvation and mycotoxicosis). Systemic and topical fungicides were evaluated in 6 different groups of infected cattle. It was found that the efficacy of Trosyd, Vinegar, Betadine, Levamisole, Potassium Iodide and Griseofulvin was (77.77%, 44.44%, 75%, 25%, 62.5% and 100%) and (66.66%, 37.5%, 50%, 37.5%, 44% and 62.5%) in Baladi and Zaribi goats respectively. It was concluded that the best fungicide for treatment of caprine dermatophytosis in Baladi goats is Griseofulvin (100%) while in Zaribi is Trosyd (66.66%).

Keywords: Caprine, dermatophytosis, epidemiology, diagnosis, fungicides.

**THE INFLUENCE OF DIFFERENT FARMS PRACTICES ON THE
BIOSECURITY SCORE AND INCIDENCE OF CLINICAL PROBLEMS ON
ARABIAN HORSE FARMS**

Abd El Hamid A.S.¹ , Fayed R.H² , Matooek M.Y²

¹veterinarian at El Zahraa Stud for breeding Arabian horses

² Professor of Animal and poultry Behaviour and Management Department of Veterinary Hygiene and Management Faculty of Veterinary Medicine Cairo University

ABSTRACT

Three different Arabian horse farms with various management practices were studied in the period from (February 2014 to January 2017). The total biosecurity score for the three farms was evaluated as follow 42 (high risk), 31 (medium risk) And 16 (low risk) for farm 1, farm2 and farm 3 respectively. There have been high positive correlation coefficient of total biosecurity score with the incidence of clinical problems among Arabian horses in the three farms.

Regarding gastrointestinal tract problems, the incidence of diarrhea among foals was about 12.8 ± 3.7 while it was 2.1 ± 0.05 and 8.1 ± 3.4 for farm 1, farm2 and farm3 respectively, also the incidence of strangles have been 9.6 ± 2.7 in farm 1 while it was 0% for other two farms. Similarly, the incidence of hoof canker was the highest on farm one 1.8 ± 3 in comparison to 0% on the other two farms.

Keywords: Biosecurity, Arabian horse, Strangles, hoof canker.

APPETITE, FEEDING BEHAVIOUR, SWIMMING PERFORMANCE AND STRESS RESPONSE IN NILE TILAPIA *OREOCHROMIS NILOTICUS*: APPLICATION OF SANOLIFE PRO-F® AS PROBIOTIC (*BLEND BACILLUS SP.*) FEED ADDITIVES

Radi Mohamed^{1*}, Mona M. Mourad², Ahmad Hamza³, Olivier Decamp⁴

¹Department of Aquaculture (Fish Welfare), Faculty of Aquatic and Fisheries Sciences, Kafr-elsheikh University, Kafr El-sheikh (33516), Egypt

²Fish reproduction Lab., Aquaculture division, National Institute of Oceanography and Fisheries, Alexandria, Egypt

³AQUAVET for fish nutrition and health solutions, Alfarouk tours, Zohdy Square, Egypt

⁴INVE Asia Services 471 Bond St., TambonBangpood, AmphurPakkred, Nonthaburi 11120, Thailand

ABSTRACT

To evaluate the impact of a probiotic (*blend Bacillus sp.*) to enhance the appetite, feeding behaviour, swimming performance and stress response on monosex Nile tilapia, *Oreochromis niloticus*, Sanolife PRO-F® (manufactured by INVE AQUACULTURE, Belgium) was used. Monosex Nile tilapia were sized and divided into two separated groups. The 1st experiment; small size fish group (N=180, 23±2.86 g) were allocated into three trails each had three replicates and placed into glass aquarium (80×30×45 cm). The fish behaviour during this experiment was assessed through feed preference and swimming performance tests. The same design was set for the 2nd experiment; the large size fish group (N=108, 52±3.26 g). At this design we used the appetite inhibition test (AIT), swimming behaviour test and net restraint test (NRT) to evaluate fish behaviours. Both fish groups were fed for 14 days on a basal commercial diet (30% CP and 3000 Kcal/kg diet) manufactured by ALEKHWAS® feed factory (Baltem, Kafr El-Sheikh, Egypt), which superior with different doses; 0.0, 0.1 or 0.2 g of Sanolife PRO-F®/kg diet; (Conts, TS₁ and TS₂ for the 1st experiment and Cont_L, TL₁ and TL₂ for the 2nd experiment, respectively.). The results showed that, appetite, feeding behaviour, swimming behaviour were improved in fish fed on treated diet compared to control one. Stress response of treated fish was improved after application of NRT compared to control one. Treated fish showed rapid feeding time, rapid latency to start feed intake and consumed larger amount of feed compared to control group. For swimming performance test, treated fish showed higher resistance to water current and showed better swimming performance compared to control one. In conclusion, using *Bacillus*-based probiotic as a feed additive had a significant positive impact on appetite, feeding behaviour, swimming performance of Nile tilapia. It also improved health status and welfare of fish.

Key words: appetite inhibition test, behaviour, Nile tilapia, probiotic, welfare

**MATERNAL SEPARATION VERSUS MATERNAL NON SEPARATION IN
ENRICHED AND NON- ENRICHED ENVIRONMENTS FOR RAISING
LABORATORY RATS**

Asmaa K.M.¹; Naglaa M. Abdel-Azeem¹; Mostafa, A.S.² and Emeash, H.H.¹

¹Departement of Animal and Poultry Management and Wealth Development, Faculty of
Vet. Med., Beni-Suef University

²Department of Behaviour, Management and Development of Animal Wealth, Faculty of
Vet. Medicine, Minia University

Correspondence to: Naglaa M. Abdel-Azeem. Department Animal and Poultry
Management and Wealth Development. Fac.Vet.Med, Beni-Suef University, Beni-Suef,
62511, Egypt. Tel: 02+01282250708 Fax: 082-2327982 E-mail address:
nagl81b@yahoo.com Official email: naglaa.mohamed@vet.bsu.edu.eg

ABSTRACT

Separation of pups from their mothers during early postnatal period could have long lasting effects on emotionality, stress responsiveness, increase anxiety like behaviours and affects brain functions at the adulthood. The aim of this study was to compare between maternally non separated (NS) and maternally separated (S) rat neonates in both standard and enriched (E) environment regarding behaviour, physiological measures and brain neuroanatomy. A total number of 30 female Wister rats were randomly divided into two equal groups, maternal non separation group and maternal separation. Offspring of both groups were randomly raised either in standard housing or in enriched housing from day 23- 35 postnatal. On day 36 postnatal, rats subjected to elevated plus maze (EPM) and open field tests, and on day 40 postnatal, blood samples were collected, rats were humanely sacrificed to obtain brain samples for neuroanatomy examination. The results showed that environmental enrichment reversed effects of postnatal maternal separation on both behavioural and endocrine responses to stress which reflected on the animal welfare, Moreover the S group showed normal distribution of the cytoplasmic processes of the neurons and neuroglia cells, while S+E group showed extensive cytoplasmic processes with a marked increase in the size of neurons and neuroglia cells. However NS and NS+E groups were nearly similar showing normal distribution of the cytoplasmic processes of the neurons and neuroglia cells.

Key words: Behavioural tests, Enrichment, Neuroanatomy, Maternal separation.

**ENVIRONMENTAL PATHOGENS IN THE RESTAURANT OF SOHAGE UNIVERSITY
HOSPITAL AND ITS IMPLICATION ON THE BACTERIOLOGICAL QUALITY OF MEAT.**

Elsayed¹, A.M., Sotohy², A.S

¹Sohag University Hospital. Sohag, Egypt

² Faculty of Veterinary Medicine, Al Wadi El Gadeed, Assuit University

ABSTRACT

The bacteriological quality of beef produced from most of the food-processing plants in Egypt has always been questionable. This work therefore investigated the bacteriological quality of restaurant of Sohage University hospital environment (air, water; worker's hands, worker's clothes and knives) beside the meat surfaces. The results of our findings revealed that the total colony counts, total coliform counts, total faecal coliform count and total *E.coli* i count were higher than the recommended standard for sanitary practices. Mean TCC, Total coliform count, total faecal coliform count, total *E.coli* i count, and total *Staph. aureus* were 8.4×10^3 ; 2.0×10^2 ; 1.2×10^2 ; 3.0×10 , and 5.0×10^2 , respectively cfu/L. Moreover, the mean TCC, Total coliform count, total faecal coliform count, total *E.coli* i count, and total *Staph. aureus* of tap water used were 8.2×10^2 , < 3 , < 3 , < 3 , and 5.8×10 cfu/L. On the other hand, mean TCC, Total coliform count, total faecal coliform count, total *E.coli* i count, and total *Staph. aureus* of meat surface's swabs were 4.5×10^5 ; 2.8×10^2 ; 1.4×10^2 ; 1.0×10 , and 2.5×10^2 CFU/m², respectively. The results revealed that the worker's clothes contain more bacterial count than the hands and knives. The mean TCC, Total coliform count, total faecal coliform count, total *E.coli* i count, and total *Staph. Aureus* of worker's clothes were 2.8×10^2 ; 1.2×10^2 ; 2.6×10 ; 1.8×10 , and 3.4×10^2 CFU/m². The knives' swabs were contain less number of bacterial burden but still higher than the recommended guidelines. Nine bacterial isolates were consistently isolated during this study, and they included; *Escherichia coli*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, *Enterbacter species*, *Klebsiella ss.*, *Proteus spp*, *Citrobacter spp*, and *Serratia spp*. with varying percentage of frequency across the sampling points. No *Salmonella* species were isolated. The presence of indicator organisms as well as possible pathogens is of special concern and meat hygienists should be encouraged to review the processes involved in the establishment and operation of University restaurants .

Keywords: *E.coli*, pathogens, faecal coliforms, food processing.

EFFECT OF DIFFERENT TYPES OF FEED REGIMES ON THE PHYSICAL PERFORMANCE OF GUINEA PIG (CAVIA PORCELLUS).

Kholoud, A. Ali.; Matook, M.Y. and Abeer, H. Abd El Razek.

Department of Veterinary Hygiene and Management, Faculty of Veterinary Medicine,
Cairo University

ABSTRACT

This study was carried out during the period from March (2016) to January (2017) in the Laboratory Animals Unit of Animal Behaviour and Management, Department of Veterinary Hygiene and Management at Faculty of Veterinary Medicine, Cairo University. The aim is to evaluate the effect of different types of feed regimes on the physical performance of guinea pig (*Cavia porcellus*). Total number of (70) guinea pigs were randomly allocated into four groups. They fed as follow; first group on commercial rabbit diet with alfalfa hay, the second one on alfalfa hay, the third one on commercial rabbit diet and the last one on NRC ration formed manually based on the requirements of the guinea pigs. The daily feed amount was measured for all animals was about 12% of guinea pigs weight. The analyzed variables were weight gain, feed intake behaviour (feeding rhythm, preferences), amount/duration of feed intake and water intake were determined. The result was revealed that there was statistical significance difference among the body weight of guinea pigs, 540.3 ± 142.9 , 495.9 ± 50.2 , for the group (4) and (1) respectively and there was no statistical significance between group (2) and (3) 401 ± 37.1 , 396.8 ± 77.8 respectively.

Keywords: alfalfa, hay , behaviour , guinea pigs.

ISOLATION AND IDENTIFICATION OF *MYCOPLASMA ARGININI* FROM SHEEP AND GOATS IN EGYPT

Mounier M. Abdel Halium , Fayez A. Salib *, S. A. Marouf , Emil S. Abdel Massieh

¹Department of Medicine and Infectious Diseases, Faculty of Veterinary Medicine, Cairo University, Egypt.

ABSTRACT

Mycoplasmas are group of bacteria which lack cell wall they cause different clinical manifestations, *Mycoplasma arginini* are one of mycoplasmas species which cause respiratory manifestations. A total of 327 samples were collected from sheep and goats as 142 nasal swab from clinically affected animal, 167 from pneumonic lung and 18 samples from tracheal bifurcation and cultured on pplo media for isolation and identification of mycoplasmas species. A total of 21 mycoplasmas isolates were isolated and identified by biochemical test and confirmed by PCR. Seven isolates are confirmed as *Mycoplasma arginini* by using PCR specific primer. Role of *Mycoplasma arginini* in pneumonic sheep and goats must be studied in more details due to high frequency isolation.

Key word: Mycoplasma arginini; Sheep ; Goats ; Identification ;PCR.

**HYGIENIC STUDY ON PARASITIC INFESTATION IN DOGS KEPT IN
SHELTERS AND KENNELS**

Ali, M. A., Fawzy T.F., Anwer , W. and El-Dahshan, A.

Department of Veterinary Hygiene and Management, Faculty of Veterinary
Medicine, Cairo University

ABSTRACT

This study was carried out during the period from July (2014) to December (2016) in 10 dog shelters and kennels in Cairo and Giza. The aim is to assess the hygienic level in the dog kennels, shelters or even a pen as a unit through investigate the prevalence of internal parasite in dogs before and after deworming. Total number of (164) fecal samples were randomly collected from dogs regardless their breed, age, health state. Each sample examined microscopically by using the concentration floatation techniques for detection of parasitic eggs and oocysts. Egg identification based on morphological characteristics (shape and structure of shell) and measurements. A dog was classified as positive if at least one dog parasite egg, oocyst, cyst or proglottid was observed, regardless of whether or not it was zoonotic. Obtained results revealed that most common parasitic infestation of dogs was *toxocara canis* , *Dipylidium caninum* and *Isospora*

Keywords: dog shelter , parasitic infestation of dogs , toxocaracains.

**THE EFFECT OF LOCAL TRANSPORTATION METHOD ON THE MICE
BEHAVIOUR AND PHYSIOLOGICAL PARAMETERS**

Rawda Samir Abd el Galil, M.Y.Matoock, E.M. Abd El Gawad

Department of veterinary hygiene and management Faculty of veterinary
medicine, Cairo University

ABSTRACT

Local transportation causes stressful condition on the mice and affects behaviour and physiological parameters. The aim of this work is to reduce the local transportation stress on physiological and behavioural parameters of mice. This study was carried out during the period from February 2017 to April 2017 in the laboratory animal Unit of faculty of pharmacy, British university in Egypt. Total number of twelve mice was randomly allocated in to two groups and blood samples were taken before and after one hour. The first group was transferred from the cage to closed jar individually and the second group was transferred in a enriched box with their cage bedding material. Comparing the two groups we found that ordinary container group shows high glucose, hemoglobin, hematocrite, neutrophil and lymphocyte ratio, escape behaviour, urination, defecation and hyperactivity compared to enriched box group. We conclude that mice less stressful and adaptable to be individually housed in modified box.

Keywords: Enriched box , Mice, Transportation, Stress.

MITIGATIVE EFFECT OF HERBAL EXTRACTS ON THE PRODUCTIVE PERFORMANCE, PHYSIOLOGICAL AS WELL AS HISTOPATHOLOGICAL PARAMETERS OF OREOCHROMIS NILOTICUS (NILE TILAPIA).

Arby E.M.* , Kamel M. M. **, and El Iraqi K.G.**

*Veterinary directorate of Fayuim Governorate

**Dep. Of Vet. Hygiene and Management. Faculty of veterinary Medicine, Cairo University

ABSTRACT

This study was conducted to evaluate the effect of Glycyrrhiza glabra (Liquorice) and Zingiber officinale (Ginger) on the productive performance, physiological and histopathological picture of Oreochromis niloticus (Nile tilapia) reared in agriculture waste water. 1800 fingerlings were randomly distributed into four experimental groups each in three replicates in three hapas stocked in the experimental hapas at a rate of 150 fish /hapa. With an average initial weight were 17.5 ± 0.109 gm and the average initial length 10.13 ± 0.37 cm/fish. Group one (control) fed on the basal diet, group two (Ginger group) fed on basal feed fortified by ginger 5ml/kg, group three (liquorice group) taken basal feed plus Liquorice 4ml/kg, and the last group was group four (mix group) received basal feed treated ginger and liquorice 2.5ml/kg ginger+2ml/kg liquorice, all herbal extract sprayed on feed 12 hour before feeding. Data collected were, productive Performance includes body weight, body length, feed intake, feed conversion ratio, mortality rate. Physiological and blood biochemical parameters includes RBCs count, WBCs count, Hb concentration, PCV %, differential leukocytic count, serum proteins (g /dl), serum albumin (g /dl), serum globulins, albumin/globulin (A/G) ratio and Creatinine (mg/dl) finally tissue specimen from, gills, intestine and liver of fish were collected at the end of the experiment for histopathological examination. Results obtained were, higher significance different between different treatment groups as group four recorded higher body weight 237.21 ± 5.6 gm followed by group three 211.03 ± 3.2 gm, and the lowest body weight was in control group 190.77 ± 3.88 gm. Lower feed conversion ratio recorded in group four 1.82 ± 0.03 , higher feed intake recorded in group four 399.51 ± 4.18 gm. Higher level of hemoglobin conc., white blood cell count, and total leukocytic count recorded in group four followed by group 2 and 3. It can be concluded that using one Ginger or liquorice herbal extract separate or in mixture has positive effect on performance, blood biochemical and histological picture in the Oreochromis niloticus (Nile tilapia).

**DESIGNATION OF A HACCP LIKE MODEL FOR FOOT AND MOUTH
DISEASE VACCINE PRODUCTION**

**Assem, A.Mohamed, Hind M.Daoud, Hiam M.Fakhry, Akram Z. Abdelhak,
Ahmed F. Ramadan, Mohamed A. Gamil, Ehab E. Ibrahim, Amr I Hasanin
and Wael M. Gamaledin**

Department of FMD, Veterinary Serum and Vaccine Research Institute (VSVRI),
Abbasia, Cairo, Egypt P.O. Box 131 svri@idsc.gov.eg

ABSTRACT

The Veterinary Serum and Vaccine Research Institute (VSVRI) was constructed to meet a specific aim – protection of animal health and welfare. Disease prevention and control calls for programs and projects that, depending on the characteristics of each disease, may involve all aspects from the laboratory to field activities. For the purpose of this work, the model used is that of a country that is ‘endemic for foot and mouth disease with vaccination’ in accordance with the conditions stipulated in **OIE (2015 a -b)** . This is achieved by applying good practice and identifying the critical control points in all FMD vaccine manufacture processes, using a checklist that simplifies the task. The system that is developed can also serve as a guide for internal or external program audits.

Keywords:Hazard Analysis , HACCP,FMD , Vaccination.

**MOLECULAR DETECTION THE INFLUENCE OF AFLATOXIN
BIOSYNTHETIC GENES BY *ASPERGILLUS FLAVUS* BEFORE AND AFTER
BACILLUS SUBTLIS AND *CANDIDA ALBICANS* BIOCONTROL.**

***Hassan, A. A; *Howayda, M. El-Shafei; *Rasha, M.H. Sayed El-Ahl and
*El-Hamaky, A.M.**

***Department of Mycology and Mycotoxins, Animal Health Research Institute
(AHRI), Dokki, Agriculture Research Centre (ARC), Giza, Egypt.**

ABSTRACT

The present study was undertaken to evaluate the efficacy of bio-control on structures and regulatory genes in the biosynthetic pathway (aflD and aflO) and the production of aflatoxin B₁ (AFB₁) by aflatoxigenic *A. flavus* that recovered from animal's feeds. A total of 100 samples (25 of each) of consumed animal's feeds, water, litters and walls of animal's houses halls, from a private farm of cattle at Giza Governorate in which the cattle calves suffered from symptoms of toxicosis as vomiting and profuse diarrhea and related environmental factors were investigated for fungal and aflatoxin pollution. The mould of *A. flavus* was recovered from (80%, 20%, 12% and 4%) of environmental factors of diseased animal's (feeds, water, litters and walls), respectively. All *A. flavus* that recovered only from animal's feeds 100% were aflatoxigenic. While, the highest total aflatoxin residues only were detected also in animal's feeds samples (100 %). Whereas, the maximum levels of AFTs were detected in (animal's feeds) (20 ppm) and the minimum amount were (2.0 ppm), with a mean level of (10.4 ± 4.91ppm). The bio-control of *A. flavus* by bacteria (*B. subtilis*) and yeast (*C. albicans*) were evaluated by biochemical and molecular detection of the changes in AFT-s genes production (aflD and aflO). All treated isolates of *A. flavus* were inhibited their ability for AFTs production as detected by chemical chromatographic method. However, the extraction of DNA from these treated isolates showed that the responsible AFTs biosynthesis genes (aflO and aflD) detected by PCR method in control non-treated *A. flavus*. Whereas, the same isolates were negative for AFTs biosynthesis genes (aflO, aflD) and completely eliminated after bio-control. These results indicated the efficacy of bio-control which caused inactivation and removal of regulatory gene in the biosynthetic pathway (aflD and aflO) and the production of AFB₁

Keywords: PCR, Aflatoxin B₁, Biosynthetic Genes, *A. flavus*, Inactivation, *B. subtilis*, *C. albicans*, aflD, aflO.

STUDIES ON ANTIVIRAL ACTIVITY OF ZEOLITE AGAINST FOOT AND MOUTH DISEASE AND EPHEMERAL FEVER VIRUSES

***Assem, A. Mohamed and **Mustafa Amin.**

*Department of FMD, Veterinary Serum and Vaccine Research Institute (VSVRI),
Abassia, Cairo, Egypt P.O. Box 131 svri@idsc.gov.eg

** Central Laboratory for Evaluation of Veterinary Biologics, Abassia, Cairo

ABSTRACT

This work was aimed to document the antiviral activities of zeolite against foot and mouth disease virus (FMDV) serotypes O/ Panasia, A/Iran 05, and SAT2/ Egy 2012 and bovine ephemeral fever virus (BEFV/Abbasia / 2000) to evaluate its replication in Baby Hamster Kidney (BHK) and Vero cell culture and in baby mice. Zeolite is a natural non-toxic, fine powder of micronized zeolite (MZ). Cytotoxicity assay studied for zeolite on BHK cells and Vero cell culture to determine the non-toxic dose. The non-toxic dose of zeolite was mixed with each type of FMDV (A, O, SAT2) also BEFV. Different viral suspensions were treated with different concentrations of zeolite ranging from 10 to 50 µg /ml. The viral replication was evaluated by inverted microscope as percentage of cytopathic effect (CPE). Furthermore, old baby Swiss mice were inoculated with 0.1 ml intraperitoneally from the mixture of FMDV different types and different concentration of zeolite. After 48 h post inoculation, all the baby mice examined to evaluate the antiviral action of zeolite. The result showed that the concentrations of 10 and 20 µg / ml of zeolite little or no antiviral effect was observed at all, while concentrations of 30 to 50 µg/ ml of zeolite had no cytotoxicity effect on cells also revealed 100 % reduction in the virus infectivity. The antiviral effect of zeolite seems to be non-specific and is more likely based on the incorporation of viral particles into pores of zeolite aggregates than ion exchange properties of zeolite. This study confirmed the biological activity of zeolite against FMDV Types O, A, and SAT2 and BEFV. From the results, zeolite could be useful as antiviral lead to limitation of infection.

**THE PROTECTIVE AND THERAPEUTIC ROLE OF MESALAZINE AS
OSTEOPONTIN INHIBITOR IN EXPERIMENTALLY INDUCED-LIVER
FIBROSIS IN RATS.**

**Ramadan, A. ¹, Nehal Afify¹, Nemat Z. Yassin², Rehab F. Abdel-Rahman^{2*},
Sahar S. Abd El-Rahman ³ and Hany M.Fayed²**

¹ Pharmacology Department, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt. ² Pharmacology Departments, National Research Centre, Giza, Egypt. ³ Pathology Department, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt

ABSTRACT

Liver fibrosis is a major health issue leading to high morbidity and mortality. Liver fibrosis induced by thioacetamide (TAA) is a well-established animal model. It is assumed that the development of hepatic fibrosis is an imbalance between the deposition and removal of extracellular matrix (ECM). The current study aimed at evaluating the potential anti-fibrotic activity of mesalazine, an anti-inflammatory drug, against TAA-induced liver fibrosis in rats. This mechanistic study focused on investigating the effect of mesalazine on osteopontin (OPN), an ECM component. For this purpose, fifty-six adult male Wistar rats were divided into two major groups; each group was further divided into 4 subgroups. The 1st group was assigned for the hepato-protective study in which animals were allocated as normal control, fibrotic control and mesalazine (50 and 100 mg/kg, orally for 4 weeks). All animals, except the normal control, were injected i.p. with freshly prepared TAA (200 mg/kg) twice weekly for 6 consecutive weeks and mesalazine was concomitantly administered to rats with TAA. The 2nd group was designated for the hepato-therapeutic study in which animals were allocated as previously described in the protective study. Rats were i.p. injected with TAA twice weekly for 6 successive weeks then daily oral dose of mesalazine (50 and 100 mg/kg) daily for another 6 weeks in the two mesalazine groups. In both studies, mesalazine administration improved serum

biomarkers by decreasing serum levels of AST, ALT and total bilirubin when compared to TAA-intoxicated group. Our results demonstrate significant increase in total protein and albumin levels in mesalazine administered rats. Mesalazine significantly decreased hepatic MDA level and counteracted the depletion of hepatic GSH content and SOD activity. It also limited the elevation of OPN and TGF- β 1 concentrations and suppressed TNF- α and α -SMA levels in liver homogenate. Immuno-histochemical evaluation of liver sections revealed suppression in the expression of both α -SMA and caspase-3 in mesalazine treated rats. In conclusion, mesalazine could have a potential new indication as anti-fibrotic agent through limiting the oxidative damage and altering TNF- α pathway as an anti-inflammatory drug with down-regulating TGF- β 1, OPN, α -SMA and caspase-3 signaling pathways.

Key words: Liver fibrosis; thioacetamide; osteopontin; mesalazine.

