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Abstracts

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3rd International Workshop on Dairy Science Park

(November 16-18, IW-DSP-2015)

Venue: The University of Agriculture Peshawar-25120, Pakistan

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ABSTRACTS

ANIMAL HEALTH AND TECHNOLOGY (AH)

AH-1

GENETIC MAKEUP OF *GRASS CARPS* IN REVRINE POPULATIONS OF PUNJAB PAKISTAN

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ABSTRACT

The present research work was conducted to determine the level of genetic diversity in selected populations of grass carp in the Punjab province. The sampling locations included Head Baloki, Head Trimu, Taunsa Barrage, Head Punjnad and Chashma Barrage. Total 120 samples of grass carp were randomly collected averaging 24 samples from each population. For the estimation of genetic diversity and population structure genomic DNA was isolated by phenol chloroform protocol. The quality of DNA was confirmed by 0.8% agarose gel and quanity was determined by spectrophotometer. PCR was performed to amplify the target microsatellite loci. Amplicons were separated on PAGE and to visualize the bands in gel documentation chamber for genotyping silver staining method was used. Different parameters including allelic frequency, observed hetrozygosity and expected hetrozygosity were measured. Various parameters such as allelic size, allelic frequency, observed hetrozygosity and expected hetrozygosity was determined by using different soft ware such as UPGMA, TFPGA. Maximum heterozygosity was seen in TH, HP and TB population. Observed hetrozygosity and expected hetrozygosity ranges were 0.321-0.493 and 0.362-0.490, respectively. FST value showed that there were slight variations in all five populations. AMOVA analysis showed that genetic differentiation was non significant among populations while 100% variation was observed within population. The values of variance among sampling groups and within populations were 2.73% and 97.27%, respectively. In UPGMA dendrogram two clusters were formed indicating high variation between geographic and genetic distance. The genetic distance in different populations was ranged from 0.0651-0.5118. GENEPOP software was used to find the relationship among genetic distance and geographical distance. The results represent moderate level of genetic distance in all these populations although all were brought from different geographical location.

KEY WORDS: Genetic diversity, population structure, genomic DNA, grass carps, Punjab

AH-2

RATIONAL USE OF ANTIBIOTICS IN NANGARHAR CENTRAL ANIMAL CLINIC.

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ABSTRACT

The study was conducted in Nangarhar central animal clinic for the period of one year total of 11511 deferent animals where 3080 in animals (Cow 40,77%, calf 16,03%, Sheep,32,33% goat,7,98% hores,1,17%, donkey1,3% dog 0,11%) antibiotics were used. The total amount of antibiotic used was 7514 grams based on active ingredient which contain tetracycline's62, 89%; penicillin's 19, 52% (benzyl penicilline16,77, ampicilline 1, 30, amoxacilline,1,29) Aminoglycosides 18,924%(streptomycin 14,054, Gentamycin2,541,neomycine 2,32) avermectines0,759%. Tylosin 1, 44% . Each vet doctor used 1787 gr antibiotic and in 90 percent cases single antibiotic is used while in 10 % double antibiotic was used but no triple use is seen during the study. Rout vise 90% antibiotics was used through parenteral rout where no attention is given to drug residue and environmental related issues. The main disease except contagious disease, for which antibiotics used, were babesia, thelieria, anaplasmosis, mastitis, pneumonia, metritis, abscess, arthritis, laminitis, actinomycosis, while just theliaria and babesia diagnosis was based on laboratory blood smear, the base for others was clinical signs and high temperature. The dose commonly for tetracycline's was 20 % higher than max label dose. Even though in most cases the use of antibiotics was irrational but from public health point it is not critical in general, In comprising findings with data from a poultry diagnostic center (PDC) the use of antibiotics in (PDC) is critical from public health and veterinary aspects.

KEY WORDS: Antibiotics, Vet Clinics, Afghanistan

AH-3

HISTOMORPHOLOGICAL STUDIES ON THE SPERMATOGENSIS OF *Pipistrellus kuhlii* CAPTURED FROM FAIASLABAD

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ABSTRACT

The present study was conducted to investigate the actual annular reproductive cycle. A group of 12 bat species of P.kuhlii were captured from five different areas of Faisalabad during different season from August 2012-March 2013. After capturing morphometric measurements of each bat was taken with the help of digital Vernier's caliper. Morphometric measurements of each bat were made by digital Vernier caliper. Histometric measurements were made by image J®. One way ANOVA and Fischer LSD revealed that morphological parameters (testis weight, body weight and position of testis) and histological parameters (length of testis, width of testis, length of seminiferous tubules, width of seminiferous tubules, lumen area of seminiferous tubules) showed lowest values of all parameters except

lumen area, from December to February, which was non spermatogenic period. In August, parameters showed low spermatogenic activity. In October all parameters were at their maximum value and showed the peak spermatogenic activity. Values showed gradual gradually increase during low spermatogenic phase. Maximum values were observed in peak spermatogenic phase, except area of lumen which was almost filled in peak phase. Results from morphometric and histometric analysis showed that the non spermatogenic period of male S. heathii was Feburary and March, low period September and October, peak spermatogenic period was observed in November.

KEY WORDS: histomorphometry, testes, spermatogenesis, bats, Pipistrellus kuhlii,

AH-4

EFFECTS OF NATURAL ENVIRONMENT CONDITIONS ON REPRODUCTIVE HISTO-MORPHOMETRIC DYNAMICS OF MALE DROMEDARY CAMEL

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ABSTRACT

The present study was carried out to establish the effects of natural environments on the reproductive organs of 24 clinically healthy male dromedary camels. These were 4-7 years old and the seasons were: winter, spring, summer and autumn. Gross parameters including weight, length, width, thickness, circumference and volume were measured. Tissues were prepared by paraffin tissue technique and stained with H&E. The percentage areas of interstitial tissue and seminiferous tubules were measured from testicular sections captured by Nikon optiphot 2 microscope at 100X using AutoCAD®. The diameter of the seminiferous tubules was determined at 400X with the help of micrometer. The remaining microscopic measurements i.e. epithelium height, thickness of muscular wall of all organs and diameter of secretory units of accessory glands were done with help of micrometer. Statistical analysis revealed that 16 out of 29 studied parameters (thickness, circumference and weight of testes; diameter of seminiferous tubules; percentage area of testicular interstitial tissue; epithelial height and lumen of epididymis; thickness, width, epithelial height of prostate gland and diameter of its secretory end-pieces; width, epithelial height of bulbo-urethral gland and diameter of its secretory end-pieces) showed significantly higher values in Winter and Spring seasons except weight of prostate and bulbo-urethral glands which were excelled in Summer and Autumn. The results of present study give a clear indication that season has a marked influence on morphology of male reproductive system of one-humped camel and hence, the reproduction in dromedaries affected by season.

KEY WORDS: reproductive organs, environment, histomorphometry, dromedaries

AH-5

RISK FACTORS ASSOCIATED WITH *MYCOBACTERIUM BOVIS* SKIN POSITIVITY IN CATTLE AND BUFFALO IN PESHAWAR, PAKISTAN

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ABSTRACT

A cross-sectional study was carried out to determine the prevalence of bovine tuberculosis and associated risk factors in cattle and buffalo in Peshawar, Pakistan. Cattle and buffalo randomly selected from all the four towns of District Peshawar were screened for bovine tuberculosis using comparative cervical intradermal tuberculin test (CCIT). Data about risk factors were collected from the animal handlers by face to face interview through predesigned questionnaire. Multivariable logistic regression models were used to measure association between risk factors and comparative cervical intradermal tuberculin reactors. A total of 556 cattle and buffalo were screened for bovine tuberculosis. Out of 556 animals screened, 5.75% (32/556) were found positive. The prevalence was higher in old animals ($P< 0.05$) as compared to younger animals. Prevalence also varied with source of animal (either raised on the farm or purchased), stay of the animals at night (indoor or outdoor) and herd size. Farmers knowledge about transmission of TB from animals to human as well as signs and symptoms of TB was extremely low. Only 3.6% farmers correctly stated the combination of three major symptoms of TB. The results of the study warrant immediate intervention for control of bTB in animals as well as its transmission to human population. Furthermore it is suggested to emphasize on local epidemiology of bTB and husbandry practices of cattle and buffalo during the control program.

KEY WORDS: Bovine tuberculosis, cattle, buffalo, prevalence, risk factors

AH-6

INFLUENCE OF GINKGO BILOBA ON THE BIRTH WEIGHT AND RENAL GENESIS OF NEONATAL KIDNEYS IN ALBINO RAT-A HISTOMORPHOMETRIC STUDY

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ABSTRACT

The present study was conducted evaluate the influence of Ginkgo biloba, a Chinese herbal neutracuetical, on the birth weight and renal genesis by observing histomorphometric characteristics of neonatal kidneys. A total of twenty eight adult pregnant females albino rats were divided into four groups A, B, C and D. Each group contained seven pregnant females. Ginkgo biloba was administered via oral gavage at the rate of 3, 5, 7 and 14 mg/kg/day in a single dose to group A, B and C, respectively while group D served as control which received 1ml of water instead of medicine. The medicine is administered from 8th to 20th day of gestation, in addition to the food and water ad-libitum. Neonates were collected immediately after delivery on the day 1, weighed and inspected for any gross congenital malformations. The morphological parameters like crown rump length, head circumference and abdominal circumference were measured by measuring tape. After euthanasia, neonates were dissected; isolated kidneys were fixed in NBF. After collection of all the samples, morphological and histometric parameters of neonatal kidneys were observed with the help of image analysis system Image J®. Group-wise comparison of maternal parameters like weight gain in pregnancy, daily water and food intake and any locomotors changes revealed no significant change. No maternal death or sign of toxicity observed. Group wise comparison of neonates' revealed significant decrease in the birth weight, crown rump length and head circumference

in the neonates of mothers treated with 7 and 14mg/kg/day. No gross congenital malformations were observed. Among the neonatal organs, an increase was seen in neonatal kidneys absolute weight in Gb 7 and 14mg/kg/day treated group. The values of histometrical parameters studied viz., cortical and medullary thickness, diameter of Bowman's capsules and glomeruli were found significantly different in dose dependent manner.

KEY WORDS: Ginko biloba, renal genesis, birth weight, histomorphometry, albino rats

AH-7

SELECTION OF DAIRY CATTLE AGAINST MASTITIS USING CANDIDATE GENE APPROACH

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ABSTRACT

Mastitis is the most common inflammatory disease of dairy cattle characterized by physical and chemical changes in the milk and pathological changes in the mammary gland. Somatic cell count (SCC) is a useful indicator of udder health and has highly positive genetic correlation (r_g=0.84) with clinical mastitis. Lymphocyte-activation gene-3 (*LAG-3*) is located on bovine chromosome 5 and plays crucial role in inflammatory condition. The genetic effects of single nucleotide polymorphisms (SNPs) in *LAG-3* gene were investigated on some serum cytokines and mastitis indicator traits in a population of 268 Chinese Holstein cattle. Pooled DNA sequencing revealed three novel SNPs including one (SNP 1) in exon 4 and two (SNP 2 and SNP 3) in 3' flanking region of *LAG-3*. Fixed effect model considering the effects of SNPs, parity, herd, season and year of calving was used by general linear model (GLM) procedure of SAS 9.1. Genotypic frequencies of these SNPs in the population were in Hardy–Weinberg Equilibrium (HWE) (P>0.05). SNP in exon 4 was missense that was predicted to cause amino acid substitution from threonine to proline. The results of association study showed that SNP2 was significantly associated with SCC, whereas, SNP3 was significantly associated with SCC, SCS and IL-10 (P<0.05). The combination of SNP2 and SNP3 showed significant effect on SCC and SCS (P<0.05). As for mRNA expression analysis, the homozygous wild type genotype in SNP3 showed higher expression level and were significantly different from the heterozygous genotype (P<0.05). The results imply that *LAG-3* gene can be considered as useful candidate gene, and the identified polymorphisms could be potentially strong genetic markers to select dairy cattle for genetic resistance against mastitis. Thus improving the host genetics eventually can minimize the public health hazards associated with mastitis.

KEY WORDS: *LAG-3* gene, single nucleotide polymorphism, mRNA expression, mastitis resistance

AH-8

INSULIN-LIKE GROWTH FACTOR-1 REGULATES THE EXPRESSION OF LUTEINIZING HORMONE RECEPTORS AND STEROID PRODUCTION IN BOVINE GRANULOSA CELLS

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ABSTRACT

Luteinizing hormone (LH) plays important roles in follicular maturation, ovulation and corpus luteum formation. Recent *in vivo* findings suggest that LH actions are also critical for the continuous growth and selection of a dominant preovulatory follicle. The effects of LH are mediated by LH receptor (*LHR*) in theca and granulosa cells (GCs). However, the factors that regulate the *LHR* in bovine GCs are not well known. *In vivo* studies have shown that insulin-like growth factor-1 (IGF-1) plays critical roles in the selection of the dominant follicle, which occurs as a result of difference in the growth rates between the first and second largest follicles. The hypothesis of the present study was that IGF-1 increases the expression of *LHR* in GCs of healthy growing follicles to acquire ovulatory capacity. To test the above hypothesis, we determined (1) mRNA expression of *LHR* in the GCs of developing follicles between days 1 and 4 post-ovulation, (2) the effects of IGF-1 on *LHR* mRNA expression in cultured GCs collected from small (6< mm Ø) and large (≥9 mm Ø) follicles, and (3) the effects of IGF-1 on estradiol (E2), progesterone (P4) and androstenedione (A4) production by cultured GCs. In experiment 1, mRNA expression of *LHR* in GCs obtained the three largest follicles from each pair of ovaries were examined. Small follicles (<6 mm Ø) expressed lower levels of *LHR* than mid-sized follicles (6 to 8 mm Ø) and large follicles (≥9 mm Ø) expressed the highest level of *LHR* mRNA ($P<0.05$; ANOVA). In experiment 2, GCs collected from small and large follicles were cultured with IGF-1 (0.1~100 ng/mL) for 24 h. IGF-1 increased the expression of *LHR* mRNA in GCs from both small and large follicles at concentrations of 100 ng/mL and 1 ng/mL, respectively ($P<0.05$). In experiment 3, GCs collected from small or large follicles were cultured with IGF-1 alone (0.1 ~ 100 ng/mL) or in combination with LH (0.1 and 1 ng/mL) for 24 h. 100 ng/mL LH increased P4, A4 and E2 in GCs from large follicles ($P<0.05$). LH (100 ng/mL) increased E2 and A4 ($P<0.05$) but did not increase P4 in small follicle GCs. IGF-1 (100 ng/mL) increased P4 and A4 ($P<0.05$) but did not affect E2 production in large follicles, and increased E2 and A4 ($P<0.05$) but not P4 in small follicles. IGF-1 (0.1 and 1 ng/mL) in combination with LH (0.1 and 1 ng/mL) increased P4 and A4 in large follicle and E2 and A4 ($P<0.05$) in small follicle GCs. Overall findings support the hypothesis that IGF-1 up-regulates *LHR* in GCs, which is crucial for developing follicles to become dominant and to acquire ovulatory capacity.

KEY WORDS: Insulin-like growth factors, LH, Bovine

AH-9

PREVALENCE OF ANAPLASMOSIS IN SMALL RUMINANTS: AN OVERVIEW

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ABSTRACT

Anaplasmosis (rickettsial parasitic disease), particularly in small ruminants is increasing worldwide at higher prevalence rate. *Anaplasma ovis* and *Anaplasmosis phagocytophilum* (*Anaplasmatecae*: obligate, intraerythrocytic rickettsial parasite) are responsible for disease onset. Presence of a variety of biological vectors including ticks, mosquitoes, flies along with favorable environmental attributes are playing an inevitable role in disease prevalence. Prevalence data of *Anaplasmosis* from tropical and subtropical countries represents a devastating situation. Anaplasmosis presence around the globe with percentage prevalence ranges from 0.80% to 62.5%. Giemsa staining, card agglutination test (CAT), competitive ELISA, indirect florescent assay (IFA) and polymerase chain reaction (PCR) have been used around the globe for the diagnosis of disease in small ruminants. Along with worldwide population of 1602.3 million, small ruminants sharing 57% of the total population in Pakistan are being encountered by Anaplasmosis. This presentation is aimed to have a deep look on the prevalence and to find the gapes in the diagnosis track along with future challenges in the disease distribution in Pakistan.

KEY WORDS: *Anaplasmosis*, intraerythrocytic parasite, rickettsial parasitic disease, prevalence

AH-10

DETECTION OF *CAMPYLOBACTER* SPECIES BY REAL TIME PCR FROM MEAT SOURCES IN PAKISTAN.

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ABSTRACT

Thermo-tolerant *Campylobacter* is one of the most well-known causes of food borne diseases in humans worldwide. The digestive tract of all warm blooded animals is a significant reservoir for these bacteria resulting in huge economic losses to any country because of restrictions in international trade of meat and meat products. A total of 600 meat samples (200 samples each from beef, mutton, and poultry) were collected through convenience sampling from 10 administrative towns of District Lahore during September 2014 to January 2015. *Campylobacter* species were isolated according to ISO 10272-1:2006 (E) followed by DNA extraction, quantification and identification up to the species level by real time PCR. A total of 125 meat samples (20.8%) were positive for *Campylobacter* species. The prevalence of *Campylobacter* in beef was 15.5% (31/200), in mutton 18% (36/200) and in poultry 29% (58/200). *Campylobacter jejuni* was more frequently isolated than *C. coli* with isolation rates of 74.4% and 25.6%, respectively. Higher prevalence was observed in warm month of September 2015 while there was low prevalence in January 2015. *Campylobacter* species are

circulating in meat sources in Lahore. The highest prevalence was recorded in chicken meat followed by mutton and beef, respectively. These results indicate that various control strategies need to be developed and strictly adapted to overcome this barrier in export of meat and meat products.

KEYWORDS: *Campylobacter*, thermo-tolerant, meat, Lahore, Pakistan.

AH-11

SEROPREVALENCE OF HUMAN BRUCELLOSIS IN KOHAT REGION, KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

This study was carried out at "Veterinary Research & Disease Investigation Centre Kohat from January, 2014 to December, 2014. Serum was collected from a total of 106 patients referred through KDA hospital Kohat. Total positive and negative as well as male to female distribution of Brucellosis was observed during this study. Total of 21 samples out of 106 samples (19.81%) were found reactive during this study. As for as male to female distribution of Brucellosis is concerned, blood samples from males were found 10.86% (05 samples out of 46) seropositive and from females 26.66% samples (16 out of 60 samples) were found seropositive respectively.

KEYWORDS: Brucellosis, Kohat, prevalence

AH-12

PHYSIOLOGICAL AND BIOCHEMICAL EFFECTS OF ELECTROACUPUNCTURE COMBINED WITH INTRAMUSCULAR ADMINISTRATION OF DEXMEDETOMIDINE TO PROVIDE ANALGESIA IN GOATS

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ABSTRACT

To investigate the physiological and biochemical effects of electroacupuncture (EA) combined with dexmedetomidine (dex) administration in goats. Goats (30 female) were randomly allotted to five groups: EA, two doses of dex (5 and 20 µg/kg, IM), EA plus dex (5 µg/kg, IM) and control. The pain threshold, cardiorespiratory effects, rectal temperature, and hematological and biochemical parameters were assessed. Dexmedetomidine (20 µg/kg) increased the pain threshold and decreased the heart rate, respiratory rate and rectal temperature. The pain threshold in goats undergoing EA plus dex (5 µg/kg) was higher compared to goats receiving EA alone at 30 minutes or dex (5 µg/kg) at 30 or 60 minutes, but did not differ from goats receiving dex (20 µg/kg). The heart rate in goats receiving EA plus

dex (5 µg/kg) was higher compared to goats dex (20 µg/kg) at 30 to 60 minutes; the respiratory rate in the former group was higher compared to the latter group at 10 to 60 minutes. EA plus dex (5 µg/kg) did not affect the rectal temperature. The serum glucose concentrations in goats treated with EA plus dex (5 µg/kg) were increased compared to treatment with dex (5 µg/kg) alone at 30 or 60 minutes, but not with goats receiving (20 µg/kg). The concentrations of BUN and CR, the activities of ALT and AST, and the hematological parameters of all treated goats did not change. Electroacupuncture in combination with a low dose of dex can be safely used in goats for antinociception.

KEY WORDS: Electropuncture, Physiology, Biochemistry, goats

AH-13

EPIZOOTIOLOGY AND CONTROL OF SMALL RUMINANT FASCIOLOSIS: A GLOBAL SCENARIO

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ABSTRACT

Fasciolosis is a plant-borne trematode infection of sheep, distributed round the globe and having huge economic significance in livestock. It is caused by *Fasciola (F.) hepatica and F. gigantica*. The mechanical injuries by extensive migration of juveniles to the liver, the prediction site of *Fasciola* and the most damaged organ, and the bile duct endothelium lead to haemorrhages and eventually death of hosts. Clinical signs are determined by severity of infection, nutritional plan, individual host species, and breed. The diversity of fasciolosis is variable in different continents of the world; however, strongly associated with the ecology of snails, which act as intermediate hosts of these parasites. Factors which can influence the frequency distribution of fasciolosis include age, sex, breed, husbandry management practices etc. In Pakistan, the disease is well-settled in the water-logged niches of all the five provinces; however, it remained underreported. Factors like wet and humid environment are favorable for the propagation of parasites and/or their vectors in the indigenous habitats of Pakistan. Over the past decade, the increasing trend of this disease has been reported from various climatographs of the world, which warrants its wider spectrum in the future. This manuscript comprehensively reviews the distribution pattern, pathophysiology, probable risk factors and control strategies of fasciolosis in small ruminant population of the world, in general and Pakistan, in specific.

KEY WORDS: Epidemiology, Fasciolosis, Pathophysiology, Risk factors, Control strategies, Small ruminants.

AH-14

AN UPDATE ON GASTRO INTESTINAL PROTOZOAN INFECTIONS; A PERSISTENT THREAT FOR CALF RAISING

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ABSTRACT

Intestinal protozoan pose a serious health threat for growing calves globally. These including; *Giardia lamblia, Entamoeba histolytica,* and *Cryptosporidium parvum* are the main intestinal protozoan that affects calves during their early life. These protozoans gain entrance through faecal oral route. Unlike rest of the world, these intestinal protozoan has been reported from various part of the country with different prevalence rate e.g. 27.2% and 31.11% respectively for cryptosporidium and giardia whereas globally infection rate is up to 18-93%. Infected animals show persistent diarrhea, dehydration, weight loss, retarded growth and ultimately Death (in mixed infections). Simultaneously, personnels handling the calves are at great risk as these infections are zoonotic. Several factors including age, sex, gender, genetic and immunological response renders calf more vulnerable to intestinal protozoan infections. High rate of infection can be attributed to poor faming conditions, breed susceptibility, geoclimatic conditions, improper diagnosis, poor feeding practices and lack of awareness. Purpose of this presentation is to share the current global and indigenous situation of intestinal protozoan in calf. There is need of planning surveillance studies at country levels in order to jot down the possible contributory factors of these intestinal protozoans. Further, education of farmers and producers through application of participatory epidemiological tools is need of the time.

KEY WORDS: Intestinal protozoan, calf rearing, cryptosporidium, giardia, associated risk factors

AH-15

COMPARATIVE STUDY OF HARNESS RELATED WOUNDS IN EQUINES WORKING IN BRICK KILN VIS-À-VIS TO THOSE WORKING IN OTHER TRADES. (II) ROLE OF AWARENESS AND OTHER INTERVENTIONS TO DECREASE THESE HARNESS WOUND

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ABSTRACT

The prevalence of harness wounds in equines working in Brick kilns (BKC) and to compare them with harness related wounds in equines working in other trade (TGC). Study describe association between owner knowledge (KAP) and approach in wounds treatment and prevention and also establishing baseline. Equines randomly selected were clinically examined and assessed. Owners were interviewed about harness management, wound management and about saddlers. The study was conducted at catchment area of 10 Brick kilns and city (working places) in Lahore. The study population comprised n=220 equines of

either sex and all ages. The population was divided into 2 Groups. Group-I: n=110 are equines working in Brick Kiln (BKC) and Group-II: n=110 are equines working at working places (TGC). Wounds were numbered on their sites and scored according to their severity. Sample was randomly selected. Clinical examination tool was used in wounds numbering and Sites in equines. Questionnaires were used to gather data from owner. Owners were interviewed at catchment area of 10 Brick kilns and Lahore city (working places). Clinical examination showed an overall harness wound prevalence of 27.7% (n=61/220). The prevalence of harness wounds in Group-1 (33.6%). The prevalence of harness wounds in Group-II (21.8%). The most common site was withers and girth gall respectively. Equids working in the Brick kilns study population were at possibility of increasing harness wounds. 220 owners were interviewed. Owners had variable knowledge on equine basic management practices and frequency of visits to saddlers. Finding could be used in working equines with the aim of better informing preventative animal welfare project planning and implementation.
KEY WORDS: Harness, wounds, equine

AH-16

THE INCIDENCE OF THE TICK BORNE HEAMOPROTOZOAN DISEASES IN CROSSBRED CATTLE IN AND AROUND PESHAWAR

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ABSTRACT

The current study reported the prevalence of heamoprotozoan diseases in crossbred cattle in and around Peshawar that has been evaluated using the blood samples. Result demonstrated high incidence of blood protozoan diseases in August and September whereaslow incidence was observed in December, January and February respectively. These results indicated the strong association of the blood parasites with high temperature and humidity. During current investigation, 24% were harboring Babesia, theileria and Anaplasma species Theblood protozoan identified were Babesia bovis 4.55%,Babesia bijmena 5.85,T.parva 5.19,T.annulata 2.92%,A.marginale 1.62 % and A.centrala. The mixed infection were also recorded; A.marginale with A centrala ; B.bovis with T.parva; and T.annulata with A.centrala . From the current study it is evident that Babesiosis and Theileriosis were prevalent over anaplsmosis in cross bred cattle. This study and similar studies on tick borne diseases in cross bred cattle would be useful in planning the control strategy of these diseases from the region.
KEY WORDS: Ticks borne diseases, cattle, Peshawar

AH-17

EVALUATION OF ANTIBACTERIAL ACTIVITY OF MACROLIDES IN COMBINATION WITH LEVAMISOLE HCL AGAINST DIFFERENT PATHOGENIC BACTERIA

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ABSTRACT

Antibiotics have enormous victory in treatment as well as decreasing the number of pathogenic bacteria in humans and animals. In dealing with some particular bacterial pathogens, the antibiotic resistance has been observed to be more common as only a few therapeutic alternatives are available in such cases. Moreover, pan-resistant strains are also showing up. An *invitro* study was designed to evaluate the antibacterial activity of Azithromycin, Clarithromycin, Erythromycin, Tylosin, and Tilmicosin alone and in combination with Levamisole HCI against different pathogenic bacteria (*K. pneumoniae, P. multocida and S. aureus)*. Antibiotic sensitivity test was performed on pure culture of *K. pneumoniae, P. multocida* and *S. aureus* by disc diffusion method. Isolates resistant to antibiotics were further tested for susceptibility in the presence of different concentrations of Levamisole HCl by broth dilution method. Standard concentration of antibiotic agents and different concentrations of Levamisole were used. Minimu Inhibitory Concentration (MIC) of Azithromycin, Clarithromycin, Erythromycin, Tylosin and Tilmicosin against *K.pneumonia* was 32mcg, 1024mcg, 512mcg, 128mcg and 16mcg respectively. While MIC of Azithrornycin, Clarithromycin, Erythromycin, Tylosin and Tilmicosin against *P. multocida* was 128mcg, 128mcg, 64mcg, 32mcg and 64mcg and against *S. aureus,* it was 32mcg, 64mcg, 64mcg, 32mcg, 32mcg respectively. So Tilmicosin along with Levamisole having MIC 16mcg against *K.pneumonia*, Tylosin with levamisole having MIC 32mcg against *P. multocida* and Azithromycin, Tylosin and Tilmicosin in combination with levamisole having MIC 32mcg against *S. aureus* are best combinations to reverse the resistance against these pathogenic bacteria.

KEY WORDS: Macrolides, Levamisole HCl, Antibacterial activity, Resistance

AH-18

FREQUENCY DISTRIBUTION OF GASTROINTESTINAL PARASITES OF GRAZING SHEEP (OVIS ARIES) IN DISTRICT SIALKOT, PUNJAB, PAKISTAN

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ABSTRACT

Parasitic infections, prevalent all over the world are major constraints to animal production which cause huge economic loss (either direct or indirect), especially in developing countries like Pakistan. But still distribution and effect of gastro-intestinal (GI) parasites in sheep of Pakistan is not very well studied. To this end, a cross-sectional study was conducted during autumn 2014 on 384 randomly grazing sheep in Sialkot district, Punjab, Pakistan with the

objectives of determining the major type along with the prevalence and the degree (Severity) of GI parasites. Faecal samples collected from the rectum of sheep were subjected to floatation and sedimentation and McMaster egg counting techniques. The study found that the overall prevalence of GI parasites in study district was 32.55%. Prevalence of GI parasites was found to be significantly higher ($P<0.05$) in ewes than rams, however, there was no significant difference ($P>0.05$) in the prevalence of GI parasites between age and breed. Different types of helminth parasites with prevalence of 23.44% Haemonchus contortus, 18.23% Eimeria crandallis, . 12.24% Trichostrongylus sp., 7.55% Gongylonema pulchrum, 5.21% Fasciola (F.) gigantica and 3.13% F. hepatica were recorded. The degree (Severity) of GI helminth infection was also determined from the total faecal egg count. Results of the present study indicate that sheep of different age and breed are equally significant for GI parasites. Awareness creations to the farmers, the systematic testing and use of traditional plants and their remedies might be a general means of reducing GI infection.

KEYWORDS: Coprological examination, Sheep, Gastro-intestinal parasites, Prevalence, Sialkot, Pakistan

AH-19

ANTIBACTERIAL ACTIVITY OF LEAF EXTRACTS OF *AZADIRACHTA INDICA* (NEEM) AGAINST *MYCOPLASMA PUTREFACIENS*

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ABSTRACT

Respiratory diseases in sheep and goat is the major problems of livestock sector which is mostly associated with mycoplasma species including *Mycoplasma putrefaciens,* which is responsible for urogenital, skeletal and respiratory complications. The present study was conducted to screen and evaluate antimicrobial activity of leaf extracts of *Azadirachta indica.* A total of 40 PCR conformed local isolates of *Mycoplasma putrefaciens* were used in this study. The crude methanolic extract of *A. indica* was tested as a well diffusion assay and micro broth dilution method for determination of zone of inhibition and minimum inhibitory concentration (MIC). Results showed that leaf extract exhibited significant antimycoplasmal activity with zone of inhibition 8±01 mm in well diffusion at 20 mg, while the MIC was 02±0.03 mg by micro broth dilution methods against all isolates. The results revealed that leaf extracts of *A. indica* exhibited dose dependent significant antibacterial activity against all the tested isolates. In future bioassay guided fractionation of this extract can lead to isolation of new drug molecules for control of Mycoplasmosis.

KEY WORDS: *Azadirachta indica*, methanol, *mycoplasma putrefaciens,* well diffusion

AH-20

ANTIMYCOPLASMAL ACTIVITY OF *CALOTROPIS PROCERA* AGAINST LOCAL ISOLATES OF *MYCOPLASMA MYCOIDES SUB SPECIE CAPRI* IN KHYBER PAKHTUN KHWA, PAKISTAN.

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ABSTRACT

Mycoplasmosis is important respiratory disease of small ruminant, causing heavy economic losses throughout the country, especially in Northern and southern regions of Pakistan. The present study was conducted in three different zones consisted of Northern, Central and Southern zones of Khyber PakhtunKhwa for the isolation, molecular identification and chemotherapeutic trails against PCR conform isolates of mycoplasma *species*. Among several pathogenic species *mycoplasma mycoides capri* is one of important agent responsible for respiratory complications in small ruminant. *Calotropis procera* was tested against the PCR conformed local isolates of Mycoplasma mycoides *capri*. The methanolic crude extract was tested as gel diffusion assay and micro broth dilution method to determine minimum inhibitory concentration (MIC). The results revealed that the leaf methanolic extract exhibited strong antimycoplasmal activity by producing zone of inhibition 10, 8, and 4 mm at concentration of 30, 20, 10mg respectively, while no inhibition was observed at 05mg. The MIC for crude methanolic extract was 0.3±0.01 mg by micro broth dilution method. The present study has shown successful approach in the direction of new antimycoplasmal drug discovery from plant origin for Veterinary practices. The results also established a good support for the use of *C. procera* in folk medicine.

KEY WORDS: *Mycoplasma*, methanol, *Calotropis procera*, Antimycoplasmal activity.

AH-21

COMPARATIVE STUDY OF DNA EXTRACTION PROTOCOLS FOR MYCOPLASMA *SPECIES*

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ABSTRACT

Mycoplasma are smallest bacteria, belong to class the mollicultes with lowest DNA contents among prokaryotes. Mycoplasma is very difficultly grow in laboratory due to fastidious nature and growth requirements. It is important for PCR optimization to get good DNA concentration and purification. Different labs adopted several protocols for DNA extraction with variable success. The present study was carried out to evaluate different DNA extraction protocols i.e. through commercially available kit method, Trizol reagent method and direct

sonication method. A total of 30 Mycoplasma biochemically conformed cultures were extracted through commercially available kit, trizol reagent method and sonication. The extracted DNA was quantify by NanoDrop™ 1000 Spectrophotometer (Thermo Scientific) for concentration and purity. The Trizol method yield highest amount of DNA 480 ±25 ng/ µl, 185±22ng/µl and 105±17 ng/µl for kit method and sonication method respectively. A ratio of ~1.8 is generally accepted as "pure" for DNA. The ratio of absorbance 260/280 for purity was 1.71 for Trizol method followed by 1.42 and 1.18 for Kit method and Sonication respectively. The result obtained showed that Trizol reagent method was the best protocol for mycoplasma DNA extraction both for quantity and purity.

KEY WORDS: DNA, Trizol, Sonication, NanoDrop, *Mycoplasma*

AH-22

EXPLORATION OF CATSPER1 GENE POLYMORPHISM ASSOCIATED WITH SPERM MOTILITY AS A MEASURE OF BULL FERTILITY

Muhammad Muaaz Aslam

Abstract

Bull fertility is the crucial factor which determines the reproductive efficiency of animals in herd. Quality of sperm in AI straws is important to have better fertility ratios. *Catsper*1 gene spans 8340 base pairs (45817393 to 45809053) on chromosome 19 having 11exons and 10 introns and is vital for sperm motility. *Catsper*1 gene ensures the hyperactivation and capacitation of sperm. It is hypothesized that *Catsper*1 gene may have genetic association with semen quality traits and might be used as molecular marker. Frozen semen samples, from semen producing Nili Ravi buffalo bulls (n=50) were collected from Semen Production Unit (SPU) Qadirabad. Organic method was used for DNA extraction. PCR primers were designed by Primer3 software and amplification of gene was done by Polymerase Chain Reaction. PCR products were sequenced bi-directionally by Big Dye™ Terminator on ABI 3130XL Genetic analyzer. For sequence data analysis, Chromas Software was used with sequence-alignment program and multiple alignment algorithms provided in Clustal W program. Multiple sequence alignment was performed for polymorphism identification. The analysis and correlation of identified polymorphism was done by using SNPs data analysis software" SNPator". A total of 22 SNPs were identified in *Catsper*1 gene. Among these 22 SNPs 19 were found in coding region of *Catsper*1 gene and 3 were found in the intronic region. Bioinformatical analysis was performed to check the significance and association of these SNPs with the traits under study. Data manifests that among the identified 22 SNPs most of the SNPs lies in exon 1 and 4. Among 19 identified SNPs which are located in the exonic regions ten SNPs tends to cause non synonymous change in amino acid and rest of 8 cause synonymous change in amino acid. The findings of the study will be helpful in the selection of buffalo dairy bulls which are superior in sperm motility.

AH-23

IN VITRO ANTIMICROBIAL SUSCEPTIBILITY OF *MYCOPLASMA GALLISEPTICUM* LOCAL ISOLATES

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ABSTRACT

The present study was conducted to find out the most efficacious antimicrobial for the treatment of avian Mycoplasmosis. For this purpose 400 nasal and tracheal samples were collected from naturally infected broilers in District Peshawar. The samples were subjected to growth on specific PPLO broth and 49 % were found positive for *Mycoplasma gallisepticum*. Among the positive samples 39 samples were subjected to broth dilution and agar dilution tests for selection of the most effective antimicrobial among five commercially available antimicrobial agents i.e. Enrofloxacin, Tylosin, Gentamicin, Oxytetracycline and Sulphonamides. Drug sensitivity results showed that enrofloxacin was the most efficacious drug having Minimum Inhibitory Concentration (MIC) of 0.1±.03 µg/ml and maximum zone of inhibition 17±03 mm among the tested drugs followed by Sulphonamides with MIC of 0.2±.04 µg/ml and zone of inhibition of 15 ±02 mm. Tylosin, Oxytetracycline and Gentamicin were not sensitive against *Mycoplasma gallisepticum*. Enrofloxacin is the most effective antimicrobial agent for the treatment of the disease.

KEY WORDS: CRD, PPLO, MIC, Broth Dilution, Agar Dilution, *Mycoplasma gallisepticum*.

AH-24

HEMATOLOGICAL AND SEROLOGICAL PROFILE OF GOATS AFFECTED WITH CONTAGIOUS CAPRINE PLEUROPNEUMONIA IN NORTHERN DISTRICTS OF KHYBER PAKHTUNKHWA

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ABSTRACT

This study was conducted in two districts of Khyber Pakhtunkhwa including Swat and Buner. Total of thirty fresh blood samples and thirty serum samples were collected from goats suspected for caprine mycoplasmosis from each district and subjected to Hematological and Serological profile. The results showed that there was significant decrease in total erythrocyte count, packed cell volume and hemoglobin concentration. While significant increase in the Mean Corpuscular Hemoglobin (MCH) and Mean Corpuscular Volume (MCV) value was recorded. Blood biochemistry revealed that total serum protein and albumin were decreased significantly while there was significant increase in Serum Glutamic Pyruvate Transaminase (SGPT) and Globulin fraction of serum. Due to *Mycoplasma mycoides* subsp. *capri* infection hyperactive free radicals are produced which lead to lysis of erythrocytes causing anemia

which can be classified as macrocytic normochromic anemia on the basis of erythrocytic indices. Due to involvement of liver SGPT, total serum protein and albumin level are disturbed. The findings revealed that contagious caprine pleuropneumonia alter both hematological and serological parameters of blood.

KEY WORDS: Goat, Buner, Swat, Hematology, Serology, *Mycoplasma mycoides* subsp. *capri*,

AH-25

BIOCHEMICAL PROFILE OF ISOLATES OF MYCOPLASMA FROM FIELD OUTBREAK IN KHYBER PAKHTUNKHWA

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ABSTRACT

Contagious Caprine Pleuropneumonia (CCPP) is an infectious disease of goats throughout the world including Pakistan causing heavy losses. The aim of this study was to investigate the clinico-pathological picture of CCPP in the Northern zone of Khyber Pakhtunkhwa. For this purpose total of 300 samples, 150 each from district Buner and Swat were collected from goats clinically suspected for CCPP. For isolation of mycoplasma species, all samples were inoculated on Modified Hayflick's media and incubated at 37ºC for 48-72hrs under anaerobic condition (5% CO_2). Out of total samples, 31.3% and 21.3% cases were positive on broth media from district Buner and Swat respectively. All the positives samples on culture showed typical fried egg or nipple like colonies. The isolated mycoplasma was further subjected to biochemical and growth inhibition test for species and subspecies identification. On biochemical analysis all the isolates shows positive reaction for glucose fermentation test, Tetrazolium reduction test, serum digestion and casein hydrolysis test while none of them show positive reaction for arginine hydrolysis test. In Growth inhibition test all the isolates showed zone of inhibition 2±0.02mm on Modified Hayflick agar. The result revealed that *Mycoplasma mycoides* subsp. *Capri* is the prevalent species in the study areas.

KEY WORDS: CCPP, Northern zone, Biochemical tests, Growth inhibition test, *Mycoplasma mycoides* subsp. *Capri*

AH-26

ASSISTED REPRODUCTIVE TECHNIQUES (ARTS) IN WATER BUFFALO: APPLICATION OPPORTUNITIES AND LIMITATIONS

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ABSTRACT

Buffalo is a vital part of livestock production system in South and South-East Asia contributing enormously in rural economy. Application of Assisted Reproductive Techniques (ARTS) is the only way to cope up the limitations in bubaline reproduction *i.e.* delayed puberty, higher age at first calving, long post- partum anestrus period, long inter-calving period, poor detection of heat and low conception rate. Some of the ARTs have found

commercial application like Artificial Insemination (AI; hampered by difficulties in estrous detection), Multiple Ovulation and Embryo Transfer (MOET) and sex selection. *In vitro* fertilization (IVF), somatic cell nuclear transfer (SCNT), intra-cytoplasmic sperm injection (ICSI) and use of embryonic stem cells (ESCs) are those reproductive techniques which still remain a research tool and their commercial application is being hindered by their low efficiency reported in the literature. These alternative reproductive techniques are available not only for manipulation of reproductive processes but also proven to be powerful tools in bio-pharming. Launching pilot projects regarding these reproductive techniques, capacity building and further exploration for their commercialization is the way forward in efficient use of these modern reproductive techniques to boost production from buffalo-an integral part of Asian livestock resource.

Keywords: reproductive efficiency,sexed semen,nuclear transfer,stem cells

AH-27

STUDY ON QUALITY AND EFFICACY OF COMMERCIAL AMOXICILLIN AND COLISTIN PRODUCTS AGAINST LOCAL ISOLATES OF *E.COLI* AND *SALMONELLA* IN BROILERS

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ABSTRACT

This study was carried out to determine quality and efficacy of selective commercial brands of poultry antibiotics containing Amoxicillin (AMX) and Colistin (COL). Quality of the test drugs was evaluated through high performance liquid chromatography (HPLC) while the *in vitro* efficacy was assessed through broth dilution method and *in vivo* efficacy was determined in 1 week old broiler chicks challenged with *Escherichia coli* (E.coli) and *Salmonella gallinarum (S. gallinarum)*. HPLC analysis of the test drugs indicated that test drug B contained substandard level of the active ingredients i.e. 125% AMX and 88% COL. The *in vitro* results indicated that most of the drugs were significantly active against the pathogenic *E. coli* and *S. gallinarum* with MIC of 0.001mg.mL^{-1} except test drug C which had MIC of 0.01mg.mL^{-1} for *S. gallinarum*. The *in vivo* test results showed all test drugs significantly ($p<0.05$) reduced morbidity and mortality in the treatment groups. Histopathological examination revealed microscopic changes like vaculation, sloughing and congestion in birds treated with test drug B which was representative of the drugs toxicity. This study recommends that strict rules need to be implemented to counteract drug misuse and counterfeiting.

KEY WORDS: Poultry, Amoxicillin Trihydrate, Colistin Sulphate, HPLC, *in vitro*, *in vivo,* histopathology.

AH-28

EVALUATION OF SELECTED COMMERCIAL BRANDS OF AMPROLIUM AND TOLTRAZURIL THROUGH HPLC AND THEIR COMPARATIVE IN-VIVO ASSESSMENT IN BROILER CHICKENS

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ABSTRACT

The current study was performed to check the composition and effectiveness of selected commercial brands of amprolium and Toltrazuril. High Performance Liquid Chromatography (HPLC) analysis was performed to evaluate the selected anticoccidial drugs for their composition while different in-vivo tests were performed on 21 days old, 240 broiler chickens to check the efficacy of the selected drugs. The HPLC results showed that all the brands were of standard quality but the recovery percentage of the active drug was at the margin of rejection in some of the brands such as SB-Tolcox. Coccitech, Amprokail and Toltrabak brands were having lower than the mentioned quantity of active drug. For in-vivo study, the birds were divided in eight groups. Six groups were treated while two of them were control groups. All the drugs were effective against coccidiosis but none of them was able to control the infection within due time. It was concluded from the present study that substandard and counterfeit drugs are present in the market, which not only leads to economic losses but also development of resistance.

KEY WORDS: Amprolium, Toltrazuril, HPLC, Coccidiosis, Efficacy.

AH-29

STUDIES ON PREVALENCE, SEVERITY AND TREATMENT OF *BALANTIDIUM COLI* INFECTION IN BUFFALOES IN LAHORE, PAKISTAN

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ABSTRACT

This study was conducted to investigate the prevalence, severity and treatment of *Balantidium coli* infection in commercial dairy buffalo herds from peri-urban areas of Lahore., Pakistan. For prevalence and severity of *B. coli,* 250 buffaloes from 5 commercial dairy herds were examined coprologically. After recording data about each animal in "Data Capture Form" , fecal samples were collected directly from the rectum of each buffalo and examined through Direct Smear Method while severity of infection (OPG) was determined by modified McMaster Technique. For treatment, 30 buffaloes positive for *B. coli* (>600 OPG)

were divided into 5 groups of 6 (A-D). A 6th group F was comprised of 6 buffaloes negative for *B. coli.* The animals in group A were treated with Oxytetracycline at 8 mg/kg i.m. while group B was given Metronidazole at 25 mg/kg orally. The members in group C were administered combination of Tylosin tartrate, colistin sulphate and dimetridazole (Metrocol, injection) at 1ml/10 kg i.m. and buffaloes in group D were treated with Shahtra (*Fumaria indica*) at 35 mg/kg orally. All the treatments were continued for 3 consecutive days. Animals in group E served as positive control and group F as negative control. Fecal samples from buffaloes in each group were collected on day 0 (pre-treatment) and on days 3, 7, 14, and 21 (post-treatment) for OPG count. The efficacy of the drugs was calculated on the basis of reduction in OPG. The prevalence of *B. coli* was 42% (105/250) in buffaloes. Age-wise prevalence of *B. coli* was 30% (15/50), 41% (41/100) and 49% (49/100) in <2 years, 2-5 years and >5 years age groups, respectively. Oocyst excretion was non-significantly different (P>0.05) in different age groups. As the body condition score of buffaloes decreased the prevalence of *B. coli* increased with highest prevalence of 54% (27/50) in buffaloes having BCS 2.5. However, severity of infection (OPG) was non-significantly different (P>0.05) in buffaloes having different BCS. The buffaloes kept on muddy floor had high prevalence (50% (60/120)} compared to concrete floor {35% (45/130)}. Diarrheic buffaloes showed high prevalence of *B. coli* {56% (70/125)} than non-diarrheic buffaloes {35% (28/125)}. The oocyst shedding was also significantly higher (P<0.05) in diarrheic buffaloes than buffaloes passing normal feces. Season-wise prevalence of *B. coli* was 28% in winter, 56% in spring, 41% in summer and 38% in autumn. Moreover, season does not have any effect on the severity of *B. coli* infection. Lactating buffaloes had high prevalence (46%) compared to dry ones. Similarly, lactating buffaloes have significantly higher (P<0.05) oocyst excretion compared to dry buffaloes. Highest prevalence of *B. coli* was observed in grazing buffaloes (47%) followed by both stall feeding plus grazing (41%) and stall fed buffaloes (39%). However, feeding system did not has significant effect (P>0.05) on severity of *B. coli* infection. The OPG values in groups A-D were significantly reduced at day 21 compared to group E. The maximum efficacy was of Oxytetracycline (54%) followed by Metronidazole (44%), Shahthra (28%) and Metrocol (28%) at 21 days. It was concluded that *B. coli* was prevalent with different levels of severity and variable risk factors in dairy buffalo herds in Lahore. Oxytetracycline was more efficacious than Metronidazole, Shahtra or Metrocol to treat *B. coli* infection in buffaloes.

Keywords: *Balantidium coli*; buffaloes; severity; treatment; Lahore; Shahtra

AH-30

COMPARATIVE EFFICACY OF DIFFERENT NSAIDS AGAINST BOVINE EPHEMERAL FEVER

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ABSTRACT

This study was accomplished to investigate clinical, hematological and serum electrolyte picture, and to evaluate the comparative efficacy of 3 non-steroidal anti-inflammatory drugs (NSAIDs) against bovine ephemeral fever (BEF). Thirty dairy cows suffering from BEF were selected and randomly divided into three groups of 10 each (A, B, C). A 4th group (D) comprised of 10 healthy cows. BEF was diagnosed based on clinical signs of fever, off-feed, lameness, respiratory distress and drop in milk production. Animals in group A were treated with ketoprofen while cows in group B were given phenylbutazone. The member in group C

were administered meloxicam whereas the group D served as negative control. The treatment in all the groups was continued for 3 consecutive days. Clinical signs of BEF were observed before and after treatment. Blood and serum samples from individual cow in each group were collected at day 0 (pre-treatment) and then at days 3 and 7 (post-treatment). Clinical signs observed in naturally BEF infected cows were fever in 100 %, respiratory distress in 16.67%, off feed in 73.33%, lameness in 66.67%, drop in milk production in 90%, recumbency in 10% and death in 3.3% of the affected animals. Among 3 NSAIDs used in this study, meloxicam presented best results to ameliorate the overall clinical signs followed in order by ketoprofen and phenylbutazone. A significant difference ($P<0.05$) was observed in leucocyte count, lymphocytes and neutrophils in BEF affected cows than negative ones. Leukocytosis with 13.06×10^3 /µl, lymphopaenia with 3.55×10^3 /µl and neutrophillia with 8.92×10^3 /µl was seen in affected cattle on day 0. On serum analysis hypocalcaemia was observed in BEF infected cows. No significant changes were observed in the serum sodium, potassium and chloride levels. On the whole, hemogram and serum electrolyte alterations were reversed to normal range in cows of all groups within 3 days from the onset of signs. It was concluded that meloxicam is superior to ketoprofen and phenylbutazone in treating BEF, and BEF has detrimental effects on hemogram in cows.
KEY WORDS: meloxicam, phenylbutazone, ketoprofen, BEF, NSAIDs

AH-31

HAEMONCHOSIS: DYNAMIC DISPERSAL, TREATMENT AND EFFECT ON BLOOD PROFILE IN SMALL RUMINANTS

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ABSTRACT

This study was conducted to determine dynamic dispersal, treatment of *H. contortus* and its effect on blood profile of small ruminants in district Lodhran, Punjab, Pakistan. Out of total 646 animals, 30.03% (97/323) sheep and 25.07% (81/323) goats were found positive. The prevalence was found having positive ($P<0.05$) association with seasons and body condition score. A total of 60 infected animals (n = 30 for each sheep and goats) were divided into five groups A, B, C, D and E (n=6 for each group) for the analysis of efficacy trials and blood profile. They were treated with the combination of triclabendazole and levamisole (A), *Mallotus philippensis* (B) and *Fumaria indica* (C) whereas groups D and E were maintained as control positive (infected untreated) and control negative (uninfected untreated) respectively. Triclabendazole and levamisole combination was the most effective treatment in order followed by kamila (*Mallotus philippensis*) and shahtrah (*Fumaria indica*).The statistical analysis of blood profile showed significant ($P<0.05$) decrease in red blood cells, haemoglobin, pack cell volume, total serum protein concentration, serum albumin and significant ($P<0.05$) increase in eosinophil number and serum enzymes level in infected animals. In conclusion, *H. contortus* may be considered as endemic in study area.

KEYWORDS: Haemonchosis, treatment, hematology

POINT PREVALENCE AND HAEMATOLOGICAL STUDY OF ANAPLASMOSISAND COMPARATIVE EFFICACY OF COMBINATIONS OF OXYTETRACYCLINE WITH IMIDOCARB DIPROPIONATE, AND ENROFLOXACIN WITH IMIDOCARB DIPROPIONATE IN CATTLE

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ABSTRACT

In the present study, point prevalence, association of various risk factors and haematological alterations due to bovine anaplasmosis in Sahiwal and crossbred cattle of the district Faisalabad were studied. Moreover, efficacy of combinations Oxytetracycline with Imidocarb dipropionate and Enrofloxacin with Imidocarb dipropionate against *Anaplasma marginale* was determined. For this purpose, blood samples of three hundred and sixty nine cattle of 20 dairy farms, having at least 40 animals were collected. Detection of *Anaplasma marginale* was carried out by preparing Giemsa stained thin smears and PCR. Examination of Giemsa stain smears revealed that 10.84 % cattle were infected with *Anaplasma marginale* while 4.87% were infected with *Theileria* and 3.79% were infected with *Babesia*. Detection of *Anaplasma marginale* positive cases through PCR enhanced the prevalence of Anaplasma upto 15.17%. Among hypothesized risk factors, age, breed, frequency of acaricidal treatment, number of cleaning times, feeding system, floor pattern and hygienic measures were found significantly influencing the incidence of disease in cattle of district Faisalabad. While non-significant association was recorded between the incidence of disease and gender, herd size, farming system. Analysis of haematological profile of infected and healthy animals revealed that infection of *Anaplasma marginale* induced statistically significant reduction in RBC count, PCV, Hb, MCV and MCHC in infected cattle as compared to those of healthy animals. While non-significant association was found between WBC count and MCH of infected animals with the prevalence of disease in cattle of district Faisalabad. Infected animals were grouped into three groups of 15 animals each. Group I was administered with combination of Oxytetracycline and Imidocarb dipropionate and group II was administered with combination of Enrofloxacin and Imidocarb dipropionate while group III was infected non-treated control. The chemotherapy was continued for a week. It is conceivable that significantly higher efficacy was shown by combination of Oxytetracycline and Imidocarb dipropionate as compared to combination of Enrofloxacin and Imidocarb dipropionate.

KEY WORDS: Cattle, Anaplasmosis, Oxytetracycline, Enrofloxacin Imidocarb dipropionate, haematology , PCR

AH-33

SEQUENCE ANALYSIS OF DGAT1 GENE IN SEVEN DIFFERENT FARM ANIMALS

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ABSTRACT

Diacylglyceroltransferase is an important enzyme has a major role in glycerol lipid metabolism. This enzyme is encoded by diacylglycerol-o-acyltransfarse (DGAT) gene. This enzyme controls the synthesis of triglycerides in adipocytes and catalyzed the final step of triglyceride synthesis into triacylglycerol. Total of 30 DGAT1 gene sequences of 07 different species including cattle: Bos *indicine,* Bos *taurine*), sheep, goat, camel, Buffalo (river and Swamp), deer and yak were analyzed and differentiation within and among these species were also measured. The frame length of exon 8 and 9 were 75 and 64 bp were observed, respectively. Observed genetic diversity was higher among species than within species. Cattle had more polymorphic content than any other species. A nova amino acid variation sites were detected within several species, which might be used to illustrate the functional variation. Differentiation of DGAT1 gene was clear among all selected species. Cluster analysis revealed that consistent with the taxonomy of these species in the national center for biotechnology information (NCBI).

KEYWORDS: DGAT1. Species, bioinformatics, enzyme, NCBI

AH-34

RUNS OF HOMOZYGOSITY IN SAHIWAL CATTLE USING SNPs GENOTYPING

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ABSTRACT

Breeding schemes for dairy traits are very complex and often low progressive for Sahiwal (Bos indicus) cattle breed in Pakistan. Selection for dairy characteristics for this breed is mainly on phenotypic observation with zero knowledge of genomic information. Intro of SNP genotyping opens the new avenue for this important milch breed. Less numbers of phenotypic selected sires are used for breeding or semen production for this breed in the country since long. There are some serious concerns about the inbreeding, which direct affect not only the conservation of this important dairy genetic resource but also affect the sustainability of this breed. In this study, we investigate the distribution of autozygosity in Sahiwal cattle breed based on runs of Homozygosity (ROH). Total 14 pure different samples of Sahiwal cows were genotyped for 777, 962 SNPs. The results revealed that the ROH segments are larger than 10MB in over 74% of the samples representing signatures most likely related to the recent use of few numbers of sires. Moreover, the average genomic coverage by ROH >0.9 MB, which was lower than the previous reported for other cattle breeds (~4-5%). Only 17 % of the markers were included by common ROH, which suggest that the ongoing selection for milk and reproduction traits in this selected population is too recent. Two short range ROH

autosomal hotspots were observed in this study, which indicate candidate regions most likely under selection since long. The putative signature of selection on chromosomes 4 and 7 may be involved in resistance to infectious disease and should be a new topic for future selection of this important dairy breed.

KEYWORDS: Bos indicus, runs of homozygosity, selection, cattle, fertility, disease resistance

AH-35

A STUDY ON PRESCRIPTION PATTERN OF VETERINARY DRUGS IN SELECTED AREAS OF KHYBER PAKHTUNKHAWA

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ABSTRACT

Prescription is the written orders by the authorized practitioners to the owners, pharmacist, and compounders. Standard template for prescription is available and must be followed by every veterinary medical practitioner. The aim of this project was to evaluate prescription pattern of different veterinary drugs in selected areas of Khyber Pakhtunkhwa province, Pakistan for rationality and appropriateness. Two hundreds prescriptions were collected from qualified veterinary doctors, postgraduates and veterinary assistants of different institutes of KPK i.e. directly from Civil Veterinary Hospital Haripur, Veterinary Research Institute, Peshawar, Veterinary Research and Disease Diagnostic Centre Abbottabad, Veterinary Teaching Hospital, Peshawar and from some other hospitals of KPK for a period of six months. The results show that in 20% of prescriptions weight and age of animal was not mentioned. Similarly doctor's identity, patient's name, superscription, route of administration and duration of therapy was mentioned in 100, 80, 98, 100, and 100% of prescriptions respectively. It was concluded that majority of the prescriptions did not meet standard specification and regular refresher courses on prescription writing should be arranged for people involved in veterinary prescription writing.

KEYWORDS: prescription, veterinary, drugs, medicine

AH-36

EFFECT OF THERMAL STRESS ON PHYSIOLOGICAL AND REPRODUCTIVE PARAMETERS IN BOS INDICUS, CROSS-BRED AND BOS TAURUS DAIRY COWS – A PRELIMINARY STUDY:

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ABSTRACT

This study was conducted to assess physiological and reproductive changes, in relation to heat stress in different dairy cattle breeds. Thirty six (nine from each breed of Sahiwal, Achai, Cross-bred and Pure-exotic) lactating dairy cows were selected. Sampling was conducted

during the di-estrus phase of estrus cycle at 18°C (thermoneutral), 32°C (thermo-transitional) and 42°C (thermal stress) in February, April and June respectively. Daily milk yield (DMY), body condition score (BCS) and physiological parameters (rectal temperature, respiration rate and pulse rate) were recorded. Progesterone, cortisol and glucose levels were determined from blood serum. Breed had greater effect on DMY ($P< 0.001$) and BCS ($P< 0.01$). The pure-bred dairy cows showed the highest mean DMY followed by cross-bred, Sahiwal and Achai at all temperatures. Physiological parameters significantly ($P< 0.001$) increased with rise in ambient temperature. The intensity of changes was more prominent in pure and cross-bred dairy cows. Blood glucose level was significantly affected by breed ($p< 0.01$) and temperature ($P< 0.001$). The two local breeds expressed little changes in glucose level as compared to crossbred and pure-bred breeds. Cortisol level significantly ($p< 0.001$) increased with increase in ambient temperature. Cross and pure-bred showed more intensity than the local breeds ($P< 0.001$). Progesterone level decreased ($P< 0.001$) with rise in ambient temperature affecting lightly Achai and Sahiwal. Daily milk yield and progesterone were negatively while glucose and cortisol were positively correlated with ambient temperature. It can be concluded that heat stress was prominently manifested in exotic and cross-bred than Achai and Sahiwal.

OH-1

PHYTOTHERAPY: A TOOL TO COMBAT INCREASING PARASITIC RESISTANCE AGAINST ANTHELEMENTICS

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ABSTRACT

Parasitic resistance against drugs is responsible for thoughtful economic losses in terms of decreased production, stunted growth and delayed puberty in livestock. Helminths including nematodes, trematode and cestodes are generating economic losses by exhibiting gastro-intestinal parasitism in small and large ruminants. The prevalence of helminthes is reported about 15- 95% round the globe. A variety of broad spectrum anthelmintic drugs are being used by veterinarians to combat with gastrointestinal parasitism since 1950s but with increasing resistance with passage of time. First report on parasitic resistance was reported in 1957 against phenothiazine. *Haemoncus contortus* is reported to develop resistance against various groups of drugs including phenothiazine, thiabendazole, levamizole, rafoxamide, ivermectin, macrocyclic lactones and organophosphates. *Ostertagia, Trichostrongylus* and *Cooperia* species against Benzimidazoles, imidazothiazoles and macrocyclic lactones while *Fasciola hepatica* against benzimidazoles have also been reported to develop resistance against anthelmintics. In this aspect some medicinal plants which have been reported effective against different gastrointestinal parasites include: seed extract of *Trachyspermum ammi Linn.* and *Allium sativum* against *Haemoncus contortus*, leaves extract of *Cannabis sativa Linn.* against Flukes, *Crataeva nurvala*, *Artemesia pallens* and *Butea monosperma* against earthworm, tapeworm and roundworms. Ether and aqueous extracts of leaves of the *Adhatoda vasica* proved effective against larvicidal and ovicidal activity of nematodes. This presentation is aimed at sharing the therapeutic use of plants against specific parasites and future challenges to investigate their effects.

KEY WORDS: Phytotherapy, Parasitic resistance, Anthelmintics

OH-2

MICROBIAL CONTAMINATION OF COMMERCIAL AND DESI POULTRY EGGS CONSUMED IN DISTRICT PESHAWAR

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ABSTRACT

The present study was conducted to determine the microbial contamination of commercial and desi poultry eggs consumed in district Peshawar. Total of 650 egg samples were collected from different commercial and desi sale points in Peshawar. Analytic profile index (API) was used for microbial identification. The incidence of *Salmonella spp.* on commercial egg shell and yolk was 46.29 and 7.40%, respectively followed by 59.23 and 12.96% in desi egg shell and yolk, respectively. The positive samples (50:50 ratio) were processed with cooking (at ordinary temp.100° C) and freezing (at normal refrigerator temp- 4°C) treatments. Desi eggs showed higher load of *Salmonella spp*. than commercial eggs. The occurrence of *E. coli* on commercial egg shell and yolk was 38.83 and 1.83%, respectively followed by 35.13 and 5.5% in desi poultry egg shell and egg yolk, respectively. Egg shell contamination of commercial poultry egg was higher than desi poultry eggs and cooking significantly decreased *E. coli* contamination in egg shell and egg yolk from desi and commercial eggs. Freezing treatment was not significantly effective against *E.coli* contamination. It was concluded that that microorganisms present in eggs were controlled by cooking and therefore eggs consumed in district Peshawar were safe regarding public health.

KEYWORDS: Contaminants, Commercial eggs, Desi eggs, *Salmonella*, *E.coli*.

OH-3

FASCIOLIASIS: AN EMERGING THREAT FOR HUMANS

Food for Thought:

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ABSTRACT

Fascioliasis is primarily a disease of cloven footed animals which is prevalent all over the world. Two trematodes: *fasciola gigentica* and *fasciola hepatica* cause this disease. These two species are commonly known as liver flukes as these trematode species are occupant of liver and bile duct of their definitive host. Since, last two decades numbers of reports have been published around the globe which pointed out consequence of disease in human population in term of its transmission, distribution, morbidity, cost of medication and control measure strategies. This is one of the emerging foods borne zoonotic disease. As every year new cases of human fascioliasis have been continuously reporting around the sphere in general and in asian countries in particular. Although, there is no evidence of human fascioliasis existing at Pakistan level does not means that the disease in not prevalent at country levels. On the other hand there are numbers of reports available that reveals that *fascioliasis* is common in livestock species of country. The aim of this presentation is to share present prevailing global

scenario of human fascioliasis among different human civilizations. In addition, there is need to aware public regarding facts about sudden emerging epidemic e.g. *fascioliasis* and this platform of 3rd Dairy science park workshop is good opportunity to convey the message.
KEY WORDS: Fascioliasis, Humans, Global scenario

OH-4

EFFECT OF DIFFERENT WATERING REGIMES ON FEED INTAKE, MILK PRODUCTION PERFORMANCE, PHYSIOLOGICAL AND HEMATOLOGICAL PARAMETERS IN LACTATING MARECHA CAMEL DURING SUMMER SEASON

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ABSTRACT

This study was designed to investigate the effect of different watering regimes on feed intake milk production performance, physiological and hematological parameters in lactating Marrecha camel during summer season. For this purpose twelve lactating camels of almost similar age and parity were selected in a completely randomized design with 3 treatments, four animals per treatment at CBRS, Rakh Mahni, District Bhakkar. Seven days were given as acclimatization period for adaptation. This trial was completed in 60 days. The treatments were Group-1 control access to water once in a day, Group-2 access to water once in 4 days and Group-3 access to water once in 6 days. Animals were housed individually for feeding and watering. The same feed consisting of green fodder and gram straw was offered to all lactating she camels. Feed intake of all experimental animals was calculated on dry mater basis. Dry matter of the offered and refused feed was determined to find out the daily dry matter intake. Average ambient temperature and relative humidity during research trial was 39-41°C and 55-63(%) respectively. Results of this study showed that dry mater intake (DMI) and milk production were affected significantly ($P<0.001$) during different watering regimes. Watering regimes had significant effect on milk fat protein (%)total solids(TS) and density except lactose contents which were affected non- significantly .Watering regimes had significant ($P<0.001$) effect on water intake and mean values of water intake 82.94±1.34 litters in group-3(G-3) were reported higher than group-1 (G-1) and group-2 (G-2). Watering regimes had non-significant effect on physiological parameters. Analysis of blood showed watering regimes had non-significant effect on hematological values except packed cell volume (PCV), white blood cells (WBCs) and hemoglobin (Hb) which were affected significantly($P<0.001$),($P<0.01$) and ($P<0.05$) respectively .Watering regimes had significant ($P<0.001$) effect on body weight changes. A significant ($P<0.001$) positive correlation was found between water intake, dry mater intake ($r=0.168$) and milk production ($r=0.63$).Similarly a significant ($P<0.001$) positive correlation ($r=0.239$) was found between thermal heat index (THI) and feed intake (DM basis).
KEY WORDS:

OH-5

ONE HEALTH CONCEPT: ACCOMPLISHING OPTIMAL QUALITY HEALTH FOR PEOPLE, ANIMALS, AND THE ENVIRONMENT

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ABSTRACT

The One Health concept recognizes that the health of humans is connected to the health of animals and the environment. There are many examples those define the relation of health of people to the health of animals and the environment. Like zoonotic diseases which animals can pass to humans like rabies, salmonellosis and west Nile virus fever etc. Animals also share our susceptibility to some diseases and environmental hazards. Due to these reasons they can also serve as early warning signs of potential human illness as observed that birds often die of West Nile virus before humans get sick with this disease. Zoonotic diseases can be caused by viral, bacterial, parasitic and fungi and it has been estimated that more than six out of every 10 infectious diseases in humans are spreading from animals.

There are many factors/changes which results in emergence and reemergence of many zoonotic diseases. First important cause which is identified is that human populations are extensively growing and expanding into new geographic regions. Due to this close contact with domestic and wild animals provides opportunities to pass between humans and animals. Another reason is climate changes occurring due to intensive farming and deforestation which provides opportunities to the transfer of diseases to animals and humans. An important reason of spreading of diseases across the globe is due to frequent international travel and trade. Because of these interactions, humans can get zoonotic diseases through different ways like direct contact with infected animal secretions (saliva, blood, urine, or feces) or through vector (bitten by a tick or mosquito) or through consumption of animal products (such as unpasteurized milk, undercooked meat, or unwashed fruits and vegetables those are contaminated).

Although the term "One Health" is fairly new, the concept has long been recognized globally. Since the 1800s, scientists have noted the similarity in disease processes among animals and humans, but human and animal medicines were practiced separately until the 20th century. In recent years, through the support of key individuals and vital events, the One Health concept has gained more recognition in the public health and animal health communities. Successful public health interventions require the cooperation of the human health, veterinary health, and environmental health communities. By promoting this collaboration we can achieve optimal health outcomes for both people and animals.

KEY WORDS: One health, people, animal, environment

OH-6

OCCUPATIONAL HEALTH AND SAFETY RISK MEASURES CONCERNING ZOONOSIS IN THE DAIRY FARM WORKERS

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ABSTRACT

Livestock owners and farm workers rarely could recognize the human health hazards of infectious diseases commonly encountered in most of the livestock operations. Two third of human infectious diseases are reported as zoonotic diseases. Awareness of common risks and knowledge of procedures is needed to reduce the chances of infection and it is key element in preventing zoonotic disease. Taking into account the zoonotic diseases is an important part of a farm safety programme but yet it has not got its prime importance. There is a major threat to the health of people involved in the production process of very food we eat – a terrible consequence of our modern livestock production systems. Zoonosis is a major global threat to public health and as well as animal welfare. Farming methods have changed dramatically in recent decades in order to produce human food in bulk to support drastically increasing human population. As farming methods have become more intensive, there is an increase in animal densities combined with breeding and feeding approaches designed to increase production. It is putting both animals' welfare and human health at risk. It can also lead to serious illness in humans and may be fatal. These changes have a huge impact on farm animals' welfare that we rear for food and can increase the risks of zoonotic diseases as well. Thesefacts are based on different reports written by experts. Some important methodological approaches opted could be ensuring health by developing farming policies that ensure the health of animals and people by better management to minimise stress and optimise animal welfare and immunity, using tools of surveillance and vaccination, investment in research and extension of knowledge regarding transmission of zoonotic infections, helping and supporting farmers to develop and implement standards for livestock welfare, limiting the use of non–therapeutic drugs and reducing the risk of exposure to food infected with infectious agents (Salmonella, Campylobacter or E. coli).

KEY WORDS: Transmission, Zoonosis, Industrial Livestock, Farming method, Animal welfare

OH-7

RISKS ASSOCIATED WITH THE USE OF ANTIMICROBIAL AGENTS AS FEED ADDITIVES

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ABSTRACT

Antimicrobial resistance (AMR) is increasing due to indiscriminate use of these agents particularly in veterinary practice as feed additive. It has aggravated the problem of bacterial resistance leading to therapeutic failure and also tissue residue as the farmers do not observe the required withdrawal period when they are using medicated feed. European Union (EU) has banned the use of antibiotics as feed additives since 2006. Therefore, this project was designed to evaluate the replacement of low level antibiotic feeding with extracts of medicinal plants in poultry. The first objective of this project was to evaluate antimicrobial activity of indigenous medicinal plants against common poultry pathogens. For this purpose extracts of eight plants (*Opuntia dillenii*, *Zingiber officinalle***,** *Ocimum basilicum, Gymnema sylvestre***,** *Glyceriza glabra,* **Astragalus membranaceus,** *Eucalyptus globules*, *Calotropis procera)* were evaluated against five common poultry pathogens (*Staphylococcus aureus, Escherichia coli, Salmonella* **enterica***, Clostridium perfringens, Hemophelous* **paragallinarum***)*. Well diffusion method was used for sensitivity testing and serial dilution method was used for MIC determination. Cytotoxicity of these extracts was evaluated by MTT assay. The data obtained from the antimicrobial assays (well diffusion and MIC) was evaluated through one-way analysis of variance (ANOVA) using SPSS software. *Eucalyptus globulus, Calotropis procera* and *Opuntia dillenii* exhibited antibacterial activity against all the five poultry pathogens with low MIC. The results indicated that these extracts can be used further in next phase for other objectives such as effect on feed conversion ratio and body immune system.

KEY WORDS: Antimicrobial resistance, feed additives, poultry pathogens, medicinal Plant extracts

FS-1

EFFECT OF NUTRITIONAL AND THERAPEUTIC ASPECTS OF WHEY ON HUMAN HEALTH; A REVIEW STUDY

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ABSTRACT

In the past 25 years, whey protein for providing nutritional and functional properties to be used in infant formulas, food supplements, sport bars and beverages. The biological components of whey, including lactoferrin, β-lactoglobulin, α-lactalbumin, glycol-macropeptide, and immunoglobulins, have immune-enhancing properties. In addition, whey has the ability to act as an antioxidant, antihypertensive, antitumor, hypolipidemic, antiviral, antibacterial, and chelating agent. Leucine a key branched chain amino acid (BCCAs) in whey protein synthesis plays a role in insulin and glucose metabolism. A number of clinical trials have successfully been performed using whey in the treatment of cancer, HIV, hepatitis B, cardiovascular disease, osteoporosis, and as an antimicrobial agent. Whey protein has also exhibited benefit in the arena of exercise performance and enhancement. Whey plays important role in weight management. Specific factors studied in whey protein have proved that they contribute to weight loss by increasing satiety, maintaining lean body mass and having an influence on glucose homeostasis levels. Enhancement of glutathione status (an antioxidant) by taking 20 grams of whey protein per day for 12 weeks improves athletic performance and minimizes the body fat percentage in healthy young athletes and also in adults. Intake of about 60 grams of whey protein per day for 12 weeks proved effective in decreasing body fat and increasing lean body mass in overweight men following a calorie restricted diet and resistance training program. Resistance-trained men with whey protein supplement intake of 1.5g/kg of body per day for 11 weeks showed improvements in strength and doubling their lean body mass as compared to those groups which were using different carbohydrates, creatine or combination of creatine and whey protein supplements. In fact, whey is a full nutritional and therapeutic food, which must be used in future for encountering acute and severe malnutrition in many developing countries.

KEY WORDS: Whey protein, Glutathione status, Therapeutic value, Weight loss, Body Fat, Nutritional value

FS-2

EFFECTS OF WHEY BIOACTIVE PEPTIDES AND MODIFIED WHEY PROTEINS ON HUMAN HEALTH – A PRESENT AND FUTURE PERSPECTIVE STUDY

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ABSTRACT

Derived originally from whole milk, whey protein also separated and collected during the cheese making process and its powder has proven to yield the highest amount of rapidly absorbed whey protein which made it easily tolerable by athletes and sportsmen. Processing of whey proteins yields several bioactive peptides able to activate physiological effects in the human body. Such peptides if commercially available in concentrated form can be appealing because their claimed health promoting features are nowadays are important in consumers food choices. The technology developed is not excessively expensive and can be easily implemented in dairy plants of either small or large dimensions. Substituting native or denatured whey protein ingredients for milk protein in yoghurt formulations results in excessive elasticity and grainy texture. Such characteristics are comparable with the smooth and short texture expected from yoghurt. Whey protein ingredients used for modification to produce yoghurts with acceptable texture properties. By modifying the ratio of α-lactalbumin to β-lactoglobulin, heat denaturation and hydrolysis treatments applied to whey protein to improve their behavior in yoghurt formulations for better texture and elasticity. Increased proportion of α-lactalbumin protein produced yoghurts which closely matched the characteristics of control yoghurt. In result of this, such yoghurt provided more health promoting and nutritional factors than controlled one in our body. The industrial scale production of such peptides and modified whey proteins is limited by lack of suitable technologies but it is almost unknown in Pakistan. However, products enrichment with specific fractions of whey proteins still remains potentially most viable approach in industries. One of the major challenges is to determine how to formulate better milk bioactive peptides and modified whey proteins as food supplements so that they can withstand the harsh environment of the gastrointestinal (GI) tract and promote healthy life-style and nutritional benefits in human body.

KEY WORDS: Whey, Bioactive peptides, Yoghurt, Nutritional value, Heat denaturation

FS-3

WHEY PROTEIN HEAT STABILITY; PRESENT AND FUTURE PERSPECTIVES – A REVIEW

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ABSTRACT

Beverages probably give the greatest challenge to whey protein researchers. Majorly concern one biggest challenge is protein stability due to high concentration needed for beverages making. Whey protein ingredients such as WPI and WPC are powders that require good hydration although hydration of whey protein ingredients is not a problem at all but during processing or heating problems may occur so best optimum hydration practice required. Continuous mixing may denature or cause foaming of whey proteins prior to heat treatments.

This denaturation may give chalky or grainy texture and precipitation after heat treatment. Recent research by Dairy Research Institute focus on improving whey heat stability to increase their usage in wide range of foods give an approach to researchers to use these approaches in improving whey proteins stability including; controlling size of protein aggregates (Figure 4.) through adding sugar, enzymatic cross-linking, ultrasonication techniques and mineral chelation. Modifying or controlling protein aggregation by molecular chaperones, enzymatic hydrolysis, electrostatic repulsion, conjugating with carbohydrates, and protein encapsulation are also techniques for improvement of whey heat stability. Another study found that combination of ultrasonication with a follow of pre-heat treatment at 80C for 1 minute or at 85C for 30 seconds improves heat stability of WPC. Improvements in heat stability of whey proteins can prove helpful in other foods where protein enhancement is a desire. Some retorted products like sauces, soups, confection products like caramels, whey protein biscuits to cover malnutrition in many countries and protein-enhanced ice creams and other products with extra high heat treatment to extend their shelf life, these products always need protein enhancement. So efforts in improving heat stability of whey proteins are still in progress to make continuous improvement in functionality of whey protein ingredients that can be used for future use in such products (foods and beverages).

KEY WORDS: Whey protein, Heat stability, Ultrasonication, Enzymatic hydrolysis, Encapsulation, Malnutrition

FS-4

DETERMINATION OF MYCOFLORA, MYCOTOXINS, AND NUTRITIONAL PROFILE IN MAIZE SILAGE BY USING HOMOFERMENTATIVE INOCULANT

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ABSTRACT

Mycotoxin contamination in silage is generally ignored due to anaerobic and acidic environment of silage which is considered to be appropriate for inhibition of mycotoxigenic fungal growth. In view of foregoing, present study was planned and samples of fresh maize fodder (n=24) were collected from various regions of Punjab and put forth for ensiling process for a period of 45 days supplemented with homofermentative microbial inoculant at inclusion level of 4g/ton. Samples of fresh and ensiled maize fodder were then analyzed for screening of general mycoflora, mycotoxins and determination of nutritional profile.Results of present study showed that pH was immediately dropped down to 3.6 which is an indicator of good quality silage.Mycoflora assessment revealed the presence of *Aspergillus species.* Among these, *A. niger* was the most dominant specie followed by*A. fumigatus, A. flavus, A. terrus* and *A. ochraceous* in fresh and ensiled maize fodder. Total fungal densities observed (6×10^3) in present study were less than safety limits i.e. 1×10^4cfu/ml recommended by GMP (2005). Mycotoxins analysis showed that AFB_1 was present with high frequency in ensiled (41.66%) than in fresh (37.5%) maize fodder with an average concentration of 8.36 and 9.49ng/g respectively. However, higher incidence of Ochratoxin A was found in fresh (54.16%) than ensiled (20.86 %) samples with a mean of 8.06 and 4ng/g respectively. Average values for total aflatoxins (TAFs) and OTA were below the permissible limits defined by European commission (EC), i.e. 20ng/g and 10ng/g respectively.As far as nutritional parameters are concerned, DM and CP and energy parameters were found improved in ensile maize fodder.

KEY WORDS: Ensiling; silage; maize fodder; Fungi; aflatoxins; nutritional profile

FS-5

EFFECT OF HOMOFERMENTATIVE INOCULANT ON FERMENTATION CHARACTERISTICS AND NUTRITIVE VALUES OF CORN SILAGE

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ABSTRACT

The present study was planned to assess the effects of a homofermentative microbial inoculant on the fermentation parameters and nutritive value of corn silage under laboratory conditions. The whole corn plant were chopped of 1.3cm and ensiled with various treatments in buckets under lab conditions. The inoculant was applied at concentrations of $5x10^4$cfu/g of forage (T1),$1x10^5$cfu/g of forage (T2) $1.5x10^5$cfu/g of forage (T3) and negative control group (T0) without bacterial inoculant in three replicates each. At day 3, 7, 45 and 90 of the experiment individual buckets were opened to characterize the material, quick acidification, dry matter recovery, and stability of silage respectively. Findings of present study revealed the inoculant with graded levels (T2 and T3) significantly ($P<0.05$) affected the silage characteristics in terms of pH, acids, DM, protein and energy parameters. A rapid and significant reduction in pH even at third day of trial from 6.5 to 3.61 in the tests (T2 & T3) groups and remained consistent till 90th day of experiment (with non-significant fluctuation) when compared with control group (6.5). The levels of lactic acid, acetic acid and propionic acids were significantly ($P<0.05$) higher for treatment groups (i.e. T2 & T3) than the T1 & T0 groups and almost stabilized till 90 day of the trial. A consistency in improved dry matter contents were observed at 3rd, 7th and 90th day of trial for T2 and T3 test groups. As far as the crude protein contents are concerned, a non-significant reduction was observed in treatment groups. However, inoculant didn't affect crude ash, crude fat and crude fiber, NDF and ADF. Overall, inoculant shows nutritive stability and consistency of acid production at $1x10^5$cfu/g and $1.5x10^5$cfu/g inclusion levels of inoculant.

KEY WORDS: silage, inoculants, nutrition, acids profile

FS-6

DETERMINATION OF AFLATOXIN M1 IN RAW AND PROCESSED MILK SAMPLES BY ELISA TECHNIQUE IN PAKISTAN

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ABSTRACT

Aflatoxin M_1 (AFM_1) is an important milk contaminant; a monohydroxylated metabolite of Aflatoxin B_1(AFB_1), produced by hepatic cellular activity of lactating animals/ human fed on AFB_1contaminated diet. It is classified as class 2B carcinogen by IARC (1993). It may cause serious human diseases i.e. primary liver cancer and DNA damage. In view of this, present study was planned to observe the prevalence of AFM_1 in different types of milk samples. For this, a total five hundred and seventy milk samples (raw = 340 & processed = 230) were collected from dairy farms, local vendors and market during a period of October 2012 to 2015.

Processed milk samples included Ultra Heat Treated (UHT) (n=105), pasteurized (n=65), dried (n=40) and condensed milk (n=20). Concentration of AFM_1 was quantified by direct competitive ELISA technique with Gen5 Software. Analysis revealed 100 percent incidence in UHT and pasteurized milk with a mean of 0.42ng/ml (range 0.01-0.95ng/ml) and 0.11ng/ml (range 0.07-0.15ng/ml) respectively. However, 86.66% raw milk samples were tainted with AFM_1 with mean of 0.52ng/ml (range 0.01-1.63ng/ml) and 66.66% of dried milk samples with mean of 0.03ng/ml (range 0.01-0.15ng/ml). However, none of the condensed milk sample was found positive. Data was further computed seasonal variation. Highest prevalence (100%; mean, 0.029ng/ml) was observed in autumn season followed by winter (81.81%; mean, 0.46ng/ml), summer (80%; mean, 0.39ng/ml) and spring season (62.34%;mean, 0.25ng/ml) respectively. Furthermore, all average values were found below than the FDA legislation (0.50ng/ml) except raw milk i.e. 0.52ng/ml. Briefly, the presence of AFM_1 in milk is an alarming situation and can be control by managing AFB_1 contamination in feed by adopting good agriculture practices.

KEY WORDS: AFM_1, Milk, Season, Feed, Legislation

FS-7

GIS BASED MAPPING OF THE DAMS OF KHYBER PAKHTUNKHWA (KPK) AND FEDERALLY ADMINISTERED TRIBAL AREAS (FATA) FOR PROMOTING THE CULTURE OF EDIBLE FISHES IN PAKISTAN

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ABSTRACT

As dams are most commonly used for drinking, irrigation, electricity generation and fish culturing purposes throughout the world, therefore, present study was conducted the GIS based mapping of the large and small dams and reservoir to assess the potential dams for development of freshwater aquaculture in Province Khyber Pakhtunkhwa (KPK) and Federally Administered Tribal Areas (FATA) of Pakistan. The obtained results of the present study will provides new information's about the large and small dams and reservoir of KPK and FATA regarding the dam's name, coordinates, height, status, purpose, elevation, storage capacity etc., that will be very helpful for the researchers and fish culturists in future to see the penalty of their need to locate a new fish meat production unit at any particular district, in terms of dam's latitude, longitude, status, dam's height, water depth, quality, hydrodynamics, existing dam locations, and benthic fauna to support the preparation of aquaculture strategies and development plans that later will also contribute in the economy of the nation. Such information's could also be valuable for determining the growth rate and productivity of fishes that could be valuable in the systematic, fisheries management and conservation to further improve the ecological setup necessary for growing fish.

KEY WORDS: Dams, KPK, FATA, Fish food production, GIS Mapping.

FS-8

EFFECT OF DIFFERENT FEEDING SYSTEMS ON THE PERFORMANCE OF BEETAL AND TEDDY GOATS UNDER DESERT LAND CONDITIONS

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ABSTRACT

This experiment was conducted to study the effect of feeding systems on production of Beetal and Teddy goats managed under dessert land conditions. Growth of Beetal and Teddy goat kids under three feeding systems i.e. T1-total fodder grazing (extensive), T2-fodder grazing + 100 gm concentrate/head/day (semi-intensive) and T3-A mixed ration consisting of 7 parts of concentrate + 3 parts of berseem hay *ad libitum* (intensive) was observed. All three treatments differed ($P<0.01$) in their effect on growth rate of goat kids. The mean values of average daily gain (ADG) were (24.44g, 56.67g and 87.78g in Beetal and 27.78g, 42.22g and 73.33g in Teddy for T1, T2 and T3, respectively). The blood constituents did not showed the significant difference among the treatment groups and the mean values of blood constituents in Beetal and Teddy were: glucose (66.68 mg/dl and 73.27 mg/dl), blood urea nitrogen (BUN) (28.24 mg/dl and 23.40 mg/dl) and blood creatinine (1.70 mg/dl and 2.00 mg/dl). This study revealed that the intensive system resulted in higher growth performance than semi-intensive system and extensive system in Beetal and Teddy goats in Thal area.

KEYWORDS: Goat, Beetal, Teddy, feeding systems, growth

FS-9

EFFECT OF DIETARY MINERAL MIXTURE AND YEAST CULTURE ON WEIGHT GAIN IN COW CALVES

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ABSTRACT

The present study was conducted at Livestock Research and Development, Station, Surezai, Peshawar to investigate the separate and combined effect of mineral mixture and yeast culture on weight gain in cow calves. A total of 12 numbers of cow calves of approximately same age and weight were selected and divided randomly into four treatment groups A, B, C and D with three numbers of calves in each group. Group A was considered as control and fed, the concentrate ration, green and dry roughages according to the routine as practiced in Livestock Farm of Livestock Research and Development Station, Surezai. Group B, C and D were fed, in addition to the basal control diet, 10 grams of yeast culture/head/day, 40 grams of mineral mixture/head/day and 10 grams of yeast culture/head/day plus 40grams of mineral mixture/head/day, respectively. The data of weight gain was collected on weekly basis.

Highest average weight gain of 428 grams was noted in group D (mineral plus yeast) followed by 381, 353 and 314 grams in group C (mineral), B (yeast) and A (control), respectively. The data was analyzed using SPSS version 21. The analysis of data reveals that yeast plus mineral supplementation is the most viable feed option for cow calves.

KEY WORDS: Mineral Mixture, Yeast culture, Weight Gain, Cow calves

FS-10

FRAUDULENT SUBSTITUTION OF MEAT; AN UPDATE ON DIAGNOSTIC METHODS AND FUTURE CHALLENGES FOR ITS CONTROL

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ABSTRACT

Meat and meat products represent a significant component of human food and its quality is of great concern to consumers. Meat from different sources differ in taste, texture and even have different energy values. Generally, meat substitution means mixing of meat of one specie to other. Resemblance in colour and consistency of various meats make it more convenient for substitution Detection of substituted meat and meat products is very important for numerous reasons such as religious beliefs, cultural conflicts, meat borne diseases, allergic reactions, consumers satisfaction, food safety, conservation of laws and to protect slaughtering of endangered species. Thus, provision of simple and reliable analytical methods to check the substitution of meats plays a fundamental role in the operation of modern society. Conventionally, various meats are differentiated by physical, anatomical, chemical and biochemical techniques but all these have certain limitations like post slaughter changes, lack of bony structure in flesh, low detection rate, low specificity and sensitivity. Serological and molecular approaches have been used around the globe to detect meat substitutions. The use of Enzyme Linked Immunosorbent Assay, Polymerase Chain Reaction, enzyme assays, chromatography, infrared reflectance spectroscopy, DNA typing and hybridization, isoelectric focusing and capillary gel electrophoresis are revolutionary step to break the fraudulent substitution. In Pakistan, meat substitution is major issue and lack of prompt detection is the key factor in this regard. The purpose of this presentation is to disseminate the information regarding use of advance techniques at national level to ensure the consumers satisfaction and food safety.

KEY WORDS: meat, meat substitution, diagnosis, analytical tools, Pakistan

FS-11

DIETARY SUPPLEMENTATION OF *SACCHAROMYCES CEREVISIAE* ON PRODUCTION AND HEALTH STATUS IN LACATATING DAIRY CATTLE

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ABSTRACT

Balance diet is one of the important factors in livestock productivity. Inadequate and unbalanced diet is considered a major constraint for livestock promotion in Pakistan. The uneven dietary patterns result in dysbiosis in rumen. This leads to reduced growth rate, low milk production and poor reproductive performance. Under such situation, production of livestock can be increased through treat dysbiosis by supplementation of probiotic-yeast that may stable rumen pH, increase microbial population, improve gut microbial balance and consequently improve nutrient utilization and digestion efficiency resulting in enhanced growth rate, feed efficiency and milk yield. Many commercially yeast culture products available are imported and are not suitable for our local breed. Therefore, this study is planned to compare laboratory prepared and commercially available probiotic yeast supplemented to lactating dairy cattle. 9 lactating dairy cattle of *Sahiwal* breed were randomly divided into three equal groups. Group I fed @ 3 kg concentrate, 8 kg maize silage and 30 kg oats fodder per animal. Group II fed control diet plus commercially (COM) available yeast (Yac-Sac^{1026}; 10g/day/animal) corresponding to 2.5×10^{7} CFU/g *S. cerevisiae* while group III fed control diet plus laboratory (LAB) produced yeast (8g/day/animal; corresponding to 3.13×10^{07} cfu/g *S. cerevisiae*) for 60 days. Results revealed that LAB supplemented group produced more milk with high fat content than other groups. Nutrient digestibility was significantly better in both yeast supplemented groups than control group. However, milk protein, lactose, total solid and solids not fat remained unchanged. Economic efficiency of LAB was better than the other groups. From this study it can be concluded that supplementation of LAB yeast improved milk production and milk fat content in dairy cattle is cost effective than COM yeast supplemented group.

KEY WORDS: *S. cerevisiae,* cattle, production, health

FS-12

EFFECT OF DIFFERENT LEVELS OF POTASSIUM NITRATE WITH OR WITHOUT SULPHUR ON ENTERIC METHANE PRODUCTION IN TEDDY GOATS AT POST WEANING AGE

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ABSTRACT

Efforts to reduce enteric methane (CH_4) production from ruminants in global warming have gained attention as a top priority issue of this era. Nitrate and sulphate supplementation could be used to mitigate enteric CH_4 production. This experiment was designed to study the effects of different levels of KNO_3 (PN) with or without added sulphur (S) on the enteric CH_4 production and growth performance in weaned *Teddy* male goats in a 3×2 factorial arrangement under Randomized Complete Block Design. The experiment lasted for three months. Twenty four, male goats approximately 3 months of age were randomly divided into six groups, 4 animals in each group. Six iso-nitrogenous and iso-caloric diets were formulated. Nonprotein nitrogen was same across all diets. The control diet (C) only contained urea as NPN with neither KNO_3 nor S. However, PN0-S4, PN3-S0, PN3-S4, PN6-S0 and PN6-S4 diets had 0% KNO_3 and 0.4% S, 3% KNO_3 and 0% S, 3% KNO_3 and 0.4% S, 6% KNO_3 and 0% S and 6% KNO_3 and 0.4% S, respectively on DM basis. Feed intake was recorded daily and the animals were weighed fortnightly. Digestibility and nitrogen balance trials were conducted during the last week of experiment. Enteric CH_4 was analyzed at the end of the experiment using GASMET infra-red CH_4 analyser. There were no differences ($P > 0.05$) in dry matter intake, nutrient digestibility and nitrogen balance in goats fed all diets. The enteric CH_4 was 56% reduced ($P<0.05$) in goats fed PN6-S4 diet compared to those fed C diet. Daily live weight gain of goats fed PN6-S4 diet was the highest (66.0 g/day) and goats fed PN3-S0 diet had the lowest weight gain (61.25 g/day). The feed conversion ratio was better in animals fed PN6-S4 diet. In conclusion, animals fed diet containing PN and S did not only grow at faster rate but enteric CH_4 production was also reduced.

KEY WORDS: Teddy goats, potassium nitrates, enteric methane

FS-13

FATTY ACIDS CONTENTS AND COMPOSITION OF TROPICAL FORAGES

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ABSTRACT

Information on the fatty acid (FA) content and composition of tropical forages are scarce. The aim of this study was to quantify the FA content and composition of forages commonly fed to dairy animals in the tropics. Twelve forage species, namely, Trifolium alexandrinum, Cichorium intybus, Hordeum vulgare L., Medicago sativa, Avena sativa, Pennisetum purpureum, Setaria anceps, Sorghum almum, Panicum maximum, Rumex nepalensis, Panicum coloratum and Panicum antidotale were evaluated. Each forage species was grown in four replicate plots under standard agronomic conditions, and sampled at early, normal and late stages of maturity. The samples were anaerobically transported to the laboratory in cooled plastic bags, mixed, and representative subsamples were analysed for chemical profile, in vitro digestibility and FA contents. The FA profile was quantified by gas chromatography. The chemical composition, dry matter digestibility and FA contents varied ($P < 0.001$) among forage species and harvest maturity. Linolenic acid (C18:3n-3), palmitic acid (C16:0) and linoleic acid (C18:2n-6) were the predominant FAs with an average content of 8.65, 3.61 and 2.38 g/kg DM, contributing on average to 53%, 22% and 14% of the total measured FAs, respectively. The contents of all individual and total FA had large variation ($P < 0.001$) among the forage species. Among the individual FAs, C18:3n-3 had the largest variation ranging from 4.26 (H. vulgare L.) to 17.43 (A. sativa) g/kg DM at first harvest. The content of C16:0, C18:2n-6 and C18:3n-3 decreased ($P < 0.001$) with maturity, with the largest decrease being observed in C18:3n-3, ranging from 20% in R. nepalensis to 68% in S. almum. The large variation in FA content among forage species presents an opportunity to further improve the FA content through breeding. This study also highlights that harvest management is an important tool to manipulate the FA content and composition within a forage species, thereby presenting an opportunity to improve the FA profile of forages and ruminant products.

FS-14

CHEMICAL COMPOSITION, RUMINAL DEGRADATION KINETICS AND METHANE PRODUCTION POTENTIAL OF WINTER FORAGES: EFFECT OF FORAGE SPECIES AND HARVEST MATURITY

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ABSTRACT

The objective of this research was to evaluate the nutritive value and methane (CH_4) production potential of winter forages grown in Khypber Pakhtunkhwa Province of Pakistan. Fourteen forage species were samples at early, mid and late stages of maturity. Seven fodder species, namely, *Trifolium alexandrinum, Avena sativa, Cichorium intybus, Trifolium resupinatum, Triticum aestivum, Brassica campestris, Hordeum vulgar* were collected from research fields of the department of Agronomy the University of Agriculture Peshawar. While, seven grass species, namely, *Cenchrus ciliaris, Setaria anceps, Penicum entidotale, Penicum maximum, Pennisetum purpureum, Pennisetum orientale, Atriplex lentiformis* were collected from the range fields of Pakistan Forest institute Peshawar. From each species samples were collected from 1 m^2 area in triplicate on March 6, 20 and April 04, 2013. The samples were quickly transported to laboratory in pre-labelled polythene bags, mixed by specie and chopped and mixed by species. Subsamples ~0.5 kg were dried, ground, and stored

for laboratory analysis. The samples were analysed for dry matter (DM), ash, crude protein (CP), neutral detergent fibre (NDF), acid detergent fibre (ADF), acid detergent lignin (ADL), minerals, *in vitro* dry matter digestibility (DMD), in vitro total gas production (IVGP) and methane (CH_4) production. Forage species and harvest maturity significantly ($P<0.001$) affected the contents of all chemical components and *in vitro* DMD. The CP content decreased with maturity in all forages, ranging (g/g DM) from 0.24 in *C. intybus* to 0.66 in *H. vulgar*. The NDF content increased with maturity in all forages. *H. vulgar* showed minimum increase (0.21 g/g DM) and *B. campestris* showed maximum increase (0.44 g/g DM) in NDF contents. The *in vitro* DMD decreased with maturity in all forages. However, there was a large variation in the decrease in the *in vitro* DMD among forages species ranging from 0.06 (g/g DM) in *C. intybus* to 0.36 (g/g DM) in *B. campestris.* The rate and extent of IVGP increased with the increasing fungal incubation period. Among the forage species investigated in the present study, *Trifolium resupinatum, Hordeum vulgar* and *Avena sativa* showed the highest IVGP. There was also variation in CH_4 production among the forages species. The lowest CH_4 emission was observed for *B. campestris, T. Alexandrinum, T. resupinatum* and *C. Intybus*. The present study demonstrated that the chemical composition, digestibility and CH_4 production of fodder and grass species in Khyber Pakhtunkhwa are highly variable. In our study, *H. vulgar, T. alexandrinum* and *T. resupinatum* had high nutritive value, degradability and produced lower CH_4. Forages with higher nutritive value and digestibility, and lower CH_4 production potential will provide more energy to ruminants, and will improve their productivity.

FS-15

ASSESSMENT OF *IN SITU* RUMEN DEGRADATION CHARACTERISTICS OF INDIGENOUS FEED INGREDIENTS IN BUFFALOES

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ABSTRACT

Local cereals and their by-products can be efficiently used in the ruminant's diet but very limited information is available on the rumen degradation characteristics of these feed ingredients. Therefore, the present study was planned to determine rumen degradation characteristics of dry matter (DM), organic matter (OM), crude protein (CP) and neutral detergent fiber (NDF) of indigenous feed ingredients. Sorghum, oat, arugula, rice bran, rice polish, rapeseed meal, rapeseed cake, corn gluten meal 30% and corn gluten meal 60% were tested in this study. Feed ingredients were procured from local market. Approximately 5 g of each feed ingredient was filled in nylon bags and incubated in the rumen of three buffalo bulls for 0.25, 1, 2, 3, 6, 9, 12, 18, 24, 36 and 48 h, using *in situ* nylon bag technique. After rumen incubations, the rumen incubated residues were dried, ground and analyzed for DM, ash, CP and NDF. Results showed variation in the rumen degradation characteristics of DM, OM, CP and NDF because of the variable chemical contents of feed ingredients. A broad range in the potentially rumen degradable fraction (24.6-87.9%) and degradation rate (0.02-0.17 h^{-1}) of

DM. The potentially degradable fraction of CP was found higher (P<0.05) in corn gluten 60% (84.1%) while lower in rice bran (11.6%). The data obtained by this study can be helpful in ration formulation using these local feed ingredients.

FS-16

IN SITU RUMEN DEGRADATION KINETICS OF FOUR SORGHUM VARIETIES IN NILI RAVI BUFFALO BULLS

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ABSTRACT

Different sorghum varieties are introduced in practice to ensure the provision of good quality fodder for ruminants. Limited information is available on *in situ* rumen degradation characteristics of dietary nutrients of sorghum varieties. This study was planned to evaluate the chemical composition and *in situ* rumen degradation kinetics of four sorghum varieties in *Nili* Ravi bulls. Four sorghum varieties (Viejin 4003, Viejin 4005, Viejin 4006 and Viejin 4571) were harvested at 80th day after sowing. Samples of fresh fodders were taken and used for the determination of chemical composition. These sorghum varieties were evaluated using *in situ* nylon bag technique. The fresh samples were filled in nylon bags and incubated in the rumen of four rumen cannulated buffalo bulls for 0, 2, 4, 6, 12, 24, 36, 48, 72 and 96 h. Rumen incubated residues were analyzed for dry matter (DM), neutral detergent fiber (NDF) and acid detergent fiber (ADF). Chemical analysis showed that the crude protein and ADF content were found higher (P<0.05) for Viejin 4003 compared to other varieties, whereas, the higher values of NDF and hemicellulose contents were found for Viejin 4005. Results showed that significant (P<0.05) higher effective rumen degradation (ED) and extent of degradation of DM were found for Viejin 4571. The extent of degradation and ED of NDF and ADF were found higher (P<0.05) for Viejin 4006 variety compared to other varieties. It is concluded that Viejin 4006 variety has the good nutritive profile and better values for rumen degradation characteristics.

KEYWORDS: Sorghum varieties, rumen degradation kinetics, effective rumen degradation, buffalo bulls.

FS-17

IMPROVED ORGANIC LIVESTOCK FARMING THROUGH NUTRITIONAL MANAGEMENT

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ABSTRACT

Different option of farming rose day by day with their benefits and constraints. Organic farming is a new term for the developing countries and its demand increase day by day due to the product quality and environmental concerns. However, organic farmers face challenges for prevention and control of diseases in farm animals and enhanced production because of banning of use of chemical drugs and feed additives. Nevertheless, nutritional technologies

are valuable to combat some of the diseases and disorders and for improved health and welfare of the animals. Parasitic management program in organic farming could be practiced through improved nutrition, and pasture and grazing management in combination. Additional supplements feeding of high amount of dietary proteins in the form of undegradable protein, minerals i.e., zinc, molybdenum, copper and phosphorus and insoluble vitamins (A, E, B12) and have shown fruitful for resistance, resilience and expression of immunity against nematode infections. Pasture and grazing management, fungal feed additives and botanical dewormers might be of particular interest to decrease the prevalence of nematode infections in animals as well as pastures. Many minerals (iron, zinc, manganese, selenium and copper), vitamins (carotenoids, vitamins E and C), probiotics and pre-biotics have been identified as important for normal immune function and disease resistance in farm animals. Saponins, tannins, essential oils and many other plant secondary metabolites appear to be future potential feed additives to improve ruminant production in organic livestock production system. Nutritional management plays a bigger role to control and prevent many economically important diseases, better health and enhanced performance of animals in sustainable organic animal farming as compared to conventional farming systems.
KEYWORDS: nematodes, health, nutrition, organic livestock farming, plant secondary metabolites

FS-18

METHANE MITIGATION AND DAIRY FARM OPERATION

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ABSTRACT

A commercial dairy operation of the day is a major emitter of methane, which is an important greenhouse gas. Dairy farms are also a major emitter of ammonia, which is precursor of fine particulate. This relates with major concerns of public health. Here in this study we present an integrated process model of engineering economics of technology to reduce methane and ammonia emissions at dairy operation. Greens house gas offset credits for methane control; particulate matter offset credits for ammonia control and expanded net metering policies to provide revenue for the sale of power generation from biogas. Individually, any of these policies appears to be sufficient to provide the economic incentive for farm operators to reduce emissions. This paper discussed initial steps to fully develop the integrated process model that will provide guidance for policymakers.

KEY WORDS: methane, ammonia, carbon dioxide, greenhouse gases, climate change

ABSTRACTS

LIVESTOCK DEVELOPMENT AND BUSINESS INCUBATION (BI)

BI-1

CREATING A MARKETING CHANNEL FOR LIVESTOCK RESOURCES OF NORTHERN PAKISTAN UNDER THE DAIRY SCIENCE PARK- sharing the Konya Seker success story

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ABSTRACT

The Khyber Pakhtunkhwa province of Pakistan and FATA possess a huge scope, based upon the sheep and goats populations inhabiting the hilly and mountainous terrains. Dairy Science Park (DSP) has emerged to provide solutions to the farming and business communities. Two International Workshops were held in 2011 and 2013 and the third one will be held in November 2015. The provincial Agriculture Minister has inaugurated Business Desk and the Local Government Minister has supported establishment of DSP Board and promulgation of DSP Act. Special Assistant to Chief Minister KP (Law) and (Livestock) have endorsed the Park. The US Department of States has offered cooperation in Bio risk Management. University Feed Mill is being run under a lease arrangement and Meat Park has been established. The Park has introduced new concepts in postgraduate research like maggot meal, silk worm meal, meal worm, omega-3 enriched eggs, iron and zinc enriched eggs, quality control through drug-residues, aflatoxin levels, antibiotic resistance, herbal probiotics as growth promoters, improvement in meat quality through dietary antioxidants supplementations, stress management, artificial insemination, introduction and evaluation of rabbits for meat production. Sheep and goats are being investigated for enhanced growth, fertility, immunity with minimum production cost per unit and better quality of products. DSP has got registered as a Society under the Registration of Societies Act XXI of 1860 with a focus on supporting the people of the war-hit Khyber Pakhtunkhwa, FATA and the adjoining Afghan Regions through livestock entrepreneurship, public health safety, food security, and exportable surpluses. The DSP Board is being established under DSP Act and will comprise a Business Incubation Center, a Halal Research Center and a Quality Control Laboratory backed up with an Endowment Fund to support establishment of Graduate Entrepreneurs, nuclear breeding stocks, veterinary clinics, marketing centers and processing facilities for meat, eggs, milk and other products.

KEY WORDS: Livestock, poultry, business, economics, entrepreneurs

BI-2

COMMERCIAL BIOGAS SECTOR FOR MITIGATING ENERGY CRISES IN PAKISTAN, A REVIEW

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ABSTRACT

This paper presents potential of commercial biogas sector for mitigating energy crises in Pakistan. Pakistan is an agriculture based country. The country's GDP (Gross domestic product) has 22% contribution from agricultural sector. According to economic survey of Pakistan 2012-2013, there is a marked increase of 3.7% in livestock sector of Pakistan, with 1140 million dung production. There is a need to utilize all waste and manure from livestock sector in an efficient way. Biogas is a process in which manure and waste are transformed to methane gas. This gas can be valuable fuel for domestic and industrial purpose. So biogas can act as a sustainable and renewable energy resource. The analysis of the data provided by PCRET (Pakistan Council of Renewable energies technologies) is presented in this paper. This analysis shows that there is a great potential for commercial biogas sector in Pakistan.

KEY WORDS: Greenhouse gas, Carbon dioxide, Pakistan Council of Renewable Energies Technologies, Energy crises,biogas

BI-3

SOCIO-ECONOMIC IMPACT OF LIVESTOCK DAIRY HUB TRAININGS ON LIVELIHOOD OF FARMERS

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ABSTRACT

Livestock management is an important factor linked to milk and meat production worldwide specifically in Pakistan. Pakistan livestock sector contributes 55.1% to the agriculture and about 11.06% to total GDP. It was a dire need to understand the limitations and key aspects related to low milk and meat production in the country. In the present survey 2 tehsils of Sahiwal,42 villages of Mian Channu and Kasowal, associated with dairy milk collection centers of Nestle and Engro Dairy Hubs were selected. Two separate questionnaires were used to examine the prerequisites for Dairy Hub Trainings. Significantly higher milk yield, meat production and income exhibited through capacity building of farmer. From April to June 2011 farmers were interviewed keeping in view the 500 questionnaire sample size. . Dairy milk yield was 0.5L per Sahiwal cattle traditionally. Training influenced considerably and

substantial increase was observed in milk yield from 1-1.5 liters/cattle. Report figured out that addition of cottonseed cake, silage and hay with concentrates lead to remarkable increase in milk yield during dry and rainy season. Quality semen for Artificial Insemination services improved quality of animal production (13.2% farmers require AI services for 1 time conception while 75% farmers prefer AI services and 40% farmer's house holding 1-4 animals respectively) It was concluded that dairy hub trainings module supports capacity building of farmers shifting from traditional to advanced modern dairy farming ultimately impacting farmer's livelihood via generating more income from milk sale

KEYWORDS: Livestock; Dairy hub trainings; Farmer's livelihood; Milk sale; Income generate;

BI-4

ZARAI TARQIATI BANK LIMITED CREDIT PROGRAM ROLE IN THE DEVELOPMENT OF GOAT PRODUCTION IN RURAL AREA OF DISTRICT MARDAN, PAKISTAN

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ABSTRACT

The study examined Zarai Tarqiati Bank Limited(ZTBL) credit program for enhancing goat productivity in rural areas of district Mardan,Khyber Pakhtunkhwa. For this a total of 64 credit beneficiaries was selected from the three tehsils of the district and was interviewed by pre-tested interview schedule for collecting of relevant information's. Descriptive statistics, correlation and paired t-test were used to analyze data. Findings revealed that majority of the respondents were literate but having low level of education and only short and medium term credit was provided by ZTBL. The goats keepers in the study area were small farmers (bellow 5 hectares of land) and size of land and average goats number of the respondents having a correlation value (-0.156) implies that the ownership was negatively associated with the average numbers of goat possessions. The t-test value states for negative effect on average number of goats after credit due to miss-utilization of the credit. Average annual returns and cost per goat results were significant at 5% and 10 % level of significance.The positive aspect of the credit programme was revealed due to the significant results of cost and annual return per goat. The major constraints reported by respondents in taking credit were complicated procedure of passbook, non-availability of collateral, less amount of credit than requirements and unavailability of timely credit. The study recommends a comprehensive credit programme to address all the deficiencies found by this study and to ensure proper utilization of credit.

KEY WORDS: Goat possessions, credit programme, rural areas development and credit miss-utilization

EFFECTS OF ZARI TARQIATI BANK LIMITED CREDIT PROGRAM ON BUFFALO PRODUCTION IN RURAL AREAS OF DISTRICT MARDAN

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ABSTRACT

The present study was conducted in rural area of district Mardan. The major objectives were to examine the effects of ZTBL Finance Program on buffaloes production on various size of farms, problems and constraints faced by farmer in financing procedure by bank, recommendations for improvement of ZTBL,s finance program for buffaloes development. The universe of the study consists of three tehsils, namely Mardan, Takhth Bahi and Katlang. Purposively from each tehsil two villages namely Gujar gari, Rustum, Lund khawar, Sharegarh, Katlang and Jamal Gari were respectively selected. All beneficiaries of the ZTBL consist of 260 while the number of buffalo owners was 100 in the study area. In tehsil Mardan 29, Takhth Bahi 19, Katlung 52 while village wise distribution Gujar garhi 21, Rustam 8, Lundkhwar 11, Shargarh 8, Katlung 22 and Jamal garhi 30. All the way through questionnaire data were collected. Through SPSS, descriptive statistics, correlation and paired t-test were used for analysis. According to result in buffalo owners the illiterate farmers was 28% and literate 72%. The owner farmer was found 93%, owner-cum-tenant,7% and tenant was recorded zero percent. The Short term credit respondents, was 42%, medium term 56% where as the long term was counted only 2%. The total amount disbursed to sampled buffalo owners was Rs.25736000 and the share of the short term 16%, medium term 80% while the long term exposure was only 4%. According to result average buffalo number after credit was 1.87 and before 1.91, while percent change was -2 %, t value -.180 and P value .857 at .05 levels. According to analysis the result was found non- significant which explains that credit has no effect on buffalo's number. Average annual cost after credit were Rs. 90810 and before Rs.48730 however percent change was 86%, t value 4.497 and P value .000, so the result is found highly significant at .05 levels. The average annual production value after credit was Rs.149860 and before 100760, while % changes was estimated 49%, t value 3.067 and P value .003 and found the result significant at .05 level which shows that after credit the return in money term was higher than before due to inflations, high cost and quality breeds in the study area. The farmers are still facing number of problems such as high costs of fodder; non availability of quality breeds; high interest rate; complicated procedure of the bank; non availability of loan in time etc. Recommendations are suggested for future policy implication which are stated as Loan should be provided to farmers according to requirements; interest rate should be decreased in future; fodder cost of the buffalo should be decreased by protecting grazing field; hospitals facilities should be provided for treatment of animals; one window operation policy should be applied by bank and Special buffaloes program should be arranged in future for enhancement of buffaloes production for high return to farmer in the study area etc.

KEY WORDS: Effects, Zari Tarqiati Bank, Credit Program, Buffalo Production, Rural Areas of District Mardan

BI-6

COMPARATIVE EFFECT OF MILK REPLACER ON HOLSTEIN FRISIAN CALF GROWTH AND ECONOMICS

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ABSTRACT

Calf rearing is the most neglected segment in the animal husbandry practices by Dairy farmers that has been associated with lower growth rate, resulting in high rate of mortality in calves. Here we attempted to clarify the efficacy of milk replacer on Holstein Frisian calf growth and economics. Experiments were executed on 12 newly born Holstein Frisian calves, that were divided randomly into three groups to investigate the effect of whole milk (100%), mixed milk (50% milk replacer+50%whole milk) and milk replacer (100%) on the body weight gain and economics of these calves. Calf group-1 received milk replacer (MR), calf group-2 was fed with whole milk and calf group-3 was given milk replacer mixed with whole milk. All the corresponding feeds were fed twice a day to the respective groups of calves @2.5 liters/calf. Data was recorded on weekly basis for three months to record weight gain and milk consumption. Initial body weight of all the calves was recorded before starting the experiment. The calves were weighed individually early in the morning, once in a week for a period of three months. The data was statistically analyzed by ANOVA using completely randomized design. The current study demonstrated no significant difference among the treated groups. However, economically, the current study showed that milk replacer could be used significantly as low cost diet instead of whole milk and mixed milk.

KEY WORDS: Milk replacer, HF calf, growth, economics

BI-7

GLOBALIZATION: CHALLENGES AND OPPORTUNITIES IN AGRICULTURE SECTOR

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ABSTRACT

Famine once again is threatening vulnerable countries. To provide food relief into the hands of the hungry seems to be the simplest challenge they face. Rather the complexity of the issue is to restore the world's ability to feed itself at widely affordable prices. The current wave of hiking food prices is threatened to pull around 100 million people back in to poverty that they had once lifted out of the chore (Anonymous, 2008). The global population has grown nearly ten-fold over the past three centuries and has risen above 6 billion figures. The earth observed its one billion populations mark after passing thousands of years, whereas the second, third, fourth, fifth and sixth billion after passing 130, 33, 15, 13 and 12 years. Their food requirements coupled with elevated living standards demanded enhanced quality produce for food commodities. Developing countries are facing the current food crisis in greater intensity. The country like Pakistan is inherent to an inefficient Agriculture economy. Despite the fact that a larger bulk of the society (2/3 of the nation) is involved in Agri-activities, yet hardly can

feed the nation. A Pakistani farmer produces only about one third as much corn per acre as his Chinese counterpart and much less than those in the Western countries. During the era of cheap and abundant food, Western donors and multilateral aid organizations neglected agricultural research and rural development in favour of more fashionable development trends. Despite all these factors raising agricultural productivity probably would remain? The indigenous origin of half of the major livestock species of economic worth originated in the South Asia, against the human, which originates from Africa. These animals and birds migrated and moved to other regions where different breeds developed through the effect of climate and ecology and deliberate human efforts of breeding. With the introduction of latest technology in breed development, advanced counties have produced breeds with better yield and performance and are enjoying economically advantageous position. Most of the knowledge and their subsequent technology in developing countries are borrowed. There is visible reluctance on behalf of advanced countries to share the real fruits of technology with under-developed countries. Developing nations receive the end product of livestock technology in form of finished items with little knack for further development or indigenization to their own conditions and thus they remain ever dependent on the developed nations. Pakistan with an over 60 million population of large ruminants which puts it in the fourth position among the milk producing countries continues to be the inefficient livestock economy. According to an estimate the ruminants (cattle and buffalo) on the average produce one litter of milk per head. Meat production is even less and these is much to desire in case of breed development. The excessively large population of livestock is becoming a liability and is an outstanding factor for denuding soil from foliage and causing excessive erosion.

BI-8

ROLE OF GENDER IN ANIMAL PRODUCTION AND VALUE ADDITION

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ABSTRACT

Women are the hub of dairy industry in Pakistan but their role always remains behind the success. More hours are spent by them than men in management of livestock and related activities. In spite of their valuable role, mostly they are untrained and get less wages (50 – 70%) compared to man. Therefore, it is important to train them for better animal output. The ignorance of gender education and training does not only debar them to compete with man for better employment and social status but also keeps them dependent financially on man with no power of decision making in family matters; and helps in establishing male hierarchy and male influenced society. More than 48% women are engaged in livestock related activities in Pakistan. In present project gender was trained in different aspects of animal production/value addition and connected to consumers‘ market. It was noted that women were more confident and self-dependent after getting training and awareness. Under this project women based milk producer groups were established and trained in value addition especially in cheese and yoghurt and sold in local market in competition with brand dairy products. The results revealed that income after value addition was significantly ($P<0.001$) increased. After value addition there was an increase of 154.5% in profit compared with 28% (without value addition) in project area. The profit was Rs. 34.0 ±6.68 against Rs. 6.5± 1.00 per litre. The

extra income was used to purchase quality animal and inputs to increase farm productivity. This model is working successfully and sustainably and can be duplicated in other developing countries also. The paper discusses the opportunities and means to empower the women in society by giving them decision making power through providing them financial security and freedom.

KEYWORDS: gender role, small dairy hold

BI-9

MANURE MANAGEMENT: A POTENTIAL SOURCE FOR RECYCLING NUTRIENTS TO RECOVER FERTILIZER VALUE AND TO REDUCE ENVIRONMENTAL POLLUTION

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ABSTRACT

In Pakistan, dairy industry is the major component of livestock sector. The basic function of dairy operation are to import nutrients via feed, bedding and fertilizer and transform these nutrients into exportable products, and export these nutrients into milk , meat and bio wastes e.g dung and urine to generate sustainable economic returns. Livestock are inefficient in extracting nutrients from feeds; typically, 75-90 per cent of the fed major nutrients pass directly through the animal into the manure. On-farm nutrients management has focused on the production, collection, storage and field application of the animal wastes. Manure production is proportional to the animal's weight and varies by animal type. Most of the imported nutrients pass to the manure and then to the soil. Manure is a good source of plant nutrients and organic matter. Properly managed manure applications recycle nutrients to crops, improve soil quality, and protect water quality. Efficient nitrogen (N) management on dairy farms is key to profitable and environmentally sound farm operation. The separation of animal agriculture from crop production has led to accumulation of excess manure on livestock farms. Crop farms can benefit from this manure as a source of nutrients and organic matter. Manure is in fact a resource, based largely on its equivalence with commercial fertilizer, and should not be called a waste when it is recycled through new plant growth. Requirements for manure management are unique to each farm, depending upon the natural resources available, the existing and planned facilities, and the goal of the operation; in addition, these requirements sometimes are subject to major change as animal numbers increase. Major components of the manure are NDF, ADF, ADL, cellulose and hemi-cellulose. Air emission from manure includes: ammonia, nitrous oxide, methane, VOC's, particulate matter and odor. Potential impacts of manure, if it is not properly managed are both health and environmental risks. This paper will dwell light on the importance of manure, its utilization in the integrated farming, its management systems, its impact on environment and health and basic rules for efficient manure management on a dairy farm.

KEY WORDS: dairy industry, manure management, air emission, potential impacts

BI-10

DAIRY VALUE CHAIN IN PAKISTAN: CONSTRAINTS ANALYSIS AND WAY FORWARD

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ABSTRACT

The dairy sector plays a significant role in the national economy of Pakistan. Over the past decade, milk production has risen by more than 35%, partly due to the increase of cattle population. The informal sector represents the major end-market with more than 95 percent of the milk sold. This study examines the dairy value chain in Punjab province which accounts for nearly two thirds of milk production in Pakistan. Focus group discussions were conducted with different stakeholders involved in the value chain (producers, inputs providers, traders/retailers, and consumers). Data on various nodes of the dairy value chain including breeding and feeding systems, access to technology and input services as well as information on producers' linkage to the market was collected. Traders/retailers' networks, price setting related to milk quality, and marketing strategies were analyzed. A list of constraints at different levels of value chain was identified, which would assist in prioritizing interventions to increase productivity and resource use efficiency of smallholders. Just by supplying adlib water and balanced feed to animals, a significant increase in milk production could be achieved.

3rd International Workshop on Dairy Science Park
(November 16-18, IW-DSP-2015)
Venue: The University of Agriculture Peshawar-25120, Pakistan

ABSTRACTS

POULTRY SCIENCE (PS)

PS-1

EFFECT OF AN ORGANIC ACID BLEND (ACIFLEX®) ON LOWER GUT MICROFLORA AND GROWTH OF BROILERS AT DAY-42

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ABSTRACT

Organic acid has gained considerable attention during the last few decades in replacing antibiotic growth promoters (AGPs) in all type of poultry operations to ensure safe and healthy chicken products supply to consumers. Organic acids can increase endogenous enzymes secretions, assist in balancing gut microflora and improved health. A balanced colonization of useful microbes on the intestinal wall results in the reduced production of toxic metabolites that can lead to higher body weight gain and improved feed efficiency (Yang et al. 2009). We examined the efficacy of an organic acid (OA) blend (Aciflex®) as growth promoter in broilers and to monitor lower gut microflora at day 42. Two hundred and twenty five, 22-day-old broilers birds obtained from University poultry farm were randomly allotted to five replicated (n=5, 15 birds/replicate) different experimental treatments. Birds were reared in cleaned floor cages fitted with all necessary gears. Birds in control group (OA-0) were given fresh drinking water only and to others groups OA-0.5, OA-1, OA-1.5 and OA-2 were offered organic acid @ 0.5, 1, 1.5 and 2ml of per Liter of drinking water, respectively. All birds had a free access to water and feed during the course of experiment. Strict Biosecurity and hygienic measures were maintained. Weight gain (1306.9 g), FCR (1.91), carcass yield (70.39%), intestinal length (180.91 cm) and liver weight (51.16 g) were increased significantly in group OA-2 that received higher level of organic acid. Difference to groups OA-1 and OA-1.5 of OA-2 was however insignificant and only numerical. Feed and water intake and heart weight of different experimental groups were insignificant. Lower ($p<0.01$) *E. coli* and *Salmonella* count were noted in group OA-1, OA-1.5 and OA-2 to their counterparts. It was revealed that organic acid blend (Aciflex®) can potentially enhance broiler growth rate and decrease microbial pathogens in the lower gut. It is however proposed to explore further the potentials of organic acids on the nutrient bioavailability and number of beneficial microflora load of the birds at different phases of life.

KEY WORDS: broiler, organic acid, feed intake, weight gain, FCR and intestinal microflora

PS-2

GUT HISTOMORPHOLOGY, LYMPHOID ORGANS WEIGHT AND MINERAL ABSORPTION BY BROILERS ON MAIZE-SOYBEAN MEAL BASED DIET SUPPLEMENTED WITH A YEAST CARBOHYDRATE FRACTION (ACTIGEN®)

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ABSTRACT

This research work was planned to assess the strategic application of this novel yeast carbohydrate fraction (YCF) in maize-soybean meal based diet on gut health and mineral absorption by broiler at day-21 post-hatch. Day-old male broiler birds (n=180; Cobb) were procured from a local commercial hatchery and were randomly grouped to replicated (n = 4; 15 birds/replicate) experimental treatments (n = 3) as YCF-0, YCF-0.8 and YCF-1.0. Treatment YCF-0 was kept control and to others was added ACT at 0.8 and 1.0 g kg^{-1}, respectively. Maize-soybean meal diets as per standard requirements of the birds (NRC, 1994; 22% CP; 12.38 MJ/kg) were mixed in mash form and stored. Birds were reared in an open sided house in floor pens and were given ad libitum access to feed and water. Data for different parameters was noted during the trial. On day 17, seven birds were moved to metabolic cages for faeces collection. On day-21, 2 birds per replicate were killed humanely killed and lower ileum was sampled for gut histomorphology. It was observed that supplementation of Actigen® at high dose (1 g Kg-1 diet) had significantly improved apparent metabolisable energy (8.22%), phosphorus (10.8%) and calcium (9.7%) retention. Relative weights of lymphoid organs (bursa, thymus and spleen) to body weight bursa were found greater in treated birds compared to YCF-0. No difference was seen in mean intestinal length however, goblet cells number (141.35±0.912[a]) count and villus height (µm) (133± 0.022[a]) was significantly higher in group YCF-1. This also had significant impact on production performance and carcass yield of birds. These findings revealed that strategic supplementation of yeast carbohydrate fraction (Actigen®) assessed broiler birds to maintain a better gut health and mineral retention.

KEY WORDS: Gut histology, lymphoid organs, maize-soya diet, broiler chicks

PS-3

EFFECT OF OLIVE LEAVES EXTRACT ON LIPID PROFILE, GLUCOSE AND FEED INTAKE OF JAPANESE QUAIL

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ABSTRACT

In Afghanistan most times people are drinking olive leave tea for prevention and decline of higher lipid and glucose level, therefore the objective of the current study was to find out whether olive leaf extraction is having any effect on blood metabolites. The Japanese quail has been used for biological studies because of its easy management and large numbers in limited area. In this experiment quails (100 male and 100 Female) were reared on a farm

owned by the Department of Animal science of Agriculture faculty of Nangrahar University. Quails were kept under optimum environmental during rearing period (20- 22 C and 65 % relative humidity). The Adaptation period was for 10 days. Feed was given add libitum during 24 h. In this study we had five treatments T0 served as control without any water supplementation, T1 (1g/L), T2 (2g/L), T3 (3g/L) and T4 (4g of olive leaf / litter of drinking water). The Experiment continued for 4 weeks at the end of week. By increasing level of the olive leave powder in water blood glucose, cholesterol and triglycerides levels declined significantly from 509 to 422.5, 204-144.5 and 245 to 192.5 respectively.

KEYWORDS: Japanese quail, olive leaf extraction, cholesterol, triglycerides

PS-4

THE EFFCTS OF DIFFERENT EGGSHELL TEMPERATURES DURING HATCHING PERIOD ON INCUBATION RESULTS AND BROILER PERFORMANCE

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ABSTRACT

This study was carried out to determine the effects of different eggshell temperatures during hatching period on incubation results and broiler performance.A total of 1800 eggs with an avarage of 55-65 g was obtained from 42 weeks of broiler breeder flock. The eggs were randomly divided into three groups for temperature applications and placed in an incubator with same conditions as37,2°C temperature and 54%relative humidity, during the first 18 days of incubation. After transfer to hatcher, three different temperature manipulations were applied between 19 and 21 days of incubation: 1- Control group: (36,8-37,2˚C);2- High temperature application for 3 hours daily (38,0 -38,4˚C);3- Continuously high temperature application (38,0-38,4˚C). On hatching day, the chicks were weighed by individually. Saleable chick rate (%), cull chick rate (%) and late term embryonic mortality rate (%)were calculated for each application group. To determine the effects of temperature manipulations during hatching period on broiler performance, the chicks were reared under same conditions. During the growing period live weights and feed consumption of broilers in each groups were determined weekly and live weight gain, cumulative feed consumption, feed conversion rate were calculated.At the end of the growing period (42 days), a total of 20 broilers (10 male/10 female) from each group were randomly slaughtered. The effects of temperature manipulations during hatching period on saleable chick rate, cull chick rate, late term embryonic mortality rate and chick hatching weight was found significant($P<0,01$). Late term embryonic mortality rate was observed as the highset in the continously high temperature group, while the lowest in the control group.The cull chick rate was found to be lowest in the control group than the others. The effects of the applications on live weights were found to be significant during the whole growing period ($P<0,01$).Also at the end of the growing period, feed consumption and cumulative feed consumption were higher in the continously high temperature group than the others($P<0.01$, $P<0,05$).In the second week, feed conversion rate was higherin the continously high temperature group ($P <0.01$), in the fifth and sixth weeks, it was found to be lower in the control group ($P<0.05$, $P<0.01$).There was any significant difference between the groups for slaughter weightand carcass weight. Organ weights were found similar in all groups except liver weight ($P<0.05$).

KEY WORDS: broiler, eggshell temprature, hatching, incubation, performance

PS-5

EFFECTS OF DIETARY ANTIOXIDANTS (VE) SUPPLEMENTATION ON THE GROWTH PERFORMANCE AND HEALTH STATUS OF BROILER CHICKS

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ABSTRACT

Body weight gain and immune status differences with high level dose of dietary supplemented vit-e (300mg/kg) were studied in the present study.Twenty four numbers of day old (Ross strain) broiler chicks were divided into two groups. [Group I was fed with non-supplemented dietary vit-e (control), Group II was fed with high level dose (300mg/kg) supplemented vit-e (treatment) for the comparison of body weight gain, as well as twenty four numbers of day old (ross strain) broiler chicks were divided into two groups [Group I was fed with non-supplemented dietary vit-e (control), group II was fed with high level dose (300 mg/kg) dietary supplemented vit-e to observe the comparison of immune status. There was no significant difference in body weight gain between two groups after four weeks as well as after six weeks, and also did not observe significant differences for feed consumption after four weeks neither after six weeks. The feed conversion efficiency (FCE) was not significantly increase or decrease in both groups either after four weeks or after six weeks. Mitogenic responses to phytohaemagglutinin (PHA) and concanavalin A (Con A) were not significantly altered by 300mg/kg feed supplementation and there was no any significant difference after 2, 4 and 6 weeks.There was no significant difference of spleen weight per body weight ratio in experiment one as well as in experiment second. Also no significant differences were found for bursa fabricius per body weight ratio in second experiment meanwhile the weight per body weight ratio of bursa fabricius was significantly increased in treatment group after four weeks ($P<0.05$). We did not find significant differences in mononuclear (CD4,CD8,Bu1,MHCII) cells of spleen in first and second experiments as well as no significant differences in mononuclear cells of cecal tonsils ($P>0.05$). No significant differences were found in blood serum total protein after six weeks in first experiment nor in second experiment ($P>0.05$). After 2,4 and 6 weeks there was no significant differences of specific antibody titer against infectious bronchitis (IB) and infectious bursal disease (IBD) vaccine, but in the case of Newcastle disease (ND) vaccine the antibody titer tends to increase in treatment group after 6 weeks ($P=0.057$).

KEY WORDS: antioxidants diet, growth, performance, broiler

PS-6

EFFECTS OF DIETARY SUPPLEMENTATION OF MANNAN-OLIGOSACCHARIDE ON VIRUS SHEDDING IN AVIAN INFLUENZA (H9N2) CHALLENGED BROILERS

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ABSTRACT

Avian Influenza (AI) is a highly contagious disease causing significant economic losses worldwide. The aim of this study is to evaluate the effect of mannan-oligosaccharide (MOS) on tracheal and cloacal virus shedding and environment contamination in avian influenza challenged broilers. A total of 300 broiler chicks were divided into 3 groups (A, B and C) and were supplemented 0.2, 0.5 and 0.0 % MOS respectively. On day 21 the positive groups of birds were challenged intranasally with 0.1 ml of reference virus (AIV; Pk- UDL/01/08 H9N2) with EID50 = $10^{-6.66}$. Control group showed significantly higher cloacal viral shedding from day 24 to 26 and 28 to 32. Tracheal virus shedding was lower ($p<0.05$) on 25-26 and 28-30 days in treatment groups. Day 27 showed highest ($p>0.05$) virus shedding. However the reduction of tracheal viral shedding is faster in treatment groups. Hence the use of MOS may constitute a novel and effective plausible alternative to control and prevent AIV H9N2 infection in poultry.

KEY WORDS: MOS, AIV, broiler chicks

PS-7

USING QUANTITATIVE DISEASE DYNAMICS AS A TOOL FOR GUIDING RESPONSE TO AVIAN INFLUENZA IN POULTRY IN THE UNITED STATES OF AMERICA

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ABSTRACT

Wild birds are the primary source of genetic diversity for influenza A viruses that eventually emerge in poultry and humans. Much progress has been made in the descriptive ecology of avian influenza viruses (AIVs), but contributions are less evident from quantitative studies (e.g., those including disease dynamic models). Transmission between host species, individuals and flocks has not been measured with sufficient accuracy to allow robust quantitative evaluation of alternate control protocols. We focused on the United States of America (USA) as a case study for determining the state of our quantitative knowledge of potential AIV emergence processes from wild hosts to poultry. We identified priorities for quantitative research that would build on existing tools for responding to AIV in poultry and concluded that the following knowledge gaps can be addressed with current empirical data: (1) quantification of the spatio-temporal relationships between AIV prevalence in wild hosts and poultry populations, (2) understanding how the structure of different poultry sectors impacts within-flock transmission, (3) determining mechanisms and rates of between-farm spread, and (4) validating current policy-decision tools with data. The modeling studies we recommend will improve our mechanistic understanding of potential AIV transmission patterns in USA poultry, leading to improved measures of accuracy and reduced uncertainty when evaluating alternative control strategies.

KEY WORDS: Avian influenza; USA; Between-farm spread; Disease-dynamic model; Quantitative data; Poultry

PS-8

REDUCING LIPID OXIDATION IN OMEGA-3 ENRICHED EGGS WITH NATURAL ANTIOXIDANTS DURING STORAGE

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ABSTRACT

A study was performed to examine the outcome of natural antioxidants on lipid oxidation of egg yolk during storage. Four experimental rations were offered to 60 laying hens which were; negative control (NC) without hemp seed, positive control (PC) having 25% hemp seed, PC + *Curcuma longa* (CL-2%), PC + *Zingiber officinale* (ZO-2%). Egg samples were investigated for lipid oxidation, fatty acids profile and production attributes. Addition of 2% *Curcuma longa* and 2% *Zingiber officinale* significantly decrease malonaldehyde (MDA) value as compared to the positive control and negative control groups during 1 month of storage at room temperature. At Day-15 and Day-30 of storage highest total saturated fatty acids were documented in control group while lowest were reported in PC+CL-2% and PC+ZO-2% groups followed by PC group. Total monounsaturated fatty acids (MUFAs) were decreased in group PC+CL-2% and PC+ZO-2% followed by PC group and highest was reported in negative control group during 15 and 30 days of storage. Highest value of total polyunsaturated fatty acids (PUFAs) were documented in groups PC, PC+CL-2% and PC+ZO-2% while lowest was found in NC group. Best omega-6 to omega-3 ratio was attained in ω-3 enriched diets included with natural antioxiants. Hence it was deduced that antioxidants supplementation at 2% with hempseed up to 25% in the egg laying birds ration maintained poly unsaturated fatty acids, lessened saturated fatty acids and monounsaturated fats of yolk and presented best ratio of n-6 to n-3 fats.

KEYWORDS: Egg, cholesterol, hemp, ginger, fatty acids

PS-9

COMPARATIVE STUDY OF IRRADIATED AND CONTROL FEED IN BROILERS

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ABSTRACT

A study was conducted to explore the efficacy of antibiotics replacement in poultry feed with ionizing irradiation at 5kGy. A total of 1000 broiler chicks were divided into 2 groups; control and irradiated. Feed intake was not affected (P>0.05) by irradiation. Weight gain was higher (P<0.05) during 3rd and 4th weeks in irradiated group as compared to the control group. The better feed conversion ratio was recorded for irradiated group (1.95 ±0.02) than the control group (2.06±0.05). Feed conversion ratio during 1st, 2nd, 3rd and 4th weeks did not showed any significant change. Percent mortality was significantly higher in the control group than

irradiated group (P<0.05). Bone ash and minerals including iron (Fe), zinc (Zn), cupper (Cu), potassium (K), calcium (Ca), magnesium (Mg), and phosphorus (P) values for control and irradiated group showed no significant differences (P>0.05), however numerically higher values were observed for irradiated group. Irradiation has no significant (P>0.05) effect on serum triiodothyronine (T3), thyroxin (T4) and thyroid stimulating hormone (TSH) hormones. From the present study it was concluded that antibiotics in feed could be replaced by irradiation at 5kGy dose for reducing mortality and improving weight gain and FCR with minimum public health problems. This study produced some useful results in response to irradiation.

KEYWORDS: broiler, irradiation, feed, performance

PS-10

EFFECT OF ORGANIC ACIDS ON THE PERFORMANCE OF JAPANESE QUAILS

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ABSTRACT

An experiment was conducted to evaluate the effect of organic acids on the performance of Japanese quails. After a week of adaptation period, a total of 300 Japanese quail chicks were divided into five groups designated as OA-0, OA-0.5, OA-1, OA-1.5 and OA-2, having 3 replicates of 20 quails each. The birds in group OA-0 were offered untreated drinking water while those in group OA-0.5, OA-1 OA-1.5 and OA-2 were given 0.5, 1, 1.5 and 2ml of Aciflex® (Citric acid 80 g, lactic acid 52 g, Phosphorus 92 g, Cupper sulphate 10 g/ litter) per liter of drinking water respectively. Feed intake was significantly (P<0.05) affected by organic acids supplementation. Lowest feed intake was found in group OA-2 and was followed by OA-1.5, OA-1, OA-0.5 and was the highest in group OA-0. Significantly (P<0.05) higher water intake (1073.5 ± 68.92) was found in the control group. Highest weight gain was obtained in group OA-2. Significantly lower (best) FCR was recorded in group OA-2, OA-1.5, and was the highest in the control group. Highest dressing percentage was recorded in group OA-2 and was followed by group OA-1.5, OA-1, OA-0.5 and OA-0. Significantly lower liver weight was recorded in the control group, while it was the same in all treated groups. Lowest mortality was recorded in group OA-2, OA-1.5, OA-1 and was the highest in the control group. The study recommends the use of organic acid in broiler feeding program.

KEYWORDS: Organic acid, broiler, performance

PS-11

COMPARATIVE STUDY OF IMMUNOLOGICAL AND ANTICOCCIDIAL ACTIVITIES OF DIFFERENT MEDICINAL PLANTS USING VARIOUS FEEDING REGIMES IN BROILER CHICKS

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ABSTRACT

Plants derivatives are a source of natural additives which play a significant role in health and nutrition of broiler chicks. The research study was undertaken to investigate the effect of different schedules of administration of medicinal plants infusion of aloe Vera gel, barbery, garlic and ginger as immunological and anticoccidial in broilers chicks at the poultry research unit of KPK The University Agriculture Peshawar, Pakistan. A total of 240 day old broilers chick were purchased from a local dealer, divided in to four groups (60 chicks each) A, B, C and D and were reared in separate pens for 35 days in an open sided house. Each group was further divided into two subgroups of vaccinated and non-vaccinated (30 chicks each) for different treatments. Each subgroup was carrying three replicate (10 chicks/ replicate). Group A was kept as control, while B, C and D were given infusion @ 10 ml/lit of water. The schedule was designed as the group B received infusion at alternate day, group C received infusion on alternate three days in a week and group D received infusion at alternate week. Relevant data was recorded throughout the experiment till the termination of experiment. Mean lymphoid organs were significantly ($P<0.01$) influenced by the water based infusion with different schedule of administration. Antibody titer of the broilers against ND was significantly ($P<0.01$) affected by water based infusion. Significantly higher ($P<0.05$) antibody titer of ND was found for broilers in group B, while titer against IB and IBD was significantly ($P<0.01$) influenced by water based infusion in group C. Significantly ($P<0.05$) lower numbers of oocysts per gram of feaces were recorded in group B. It is concluded that schedule on the basis of receiving infusion three days in a week is more potent than other schedules of research study.

KEY WORDS: Broiler, anticoccidial, oocysts, immunity, aloe vera gel, barbery, garlic and ginger

PS-12

OPTIMIZING THE PERFORMANCE OF BROILER CHICKEN BY ENZYMES SUPPLEMENTATION FED DOUBLE-ZERO VARIETY OF CANOLA MEAL

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ABSTRACT

This study was designed to investigate the effect of different level of canola meal (CM) on the growth performance and bone quality of broiler chicks with or without enzymes supplementation in 4x2 factorial design with 4 levels (0, 10, 18 and 25%) of canola meal and 2 levels (0, half recommended) of enzymes. A total of 240 chicks were divided into 8 groups having 3 replicates of 10 chicks each. The experimental period was from d 7 to 28 days of age. Feeding different levels of CM with and without enzyme supplementation had significant effect on the body weight gain and feed efficiency and nutrients utilization. The broiler chicks fed on corn-soybean meal diet enriched with enzyme (CM_{0E}) exhibited improved overall performance. The CM inclusion up to 10% in the corn soybean meal diet with and without enzyme supplementation revealed similar response in weight gain and feed efficiency. The response in carcass weight was also not pronounced indicated that enzyme supplementation in diets containing up to 10% CM has very little effect. It showed that anti-nutrients at 10% CM in the diets were sufficiently below the marginal level to cause significant problems. The broiler chicks showed retarded growth and inferior feed efficiency on diets contained CM 18% and above suggests that it is hard for the younger birds to tolerate higher levels of CM at earlier age that contributes more than permissible level of glucosinolate (< 2.5 umol/g) in the diet. The negative effect of 18% CM inclusion was diminished when enriched with enzymes recommends that CM in broiler diet can be increased up to 18 % with enzyme supplementation. The increase in CM up to 25% with and without enzyme supplementation failed to support the optimum growth. However, the improved feed efficiency on 25% CM enriched with was attributed to the decreased feed intake in chicks observed during the 2nd and 3rd week. The CP digestibility was declined in chicks by 1.2% on diet CM_{18} and was further reduced by 4.1% when the level of CM was increased from 18 to 25% in the diet. There were 2 and 2.3% more CP digestibility in chicks fed on 18 and 25% CM when enriched with enzymes, respectively. The Ca and P content in the blood serum and tibia ash were gradually increased with the increasing level of CM in the diet and was further elevated at each level when supplemented with enzymes. Bone mineralization (tibia ash, its Ca and P contents) was increased in chicks fed 25% CM with enzymes, however, the improved CP digestibility and increased bone mineralization did not support the optimum growth performance of broiler chicks. In conclusion, 10% CM inclusion in the corn soybean meal diet is suggested safe. Reduced performance was observed to be a function of increased CM, however, the negative effect of 18% CM was diminished when enriched with enzymes. Higher level of 25% CM enriched with enzymes improved CP digestibility and bone mineralization but failed to support the optimum growth.

KEY WORDS: Broiler chicks, Canola meal, Enzymes supplementation, Ca and P.

PS-13

EFFECT OF AFLATOXIN B1 ON SERUM BIOCHEMISTRY, HEMATOLOGY AND LIVER HISTOPATHOLOGY OF JAPANESE QUAILS

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ABSTRACT

Feed is the major cost in any type of poultry production. Growth of mycotoxins in feed is a serious issue which results in poor performance and elevated feed cost. The current study was conducted to investigate the effect of aflatoxin B1 (AFB1) on serum biochemistry, hematology and liver histopathology of Japanese quails. Experiment was conducted in completely randomize design (CRD). A total of 240, day-old quails were distributed into four groups; AF-0, AF-1, AF-2 and AF-4 having 0, 1, 2 and 4mg AFB1/Kg ration. Each group was replicated thrice with 20 quails per replicate. Adaptation period was two weeks from day 0-14 and experimental period was four weeks from day 14-42. At day 42 two birds were randomly selected per replicate for blood collection. Blood samples were collected in two test tubes, one free of anticoagulant and other with anticoagulant. Serum was separated from anticoagulant free blood sample by centrifugation at 4000 rpm for 10 minutes. Liver of the birds were examined histopathologically for any abnormal changes. Total serum protein was not affected ($P>0.05$) by different levels of aflatoxin B1. Aspartate aminotransferase (AST), Alkaline phosphatase (ALP) and alanine aminotransferase (ALT) levels were significantly increased by 102, 75 and 75% respectively in quails receiving highest concentration of AFB1 in the ration followed by group AF-2 and AF-1. Albumin level was decreased significantly in group AF-4 followed by AF-2 and AF-1. Significantly lower level of total leucocyte count (TLC) was recorded in group AF-4 followed by AF-2. TLC level was the same in group AF-2 and AF-1. Lowest lymphocyte percentage was recorded in group AF-4 followed by group AF-2 and AF-1. Lowest eosinophil count was recorded in group AF-4 which was 45.35 % lower than the control group. The corresponding decrease in eosinophil percentage of quails in group AF-2 and AF-1 was 18 and 27.32%, respectively. Lowest basophil level was shown in birds receiving 4mg/kg of AFB1 in diet, which was 38.5% lower than the control. Quails in group AF-2 showed similar basophil level as group AF-4. Quails in group AF-2 and AF-1 showed similar basophil level, while quails in group AF-1 and AF-0 showed similar basophil level. Significantly higher hetrophils and monocytes were recorded in quails of group AF-4 followed by group AF-2 and AF-1. Relative weights of spleen, liver and kidney were significantly higher in group AF-4 followed by group AF-2 and AF-1. Severe vacoulation/fatty change as well as mild congestion was seen in livers from group AF-4, AF-2 and AF-1. The present study concluded that AFB1 is capable of inducing clinico-biochemical reactions and alteration in different organs when fed to quails in different concentrations.

KEYWORDS: AFBI, broiler chicks, hematology, serum biochemistry

PS-14

EFFECT OF FEED FORM AND PARTICLE SIZE IN LAYING HENS ON MINERAL DIGESTIBILITY AND SOME EGG QUALITY TRAITS

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ABSTRACT

Mineral play important role in various biochemical processes and egg formation. Roller and hammer mill is used to reduce grain size and particle size distribution in feed affected egg quality. Thermal treatment may enhance nutrient digestibility and hygiene status of feed. The present study was designed to investigate the effect of of roller (R) and hammer (H) mills, in mash (M) and expandate (E) form with fine (F) and coarse (C) particle sizes in laying hens, on apparent ileal absorption (AIA) of calcium (Ca), phosphorus (P) and magnesium (Mg) as well as some egg quality traits including egg weight, Haugh unit, shape index, shell weight per unit surface area (SWUSA), air cell, yolk color, blood spot, yolk and albumen indices, shell stability and surface area. A total of 384 hens (Lohmann Brown), 19 weeks old, were assigned using a randomized design with a 2×2×2 factorial arrangement. Eight experimental diets were offered *ad libitum* during the whole experimental period and one week before for diet adaption. Ileal digesta samples and eggs were collected and then pooled at age of 23 weeks. The digestibility of the minerals was determined using titanium dioxide as indigestible marker at 2 g/kg diet. The mineral concentrations in feed and ileal digesta were determined by atomic absorption spectrometry (AAS). For statistical analysis variables were subjected to ANOVA using the GLM procedure of SPSS 20.0. The AIA of calcium and phosphorus were not affected by milling methods, thermal treatment and particle size of feed ($P>0.05$). However, AIA of magnesium was higher in treatment R, M and C in comparison with treatment H, E and F, respectively ($P<0.01$, $P<0.01$ and $P\leq0.05$, respectively). Milling method influenced yolk index which was higher in treatment H as compared to treatment R ($P<0.01$). The interaction between milling method and particle size affected blood spot ($P\leq0.05$). The interaction between thermal treatments and particle size affected yolk color ($P\leq0.04$). Feed treatments used in present study affected apparent ileal absorption of magnesium, which might influence other biochemical processes in hen body; however calcium and phosphorus digestibility was comparable for all treatments. Additionally, most of egg quality parameters were not affected due to treatments used in present study. Therefore, milling methods, thermal treatment and particle sizes used in present study seem to be of lower importance in regard to mineral digestibility and egg quality.

PS-15

SEROLOGICAL DETECTION OF RESPIRATORY DISEASES OF POULTRY IN NORTHERN PAKISTAN

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ABSTRACT

Respiratory diseases especially Newcastle disease and Chronic respiratory disease causes huge economic losses to poultry industry throughout the world and special attention is needed than other diseases of poultry. The present study was conducted in Peshawar and surrounding areas of northern Pakistan. The main objective of this study was serological identification of Newcastle disease (ND) and chronic respiratory disease (CRD) through interpretation of antibody titer. One hundred and twenty blood samples were collected aseptically each about 5 ml in disposable syringes from two separate layer forms for the identification of CRD using SPAT test and 192 other blood samples were collected aseptically from different layer farms to check their titre of antibodies against Newcastle disease using Haemaglutination Inhibition(HI) test. The result of Serum Plate Agglutination Test (SPAT) was divided as single positive, double positive and triple positive agglutination with no sample as zero agglutination. Using HI test all samples were found positive for protective immunity against ND having a positive percentage of 100 which shows that these birds are either vaccinated against ND or have a previous history of ND outbreak. Similarly other 120 samples were confirmed as prone to CRD using SPAT test.

KEY WORDS: Northern Pakistan, Chronic respiratory disease, Newcastle disease, Haemaglutination inhibition test and Serum plate agglutination test.

PS-16

AFLATOXIN IN POULTRY FEED

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ABSTRACT

Aflatoxin are an important issue in livestock industry especially poultry sector. This directly relate with the production and public health concerns. Its affect economic losses and health problems. Its directly affect in feed reduction either quality wise or efficiency in animals through poor conversion of nutrients and also cause reproductive abnormalities. Specifically, in poultry it enhances the chances of listlessness, anorexia with lowered growth rate, poor feed conversion, drop in egg production and mortality. It may also cause anemia, reduction of immune function etc. the different levels of aflatoxin in poultry has been investigated by determining their teratogenic, carcinogenic, mutagenic and growth inhibitory effects. Producers and researchers developed some effective preventive measures to decontaminate this toxic effect in the feed. Still practical and cost-effective methods of detoxifying feed are great demand. Besides preventive management, approaches have been employed including physical, chemical and biological treatments to detoxify AF in contaminated feeds and feedstuffs. An approach to the problem has been to use non-nutritive and inert adsorbents in the diet to bind AF and reduce the absorption of AF from the gastrointestinal tract. The aim of this discussion is to highlights some important features of AF toxins and their detoxification methods briefly.

KEYWORDS: aflatoxin, feed, detoxification, mortality, production

ABSTRACTS

PROSPECTIVE DAIRY FARMING AND DAIRY PRODUCTS OF PAKISTAN (DP)

DP-1

EFFECT OF COOLING ON PRODUCTION AND PHYSIOLOGICALPERFORMANCE OF DAIRY COWS (HOLSTEIN-FRIESIAN & JERSEY) IN SUBTROPICAL ENVIRONMENT OF PESHAWAR, PAKISTAN

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ABSTRACT

The present study comprising twelve dairy cows (6 Holstein Friesian and 6 Jersey) of about similar lactation stage were selected from the herd of University Dairy Farm. The cows were divided into three groups namely Control, A and B. All animals were properly dewormed, vaccinated and were kept under similar feeding management. Cows in control group were housed having floor and fans with no sprinkler and blowers. Cows in group A were provided with a cooling system (blower and sprinklers). Three-inch layer of sand was also spread as bedding. The sand was fully soaked with water at 8 AM daily. Cows in group B were kept at cemented floor along with Blower run for 24 hours and shower with pipe twice a day. Feed intake of cows in Group A was significantly higher than the other groups ($p<0.05$). Also, higher daily milk yield was produced by animals in Group A as compared to other groups (control and Group B). Respiration rate was significantly ($p<0.05$) lower in group A than control (C) and group B. Average body temperature was higher in Control group(C) and group B as compared with group A. The correlation between Respiration Rate and temperature was positive and significant. Similarly significant and positive relation was found between Body temperature and Respiration Rate. Relative humidity was positively correlated with respiration rate and body temperature. Feed intake of animal was negatively and significantly correlated with environmental temperature and body temperature. Also daily milk yield was negatively and significantly correlated with temperature, respiration rate and body temperature, respectively. Milk yield of animal in group A was higher than treatment groups. Glucose level decreased while protein level increased with increase in environmental temperature. The combined effect of increasing temperature and humidity is increasing THI resulting stress condition for exotic dairy cows.

KEYWORDS: Holstein Friesian, Jersey, Respiration Rate, Relative Humidity, Body temperature, Environmental temperature, Temperature humidity index.

DP-2

OXIDATIVE STABILIZATION OF IRON ENRICHED BUTTER OIL: A TOOL FOR ENCOUNTERING IRON DEFICIENCY

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ABSTRACT

The objective of this study was to check the oxidative stability of iron fortified butter oil by using different concentrations of anti-oxidants (sesame oil and turmeric powder) in butter oil. The butter oil was prepared by augmented of natural anti-oxidants. i.e. T0 (100% butter oil+ 30 mg iron sulfate), T1 (butter oil + sesame oil 5% and turmeric powder 0.10%), T2 (butter oil + sesame oil 10% and turmeric powder 0.15%), T3 (butter oil + sesame oil 15% and turmeric powder 0.20%). Samples were stored for 90 days at 40 0C. Butter oil samples were analyzed for free fatty acids, peroxide value, thiobarbituric acid value, shaal oven test and sensorial attributes (color, smell, appearance and overall acceptability) at 30 days of intervals. Treatment T3 had lowest peroxide and free fatty acid values, while highest values were observed in T0 and T1. Smell, appearance and overall acceptability of iron fortified butter oil shows increased as amount of augmentation of natural anti-oxidants increased in all treatments. The lowest sensory score was observed in treatment T3 due to dark yellowish type color of turmeric powder. Over all treatments T2 and T3 received higher scores from all the physicochemical tests and sensorial evaluation.

KEY WORDS: Butter oil, Sesame oil, Turmeric powder, Natural Anti-oxidant

DP-3

QUALITY COMPARISON OF DAIRY AND NON DAIRY CREAM

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ABSTRACT

The experiments were conduct to compare and evaluate the quality of dairy and non-dairy cream. Samples of dairy and non-dairy cream were brought from super market in Lahore (Pakistan) and analyzed for microbiological, physicochemical and organoleptic properties. Microbiological analysis descried that dairy cream have higher number of total plate count as compared to non-dairy cream and there was no coli form found in both type of cream. Physicochemical analyses found that non-dairy cream have more fat, pH, protein, total solids and over run as compared to dairy cream. Organoleptically non-dairy cream was found more acceptable as compared to dairy cream

KEY WORDS: Cream, Dairy, Non-Dairy, compare

DP-4

STUDY GROWTH PARAMETERS AND TRANSMISSION OF GENETIC WORTH IN LOCAL RABBITS

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ABSTRACT

Growth traits and genetic worth of different crosses of local rabbits of Khyber Pakhtunkhwa Province were studied. A total of 48 breeding rabbits (40 does and 8 bucks) divided into four groups on the basis of color i.e white, black & white, brown and black were studied in the Rabbitory unit of "The University of Agriculture Peshawar". General Linear model (GLM) was used to study the effect of class variables on growth parameters. Litter size was found, 4.49±1.15. Average weaning weight and body weight gain was 0.449±0.04 and 0.615±0.15g, respectively. Mean heart girth and body length was found 15.33±2.21 and 15.74±2.09cm, respectively. Dam and sire significantly ($P < 0.0001$) affected litter size, weaning weight, body weight gain, heart girth, and body length. Also the time interval significantly ($P < 0.0001$) affected body weight gain, heart girth, and body length. Perfect positive and significant correlation was found between body weight gain and heart girth (0.93, $P < 0.0001$). Similarly high positive correlation (0.90) was observed between body weight gain and body length. Heritability estimate (h2) for weaning weight and body weight gain was 0.94 and 0.14, respectively, while (h2) for heart girth and body length 0.15 and 0.08, respectively.

KEY WORDS: Rabbits, linear body measurements, body weight, correlation, heritability.

DP-5

ENHANCEMENT OF NUTRITIONAL VALUE OF STIRRED YOGHURT WITH THE FORTIFICATION OF CALCIUM

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ABSTRACT

Yogurt is a product resulting from fermentation of milk by mixed starter cultures (Streptococcus thermophilus and Lactobacillus delbrueckii ssp. Bulgaricus). Physical attributes such as firmness of the coagulum, viscosity, and smoothness of the texture largely determine the consumer appeal of stirred yogurt. Calcium in milk exists in soluble, colloidal and ionic forms. The distribution of these calcium forms has a major influence on the structural stability and functionality of the milk proteins. Heat treatment of milk, changes in pH, and addition of calcium alter the distribution of calcium and thereby affect the stability of the casein system in yoghurt. The present study was planned to enhance the nutritional value of the stirred yoghurt and to check the effect of calcium addition on the smoothness and viscosity of the stirred yoghurt. Standardized milk for yogurt manufacture was prepared, and calcium was added or removed from the system. Calcium chloride was added to milk after heat treatment at different levels of 1.7mM, 5.6 mM and 13.6 mM by cation exchange method. Addition of calcium at 5.6 mM resulted in improved the firmness and viscosity without affecting yogurt smoothness which scored best by the consumers. Use of 1.7mM

calcium showed the weak texture and less viscous yoghurt while 13.6 mM resulted in a smooth texture but thick viscosity stirred yoghurt. Low pH and the presence of calcium ions enhanced the heat denaturation of β-lactoglobulin and its preferential attachment to the casein micelle surface during heat treatment of milk. Calcium fortification in stirred yoghurt increases the nutritional value of yoghurt and it will be a nutritional source for the human health especially in school going children.

KEY WORDS: Stirred Yoghurt, Cation exchange, Calcium fortification, Nutrition.

DP-6

VARIANTS IN EXONIC REGIONS OF BGH GENE AND ITS ASSOCIATION WITH MILK PRODUCTION TRAITS IN NILI RAVI BUFFALO BREED OF PAKISTAN

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ABSTRACT

Genetic variants play an important role as DNA markers in many fields of animal breeding. A major objective of Genetic variants studies is to find markers that can be applied for marker assisted selection of animals. The abundance of SNPs in the genome makes them a powerful tool for genetic studies. Bovine Growth Hormone Gene is an important as it has a key function in activating a variety of transcription factors regulating energy homeostasis and nuclear hormone receptors. The gene, consisting of 1.8k bp, is organized into 5 exons is expressed at different levels in a large number of tissues. Because of its chromosomal position in QTL region and its physiological function, the gene was discussed as a positional and functional candidate gene for QTL studies. Fifty EDTA blood samples were obtained from Govt. Livestock farm. DNA was isolated using a standard procedure. Primer were developed for PCR reactions covering all exonic regions using Primer3 software. All PCR reactions were performed with DNA, primer (forward and reverse) and Taq polymerase, according to the manufacturer's protocol. Sequencing of the PCR product was done with BigDye Terminator Sequencing Kit on an ABI Prism 3130 Genetic Analyzer, according to the manufacturer's instructions, while sequences were analyzed using Chromas. Variants in exonic regions were identified. Association of identified polymorphisms, Change in nucleotide, Genetic code, Amino Acid, Synonymous/ non synonymous and nature of amino acid of identified variants were also studies. Our results suggest that identified variants in exonic regions of bGH gene associated with milk production traits may be used for selection of high producer animals of Nili Ravi buffalo breed of Pakistan.

KEYWORDS: Variants, bGH Gene, Milk Production, Nili Ravi, Pakistan

DP-7

EFFECT OF BOVINE SOMATOTROPIN HORMONE ON THE PRODUCTION PERFORMANCE OF NILI RAVI BUFFALOES KEPT IN PERI-URBAN AND RURAL AREAS OF FAISALABAD

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ABSTRACT

The study was conducted to investigate the effect of Bovine Somatotropin Hormone (bST) on the productive and reproductive parameters of Nili Ravi buffaloes in peri-urban and rural areas of Faisalabad. A total of 40 farms (20 from peri-urban and 20 from rural areas of Faisalabad) were selected for this study. Data regarding productive and reproductive parameters were taken from bST treated and control animals were analyzed by ANOVA technique. Data regarding lactation number, stage of lactation, milk yield, mastitis prevalence, irregular estrus, repeated estrus and abortion was collected from both types of farmers i.e. those who using bST and not using. In peri-urban rural study areas bST was used in 42.2 % animals whereas the same percentage was 26.5 in the rural areas. In peri-urban area average milk yield was 7.0 versus 8.52 liters and in rural area it was 7.18 versus 8.45 liters in control (non bST) versus bST injected animals. Irregular estrous and repeated estrus were more pronounced in bST group versus control (7.14% versus 3.86% and 12.50 versus 7.85%) in rural areas and irregular estrus (5.07 versus 1.58%) and repeated estrus (11.60 versus 6.87%) in peri-urban areas. The mastitis prevalence was higher (15.21%) in bST treated animals as compared to control group (11.64%) in peri-urban areas. A similar trend was found in rural areas as mastitis prevalence was 16.07% in bST buffaloes and 12.14% in control buffaloes. However abortion was low in bST treated as compared to control group that in both areas. The milk composition was not altered significantly by bST administration. Difference in milk composition was statistically non-significant. The bST treated animals were more prone mastitis as compared non bST treated animals.

KEY WORDS: bovine somatotropin hormone, production performance, Nili Ravi buffalo

DP-8

EFFECT OF DIFFERENT TYPES OF BEDDING ON BEHAVIOR, GROWTH AND LOCOMOTION IN SAHIWAL FEMALE CALVES

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ABSTRACT

The present study was conducted to investigate the effect of different types of bedding on behavior, growth and locomotion in Sahiwal female calves. Twelve Sahiwal female calves of almost same age (8 ± 0.50 months), weight (85 ± 0.25 kg) and same health status were randomly allotted to three bedding treatments viz., A) Paddy straw, B) Sand and C) Control (without bedding) under Completely Randomized Design (CRD). There were four calves in each group. All animals were kept under similar managemental practices. The data on daily feed intake, weight gain, feeding, standing, sitting, lying behavior and locomotion were collected for six weeks excluding two weeks adjustment period. The results revealed that bedding has non-significant effect on growth rate. Dry matter intake was higher (3.7 ± 0.16 kg) in animals kept on paddy straw (A) and lowest (2.4 ± 0.12 kg) in treatment "C" (Control group). The highest locomotion score (3.50 ± 0.57 115 days) was found in the calves kept on concrete floor with-out bedding and lowest locomotion score (1.00 ± 0.00 115 days) was

found in the calves kept on sand bedding. The mean values for time (Minutes) spent in standing, sitting, lying and eating in treatments "A", "B" and "C" were (1465.8 ± 41.50, 1529.5 ± 27.67, 1840.3 ± 13.27), (1970.5 ± 11.84, 1758.5 ± 43.83, 1476.8 ± 14.5), (189.2 ± 114.67, 107.7 ± 9.7, 21.3 ± 2.98), (1111.8 ± 26.03,1038.2 ± 28.86, 768.7 ± 14.54) respectively. It is concluded that paddy straw overall proved better bedding material as compared to sand and concrete. Calves showed better weight gain and were comfortable on paddy straw and exhibit their normal behavior

KEY WORDS: bedding, behavior, locomotion, calf

DP-9

THE ROLE OF WOMEN IN LIVESTOCK PRODUCTION IN DISTRICT MARDAN, KHYBER PAKHTUNKHWA

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ABSTRACT

The current study explored the prominent role of women in livestock production in district Mardan, Khyber Pakhtunkhwa. Women role was assessed in association with livestock ownership, labour contribution and various constraints being faced by women in this sector. Through proportional allocation technique a sample size of 117 respondents/women involved in livestock sector was selected from two selected villages and respondents were interviewed by pre-tested interview schedule. Majority of the respondents in current study were of middle age, married and literate but had low level of education. The respondents were experienced in livestock rearing and livestock were mainly kept for their subsistence. Most of the respondents had no access to institutional credit facilities for livestock purchase. Buffalo, cattle and goat were major livestock species with high number of cattle. Goats were the major type of livestock kept by women. Our result indicated that significant differences between men and women exist for buffalo, cattle and goat populations. Among the major livestock activities women outnumbers that of men in herd management, animal feed preparation and sale of milk and milk products. Also milking of animals was primarily done by women whereas animal marketing was mainly done by men. In case of decision making in the areas of animal marketing and sale of produce men were dominant. The income arise from livestock was mainly spent by the choice of men. The major constraints faced by women in livestock production were inadequate capital, pre-occupation with household chores and dominance by their spouses. The study recommends that the women should be linked with micro finance banks in order to have access to capital which can be used to increase their level of involvement in livestock rearing. Moreover, the ownership trend must be given proper consideration in policy formulation for livestock development in the area.

KEY WORDS: Livestock ownership, gender role, livestock management, socio-economic factors and constraints.

DP-10

PHYSICO-CHEMICAL AND SENSORY CHARACTERISTCIS OF DATE YOGHURT PREPARED FROM CAMEL MILK

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ABSTRACT

Pakistan is the major camel raising and date producing country and in spite of the largest population of camels and date production they are unnoticed in terms of research & productivity. Camel milk has medical properties and according to the FAO organization camel milk is the nutritious & healthiest milk among all dairy animals. Camel milk and dates both are the Sunnah of our Holy Prophet Muhammad SAW and camel milk has been use to cure diseases (Hadith-Sahi Muslim & Bukhari). There is a problem in the curd formation of camel milk yoghurt. So, the objective of research work was to determine how camel milk curd formation can be improved so that the camel milk can be more acceptable to consumers who are more used to consume yoghurt from cow milk. Pectin and maltodextrin were used as thickener & stabilizer and date paste was prepared and added to increase the total solids of camel milk yoghurt. The present study was an effort to explore physico-chemical composition of camel milk and its yoghurt. Camel milk date yoghurt was prepared by adding three level of each stabilizer maltodextrin (0.6, 0.8 & 1%) and pectin (0.6, 0.8 & 1%). Then physico-chemical composition and sensory evaluation of camel milk date yoghurt was determined according to respective methods during 21 days of storage time and all analysis were performed after every 7 days. Treatments and storage days had a significant effect on the pH, acidity, viscosity, synersis, texture analysis and sensory evaluation. While treatments had so significant effect on the composition like moisture, fat, protein and lactose etc. The overall best results were obtained from CMY_3 treatment of 1% maltodextrin.

KEY WORDS: Camel, dates, yoghurt, maltodextrin, physico-chemical characteristics

DP-11

EFFECT OF HYDROLYSABLE TANNIN SUPPLEMENTATION ON MILK YIELD AND COMPOSITION OF DAIRY COWS

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ABSTRACT

Hydrolysable tannin has beneficial effect on protein utilization by ruminants. The objective of this study was to investigate the effect of hydrolysable tannin (Farmatan SCC) on performance of cross-bred dairy cows in terms of milk production and milk composition. Twelve crossbred cows (average milk production 10 liters/day, average lactation number 3-4, average age 6±2 years and average body weight 400±30 kg) were selected for this experiment. Selected cows

were divided into four groups; A, B, C and D (3 cows per group) under Completely Randomized Design. Farmatan SCC® was supplemented in the diet of groups A, B, C and D @ 0, 20, 30 and 40 g per day, respectively. Animals in group A fed diet without supplementation of Farmatan SCC®. The study was conducted for a period of 55 days including 10 days of adaptation. Milk yield was recorded daily during the experimental period. Milk sample from each cow was collected fortnightly and analyzed for milk fat, protein, total solids, milk urea and lactose contents. The results showed that milk production was significantly different ($P<0.05$) between groups and was consistent in group D and higher in group D. The difference among the groups in milk total solids, milk protein, milk lactose and milk fat was not different ($P>0.05$) between groups. However increase in milk protein and milk lactose was found in supplemented groups. Milk urea content was reduced in groups containing Farmatan SCC® but highest drop was observed in group B. Somatic cell count was also decreased with supplementation of Farmatan SCC. It is concluded that Farmatan SCC is useful for consistent milk production and to enhance feed efficiency.

KEYWORDS: Hydrolysable Tannins, Crossbred cows, Milk production, Milk composition.

DP-12

BUFFALO STATUS IN PAKISTAN: A META-ANALYSIS

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ABSTRACT

Buffalo is a very important dairy species in Pakistan as it alone shares 70% of total milk production in the country. Pakistan is a native region of river buffalo (Bubalus *bubalis*), which is mainly maintained for milk purpose but despite of milch charter some animals exhibit good meat traits, though their potential is not explored yet in the country. The best know breeds are Nili Ravi, Nili, Ravi, Kundi and Azakhali. The germplasm of such well-defined breeds constitute a valuable genetic resource which needs to conserved and promote on priority basis. The main objective of this meta-analysis to document this important milch species and compare with some other important buffalo breeds around the globe by using advanced bioinformatics tools and review some scientific studies related reproduction, biometry and behavioral about this species especially in genomic era in Pakistan.

KEYWORDS: Pakistan, Buffalo, Dairy, meat, compare

DP-13

BIOTECHNOLOGY AND DAIRY PRODUCTION

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ABSTARCT

The advantages of recent developments of biotechnology improve the quality and quantity of the farm animal's products, including milk, meat, etc. These techniques can be utilized for improve the productivities of these animals and also enhance the economics. Physicochemical and nutritional aspects are major concerns for farm animals. The active area of

biotechnological research in the field of farm animals products can be envisaged as production of high yielding food animals, improve quality of their products, enhanced production of natural food grade preservatives, efficient byproducts utilization and so forth. Many of the biotechnological techniques can be explored in the area of quality assurance programmes, which would be of great help to produce livestock products of assured quality and public health safety. The aim of this review is to highlight some important features and contribution of this technology in the dairy production of Pakistan in last ten years.

KEYWORDS: biotechnology, livestock products, feeding, economics

DP-14

AN ANALYSIS OF CONTROL OF LIVESTOCK AND POULTRY EPIDEMIC DISEASES THROUGH EXTENSION SERVICES IN DISTRICT KARAK

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ABSTRACT

The study analyzes the control of livestock and poultry epidemic diseases through extension services in district Karak. The data for the study were collected from seventy five (75) respondents randomly selected from one tehsil out of three tehsils in district Karak through a pre-tested questionnaire. The respondents included were from all age groups with different educational status. Majority of the respondents (53.66%) with age group range between 31-45 years showed their active participation in livestock activities. About 14.66 percent of the respondents were illiterate while only 85.33 percent of the respondents were literate from primary to graduation. It was concluded that 50.66 percent of the respondents lived in nuclear family while 49.33 percent lived in joint family system. It was concluded from the data that 33.33 of the respondents had land holding of 31-40 kanals. The larger area holding by the farmer is due to rain fed conditions and family inheritance. The data showed that 37.33 percent of the respondents reported that their source of income was both agriculture and non-agriculture. It was revealed from the study that only 47.76 percent of the respondents were of the view that health facilities are available from livestock extension department, while 52.24 percent of the respondents received vaccination from livestock extension department. About 38.70 percent of the respondents said that livestock extension worker visited them. The data also showed that only 14.70 percent of the respondents were satisfied from existing livestock extension services. The data also showed that most of the farmers (22.11%) knew about foot and mouth diseases of animals. It was also reported that 53.33 percent of the respondents were facing difficulties related to livestock extension services due to lack of awareness, 21.33% due to high cost of livestock inputs, and 25.33 due to lack of cooperation. The study concludes that role of livestock extension services and poultry development department could be changed, modified, and boosted up by effective policy making.

DP-15

EFFECT OF MARKETING CONSTRAINTS ON PERFORMANCE OF DAIRY ENTREPRENEURSHIP IN DISTRICT PESHAWAR

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ABSTRACT

Dairy farming is an important sub sector of Pakistan's agriculture, confronting major constraints like poor marketing channels, unavailability of technical man power for dairy business, lack of commercial rations, orthodox management practices and poor extension services by livestock extension organizations. This study was conducted in 2014 in district Peshawar with the objectives; to evaluate the effect of marketing constraints on performance of dairy entrepreneurship, to examine the role of livestock extension in marketing performance of dairy farmers and to identify the main problems faced by farmers in dairy farming in this district. The data was collected in five villages namely Dag Lara, Nothia Qadeem, Hassan Ghari, Achini Bala and Sufaid Dheri from 80 respondents using a well prepared and pretested interview schedule. Both inferential and descriptive statistical techniques were employed in the study. The data were analysed using SPSS. Results revealed that most (88.8 %) farmers stated/faced problems in their access to necessary livestock inputs. The study showed association between extension agent visits with farmers' problems to access livestock inputs. Nearly (60 %) respondents reported bad effects of market feed on livestock health. About (45 %) respondents faced problems in marketing their milk in which almost (38.8 %) respondents lacked selling point at village or nearby market. The market availability showed significant association with the farmer's monthly income from dairy business. Mostly (81.2 %) respondents purchased animals from other parts of the country especially from Provence Punjab. Availability of market for purchasing dairy animals showed significant association with total milk yield of farmers per day. An overwhelm majority (90%) of the respondents put huge income on shifting animals from other parts of the country. It was concluded that farmers are lacking market facilities for purchasing inputs, animals and for selling their milk. Beside this other problems like adulteration, poor extension services, inadequate facilities for milk marketing and lack of support from government side are also encountered by farmers. Based on conclusion it is recommended that the concerned department should provide market facilities, skills and information regarding marketing of milk and Strong extension services, training and quality inputs should be provided to farmers at local markets on convenient prices.

KEY WORDS: Dairy Farming, Technical Man Power, Commercial Rations, Orthodox Management Practices, Extension Agent, Market Facilities.

DP-16

IMPACT OF EXTENSION AGENTS VISITS ON FARM MANAGEMENT PRACTICES OF DAIRY FARMERS IN DISTRICT PESHAWAR OF KHYBER PAKHTUNKEWA, PAKISTAN

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ABSTRACT

This research was carried out in 2014 in district Peshawar of Khyber Pakhtunkhwa with the intensions; to identify the extension agents' role in enhancing the management skills of the dairy farmers, to study the prevailing system among dairy farmers, and to know the constraints faced by farmers in expending dairy sector in the district. Results of the study showed that most of the respondents (61.2%) were not aware of establishing appropriate animal housing and majority of the respondents (86.2%) were lacking in technical knowledge to operate housing water systems at their farms. About (52.5%) respondents were found able to recognise and supervise diseases in their animals. Extension agent's visits showed significant association with farmers' awareness regarding establishing appropriate animal housing, managing housing water practices, and farmers' competence to locate and control diseases in their animals. Based on the findings it was concluded that the role of extension agents was discouraging for establishing a modern dairy sector in the district and farmers lack skills to manage prevailing problems at their farms. It is recommended that appropriate extension services are important for establishing a modern dairy sector; therefore extension agents should carry out their visits on regular basis, extension services should be delivered to all farmers without any prejudices or biases and extension agents should disseminate information based on training needs of the field conditions of the dairy farmers.

KEY WORDS: Extension agent, management skills, animal housing, housing-water management, technical knowledge, modern dairy sector, training needs, field conditions.

DP-17

EFFECT OF MARKETING CONSTRAINTS ON PERFORMANCE OF DAIRY ENTERPRISES IN DISTRICT PESHAWAR

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ABSTRACT

Dairy farming is an important sub sector of Pakistan's agriculture, confronting major constraints like poor marketing channels, unavailability of technical man power for dairy business, lack of commercial rations, orthodox management practices and poor extension services by livestock extension organizations. This study was conducted in 2014 in district Peshawar with the objectives to evaluate the effects of marketing constraints on performance of dairy enterprises, to examine the role of livestock extension in marketing performance of dairy farmers and to identify the main problems faced by farmers in the district. The results revealed that most (88.8 %) farmers stated/faced problems in their access to necessary

livestock inputs. The study showed association between extension agents visits with farmers' problems to access livestock inputs. Nearly (60 %) respondents reported bad effects of market feed on livestock health. About (45 %) respondents faced problems in marketing their milk in which almost (38.8 %) respondents lacked selling points at village or nearby market. The market availability showed significant association with the farmers' monthly income from dairy business. Mostly (81.2 %) respondents purchased animals from other parts of the country. Availability of market for purchasing dairy animals showed significant association with total milk yield of farmers per day. It was concluded that farmers faced problems of adulteration, non-availability of appropriate extension services, inadequate facilities for milk marketing and non-availability of market facilities for purchasing inputs and animals. Based on conclusion it is recommended that the concerned department should provide market facilities, skills and information regarding marketing of milk and Strong extension services, training and quality inputs should be provided to farmers at local markets on convenient prices.

KEY WORDS: Dairy Farming, Marketing Channels, Technical Man Power, Extension Services

DP-18

EXTENSION-FARMERS LINKAGE AND ITS IMPACT ON DAIRY PRODUCTION IN DISTRICT PESHAWAR OF KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

A functioning extension-farmers linkage is extremely important for disseminating agricultural information to farmers as farmers' access to and use of information can generate economic stability among farmers. This study was carried out in 2014 in district Peshawar with the intensions: to examine the impact of extension-farmers linkage on dairy production, to evaluate the efficiency of extension-farmers linkage and to study the role of extension agents visits in improving dairy farmers' income in this district. Results of the study indicated that most of the farmers were not aware of local extension office neither they had carried out any visits to live stock and dairy development department (extension). Mostly farmers were not visited by the agents of livestock and dairy development department. The study showed association of farmers' visits to extension office with their milk yield each day and as well as extension agents visits with the monthly income of dairy farmers. It was concluded that though extension-farmers' linkage is poor in the study area but extremely necessary for increasing farmers' production and income. Visits by livestock extension staff are not regular; the respondents are not visiting the office of extension workers. Based on the findings it was recommended that Strong emphasis should be given to establishment of an effective linkage between farmers and extension agents so as to equip farmers with necessary information they need for increasing their production.

KEY WORDS: Extension-Farmers Linkage, Agricultural Information, Economic Stability

DP-19

LIVESTOCK EXTENSION: A KEY INPUT FOR DAIRY DEVELOPMENT INTERVENTIONS

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ABSTRACT

Livestock is an important subsector of agriculture, plays a key role in Pakistan's economy. Keeping in view the importance of livestock extension in dairy development the present study was conducted in 2014 with the intentions to determine the effectiveness of public sector livestock extension in the development of dairy sector in district Peshawar, Khyber Pakhtunkhwa. Interview schedule were used for collecting data from respondents. The data, after collection were analyzed using SPSS. Results show that 90% farmers stated loss in dairy business in the near past. Moreover 49 respondents (68.1 % of those farmers who stated loss in dairy business) reported that their loss was primarily because of non-availability of extension services. The cause of loss in dairy business was found significantly associated with the low monthly income of farmers. Based on the study it is concluded that a great majority of dairy farmers had not been adequately reached by livestock extension staff. Because of non-availability of extension services, farmers have confronted losses in dairy yield, which in turn has affected the income of dairy farmers. It is recommended that livestock extension agents must be mobilized in order to get maximum profit from dairy enterprises. Extension agents should carry out visits so that to convey research findings and provide training facilities on loss preventive methods for dairy farmers and Farmers should establish relationship with livestock extension agents so that to cope with their problems.

KEY WORDS: Livestock Extension, Extension Services, Low Monthly Income.