Journal of Entomology

ISSN 1812-5670

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Jumping Plant-Lice of the Family Psyllidae (Hemiptera: Psylloidea) From West-Cameroon: Biodiversity and Host Plants

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From 2005 to 2007, field studies undertaken in West-Cameroon permitted to enrich the biodiversity of Psyllids of Psyllidae family. This family include 7 sub-families which are: Aphalaroidinae with *Yangus* genus (4 species); Ciriacreminae with 3 genus and species (*Heteropsylla cubana*, *Ciriacremum* sp., *Kleiniella* sp.); Diaphorininae with 2 genus, *Diaphorina* (4 species) and *Epipsylla* (1 species); Paurocephalinae with 2 genus, *Paurocephala* (5 species) and *Diclidophlebia* (1 species); Rhinocolinae with 2 genus, *Cerationotum* (2 species) and a new genus with 1 species; Spondyliaspidinae with 2 genus, *Ctenarytaina* (1 species) and *Blastopsylla* (1 species); Psyllinae sub-family is the most diverse with 14 genus among which only 4 genus are knew; *Cacopsylla* (1 species), *Acizzia* (1 species), *Psylla* (3 species), *Palaeolinbergiella* (4 species); 5 genus are new to Science. Among the 37 species captured during this survey, 35 are unknown and *Blastopsylla occidentalis*, *eucalyptus* psyllid is captured for the first time in West- Cameroon. Host plants belong to more than 16 families. The damages caused by psyllids are mainly leaves folded, wrapped, deformed, discolourated with necrosis and these leaves become dry. *(Journal of Entomology 6 (1): 1-17, 2009;* ***doi:*** *10.3923/je.2009.1.17)*

An Overview of *Bactrocera* (Diptera: Tephritidae) Invasions and Their Speculated Dominancy over Native Fruit Fly Species in Tanzania

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The dominancy of introduced *Bactrocera* species (Diptera: Tephritidae) over the native fruit fly species was assessed based on data collected from a trapping and sampling program in Morogoro, Tanzania, from 2004 to 2006. Two invasions by *Bactrocera* species namely the invasive fruit fly *Bactrocera invadens* Drew, Tsuruta and White and the Solanum fruit fly *Bactrocera latifrons* (Hendel) have been recorded in 2003 and 2006, respectively. These add to an earlier introduced melon fly *Bactrocera cucurbitae* (Coquillett). Points and exact times of entry of these species are still unknown. Dominance of *Bactrocera* species over the native *Ceratitis* species has been speculated from other parts of the world. Results of this study also suggest the dominancy of *Bactrocera* species over native *Ceratitis* species in Tanzania. *B. cucurbitae* seems to dominate the other cucurbit infesters

in terms of abundance and infestation rate. Similarly, *B. invadens* seems to dominate the native *Ceratitis* species in orchard fruits in terms of abundance, host range and infestation rate. *B. latifrons*, whose distribution in the country is still unclear, seems to be the dominant species in its main hosts from family Solananaceae. The outcome of the competition resulting from these introductions is speculated upon. Presence of these pests calls for strong surveillance systems and quarantine regulations to protect the infant fruit industry of Tanzania. *(Journal of Entomology 6 (1): 18-27, 2009; **doi:** 10.3923/je.2009.18.27)*

Survey of Arthropod Biodiversity in the Brinjal Field

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Field experiment was conducted to study the arthropod biodiversity in the brinjal field during February to August. Twenty species of harmful arthropods under 17 families were observed belonging to 6 different orders. The brinjal shoot and fruit borer (*Leucinodes orbonalis*), jassid (*Amrasca biguttula biguttula*), epilachna beetle (*Epilachna* sp.) white fly (*Bemisia tabaci*) and aphid (*Aphis gossypii*) were found as the most common and major insect pests of brinjal. Ten plant dwelling predaceous arthropod families were found in the field among them 42.44% were occupied by three families under Coleopteran insect. Spider under lycosidae family possessed 30.23%, which was ranked as the second most important arthropods. Surface dwelling arthropods caught in pitfall traps were grouped into 17 families among them 7 families were identified as predators. Formicidae was occupied 67% of the total surface dwelling predaceous arthropod. *(Journal of Entomology 6 (1): 28-34, 2009; **doi:** 10.3923/je.2009.28.34)*

Genetic Variation in a Chitinase Gene of *Beauveria bassiana*: Lack of Association Between Enzyme Activity and Virulence Against *Hypothenemus hampei*

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Like other entomopathogenic fungi, *Beauveria bassiana* produces enzymes that degrade cuticle for penetration in the host at the time of infection. Chitinases are considered important enzymes for chitin hydrolysis, one of the main insect exoskeleton components. In this study, polymorphism in *B. bassiana* chitinase gene was analyzed by PCR-RFLP and compared with the enzymatic activity and

mortality caused on adults of coffee berry borer, *Hypothenemus hampei* (Ferrari) (Coleoptera: Scolytidae). Thirty *B. bassiana* isolates obtained from different insect species and geographic origins were used. The activity of chitinases was not directly related with the mortality rate of each strain, emphasizing the hypothesis that the virulence is multifactorial. The chitinase gene analyses showed low variability between isolates, as only four isolates presented polymorphism. Therefore it was not possible to correlate the polymorphism with virulence and chitinolitic activity. Lack of association between chitinase gene polymorphism and enzyme activity suggests that the polymorphic region studied may not be involved in enzymatic activity of this gene. Further, lack of association between enzyme activity and virulence suggests that there may be other enzymes and factors that could contribute to infection ability. No association between polymorphism in chitinase gene with that of geographic region or origin was observed. *(Journal of Entomology 6 (1): 35-41, 2009;* ***doi:*** *10.3923/je.2009.35.41)*

Prey Preference of *Orius niger* (Wolf.) and *O. minutus* (L.) from *Thrips tabaci* (Lind.) and *Tetranychus urticae* (Koch.)

S.A.A. Fathi and G. Nouri-Ganbalani

The two-spotted spider mite (TSSM), *Tetranychus urticae* Koch and onion thrips (OT), *Thrips tabaci* Lindeman, are two serious pests of potato and *Orius niger* (Wolff) and *O. minutus* (Linnaeus) are major predators of these pests in the potato fields in Ardabil region. Therefore, we compared the predation potential and fecundity of these predator when they fed on 2nd instar larvae of thrips and female mites on potato leaves in the no-choice and choice experiments in a growth chamber that was set at 24±1°C, 50±5% RH and 16: 8 h (L:D) photoperiod. In the no-choice tests, *O. niger* showed lower nymphal mortality percentage, higher fecundity and higher killing rate (k_m) when fed on 2nd instar larvae of thrips than female mites. *O. minutus* showed lower nymphal mortality percentage, higher fecundity and higher killing rate (k_m) on female mites than 2nd instar larvae of thrips. In the choice tests, the number of 2nd instar larvae of thrips consumed by different nymphal instars and the adult pairs of *O. niger* were significantly higher than the number of female mites consumed. Different nymphal instars and the adult pairs of *O. minutus* consumed significantly more female mites compare to 2nd instar larvae of thrips. Based on these results it can be concluded that *O. niger* and *O. minutus* are effective natural enemies of OT and TSSM in the potato fields, respectively. *(Journal of Entomology 6 (1): 42-48, 2009;* ***doi:*** *10.3923/je.2009.42.48)*

Cotton Production in the Presence of *Pectinophora gossypiella* (Saunders) in Central Greece

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The aim of the present research was to study fluctuations of populations of *P. gossypiella* in various areas in the Prefecture of Larissa. Data were analyzed to found the relation between population density of the insect and cotton production and additionally, to explore year and local (area) conditions as factors affecting damage levels. Correlations on data between years (across all communities) revealed that, when cotton production was high then the number of adult male insects of *P. gossypiella* captured in pheromone traps was also high (r = +0.93). Our data indicate that, when the environmental conditions of specific years favored cotton production, then the population of *P. gossypiella* was high due to the availability of food (more flowers and bolls), in a kind of synchronization. In parallel, the presence of increased numbers of useful insects that predate cotton enemies may result in lower damages on cotton production. In years 2002 and 2003, the presence of the insect may contribute in lower cotton production in the areas where population of adult males trapped was high. The mean cotton production was generally low in the areas where population of *P. gossypiella* was high. In this case, although statistically not significant, the tension was negative (r = -0.37). Local conditions within each area have been proved important and these results were completely different compared to data concerning years. The specific conditions within each area determine the balance between the insect population and level of damage on cotton production. There were areas where the insect showed increased populations resulting in low cotton production. These areas may need special treatment with insecticides or other techniques in order to decrease insect populations. *(Journal of Entomology 6 (1): 49-55, 2009;* ***doi****: 10.3923/je.2009.49.55)*

Integrated Pest Management of Cotton's Spiny Bollworm (*Earias insulana*) with Spray of Diazinon and Relaese of Green Lacewings

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Cotton (*Gossypium hirsutum*) was planted, in a Complete Randomized Block Design (CRBD) in an experimental field of Agricultural faculty of Razi University in Kermanshah, Iran, for a two years period. Four treatments applied, 3 different

concentrations of an organophosphorous insecticide, Diazinon, plus control (without spraying of any insecticide). One month after spray of insecticide, release of 2nd instar larvae and or eggs of green lacewing *Chrysoperla lucasina* was done. The number and weight of attacked, blind, or blossomed bolls, was considered as index of efficacity, of certain insecticide concentration, together with release of lacewing. *(Journal of Entomology 6 (1): 56-61, 2009;* ***doi:*** *10.3923/je.2009.56.61)*

Deleterious Effects of *Cotton leaf curl virus* on Longevity and Fecundity of Whitefly, *Bemisia tabaci* (Gennadius)

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Cotton leaf curl virus (CLCuV) has a complex association with their whitefly vector. To further understand these relationships, longevity and fecundity of viruliferous and non-viruliferous *Bemisia tabaci* (Gennadius) was compared on three different ages of cotton plants (25, 45 and 55 days old). *Cotton leaf curl virus* infection reduced the fecundity and longevity of *B. tabaci* compared with non-viruliferous whiteflies. Both viruliferous and non-viruliferous whiteflies survived longer on older plants than on younger plants. Female whiteflies survived longer than the male whiteflies irrespective of their being viruliferous or non-viruliferous. Plant age did not affect the fecundity however egg viability declined with increasing age of plants. *(Journal of Entomology 6 (1): 62-66, 2009;* ***doi:*** *10.3923/je.2009.62.66)*

Effects of Seasonal Changes on the Microflora In the Hindgut of Wood-Eating Termites

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The bacterial population in the hindgut of the higher wood-eating termite, *Amitermes evuncifer* Silvestri was estimated at both dry and wet seasons. The total bacterial counts in the soldier and worker termites were $1.46\pm0.26\times10^6$ and $2.51\pm0.31\times10^6$ cfu mL^{-1} during the wet season; while it was $5.30\pm1.1\times10^4$ and $5.8\pm0.9\times10^4$ cfu mL^{-1} during the dry season, respectively. There was no significant difference in the total bacterial count in the hindgut of the worker and soldier termites in both seasons. The total bacterial count in the dry season was significantly lower ($p\leq0.05$) than the population during the wet season. The bacterial species were identified to be *Bacillus subtilis*, *B. cereus*, *Micrococcus luteus*, *Streptococcus* sp. and *Serratia marcescens.* *(Journal of Entomology 6 (1): 67-71, 2009;* ***doi:*** *10.3923/je.2009.67.71)*

Combining Effect of *Beauveria bassaania* (Bals.) and *Ertemocerus mundus* Mercet (Hymenoptera: Aphelinidae) on Sweetpotato Whitefly, *Bemisia tabaci* Gennadius (Aleyrodidae; Hemiptera)

Mohammad A. Al-Deghairi

Combined effects between the entomopathogenic fungi, *Beauveria bassaina* (Bals.) and whitefly parasitoid, *Eretmocerus mundus* Mercet on *Bemisia tabaci* (Genn.) were investigated under laboratory conditions. The competitive interactions among them were also evaluated either alone or in combination, in respect of the positive and negative effects. The deleterious effects on the parasitoid were extremely low, particularly when the parasitized nymphs exposed to the fungus later. In direct contact bioassay, fungus caused 5.1-15.3% mortality in post-releasing trial and from 8.9-22.1% in pre-releasing trial. Three to five days after treatment, *B. tabaci* nymphs were rejected as a host by *E. mundus* females due to the fungal infection. In infected nymphs, the majority of *E. mundus* females were not laid and no parasitism was detected. The control efficiency of the two natural enemies of *B. tabaci*, when used separately or in combination, varied according to the tested biological agent. *E. mundus* alone reduced pest populations by 19.4 and 51.1% in pre- and post-releasing trials, respectively. *B. bassaina* caused 38.1% in pre-releasing trial and 29.4% in post-releasing trial. Meanwhile, the interaction between fungus and the parasitoid in combination reduced the pest population by 51.2 and 72.3% in pre- and post-releasing trials, respectively. *(Journal of Entomology 6 (2): 72-81, 2009; **doi**: 10.3923/je.2009.72.81)*

Sublethal Effects of Some Conventional and Biorational Insecticides on Ectoparasitoid, *Habrobracon hebetor* Say (Hymenoptera: Braconidae)

Hooshang Rafiee Dastjerdi, Mir Jalil Hejazi, Ghadir Nouri Ganbalani and Moosa Saber

This study was carried out to assess the effects of sublethal dose of profenofos, spinosad, thiodicarb and field recommended dose of hexaflumuron on demographic and biological parameters of *H. hebetor*. Gross reproductive rate in control (68.87) was significantly higher than insecticide treatments. The highest

and the lowest gross reproductive rate between insecticides were related to the profenofos and spinosad, respectively. Higher intrinsic rat of increase in control (0.17) compared with insecticide treatments indicated harmful effects of insecticides on it. Hexaflumuron and spinosad had the highest (0.15) and the lowest (0.1) intrinsic rate of increase between insecticides, respectively. Number of laid eggs was significantly affected by insecticides and it was approximately 2 times more than insecticide treatments in control. In this study, hexaflumuron had tremendous sublethal negative effects on biological parameters of *H. hebetor* with no lethal effects on adult wasps. The female longevity in control (29.41) had no significant difference with the means of profenofos and hexaflumuron, but differences between spinosad and thiodicarb with control was significant. Spinosad had the lowest longevity (12.79). However hexaflumuron, profenofos and spinosad had lower generation time compared with control and thiodicarb but differences between treatments were not significant. Sex ratio of *H. hebetor* offsprings was significantly affected by insecticides. In control, it was lowest (39.23) which indicated that proportion of female to male was highest (≈2 time) and it was highest in spinosad (54.94) which means that spinosad caused higher male production in population. In all treatments, especially spinosad and thiodicarb, increase in female age caused increase in male production. *(Journal of Entomology 6 (2): 82-89, 2009;* ***doi:*** *10.3923/je.2009.82.89)*

Seasonal Activity and Predatory Efficacy of the Water Bug *Sigara hoggarica* Poisson (Hemiptera: Corixidae) Against the Mosquito Larvae *Culex quinquefasciatus* (Diptera: Culicidae) in Riyadh City, Saudi Arabia

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Bioefficacy of the water bug *Sigara hoggarica* Poisson (Hemiptera: Corixidae) was assessed in the laboratory and in the field (at El Haeir area, South of Riyadh City) in relation to larval and pupal densities of *Culex quinquefasciatus* Say (Diptera: Culicidae) during winter and summer seasons. The results revealed that the predatory efficacy was highest against the first larval instar and it decreased as the larvae grew older. The predatory efficacy of the bug during summer was significantly higher than winter. The population of *Sigara hoggarica* started to increase gradually in November and a peak was attained in next April, when the Mean Water Temperature (MWT), Mean Ambient Temperature (MAT) and Relative Humidity (RH) were 28, 25.5°C and 39.6%, respectively. The activity

of the bug started to decline in June and it reached the lowest during August to October, when the water temperature varied between 28 to 30.5°C, the ambient temperature ranged between 26.6 to 34.9°C and the relative humidity varied between 15.5 to 23.1%. It is concluded that the water bug *Sigara hoggarica* has great potential for control of mosquito larvae in permanent and semi permanent water habitats in Riyadh City, but further studies on prey-predator relationship are required. *(Journal of Entomology 6 (2): 90-95, 2009;* ***doi:*** *10.3923/je.2009.90.95)*

Life Cycle Parameters of *Empoasca decipiens* Paoli (Hom.: Cicadellidae) on Four Potato Cultivars (*Solanum tuberosum* L.) in Iran

S.A.A. Fathi, G. Nouri-Ganbalani and H. Rafiee-Dastjerdi

Empoasca decipiens Paoli (Hom.: Cicadellidae) has been causing damage in potato fields of Ardabil region in Iran. There has been an increasing interest in controlling of *E. decipiens* using resistant cultivars. The resistance of four commonly planted cultivars including Diamant, Agria, Casmos and Omidbakhsh to *E. decipiens* was compared using some life cycle parameters of this pest in greenhouse at 24±1°C, 50±5% RH and 16:8 h (L:D) photoperiod. Incubation period, development time of 1st, 2nd and 3rd instar larvae were not significantly different on the cultivars studied. Fourth and 5th instar larvae development time and female and male life span of *E. decipiens* decreased among the cultivars in the order of Diamant >Casmos >Omidbakhsh >Agria. The percentage of larval survival of *E. decipiens* on Diamant and Casmos were significantly lower than on Omidbakhsh and Agria. Sex ratio of *E. decipiens* on four cultivars was not significantly different. High correlation coefficients were observed between the density of simple and glandular trichomes with the percentage of larval survival, larval development time, female and male life span of *E. decipiens*. These results indicated that among the cultivars that were investigated, Diamant and Casmos were resistant and Omidbakhsh was tolerant to *E. decipiens* damage. The results of this study also confirmed that the density of glandular trichomes may have more affects on the life cycle of *E. decipiens* than the density of simple trichomes by restricting larvae and adult feeding. These results are useful in an integrated management program of *E. decipiens* in potato fields. *(Journal of Entomology 6 (2): 96-101, 2009;* ***doi:*** *10.3923/je.2009.96.101)*

Variation in Germination and Growth Rates of Two Isolates of *Beauvaria bassiana* (Balsamo) Vuillemin (Deuteromycota: Hyphomycetes at Different Temperatures and their Virulence to *Callosobruchus maculatus* (Fabricius) (Coleoptera: Bruchidae)

Adaku A. Lawrence and Ayub Khan

This study aims to determine the effect of temperature on conidial germination, colony radial growth and virulence of two isolates of *Beauvaria bassiana* (ARSEF-1186 and IMI-351833) to the cowpea weevil, *Callosobruchus maculatus* under controlled laboratory conditions. Isolates grown on Potato Dextrose Agar plates indicated that the rate of conidial germination was slower at 20°C than at 25 and 30°C and was expressed by the following 50% Germination Time (GT_{50}) values: 17.23±1.02 h for ARSEF-1186 and 16.46±1.02 h for IMI-351833. The lowest GT_{50} value was estimated as 12.33±1.02 h for IMI-351833 at 25°C. ARSEF-1186 showed significantly faster colony radial growth rate (K_r) than IMI-351833 for all temperatures investigated. Bioassays using *Cajanus cajan* seeds dipped in conidial suspensions of both isolates indicated that the highest virulence gainst *C. maculatus* adults was observed with ARSEF-1186 at 30°C. This isolate exhibited both the lowest LC_{50} (2.29×10^5 spores mL^{-1}) and LT_{50} (4.17 days) values. *(Journal of Entomology 6 (2): 102-108, 2009;* ***doi:*** *10.3923/je.2009.102.108)*

Biological Activity of Methanolic Extracts of *Ipomoea murucoides* Roem et Schult on *Spodoptera frugiperda* J.E. Smith

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This study was carried out to assess the biological activity of methanolic extracts and fractions from *Ipomoea murucoides* [Roem et Schult (Convolvulaceae)] on *Spodoptera frugiperda* (J. E. Smith) (Lepidoptera: Noctuidae). The extracts were incorporated into a meridic diet in 2 mg mL^{-1} and fed to 1st instars larvae of *S. frugiperda* and incubated at 27°C with a photoperiod of 16:8 (L:D) h. After 7 days, surviving larvae were counted and weighed; surviving pupae were incubated until moths emerged, sexed and females allowed to lay eggs on paper foil. Fecundity was measured. The crude leaf extracts produced up to 46.16% mortality with effects on development, reduction in larval weight to 42.26 mg in 3rd instar and 59.6% in 5th instar, increased time for pupation and in reaching the

adult stage; there was no effect on number eggs laid. The LC_{50} calculated for methanolic leaf extract had a value of 2.692 mg mL^{-1}. The partially purified fractions showed no toxicity toward *S. frugiperda*, but had the highest effect on larval weight reduction, to 76.3% in 3rd instar and 74.6% in 5th instar, increased time for pupation and time to reach adult stage and had an effect on number eggs laid. These results indicate that the tested compounds delayed larval development. *(Journal of Entomology, 6 (2): 109-116, 2009;* ***doi:*** *10.3923/je.2009.109.116)*

Quantitative PCR Detection of Cholinesterase and Carboxylesterase Expression Levels in Acaricide Resistant *Rhipicephalus (Boophilus) microplus*

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This study was done with the objective of developing a methodology for cholinesterase and carboxylesterase expression measurement in acaricide resistant *R. microplus*, for that purpose the expression levels for these enzymes were measured by real time PCR quantification of mRNA specific detection, comparing acaricide sensitive with multiple acaricide resistant strains of ticks known as Mora and San Alfonso. Acaricide susceptible ticks were used as standard cholinesterase and carboxylesterase expression level and adjusted as a baseline of 1 Relative Expression Units (REU). A statistical significance was observed in cholinesterase gene expression level as 13.07±3.49 REU for Mora strain and 10.81±2.98 REU for San Alfonso strain compared to the susceptible strain. Also, carboxylestrase expression found statistically significant for Mora and San Alfonso strains (6.9±1.14 and 12.11±1.81 REU, respectively) compared to the susceptible strain. Present results proved that the carboxylestrase and cholinesterase genes expression increased by acaricide pesticide exposure in Mora and San Alfonso, *R. microplus*, which explained as an overexpression of AchE2 at the singanglion level for OP resistant ticks, as well as increased levels of esterase gene CzEST9 implicated in pyrethroid resistant strains. *(Journal of Entomology, 6 (2): 117-123, 2009;* ***doi:*** *10.3923/je.2009.117.123)*

Phenology and Migration of Tef Epilachna, *Chnootriba similis* Thunberg; (Coleoptera: Coccinellidae) in Ethiopia

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Studies were conducted on the phenology of tef Epilachna, *Chnootriba similis* Thunburg, formerly known as *Epilachna similis*, from 2003 to 2005 along two

selected rivers and from 2004 to 2005 in two agricultural fields. Abundance of the insect was observed in barley fields every week and fortnightly along the rivers using 0.25 m^2 quadrates and insect sweep nets, respectively. It survives along rivers during the dry period as adult in diapause, which terminates around mid-January, with increased feeding and initiation of mating. The adults then migrate to agricultural fields between March and April. This may be delayed because of the reduced cumulative rainfall in January and February. Termination of diapause and adult migration is influenced by rainfall. It is a bivoltine insect. The adults from the second generation migrate to rivers between September and October as they require moisture to overwinter during the dry period of the year, while the majority of the first generation adults remain in the agricultural fields. The ovipositional, larval and pupal periods of both generations was investigated and the duration of the developmental stages of the first generation were longer than in the second. This insect is mainly a pest of seedlings. *(Journal of Entomology, 6 (3): 124-134, 2009; **doi:** 10.3923/je.2009.124.134)*

Evaluation of Infestation Levels of the Ectoparasitic Mite *Varroa destructor* Infesting Honeybee *Apis mellifera* and its Control Using Essential Oil in Qassim Region, Saudi Arabia

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Survey study of the ectoparasitic mite *Varroa destructor* Anderson and Treuman infesting bee colonies was conducted to evaluate its infestation level for the first time in Qassim Region, Saudi Arabia. The infestation levels were variable according to the season and locality. Mite population parasitizing worker bees gradually increased from April and May and may reach its peak in June and July. Apiaries in Melida-1 presented the highest infestation level and declined significantly in Onayzah-2, Bakeriah and Melida-2 (18 to 13%), while Buraydah-1 and 2 and Onayzah-1 presented only 12% of the total annual mite population, respectively. The mites found on the bottom of bee hives started to increase in February and March and reached the peak during summer months (June-September). Apiaries in Melida-1 significantly recorded the highest level of infestation and followed by Buraydah-1, Onayzah-1 and 2, Bakeriah, Melida-2 (28 to 8%), while Buraydah-2 had the lowest infestation level with only 5% of the total annual mite population, respectively. For contamination of bee products purposes, certain local essential oil, safe to worker bees, including aloa, camphor, garlic, black seed and cloves were extracted in laboratory. Data showed that cloves was the most effective substance causing 62% mortality in *Varroa* mites, while garlic, camphor and black seed reduced mite infestation to 51, 47 and 43%

1 day after treatment, respectively. After 7 days, black seed was more effective than Garlic and camphor where they reduced mite infestation to 72, 66 and 56%, respectively. Aloe extract was the weakest extract causing reduction of only 34 and 45% for 1 and 7 days after treatment. Data showed that mite mortality percentage was positively correlated with time after treatment. *(Journal of Entomology, 6 (3): 135-144, 2009; **doi**: 10.3923/je.2009.135.144)*

Colour Variation and Genetic Diversity in Tea Mosquito Bug [*Helopeltis theivora* (Hemiptera: Miridae)] Population from Badlabeta Tea Estate, Upper Assam, India

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Tea mosquito bug [*Helopeltis theivora* Waterhouse (Hemiptera: Miridae)], one of the major pests of tea, have been studied in a randomly collected population sample from Badlabeta tea estate, upper Assam. DNA isolated from insects, separated on the basis of pronatum colour, show polymorphism using Randomly Amplified Polymorphic DNA primers-Polymerase Chain Reaction (RAPD-PCR) with seven primers. Phenograms on the basis of banding patterns were constructed using Numerical Taxonomy System (NTSYS-pc) version 2.02e. A similarity matrix based on the simple matching coefficient was generated by the SIMQUAL program and cluster analysis performed with the Unweighted Pair Group Method with Average (UPGMA) in the Sequential Agglomerative Hierarchal and Nonoverlapping (SAHN) program. The constructed phenogram shows that one colour variant is distinctly different from the rest three. The study indicates that the population consists of discontinuous phenotypes among individuals within a freely interbreeding population which has many of its hosts in the vicinity. Genetic variation among the phenotypes within a population focuses on some evolutionary mechanisms which may resist the effect of pesticide. *(Journal of Entomology, 6 (3): 155-160, 2009; **doi**: 10.3923/je.2009.155.160)*

Effects of Some Insecticides on Functional Response of Ectoparasitoid, *Habrobracon hebetor* (Say) (Hym.: Braconidae)

Hooshang Rafiee Dastjerdi, Mir Jalil Hejazi, Ghadir Nouri Ganbalani and Moosa Saber

In this research, the effects of profenofos, thiodicarb, hexaflumuron and spinosad were studied on functional response of *Habrobracon hebetor* to different densities of last instar larvae of *Anagasta kuehniella*. Two day-old mated females

were exposed to LC_{25} of the insecticides and distilled water as control. Host densities of 2, 4, 8, 16, 32 and 64 were offered to treated females wasps for 24 h in 10 cm petri dishes. Experiments were conducted in 8 replications and were carried out in controlled conditions, 26±2°C, 70±5% RH and 16:8 (L:D) h. The type of functional response was determined using logistic regression and the parameters, searching efficiency (a) and handling time (T_h) were estimated by non-linear regression using SAS software. Functional response was type II in control and all of insecticide treatments. Searching efficiency in control and insecticide treatments were 0.0935, 0.0132, 0.0511, 0.0864 and 0.0905 h^{-1} and handling times were 0.4542, 1.0646, 0.5381, 0.5275 and 0.4896 h, respectively. The maximum attach rates ($24/T_h$) were estimated 22, 52, 44, 45 and 49, respectively. Spinosad and hexaflumuron had the most and the lowest effect on searching efficiency of *H. hebetor*, respectively. *(Journal of Entomology, 6 (3): 161-166, 2009; **doi:** 10.3923/je.2009.161.166)*

New Isolate Media of the Mosquito Pathogenic Fungus *Lagenidium giganteum* (Oomycetes: Lagenidiales) for Fungal Maintenance and Zoospores Release

M.S. Shathele

Newly formulated Saudi-1 and Saudi-2 media provided highly conspicuous growth and detection of *Lagenidium giganteum* zoospores on initial plating. The selectivity of Saudi-type media was based on a lecithin (soybean) and antibiotics, streptomycin and ampicillin. The Saudi-1 media supported the vegetative growth of *Lagenidium giganteum* (under continuous 60 W light source to get conspicuous growth). The Saudi-2 media was more defined and selective than Saudi-1. The liquid proflo PB/3 media was the best growth medium for inducing sporulation. The LC_{50} values obtained in this study were higher than those reported previously. One possible reason for the discrepancies in LC_{50} values of *L. giganteum* zoospores against mosquito larvae might be due to the difference in the handling techniques of treatment concentrations. On the other hand, perhaps a more important factor is the type of water (original medium) used in the previous experiments. The present study utilized sterile volvic water (double distilled), whereas the previous studies used distilled water. In conclusion, new isolate of *L. giganteum* is reported along with their pathogenicity towards mosquito larvae and their zoosporogenesis pattern. The study showed an excellent potential for future investigations on the use of newly developed isolate Saudi media for mosquito pathogeneic fungus for its maintenance and zoospores release. *(Journal of Entomology, 6 (3): 167-175, 2009; **doi:** 10.3923/je.2009.167.175)*

The Behavior and Feeding Preference of the 12-Spotted Beetle *Epilachna indica* MULSTANT (Coleoptera: Coccinellidae: Subfamily Epilachninae) Towards the Black Nightshade *Solanum nigrum* (Family: Solanacea)

Fauziah Abdullah and Faizah Abdullah

The behavior of fifty one 12-spotted ladybird beetles *Epilachna indica* (Coleoptera: Coccinellidae: subfamily: Epilachninae) on ten black nightshade *Solanum nigrum* (Solanaceae) plants was observed from 08:00 to 19:00 h in the field at Ulu Kelang, Selangor, Malaysia. 29.26% time was spent feeding compared to 7.22% mating, 51.05% resting and walking and 12.45% flying. Optimal feeding time in the field was from 08:00 h to 10:00 h with peak feeding occurred at 09:30 h. Leaf disc choice bioassay showed that *E. indica* prefers to feed on both *Solanum melongena* and *S. nigrum* leaf discs. In the laboratory, 72 h continuous observation on ten beetles showed that the leaf area consumption of *S. nigrum* was 1.202±0.085 $mm^2 h^{-1}$ for one beetle. This study indicates that *S. nigrum* is a potential trap plant for pest management of the economically important egg plant. *Solanum melongena*. Future study on feeding stimulant on *S. nigrum* will enlighten the understanding of host selection in *E. indica*. *(Journal of Entomology 6 (4): 167-178, 2009; **doi:** 10.3923/je.2009.167.178)*

Evaluation and Identification of Superior Polyvoltine Crossbreeds of Mulberry Silkworm, *Bombyx mori* L.

C. Ramesha, S.V. Seshagiri and C.G.P. Rao

In the present study, the existing polyvoltine germplasm resource material of the Silkworm Breeding and Research and Development Institute (APSSRDI), screened for the desired qualitative and quantitative traits. After fixation of the desired traits, 5 inbred parental breeds (APM4, APM6, APM8, APM10, APM12) utilized as Lines for the preparation of 25 crosses in Line×Tester method with the five bivoltine breeds (SDD1, SDD2, SDD3, APS12, APS105) as Testers. The hybrid testing was conducted and assessed for three different seasons for their performance on eight important economical genetic traits. The data obtained on the traits such as fecundity, yield per 10,000 larvae by number, single cocoon weight, shell weight, shell ratio, filament length and reliability was analyzed with the assistance of statistical tools. Based on two popular evaluation methods such as multiple traits Evaluation Index (EI) and Sub-ordinate Function (SF)

methods, the 5 new hybrid combinations (APM12×APDR105, APM6×APS12, APM4×PDR105, APM10×SDD1 and APM10×SDD3) shown above 50 EI values with SF values varied from 5.663 to 7.596 were identified as superior over the control hybrid and recommended for large scale in laboratory trail. Further, based on the lab and field performance promising crossbreed will be identified and adjudicated for the commercial exploitation at farmers level. *(Journal of Entomology 6 (4): 179-188, 2009; **doi:** 10.3923/je.2009.179.188)*

New Records of Insect Vectors of Rice Yellow Mottle Virus (RYMV) in Côte d'Ivoire, West Africa

F.E. Nwilene, A.K. Traore, A.N. Asidi, Y. Sere, A. Onasanya and M.E. Abo

The study aimed to investigate the vectorial capacity of twelve insect species to transmit Rice Yellow Mottle Virus (RYMV) from diseased seedlings of a susceptible rice variety (Bouaké 189) and a perennial wild rice (*Oryza longistaminata*) to seven alternative host plants. Results indicated that *Trichispa sericea*, *Chaetocnema pulla*, *Chnootriba similis*, *Conocephalus longipennis*, *Oxya hyla*, *Paratettix* sp., *Zonocerus variegatus*, *Euscyrtus* sp., *Cofana spectra*, *Cofana unimaculata*, *Locris rubra* and *Locris maculata* were capable of transmitting RYMV from infected Bouaké 189 and *Oryza longistaminata* to alternative weed hosts *Leersia hexandra*, *Imperata cylindrica*, *Digitaria horizontalis*, *Echinochloa colona*, *Echinocloa crus-pavonis*, *Eleusine indica* and *Brachiaria lata*. Only *Chaetocnema pulla*, *Trichispa sericea*, *Chnootriba similis*, *Oxya hyla*, *Zonocerus variegatus*, *Euscyrtus* sp., *Parattetix* sp., *Cofana spectra*, *Cofana unimaculata* and *Locris rubra* played an important role in transmitting the disease from rice to *O. longistaminata*, *Leersia hexandra* and *Imperata cylindrica*. The present study confirmed the vectorial capacity of these vectors out of which eight were reported for the first time in West Africa. *(Journal of Entomology 6 (4): 189-197, 2009; **doi:** 10.3923/je.2009.189197)*

Effect of Tukra (Mealybug) Infected Mulberry Leaves on the Quantitative Traits of New Polyvoltine Strain of Silkworm, *Bombyx mori* L.

C. Ramesha, S.V. Seshagiri, H. Lakshmi, S.S. Kumari and C.G.P. Rao

The influencing effect of tukra infected mulberry leaves on 5th instar polyvoltine silkworm breed of APM_1, rearing was studied since, the maximum leaves

consuming at this stage of silkworm life cycle and by utilizing non-infected healthy leaves as control. Interestingly in the experimental batch, larval duration was found to be 12 h lesser than the control batch. Mulberry leaves consumption efficiency and economical characters of silkworm like larval weight, pupation rate, cocoon weight, shell weight and reeling parameters were found higher in the experimental batch than the control batch. The result indicated that tukra infected mulberry feed has no adverse effect on silkworm rearing. Moreover, overall improvement was noticed in tukra infected leaves fed batch and sturdily suggest that even mealybug infected mulberry leaves can also be effectively utilized for the silkworm rearing in acute shortage of healthy mulberry leaves. *(Journal of Entomology 6 (4): 198-205, 2009; **doi**: 10.3923/je.2009.198.205)*

Effect of Burma Padauk (*Plerocarpus indicus*), Rain Tree (*Samanea saman* (Jacg.) Merr.) and Siamese Rough Bush (*Streblus asper*) Leaves as Fiber Sources in Total Mixed Ration on *in vitro* Fermentation

S. Chumpawadee and O. Pimpa

The objective of this study was emphasized on effect of leaves as fiber sources in total mixed ration on *in vitro* fermentation using *in vitro* gas production technique. The experimental was designed in CRD with five replicates per treatment. The fiber sources in total mixed ration were corn cob (control group), Burma padauk leaves, rain tree leaves and Siamese rough bush leaves. The results showed that the kinetic of gas production and digestibility were statistical significantly differences among treatment ($p<0.05$). The corn cop as fiber source in total mixed ration gave the highest potential of extent of gas production. However, highest rate of gas production and digestibility were observed in the Siamese rough bush leaves as fiber source. Ruminal fermentation end-products consisted of ammonia nitrogen and volatile fatty acid were significantly differences among treatments ($p<0.05$). All treatment means were within the normal range. The pH values were relatively stable at 7.0-7.3. The results demonstrated that Burma padauk leaves, rain tree leaves and Siamese rough bush leaves can be used as fiber sources in total mixed ration. Importantly, leaves are abundant and available for feeding the ruminants in dry season. *(Asian Journal of Animal and Veterinary Advances 4 (1): 1-8, 2009; **doi**: 10.3923/ajava.2009.1.8)*

The Effect of Human Chorionic Gonadotropin on the Reproduction Performance in Lory Sheep Synchronized with Different Doses of Pregnant Mare Serum Gonadotrophin Outside the Breeding Season

M.M. Moeini, F. Alipour and A. Moghadam

Two experiments performed to determine the effects of different doses of PMSG and subsequent hCG treatment on the reproductive performance in estrus-induced mature Lory ewes. In first experiment 192 Lory anestrous ewes were divided into two groups and after synchronization with progestagen sponge (Fluorogestone acetate, 40 mg FGA) the ewes in first group (T_1) were injected 400IU PMSG and in second group (T_2) were injected 600 IU PMSG intramuscularly at sponge removal time. At insemination time (AI) time, ewes divided into 4 subgroups; T_1 and T_2h were injected 200 IU hCG and T_1C and T_2C were kept as the controls. In second experiment the effect of supplementing hCG at AI time or 12 days after AI were measured on the reproductive performance using 374 estrus-induced mature Lory ewes. After synchronization with progestagen sponge, all ewes were injected 400IU PMSG. The ewes then, were randomly divided into three groups: the ewes in (h_0) were injected 200 IU hCG at AI time, (h_{12}) were injected 200 IU hCG at day 12 after mating time and (C) were kept as the control group. Serums progesterone P4 concentrations were measured in days 12, 14 and 16 after AI in both experiments. The result of 1st experiment indicated that single lambs in T_1h subgroup had higher weight compared with T_1C subgroup at birth day ($p<0.05$). The prolificacy were higher in hCG treated groups compared with control ($p<0.05$). However, fertility did not differ significantly among subgroups. Mean weight of single lambs born was increased in T_1h compared with T_1C and T_1h subgroup had higher P4 concentration compared with T_1C subgroup ($p<0.05$). In Experiment 2; in comparison with control, the hCG increased prolificacy in h_0 treatment ($p<0.05$). Mean weight of lambs born was significantly increased in h_0 and h_{12} groups compared with control. The hCG increased P4 concentration in h_0 and h_{12} group and the h_{12} had higher P4 concentration compare with other groups ($p<0.05$). It can be concluded that hCG injection at AI time increased progesterone concentrations and subsequent could improve reproductive performance in Lory ewes but there were no differences between the ewes treated with 400 or 600 IU PMSG. *(Asian Journal of Animal and Veterinary Advances 4 (1): 9-15, 2009; **doi**: 10.3923/ajava.2009.9.15)*

Effects of Corticosterone Intake as Stress-Alternative Hormone on Broiler Chickens: Performance and Blood Parameters

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This study was conduced to determine effects of blood corticosterone (CS) increasing on some physiological parameters and performance of boiler chickens. To avoid treatment of birds with various forms of stress with administration of CS a model was developed to study of mimicked stress in chickens. Total 180 one-day old chicks of the cobb-500 strain from male sex were placed in 12 pens. CS at 4 levels (0, 10, 20 and 30 mg L^{-1}) in drinking water was provided *ad libitum* between 1 to 49 days of age. Continuous intake of CS for 49 days caused increasing in serum glucose, cholesterol, triglycerides, high and low density lipoprotein and mortality. Final body weight, total feed intake and abdominal fat deposition were decreased, whereas feed conversion ratio was constant. The relative weights of major immunobiological organs including spleen, thymus and bursa of fabricius were decreased ($p<0.05$). Numerically, weights of selected visceral organs especially liver were elevation in all groups that received higher levels of CS. Therefore, it seems that CS intake is an alternative tool and useful test for assess the effects of physical, psychological and physiological stress in researches on broiler chickens. *(Asian Journal of Animal and Veterinary Advances 4 (1): 16-21, 2009;* ***doi:*** *10.3923/ajava.2009.16.21)*

Changing of Cell Wall Fractions of Kermes Oak (*Quercus coccifera* L.) in a Vegetation Period and theirs Importance for Pure Hair Goat (*Capra hircus* L.) Breeding in West Mediterranean Region of Turkey

Ahmet Tolunay,Veysel Ayhan and Elif Adiyaman

This study was investigated the change occurring depending on the vegetation period in the Neutral Detergent Fiber (NDF), Acid Detergent Fiber (ADF), Acid Detergent Lignin (ADL), cellulose (CE) and hemicellulose (HEM) of feed fiber characteristics in samples taken in five periods from kermes oak (*Quercus coccifera* L.). According to the results of the research, the values obtained in the analysis conducted on the dry matter based the samples taken on May 15, June 15, July 15, August 15 and September 15, 2008 have been as follows: NDF values - 44.36, 56.05, 58.58, 59.83 and 60.71%; ADF values - 31.14, 39.94,

43.24, 47.49 and 48.03%; ADL values - 14.07, 19.37, 20.02, 24.33 and 24.35%; CE values - 17.06, 20.57, 23.22, 23.16 and 23.68% and HEM values - 13.22, 16.10, 15.33, 12.67 and 12.67% ($p<0.05$). The period when the kermes oak is best in terms of the quality of the feed is the month of June because the quality of the feed increases along with the increase in the NDF value. *(Asian Journal of Animal and Veterinary Advances 4 (1): 22-27, 2009; **doi**: 10.3923/ajava.2009.22.27)*

The Effect of Ambient Temperature on Thyroid Hormones Concentration and Histopathological Changes of Thyroid Gland in Cattle in Tabriz, Iran

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To identify the thyroid histological and hormonal changes in response to ambient temperature variations, thyroid glands and blood samples were randomly collected from 800 indigenous corss-breed cattle of both sex and different age groups from municipal Tabriz slaughter house. The extent of fluctuations in triiodothyronine (T_3), thyroxin (T_4), T_3 uptake and thyroid histopathological lesions were scrutinized in 2 months in year 2007, viz., February (the coldest month) and August (the hottest month). A marked decline was discernable in T_3, T_4 and T_3 uptake in August compared to February. Out of 800 pairs of thyroid glands, 120 (15%) had lesions in which histopathological changes were categorized as follicular atrophy (2.5%), Paranchymal cyst (1.38%), colloid goiter (3.39%), follicular cell hyperplasia (0.27%), thyroid fibrosis(0.635%), focal hyperplastic goiter (0.88%), diffuse hyperplastic goiter additional paranchymal cyst (0.63%). Mean of thyroidal parameters for T_4, T_3 and T_3 uptake was lower in lesioned group ($p<0.01$). The frequency of lesioned thyroid was higher in summer than winter ($p<0.001$). The result of this study showed that high ambient temperature has profound effect on thyroid function, secretion and pathological changes in cattle. *(Asian Journal of Animal and Veterinary Advances 4 (1): 28-33, 2009; **doi**: 10.3923/ajava.2009.28.33)*

Effect of Oestrus Synchronisation and Body Condition on Reproduction of Anoestrous Ouled Djellal Ewes

T. Madani, F. Chouia and K. Abbas

The objective of this study was to determine the effects of progestagen treatment administrated alone or coupled to an injection of eCG to synchronize oestrus on

sheep reproductive traits during the anoestrus season under extensive management conditions of Algeria. Two flocks differing by level of body condition score were used. Fertility rates of treated groups, when compared to control groups, were higher for ewes matted at lean body condition (0.45-0.47 versus 0.10), whereas ewes matted at moderate body condition recorded higher performance during first estrus (0.37-0.45 versus 0.10) and comparable fertility rate for all mating period. Higher prolificacy rates were performed in synchronized groups of poor body condition (1.38 versus 1.00) when compared to control group. For moderate body condition flock, if progesterone and eCG treated ewes performed higher level of litter size than do control ewes (1.54 versus 1.20) for first estrus, prolificacy rate was similar between all groups for all mating period. Extra lambs weaned were significant for lean body condition synchronized groups (0.45) and for moderate body condition progestagen-gonadotropin treated group (0.33). Results indicated that it is possible to increase extra lambs weaned in anestrous Ouled Djellal ewes after artificially induced oestrus. *(Asian Journal of Animal and Veterinary Advances 4 (1): 34-40, 2009;* ***doi:*** *10.3923/ajava.2009.34.40)*

Investigation of the Effects of Carrying Heavy Load on Prooxidation/ Antioxidant Status and Vitamin D_3 in Healthy Horses

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The aim of the study was to investigate the effect of carrying heavy load for a long time on lipid peroxidation (MDA: malondialdehyde), NO_2 (nitrite), NO_3 (nitrate), antioxidants (GSH: reduced glutathione, retinol, α-tocopherol) and vitamin D_3 in healthy horses. Blood samples from seventeen native 3-5 years age and 450-500 kg live weight Anatolian horses carried a load which comprised at least 30% of their body weight and for 4 h on mountainous terrain (hard working) were evaluated. Blood samples were collected in the morning before the animals started to carrying load and immediately after they finished carrying (working). It is observed that the level of MDA, NO_2 and NO_3 increased significantly ($p<0.05$) after working. While GSH concentration, increased after working; levels of retinol, α-tocopherol and vitamin D_3 levels decreased significantly ($p<0.05$). On the other hand, the vitamin D_3 levels were affected by hard working as other lipid soluble vitamins. There were a correlation between the physiological response to hard-working and some oxidant markers in healthy-hard working horses. These observations provide evidence that hard-working increases oxygen consumption and cause a disturbance of intracellular pro-oxidant-antioxidant homeostasis. *(Asian Journal of Animal and Veterinary Advances 4 (1): 41-46, 2009;* ***doi:*** *10.3923/ajava.2009.41.46)*

The Case Report of Taillessness in Iranian Female Calf (A Congenital Abnormality)

Alireza Lotfi and Habib Aghdam Shahryar

The aim of this study, is case report of taillessness abnormality in Iranian calves. Taillessness syndrome can be a lethal attribute in animals. In a village in the suburbs of Tabriz, a Northwestern city in Iran, a tailless calf was born. During the examinations and observations, no problem in digestion and faeces excretion was noticed and the calf had a normal growth. There was a small excrescence on the back of the calf where the tail grows. In this recent case, there was no rectal adhesion. The aforementioned calf was born through the Artificial Insemination (AI) of a native female cow with a Holstein bull. The cow is completely healthy and in her previous parturitions, it has given birth to several healthy calves. Comparing this case with the other reported abnormalities reveals that this anomaly is rare and the probability of its occurrence in female calves of dairy cattle is twice the probability of occurrence in male calves. Most scientific reports have shown that tail abnormalities occur when a native cattle is inseminated with a pure breed cattle such as Holstein. Future study about genetical reasons of Taillessness in native calves may help to solving of this problem, especially in Iranian hybrid (Holstein-native) cattle. *(Asian Journal of Animal and Veterinary Advances 4 (1): 47-51, 2009; **doi**: 10.3923/ajava.2009.47.51)*

General Performance of Growing Shami Kids Fed High Energy and Protected Methionine

M. Abdelrahman

This experiment was carried out to evaluate the effect of high dietary energy and protected methionine (Smartamine)™ on the growth, feed intake and efficiency and mineral concentrations in blood serum and tissues of shami kids during finishing stage. Fifteen growing shami kids (3 to 4 month old) were distributed equally to three treatments groups as follow: Control (NRC requirements); T_1 (High energy 3.0 Mcal ME kg^{-1}) and T_2 (high energy 3.0 Mcal ME kg^{-1} and 5 g/head/day methionine as Smartamine). Treatment causes a significant change ($p<0.05$) on monthly and overall weight gain. Feeding shami kids high energy significantly increased weight gain, lower feed intake and consequently improve feed conversion. A significantly lower concentrate and alfalfa hay intake were

reported in Shami kids fed high energy and protected methionine (T_2) when compared with kids from the control and T_1. Moreover, dressing and tissues percentages were not significantly affected ($p>0.05$) by treatment, except testicales which was significantly reduced in kids from T_2. Magnesium and Cu concentrations in meat were significantly increased ($p<0.05$) in kids fed high energy and methionine when compared with the control. On the other hand, the inorganic matter percentages were significantly reduced with feeding high energy (T_1) and high energy with methionine (T_2) when compared with the control group. In conclusion, feeding shami kid during the finishing period with high levels of energy improves the total weight gain and total feed conversion. Furthermore, methionine supplementation as Smartamine didn't affect shami kids performance, which means the energy requirements by Shami kids during finishing period is above the recommended levels in NRC for goats. *(Asian Journal of Animal and Veterinary Advances 4 (2): 52-59, 2009;* ***doi:*** *10.3923/ajava.2009.52.59)*

Effect of Herd Size on Sustainability of Dairy Production

V. Demircan and T. Binici

Data obtained by conducting a survey on 132 dairy farms selected by the stratified random sampling method was used to assess effect of farm size on Cultural Energy (CE) expenditure of dairy cattle production. Dairy cattle farms were divided into three groups according to farm size. Accordingly farm groups were assigned as group 1 (farms that had 1-2 lactating cows, 53 farms), group 2 (farms that had 3-5 lactating cows, 51 farms) and group 3 (farms that had more than 5 lactating cows, 28 farms). Total cultural energy expended included cultural energy expended on feed, dairy operations, transportation, machinery and equipment. Cultural energy expended on feed was similar for farm groups ($p>0.05$) and it constituted more than half of the total cultural energy. As farm size increased cultural energy required producing a kg of milk decreased and group 3 had lower CE requirement than other farm groups ($p<0.05$). Cultural energy expended (Mcal) per Mcal protein energy output was lowest for group 3 ($p<0.05$). Efficiency defined as Mcal input/Mcal output was better for group 3 and differed from other farm groups ($p<0.05$). Results show that as farm size increases efficiency of converting cultural energy into milk increases. Thus in order to be more sustainable in dairying farm size should be increased without interfering cattle performance. *(Asian Journal of Animal and Veterinary Advances 4 (2): 60-65, 2009;* ***doi:*** *10.3923/ajava.2009.60.65)*

Transcriptional Profiling of Spleen Lymphocyte in Fowl Typhoid of Broilers

H.K. Lim, K. Choi, P.K. Mandal, O. Baatartsogt, C.H. Lee, J.H. Lee and H.B. Kim

This study was carried out to investigate the differentially expressed genome between *S. gallinarum* infected and uninfected control in the spleen lymphocytes of Ross broiler chicks using microarray analysis. GeneChip Chicken Genome Array containing 32,773 transcripts corresponding to over 28,000 chicken genes for simultaneous expression was used. The signal intensity of each gene was normalized and expressed in fold change. A large numbers of genes were found with differential expression majority of which are still unknown in chicken genome. Thirty one known genes were found to have differential expression of which, 25 were up-regulated and 5 were down regulated. Majority of the up-regulated genes belong to immune response system *viz.*, IL8, IL1B, IL10, IL18, IL17A, IL15, transferrin, IFNg, TLR2, TNFRSF1b, TNFRSF15 and the down regulated genes were B-FIV, B-LA, SDF1, B-LBI, belonging to MHC-I and II and CD1d. To validate the expression of these genes RT-PCR was done using primers of 12 selected genes' with total mRNA isolated from spleen lymphocytes which has confirmed the similar pattern of expression of all the genes as in microarray. The findings in this study have lead to the identification of novel genes which may be useful in further studies to understand the patho-physiology of fowl typhoid towards development of diagnostics and therapeutics. *(Asian Journal of Animal and Veterinary Advances 4 (2): 66-75, 2009;* ***doi:*** *10.3923/ajava.2009.66.75)*

Influence of Two Sources of Cereals (Corn or Barley), in Free Choice Feeding on Diet Selection, Milk Production Indices and Gaseous Products (CH_4 and CO_2) in Lactating Sheep

Sabri Yurtseven and Irfan Öztürk

This study was performed to evaluate the effect of different cereal source in choice feeding systems on performance and on emission of carbon dioxide (CO_2) and enteric methane (CH_4) in dairy Awassi ewes. Total 16 dairy ewes were divided into two groups: the corn based free choice (CFC) group received feed ingredients separately (corn, wheat bran, soybean meal (SBM), cottonseed meal (CSM) and alfalfa hay) and the barley based free choice group (BFC) group received barley instead of corn as carbon hydrate source. The results showed no

significant differences ($p>0.05$) between treatments in live weight, live weight gain, milk yield, milk composition and CO_2 production. However, the results of CH_4 measurement indicated significant differences between groups in the amounts of CH_4 produced. The ewes in the CFC group produced less CH_4 than the ewes that received the BFC system (CFC: 21.82; BFC: 38.34 g/day/sheep). The results indicate that the CFC system modified ruminal fermentation and affected the Volatile Fatty Acid (VFA) components and levels in ruminal fluid. In ewes on the CFC system, the level of propionate was greatly increased (CFC: 19.77 vs. BFC: 14.53%) and the level of acetate decreased (CFC: 68.34 vs. BFC: 75.58%). Butyrate level was not changed relative to the total VFA components. There were no significant differences in ruminal pH level between treatments. The results indicate that the CFC system has a potential mitigating effect on enteric emission of CH_4 but not CO_2. *(Asian Journal of Animal and Veterinary Advances 4 (2): 76-85, 2009;* ***doi:*** *10.3923/ajava.2009.76.85)*

Effects of Green Tea on Mineral Levels of Liver and Testis of Guinea Pigs Electromagnetic Field Emitted by Mobil Phones

D. Kiliçalp, S. Dede, Y. Deger and L. Aslan

It was reported that the effects of green tea on the mineral levels of testis and liver of Guinea pigs exposed to a 900 MHz electromagnetic field. Four experimental groups labeled as controls (Group A), irradiated (Group B), irradiated receiving green tea extract (Group C) and green tea only (Group D) were formed with seven randomly chosen animals of both sexes in each group. After exposure for one month, the animals were sacrificed by decapitation and testis and liver samples were collected for biochemical analysis. In female Guinea pigs irradiation with and without green tea as well as green tea alone caused significant changes of the iron levels in liver, but no significant changes of manganese, copper, zinc and the copper/zinc ratio. In males, irradiation caused significant increases of manganese and a decrease of the iron levels in liver and of manganese, copper, zinc in testis. Combined with green tea, electromagnetic radiation resulted in changes of manganese, iron, copper and copper/zinc ratio in liver and of manganese only in testis. Green tea alone changed the levels of hepatic iron, zinc and copper/zinc ratio and of testicular concentrations of iron and zinc. The highest levels of copper were found in the liver tissue of the irradiated animals that were also treated with green tea. From present findings we can state that testis tissue is more sensitive to electromagnetic radiation than liver tissue, showing greater changes in trace mineral metabolism. Green tea brings the trace element levels to near normal values; supporting the idea that green tea as a supplement has a protective effect against

the damaging effects of electromagnetic radiation. *(Asian Journal of Animal and Veterinary Advances 4 (2): 86-92, 2009;* ***doi:*** *10.3923/ajava.2009.86.92)*

Detection of Avian Influenza Virus Antigen in Chicken Tissues Following Intranasal Inoculation

Mohammad Mehdi Hadipour

To understanding the pathogenicity of H9N2 in broiler chickens, the tissue distribution of viral antigen following intranasal (IN) inoculation of this subtype was studied. Eighteen 3-week-old chickens were inoculated with 10^6 EID_{50} per bird with H9N2 avian influenza virus. Then on days 1, 2, 4, 6, 8 and 11 post-inoculation (PI) samples of the trachea, lung, liver, pancreas, spleen, thymus, duodenum, kidney, brain and bursa of Fabricius were collected for immunofluorescence study. The AIV antigen was detected in the trachea, lung and kidney of inoculated chickens using indirect immunofluorescence technique. The results indicated that the H9N2 avian influenza virus is epitheliotropic in chicken. After IN inoculation it has tissue tropism for trachea, lung (pneumotropic) and kidney (nephrotropic). *(Asian Journal of Animal and Veterinary Advances 4 (2): 93-98, 2009;* ***doi:*** *10.3923/ajava.2009.93.98)*

The Effects of Different Vegetation Periods on Chemical Composition of Kermes Oak (*Quercus coccifera* L.)

V. Ayhan, A. Tolunay and E. Adiyaman

This study investigates the effect of different vegetation periods on the chemical composition of kermes oak. Five different vegetation periods from May through September 2008 were taken into consideration for this purpose. Throughout these periods, values for dry matter, crude protein, crude lipid, crude fiber, nitrogen-free extracts, crude ash and metabolizable energy were measured. The chemical composition of kermes oak underwent statistically significant changes in connection with the vegetation period ($p<0.05$). During the May, June, July, August and September periods, the natural dry matter content of kermes oak was found to be 43.26, 53.83, 56.85, 57.35 and 57.95%, respectively. During the same periods, values for crude protein with respect to dry matter were 1.27, 1.20, 1.29, 1.47 and 1.59%, respectively, values for crude lipid were 4.37, 3.95, 3.47, 2.69 and 3.73%, respectively, values for crude fiber were 20.88, 30.91, 35.53, 37.21 and 37.08%, respectively, values for nitrogen free extracts were 69.48, 59.98, 55.45,

55.57 and 54.35%, respectively, values for crude ash were 3.99, 3.95, 4.22, 3.05 and 3.25%, respectively and values for metabolizable energy were 3191.65, 3149.65, 3129.35, 3119.92 and 3124.15 kcal kg^{-1}, respectively. In conclusion, it was determined that the chemical composition of kermes oak underwent changes in connection with the vegetation period and that, in particular, as the vegetation period advanced, the crude fiber content increased and nitrogen-free extracts decreased. *(Asian Journal of Animal and Veterinary Advances 4 (2): 99-103, 2009;* ***doi:*** *10.3923/ajava.2009.99.103)*

Determination and Comparison of Nutritional Indices in Commercial Silkworm Hybrids during Various Instars

Alireza Seidavi

The aim of the present study was generate data on *Bombyx mori* feeding and nutritional indices and characteristics during 1st-5th larval instars and comparison of these parameters among eight commercial hybrids. All insect rearing and experiments were done under special laboratory conditions. The several parameters such as quantity of food consumed, fecal matter excreted and larval growth was determined based on fresh (wet) and dry weight. The experiment was set in a completely randomized design. Also, evaluation index value and sub-ordinate function value were calculated for nutritional indices. From obtained results, gain for total instars (1-5 instars) was maximal in 104×103 (0.67 g DM/larva) and minimum in 151×154 (0.56 g DM/larva). In all the hybrids, ingested food for total larval duration was observed to be above 5.8 g DM/larva. Highest food consumption was recorded in 31×32 (6.31 g DM/larva) followed by 32×31 (6.30 g DM/larva) and 104×103 (6.22 g DM/larva), whereas lowest was recorded in 151×154 (5.80 g DM/larva) followed by 154×151 (5.82 g DM/larva). ECI for total instars (1-5 instars) was maximal in 151×154 (10.35) and minimum in 153×154 (8.37). In all larval duration, approximate digestibility was observed to be above 0.47. Highest AD was recorded in 154×151 (0.507) followed by 153×154 (0.505) and 31×32 (0.504), whereas lowest was recorded in 104×103 (0.475) followed by 103×104 (0.476). After evaluation by both the statistical methods (evaluation index method and sub-ordinate function method), hybrids of 31×32, 104×103 and 32×31 were identified as potential hybrids for further development at distribution between farmers. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 104-113, 2009;* ***doi:*** *10.3923/ajava.2009.104.113)*

Seroprevalence of Q Fever in Cattle and Sheep in the East of Turkey

Ebubekir Ceylan, Mustafa Berktas, Ihsan Keleş and Zahit Ağaoğlu

The present study was carried out to determine the seroprevalence of antibodies to *C. burnetii* in cattle and sheep in the east of Turkey. Serum samples collected randomly from 92 cattle and 92 sheep were examined by ELISA (Vircell-SL, Spain) to detect IgG antibodies against *C. burnetii* phase II antigen. Seropositivity was observed in 16.3% of the cattle and in 5.4% of the sheep. Coxiellosis has an important seropositivity in both cattle and sheep and it can cause serious health problem in humans living in Eastern Turkey. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 114-121, 2009;* ***doi:*** *10.3923/ajava.2009.114.121)*

Modeling Lactation Curves of Turkish Saanen and Bornova Goats

Çiğdem Takma, Yavuz Akbaş and Turgay Taskin

Lactation curves of 23 Bornova (25% White German×25% Maltase×50% Anglo-Nubian crossbreed) and 37 Turkish Saanen dairy goats were estimated in this study. Individual 427 test-day milk yields were recorded monthly from lambing to drying off. The Wood (WD) and Cobby and Le Du (CL) models were applied to estimate lactation curve parameters of the two breeds. The WD model had greater a parameter (average milk yield at the beginning of the lactation) than CL model. The difference between breeds was significant ($p<0.05$) for the b parameter related to slope up to peak yield. The two models estimated significantly different pattern of the decline in milk production. Coefficient of determination values (R^2) of the models were high and ranged from 0.83 to 0.91. The CL model showed better performance than WD model. Lactation curve characteristics including Peak Yield (PY), Time to Peak Yield (TPY), Total Milk Yields (TMY) and Persistency (P) were also estimated using WD, CL and Fleischmann (FL) methods. WD and CL models forecasted higher PY and earlier TPY in comparison with the FL. TMY and P from two models were lower than those from FL. The effect of breed was significant ($p<0.05$) on TPY. Correlation coefficients among lactation curve characteristics were ranged from -0.29 to 0.78. The results suggest that CL model was better for the fitting of the test-day

milk yields of Turkish Saanen and Bornova goats. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 122-129, 2009; **doi:** 10.3923/ajava.2009.122.129)*

Allelic Frequencies of a *Sac*II RFLP at Exon 7 of the β-lactoglobulin Gene in Turkish Hair Goat Breed

C. Elmaci, Y. Oner and M. Koyuncu

Polymorphism in the exon 7 to the 3' flanking region of β-lactoglobulin (β-lg) gene in Turkish hair goat populations were investigated. The study was carried out including 233 hair goats using PCR-RFLP. Digestion of amplification product with *Sac*II restriction enzyme revealed two alleles namely S_1 and S_2 (which was produced by a single nucleotide substitution) and three genotypes (S_1S_1, S_1S_2 and S_2S_2) in the studied population. The genotypic frequencies of S_1S_1 and S_1S_2 were almost equal. S_2S_2 genotype was found to be lower than other genotypes (S_1S_1 and S_1S_2) in the studied population. The allele frequencies of S_1 and S_2 at β-lg locus were 0.67 and 0.33 in hair goat population, respectively. Deviation from Hardy-Weinberg equilibrium was not detected. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 130-133, 2009; **doi:** 10.3923/ajava.2009.130.133)*

The Efficacy of Moxidectin Against Gastrointestinal Nematode Infections in Goats

C. Ragbetli, E. Ceylan and P. Tanritanir

The aim of this study was to examine the efficacy of moxidectin treatment on goats naturally infected with gastrointestinal nematodes in Van region, Turkey. Two hundred and forty goats infected with gasterointestinal parasites were treated with 0.2 mg kg^{-1} moxidectin (Cydectin, Abfar), subcutaneously. Ten randomly selected goats were not treated and allocated as a control group. Faecal samples were examined for gastrointestinal parasites qualitatively and quantitatively (EPG) in 0th, 7th and 14th days of treatment. Larvae of the parasite species of *Ostertagia*, *Haemonchus*, *Nematodirus* and *Trichostrongylus* were detected in the coprocultures of the infected animals performed before treatment. It was observed that moxidectin was 100% effective against the gastrointestinal ematodes. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 134-138, 2009; **doi:** 10.3923/ajava.2009.134.138)*

Effects of Dietary Ascorbic Acid Supplementation on Growth Performance, Carcass, Bone Quality and Blood Parameters in Broilers During Natural Summer Temperature

Y. Konca, F. Kirkpinar, S. Mert and S. Yurtseven

This experiment was conducted to determine dietary supplementation of ascorbic acid (ASA) on the performance, carcass, bone traits and, some serum indices of broilers. A total of 180 day-old chicks were distributed into 3 treatment groups with 6 replicate containing 10 chicks each. The experimental diets were: (1) control, no dietary ASA supplementation (ASA0), (2) dietary ASA supplementation 150 mg kg^{-1} (ASA150) of diet and (3) 300 mg kg^{-1} of diet (ASA300). The experiment was lasted up to 42 days of age. Dietary ASA did not affect body weight and gain and feed conversion ratio but quadratically changed daily feed intake of broilers at 21-42 and 0-42 days of age ($p<0.05$). The carcass and parts yields, dry matter, crude protein and pH of meat and bone traits were not affected ($p>0.05$) but crude fat and thigh meat colour were linearly changed ($p<0.05$) by the dietary supplement. Dietary ASA supplementation quadratically changed the serum alanine aminotransferase and linearly decreased aspartate amino transferase ($p<0.05$) but did not affect other serum constituents. To conclude, dietary ASA supplementation have some beneficial effects on broiler meat composition and colour and serum AST and ALT levels during natural summer temperature. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 139-147, 2009;* ***doi:*** *10.3923/ajava.2009.139.147)*

Biomarkers Identified by Proteomic Study of Spleen Lymphocyte from Broilers Infected with *Salmonella gallinarum* after Feeding Korean Mistletoe (*Viscum album coloratum)*

Hyun-Kyung So, P.K. Mandal, O. Baatartsogt, Hee-Kyong Lim, Chi-Ho Lee, Jun-Heon Lee and Kangduk Choi

To find the alternative for antibiotic this study was carried out to investigate the differentially expressed proteome between *Salmonella gallinarum* infected and uninfected control in the spleen lymphocytes of ROS broiler chicks fed with Korean mistletoe using proteomic approach. Total four protein spots were detected with differential expression from the chicken spleen lymphocyte in 2DE gels after silver staining. These proteins were characterized by MALDI-TOF MS and MS/MS. Two known proteins were up-regulated *viz.*, Fatty Acid Binding

Protein (FABP) and MRP-126 and 2 proteins were down regulated *viz.*, ribosomal protein12, pyruvate kinase. In this experimental fowl typhoid infection in broilers fed with Korean mistletoe through proteomics approach significant differential expression of four proteins were found which appears to be candidate molecules for fowl typhoid. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 148-159, 2009;* ***doi:*** *10.3923/ajava.2009.148.159)*

Effects of Microbial Phytase on Animal Performance, Amount of Phosphorus Excreted and Blood Parameters in Broiler Fed Low Non-Phytate Phosphorus Diets

N. Tugba Bingol, M. Akif Karsli, D. Bolat, I. Akca and T. Levendoglu

The aim of the current study was to evaluate the effects of a microbial phytase on broiler performance, mineral retention and mineral excretion in broilers fed corn-soybean meal-barley based diet with low available phosphorus level. A total of 300 one day-old Ross 308 broilers were allotted into 5 treatment groups consisted of 4 subgroups. This basal diet (negative control) was supplemented with enzyme (Rovabio; control). Then, control diet was supplemented with 500 g ton^{-1} microbial phytase (Rovaphos; 500 g phytase), 1000 g ton^{-1} microbial phytase (1000 g phytase) and 1500 g ton^{-1} microbial phytase (1500 g phytase). Body weight of broiler fed low available phosphorus diets supplemented with phytase were significantly higher ($p<0.05$) compared with broilers fed low available phosphorus diet without phytase throughout the experiment starting from second week of experiment. Broilers fed negative control diet had significantly less carcass weights compared with other groups ($p<0.05$). Addition of phytase linearly increased serum P levels and decreased amount of P excreted in feces. It can be concluded that dietary available phosphorus can be reduced up to 30% in broiler diet with 1000 g phytase/ton supplementation without affecting animal performance. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 160-166, 2009;* ***doi:*** *10.3923/ajava.2009.160.166)*

Determination of Silage Quality, Herbage and Hay Yield of Different Triticale Cultivars

B. Kara, V. Ayhan, Z. Akman and E. Adiyaman

This study was carried out to determine silage quality, herbage and hay yield of different triticale cultivars (Tacettinbey, Tatlicak-97 and Karma-2000). In the research, besides herbage and hay yield of triticale cultivars, dry matter, organic

matter, crude protein, crude lipid, crude fiber, nitrogen-free extract and crude ash, silage pH, flieg point, metabolizable energy and physical quality of triticale silage were examined. Among the cultivars, while the highest herbage yield (22860 kg ha^{-1}), hay yield (14270 kg ha^{-1}), dry matter (43.4%), crude protein content (8.3%), crude lipid (2.91%), crude fiber (27.1%), flieg point (127.8) and the best pH value (4.1) were observed in Karma-2000 cultivar, physical characteristics such as smell, structure and color of the cultivars were similar among cultivars. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 167-171, 2009; **doi**: 10.3923/ajava.2009.167.171)*

The Significance of Vasoactive Intestinal Peptide in the Treatment of *Schistosoma mansoni*-Infected Diabetic Mice

Osama M. Ahmed and Gamal Allam

The effect of Vasoactive Intestinal Peptide (VIP) on Insulin Dependent Diabetes Mellitus (IDDM) and schistosomiasis together in combination has not been previously investigated. To assess its efficacy in such condition, VIP was administered to *Schistosoma mansoni*-infected streptozotocin-induced diabetic (ID) mice at a dose level of 41.6 ng kg^{-1} b.wt., 3 times/week, for 8 consecutive weeks starting from the 1st week of infection. The administration of VIP to ID mice induced a potential amelioration of serum glucose, insulin and C-peptide levels indicating the insulinogenic effect of this peptide. VIP also produced a significant decrease of hepatic granuloma volume and worm fecundity in the ID mice without affecting worm burden. The granuloma volume was found to be lower in the ID mice as compared to that of the infected non-diabetic ones. VIP administration produced marked decreases of the elevated liver collagen, serum carbohydrate antigen (CA.19.9) and liver alpha fetoprotein (AFP) content of ID mice as well as it succeeded, at least partially, to alleviate the altered liver enzyme activities. It also successfully increased the anti-inflammatory cytokine, IL-10 and decreased the elevated pro-inflammatory chemokines, IL-12 and TNF-α level in the serum of ID mice. These changes in cytokines explain the decrease in hepatic granuloma volume and reflect the anti-inflammatory effects of VIP. The increased oxidative stress markers and perturbed antioxidant defense system were profoundly improved in the ID mice treated with VIP. In conclusion, the VIP may have anti-hyperglycemic and insulinotropic effects, decrease liver and intestinal egg count and ameliorate liver pathologic deteriorations via its immunomodulatory effects on cytokines released from macrophages and T helper cells in addition to its improvement effect on the antioxidant defense system of the infected diabetic mice. *(Asian Journal of Animal and Veterinary Advances 4 (4): 172-190, 2009; **doi**: 10.3923/ajava.2009.172.190)*

Evaluation of a Mixture of Thiopental-Guafinesine-Metedomidine and Sevoflurane Anesthesia in Horses

N. Atasoy, N. Mercan, C. Atalay, E. Bayram and A. Taş

The anesthetic and cardiopulmonary effects of a combination of continuous intravenous infusion using a mixture of 6 g L^{-1} thiopental-75 g L^{-1} guafinesine-3 mg L^{-1} metedomidine (0.30 mL/kg/h) and Oxygen-Sevoflurane (OS) anesthesia (TGM-OS anesthesia) in horses were evaluated. The concentration of sevoflurane (Sevo) required maintaining surgical anesthesia was around 1.5% in TGM-OS and 3.3% in OS anesthesia. Mean Arterial Blood Pressure (MABP) was maintained at around 77 mm Hg under TGM-OS anesthesia, while dobutamine (0.43±0.13 μg kg^{-1}) infusion was necessary to maintain MABP at 60 mmHg under OS anesthesia. No apparent complication was observed during and after anesthesia in all cases. Recovery from anesthesia under TGM-OS anesthesia was very calm and smooth. The times required for the horse to return both sternal and standing position in group under TGM-OS anesthesia tended to be shorter than group under OS anesthesia which statistical differences were $p<0.05$ and $p<0.01$, respectively. Thiopental Guafinesine-Metedomidine and Oxygen-Sevoflurane anesthesia (TGM-OS anesthesia) may be useful for prolonged equine anesthesia because of its minimal cardiopulmonary effects and good recovery from anesthesia. *(Asian Journal of Animal and Veterinary Advances 4 (4): 191-199, 2009;* ***doi:*** *10.3923/ajava.2009.191.199)*

In situ Rumen Degradability, *in vitro* Digestibility and *in vitro* Gas Production of Full Fat Canola Seeds

U. Kilic and A.V. Garipoglu

The objective of this study was to determine the chemical composition, *in vitro* gas production, *in vitro* digestibility and *in situ* rumen degradability of canola hybrids. In the study, canola seeds of four different hybrids (Bristol, Eurol, Capitol and Licrown), which were obtained from the Institute of Karadeniz Agricultural Research in Samsun, Turkiye were used. Two rams aged 2 years with permanent ruminal fistulated were used in gas production and *in situ* nylon bag techniques. All of the feedstuffs were incubated for 3, 6, 9, 12, 24, 48, 72 and 96 h in *in vitro* incubations for gas production. Feedstuffs were incubated for 48 h in nylon bag technique. The results of the present study suggested that there were no

differences among the hybrids in terms of feed value. All of the hybrids had low *in vitro* gas production values due to their high fat contents. Licrown variety had the lowest production level up to 48 h of the incubation, but there were no differences after 24 h of the incubation ($p>0.05$). There were not significant differences among the hybrids in terms of estimated parameters except for gas production rate (c). The gas production rate of Licrown was significantly ($p<0.05$) lower than that of Bristol. While, *in vitro* enzyme digestibility Dry Matter Digestibility (DMD), Organic Matter Digestibility (OMD) and Metabolisable Energy (ME)) was not different among the hybrids ($p>0.05$), rumen degradabilities Dry Matter Degradability (DMD_{48}), Organic Matter Degradability (OMD_{48}) and Crude krotein Degradability (CPD_{48}) were significantly different ($p<0.01$). *(Asian Journal of Animal and Veterinary Advances 4 (4): 200-208, 2009;* ***doi:*** *10.3923/ajava.2009.200.208)*

Comparative Study of Fatty Acid Composition of Golden Mullet Fillet and Roe Oil (*Liza aurata* Risso, 1810)

Masoud Hedayatifard

In the present study, the fatty acid compositions of golden mullet fillet and roe oil were determined. Palmitic acid (C16:0) was the dominant saturated fatty acid in golden mullet fillet and roe oil with 14.39 and 6.45%, respectively. The major unsaturated fatty acids of golden mullet fillet oil, were detected as palmitoleic acid (C16:1, 17.32%), oleic acid (C18:1, 17.09%) and α-linolenic acid (C18:3, 8.72%). The most abundant unsaturated fatty acids of roe oil were determined as palmitoleic (C16:1, 21.33%), oleic (C18:1, 19.51%), α-linolenic (C18:3, 7.34%), Linoleic acid (C18:2, 6.77%) and docasahexaenoic acid (C22:6, 6.35%). The total unsaturated fatty acids of roe oil (68.59%) were higher than that of golden mullet fillet oil (56.37%). Amounts of ω-3 unsaturated fatty acids in the roe and fillet oil were 19.52 and 14.51%, respectively. Furthermore, the total amounts of eicosapentaenoic acid (C20:5) and docasahexaenoic acid (C22: 6) of roe oil were nearly 2 times higher than those of the golden mullet fillet. Further, the lipid percentage and the amounts of C14:0, C16:0, C18:2, C18:3, C20:5 and C22:6 fatty acids differed significantly ($p<0.05$) between fillet and roe oil. In addition, significant differences were observed among ω-3 and ω-6 series between both fillet and roe oil. *(Asian Journal of Animal and Veterinary Advances 4 (4): 209-213, 2009;* ***doi:*** *10.3923/ajava.2009.209.213)*

Carcass Characteristics and Economic Benefits of Weaner Rabbits Fed Cassava Tuber Meals

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An eleven-week research was conducted to evaluate the carcass characteristic and economics of production of rabbit fed cassava peel meal, peeled cassava tuber meal and composite cassava tuber meal diets. Twenty-four weaner rabbits of mixed strains and sexes aged 6 to 7 weeks randomly allotted to four dietary treatments replicated two times each with 3 rabbits per replicate in a completely randomized design. The parameters studied were final live-weights, dressed weight, dressing percentage, internal organs weights, feed cost (N kg^{-1}), total feed cost (N), feed cost (N kg^{-1} gain) and relative cost advantage (%). There was no significant difference ($p>0.05$) in the final live weights, dressed weights, dressing percentage and in most of the internal organs measured. However, economic of production data indicated lowest cost per weight gain (N kg^{-1}) by the rabbits fed composite cassava tuber meal, while highest cost per weight gain was recorded in the rabbits fed the control diet (maize meal). *(Asian Journal of Animal and Veterinary Advances 4 (4): 214-218, 2009;* ***doi:*** *10.3923/ajava.2009.214.218)*

The Effect of Delayed Ensiling and Application of an Organic Acid-based Additives on the Fermentation of Corn Silage

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The main objective of this study was to determine the effects of organic acid-based additives on the fermentation and delayed ensiling of corn silage. Prolonged exposure to air can adversely affect the silage fermentation process. To investigate a possible method to overcome this problem, we found that when a buffered propionic acid-based additive, is applied to chopped, whole-plant corn exposed to air before ensiling, it will affect the subsequent fermentation. Chopped whole plant corn mixed with 4 different additives consist of propionic acid in addition to control treatment without any additive. Additives were: (1) propionic acid, (2) propionic acid (85%)+formic acid (15%), (3) calcium propionate and (4) propionic acid (80%)+formic acid (15%)+ammonia (5%). The 10 g kg^{-1} dry matter of each additives mixed with chopped corn forage in 3 different times (0 (immediately), 24, 48 h). Silages were assessed by the method of appearance evaluation and DM, pH evaluation. CP, NDF, ADF, TVFA, WSC, so that, the aerobic stability and DM degradation of each treatment were determined after

60 days. Silages that exposed to air for 24 h, before ensiling had better appearance quality than two other delaying time (0 and 48 h) in Filg's method and whole additives in this experiment had good effects on appearance quality in comparison with control group. All of silages containing buffered propionic acid-based additive, in method of DM, pH evaluation, were good and very good. These silages had lower ($p<0.05$) pH than control ones. Amount of dry matter of control silage which ensiled immediately was lower than other treated silages. NDF in control silages (without additive) was more than that in treated silages and amount of CP and TVFA increased with addition of additives especially those containing propionic acid (85%)+formic acid (15%) ($p<0.05$). WSC in control silage that wilted 48 h before ensiling was more than other samples ($p<0.05$). Buffered propionic acid-based additives increased aerobic stability in treated silages in comparison with untreated ones. Degradation of DM (*in situ*) for untreated silages that delayed ensiled was lower. Application of the additive containing propionic acid (80%)+ formic acid (15%)+ammonia (5%) resulted in highest degradation of dry matter among experimental additives. Generally, treatment with propionic acid-based additives prevented a decrease in DM degradation (*in vitro*). *(Asian Journal of Animal and Veterinary Advances 4 (5): 219-227, 2009;* ***doi:*** *10.3923/ajava.2009.219.227)*

The Effects of Different Caponization Age on Growth Performance and Blood Parameters in Male Tibetan Chicken

Yonggang Shao, Changxin Wu, Junying Li and Chunjiang Zhao

In this experiment, forty triplets consisting of full-sib Tibetan Chicken cockerels were divided equally into two trial groups. In each group, the triplets were randomly assigned to caponization, sham treatment and intact groups. The birds of the two trials were caponized or sham-operated at either 6 weeks of age (early) or 18 weeks of age (late) and slaughtered at 24 weeks of age. The birds in the early caponization group showed significant increases in terms of intermuscular fat deposits, subcutaneous fat thickness, liver weight, triacylglycerol concentration ($p<0.05$) and abdominal fat weight ($p<0.01$) at 24 weeks of age compared with the intact and sham groups, while later caponization resulted in significant increase in liver weight, abdominal fat weight, total cholesterol and triacylglycerol concentrations ($p<0.05$). In both trials, the capons exhibited lower leg muscle weight than did the intact ($p<0.05$). There were no significant effects on breast muscle weight on either the early or late caponization group. We concluded that late caponization accelerates the rate of fat deposition within the abdominal cavity compared to other areas after sexual maturity. Present results also suggest that the

role of androgen on the growth of breast muscle is different from that on leg muscle in Tibetan Chicken cockerels. It seemed that the positive effects of androgen were reflected only on leg muscle growth. *(Asian Journal of Animal and Veterinary Advances 4 (5): 228-236, 2009;* ***doi:*** *10.3923/ajava.2009.228.236)*

DNA Polymorphism of Indigenous Chickens in Jordan

Raed M. Al-Atiyat

DNA polymorphism of four indigenous chicken ecotypes was assessed in Jordan using Random Amplified Polymorphic DNA (RAPD) markers. Ten RAPD markers showed high genetic polymorphism values in the 4 ecotypes located in the Northern, Eastern, Western and Southern provinces of Jordan. The effective number of alleles per locus ranged from 1.47 to 1.7 (mean 1.65). The expected heterozygosity varied from 0.28 to 0.41 (mean 0.39) and Shannon's index from 0.42 to 0.60 (mean 0.58). The Western ecotype showed higher levels of effective allele number, expected heterozygosity and Shannon's index than the others. The genetic similarity between the Northern, Eastern and Western ecotypes ranged from 0.95 to 0.97, while it ranged from 0.69 to 0.85 between the Southern ecotype and the others. The largest genetic distance was found between the Northern and Southern ecotypes (0.37), whereas the smallest (0.04) was between the Northern and Eastern ecotypes. The Southern ecotype was found to be the most genetically distant among all ecotypes. Based on the results, the RAPD markers were effective in detecting genetic diversity in the chicken ecotypes, representing valuable results for genetic conservation purposes. *(Asian Journal of Animal and Veterinary Advances 4 (5): 237-244, 2009;* ***doi:*** *10.3923/ajava.2009.237.244)*

Effects of Lameness, Stage of Lactation and Body Condition Scoreon Some Blood Parameters in Holstein Cows

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Effects of lameness, stage of lactation and body condition score on serum AST and ALT activities as well as serum total protein, triglyceride, cholesterol and albumin concentrations in cows was investigated in the present study. Fifty six pure Holstein cows were included in this study. AST, ALT and cholesterol levels were significantly altered by stages of lactation ($p<0.05$). Total protein, triglyceride, AST, ALT, cholesterol and albumin levels were low at early stages of lactation and dry periods; in the course of time, their concentrations increased. However,

in late stages of lactation, serum total protein, triglyceride, AST, ALT, cholesterol and albumin levels declined. No significant alterations were detected in the blood parameters of lame cows. However, AST, ALT and albumin levels were low in cows with a lameness score of 4. Likewise, blood parameters were not affected by body condition. Triglyceride, AST, cholesterol and albumin levels are high in cows with higher body conditions (≥2.75). *(Asian Journal of Animal and Veterinary Advances 4 (5): 245-251, 2009;* ***doi:*** *10.3923/ajava.2009.245.251)*

Genetic Polymorphisms of α-lactalbumin and β-lactoglobulin in South Anatolian and East Anatolian Red Cattle

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The objective of the present study was to determine the genotype and allele frequencies for alpha-lactalbumin (α-LA) ve β-lactoglobulin (β-LG) that are claimed to be associated with milk production traits in cattle in South Anatolian Red (SAR) and East Anatolian Red (EAR) cattle. In this study, 40 cattle for each of SAR and EAR were used. Genomic DNA samples were isolated by using standard salt-out method. After Polymerase Chain Reaction (PCR), α-LA and β-LG genes were digested with *Msp*I and *Rsa*I (R5), *Ava*I (R3), *Msp*I (R1), *Sau*3A (R2) restriction enzymes, respectively. As a result, SAR and EAR cattle breeds have the lower allel frequencies for α-LA and β-LG gene than high-yielding European dairy cattle breeds. Because of that reason we may claim that applying the selection programs for developing the allels belonging to both genes may contribute to the trials to improve the production parameters in SAR and EAR breed bovines. *(Asian Journal of Animal and Veterinary Advances 4 (5): 252-257, 2009;* ***doi:*** *10.3923/ajava.2009.252.257)*

PCR-Based Detection of *Yersinia ruckeri* Infection in Rainbow Trout Fish

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The aim of this study was designing a diagnostic kit for yersiniosis in the trout fish in Iran. Colonies of *Yersinia ruckeri* were collected from culture medium and a suspension was prepared in a lysing solution. DNA was extracted through a boiling and phenol chloroform method. Two primer sets targeting bacterial 16S rRNA and trout 18S rRNA. Polymerase chain reaction products were separated

by gel electrophoresis. Among 20 suspected samples tested two samples were positive for both host and bacterial PCRs indicating the positive *Y. ruckeri* infection and remaining 18 samples were negative for pathogen. The performance of PCR reactions in negative samples were confirmed from amplification of internal control reactions targeting host. A PCR based diagnostic kit with an internal control was prepared for detection of *Yersinia ruckeri* in rainbow trout fish. *(Asian Journal of Animal and Veterinary Advances 4 (5): 258-262, 2009;* ***doi:*** *10.3923/ajava.2009.258.262)*

Neospora caninum Antibodies and its Consequences for Reproductive Characteristics in Wandering Sows from Senegal, West Africa

A.R. Kamga-Waladjo, G. Chatagnon, S.N. Bakou, H. Boly, P.E.H. Diop and D. Tainturier

The aim of this study was to assay *Neospora caninum* antibodies and assess their consequences in terms of reproductive characteristics in wandering sows from Senegal, West Africa. Sera of 60 sows were assayed for antibodies against *N. caninum*. The associations between serostatus and reproductive characteristics were assessed over a period of 3 years (2006-2008). The 58.3% of sera were positive to *N. caninum* antibodies. Some reproductive disorders as age of sow at first birth, annual number of deliveries and stillbirths were significantly associated with serostatus of *N. caninum* ($p<0.05$). Results of this preliminary study indicate a higher prevalence of *N. caninum* in wandering sows from Senegal and there appeared to be an association between reproductive disorders and seropositivity. Thus, neosporosis may explain the lower reproductive performance in species from Africa. This has to be taken in account in epidemiology and impact of this new disease in African sows. *(Asian Journal of Animal and Veterinary Advances 4 (5): 263-266, 2009;* ***doi:*** *10.3923/ajava.2009.263.266)*

Cellular and Humoral Immune Responses and Antigen Recognition in Sprague-Dawley Rats Experimentally Infected with *Brucella abortus* Biotype 1

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The study was undertaken to investigate the cellular and humoral immune responses as well as antigen recognition in the acute and sub-acute stages of *Brucella abortus* biotype 1 infection in Sprague-Dawley (SD) rats. The SD rats

were infected intraperitoneally with 1×10^{10} colony forming unit (cfu) of *B. abortus* biotype 1 Korean bovine isolate. The cellular and humoral immune responses were measured at 0, 3, 7, 14, 21, 28, 35, 42, 60, 90 and 120 days after infection against Crude Brucella Protein (CBP) by Lymphocyte Proliferation Assay (LPA) and Indirect Enzyme-linked Immunosorbent Assay (IELISA). The experimentally infected rats developed specific lymphoproliferative and humoral immune response within 1 week post infection. A significant increase in the proliferative response to CBP was recorded on day 28 post infection. *Brucella abortus* specific IgG responses were initiated in SD rats at 3 days after infection. The highest IgG antibody titers were recorded at 35 days after infection and then the titer gradually decreased until the end of the experiment. Recognition of immunodominant antigens in CBP of *B. abortus* was performed by Western Blot (WB) assay using infected rat sera collected at 0, 3, 7, 14, 21, 28, 35, 42, 60, 90 and 120 days after infection. Western blot assay of the sera using CBP antigens revealed a wide array of protein bands between molecular weight of 19 and 125 kDa. Proteins of 125, 105, 82, 66, 54, 46, 32, 24, 22, 21 and 19 kDa were frequently recognized by the sera of infected rats during the experiment. The 82, 46, 32, 24, 22, 21 and 19 kDa proteins were intensely recognized during the course of infection. These antigens should be considered useful for the diagnostic of *B. abortus* infection. *(Asian Journal of Animal and Veterinary Advances 4 (6): 267-277, 2009;* ***doi:*** *10.3923/ajava.2009.267.277)*

Effect of Different Feeding Method on Methane and Carbon Dioxide Emissions Milk Yield and Composition of Lactating Awassi Sheep

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This study was performed to evaluate the effect of different feeding systems (choice feeding and conventional system) on performance and emission of carbon dioxide (CO_2) and enteric methane (CH_4) in dairy Awassi ewes. One chamber was equipped with gas analyzers to measure CH_4 and CO_2 for 23 h day^{-1}. In total, 16 ewes were used. The ewes were divided into two groups: the Free Choice (FC) group received feed ingredients separately and the Total Mixed Ration (TMR) group received a standard mixed concentrate: forage diet in a ratio of 60:40. The results showed no significant differences between treatments in performance parameters. However, the results of CH_4 and CO_2 measurement indicated significant differences between groups in the amounts of CH_4 and CO_2 produced per kg dry matter intake. The ewes in the FC group produced less CH_4 per animal than the ewes that received the TMR system. In ewes on the FC

system, the level of propionate was greatly increased relative to the total VFA components. There were no significant differences in ruminal pH and acetate level between treatments. The results indicate that the FC system may be a potential mitigating effect on enteric emission of CH_4 and CO_2. *(Asian Journal of Animal and Veterinary Advances 4 (6): 278-287, 2009;* ***doi:*** *10.3923/ajava.2009.278.287)*

Isoflavone Aglycone from Fermented Soy Pulp Prevents Osteoporosis in Ovariectomized Rats

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This study was done to investigate the effects of fermented soy pulp on the osteoporosis in ovariectomized rats. Sprague-Dawley female rats were randomly assigned to four groups as Sham Control (SC), Ovariectomized Control (OC), Ovariectomized and Soy Pulp (OSP) fed and Ovariectomized and Fermented Soy Pulp (OFSP) fed. All rats were fed on purified diets, supplemented with non-fermented and fermented soy pulp on basic diet for 7 weeks. It was observed that isoflavone aglycone was very high in soy pulp fermented for 12 h in comparison to non-fermented soy pulp. Body weight of the rats increased significantly ($p<0.05$) in comparison to other groups. Atrophy of uterus in OFSP group was significantly ($p<0.05$) prevented in comparison to OC group. The concentration of estradiol in OFSP group was higher than those of OC and OSP groups. The bone density in OFSP group was significantly ($p<0.05$) higher than those of OC and OSP groups. The histopathology indicated that OFSP group has better retarded the progress of osteoporosis than other groups. The results showed that isoflavone from the fermented soy pulp has prevented the osteoporosis in ovariectomized rats must be due to its estradiol like function. It is expected that the fermented soy pulp might serve as a functional food in osteoporosis of postmenopausal women. *(Asian Journal of Animal and Veterinary Advances 4 (6): 288-296, 2009;* ***doi:*** *10.3923/ajava.2009.288.296)*

Gross Sign, Histopathology and Polymerase Chain Reaction Observations of White Spot Syndrome Virus in Shrimp Specific Pathogen Free *Litopeneaus vannamei* in Iran

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The importation of *Litopenaeus vannamei* to Iran from Hawaii was initiated when Iranian shrimp culture was first affected by WSSV in 2004. The main reason for

the importation of *L. vannamei* to Iran was the disease susceptibility and mass mortality of the indigenous species (*P. indicus*) when faced with the first outbreak of WSSV. During the two years of study, it was found out that culturists in Iran preferred cultured *L. vannamei* than the local species (*P. indicus*). In 2008, mass mortality occurred in farmed *L. vannamei* in Khuzestan Province South of Iran. Two hundred shrimps with white spot on the carapace and body were collected and preserved in Davidson fixative for histopathology. A part of samples collected were also preserved in 95% ethyl alcohol for Polymerase Chain Reaction (PCR) technique. Two pair primers from VP24 WSSV genome was identified and used for PCR while identified one pair primer for 18SrRNA gene of shrimp was used as house keeping gene in PCR reaction in both positive and negative PCR reaction. Grossly, the samples showed white spot in the cuticle and body surface and red color on the appendages. Histopathologically, all tissue except hepatopancreas showed the intranuclear Cowdry type-A inclusion bodies. PCR studies using designated primer revealed a band of 414 bp from WSSV and 809 bp of shrimp DNA fragments in positive samples. The negative samples showed just 809 bp. This is the first report of White Spot Syndrome Virus (WSSV) in farmed *L. vannamei* in Iran. *(Asian Journal of Animal and Veterinary Advances 4 (6): 297-305, 2009;* ***doi:*** *10.3923/ajava.2009.297.305)*

Comparison of Electroanesthesia with Chemical Anesthesia (MS222 and Clove Oil) in Rainbow Trout (*Oncorhynchus mykiss*) using Plasma Cortisol and Glucose Responses as Physiological Stress Indicators

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This study investigates Alternating Current (AC) electroanesthesia of rainbow trout (*Oncorhynchus mykiss*) in comparison with MS222 and clove oil, using plasma cortisol and glucose concentrations as stress assessment indicators. A microcontroller-based apparatus was designed and constructed to allow a programmable voltage-time Pulse-Width Modulated (PWM) electrical wave application through 19×20 cm submersible electrodes for 91sec in a 33 cm long tank to induce loss of equilibrium and immobility with recovery after 52±27 sec. Recovery after 660±102 sec was observed in MS222-anesthetized fish (after induction for 720±72 sec) and a recovery time of 546±102 sec was observed in clove oil-anesthetized fish (after induction for 144±42 sec) both are significantly longer recovery times in comparison with electroanesthesia ($p<0.001$). Using direct enzyme-linked immunosorbant assay (ELISA) for cortisol and enzymatic

colorimetric assay for glucose assessments at 0, 1, 6, 12 h after each anesthesia, the anesthetics indicated similar trend of cortisol responses during 12 h of investigation. The dilatory trend of glucose changes and response derived from anesthetics and electricity and its surge at 6 h after anesthesia ($p<0.05$) confirmed glucose as a second order indicator of stress responses. Electroanesthesia is a fast, economic, eco-friendly and safe anesthetic method provides desirable trout immobility for aquaculture activities. *(Asian Journal of Animal and Veterinary Advances 4 (6): 306-313, 2009;* ***doi:*** *10.3923/ajava.2009.306.313)*

Automation of Flock Management and Establishment of Decision Support Systems for Small Ruminant Production

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This study is carried out to automate the small ruminant (sheep and goat) records and to use these records more effectively for animal breeding. It was aimed to calculate breeding values for animals by using this software. Additionally, it was aimed to calculate breeding values in terms of milk yield for male animals by using progeny testing (average offspring yield) which otherwise could not be measured by direct methods. Decision support systems, which help to decision making for flock owners and animal breeding persons, have been enhanced by using this software. Decision support systems such as determining of animals to be sold because of old age, determining of offspring that they have unknown father, accurately determining of yields of animals, health managements, determining of culling animals from flock were put into service of user as a tool. Appropriate software SURPRO V1.0 was written by use of Visual basic 6.0 and MsAccess was used as database with this objective in mind. *(Asian Journal of Animal and Veterinary Advances 4 (6): 314-319, 2009;* ***doi:*** *10.3923/ajava.2009.314.319)*

Anti-Inflammatory Activities of Diethyl-Ether Extracts of *Helichrysum plicatum* DC. and *Tanacetum balsamita* L. in Rats

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The aim of this study was to investigate anti-inflammatory activity of the diethyl ether extract of *Tanacetum balsamita* L. subsp. (TB) and *Helichrysum plicatum* DC. subsp. (HP) in carrageenan-induced inflammation in rats. Lambda carrageenan (0.05 mL) was injected into the subplantar region of the right hind

paw to induce inflammation. Control group and the reference group were administered isotonic saline solution and indomethacin, respectively. TB extract was injected in doses of 25, 50 and 100 mg kg^{-1} in the groups TB-25, TB-50 and TB-100, respectively. HP-25 HP-50 and HP-100 groups were injected HP extract in doses of 25, 50 and 100 mg kg^{-1}. Before the injections and 3 h after the injections the volume of right hind-paw of rats was measured using a plethysmometer. TB and HP had anti-inflammatory effects matching to that of the reference agent at all doses. It was found that reduction in the inflammation was 95.21% with indomethacin, 51.93% with TB-25, 52.55% with TB-50, 61.51% with TB-100, 70.73% with HP-25, 73.15% with HP-50 and 82.90% with HP-100. Median effective dose (ED_{50}) value of TB and HP were found to be 81.484 and 73.030 mg kg^{-1}, respectively. The results showed that *Tanacetum balsamita* L. subsp. and *Helichrysum plicatum* DC. subsp. had a significant anti-inflammatory activity. *(Asian Journal of Animal and Veterinary Advances 4 (6): 320-325, 2009;* ***doi:*** *10.3923/ajava.2009.320.325)*

Effects of 5 h Wetting of Sun-Dried Cassava Tuber Meal on the Hydrocyanide Content and Dietary Value of the Meal for Laying Hens

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The efficacy of wetting sun-dried cassava tuber meal as a method of reducing its hydrocyanide (HCN) content and improving its nutritive value for laying hens was investigated. Cassava tubers were peeled, chopped into pieces, sun-dried and then milled. Part of the Sun-dried Cassava Tuber Meal (SCTM) was soaked in water at the rate of 5 parts of water to 4 parts of the meal, thinly spread on the floor for 5 h and then taken out and sun-dried again. The Raw Cassava Tuber Meal (RCTM), Sun-dried Cassava Tuber Meal (SCTM) and Wetted Sun-dried Cassava Tuber Meal (WSCTM) were analyzed for HCN content. Five diets were made such that diet 1 (control) contained no cassava tuber meal; in diets 2 and 3, 50% of the maize in diet 1 was replaced with SCTM and WSCTM, respectively, while in diets 4 and 5, 100% of the maize was replaced with SCTM and WSCTM, respectively. Each diet was fed to a group of 24 laying hens for 12 weeks. At the end of the feeding trial, 4 birds were randomly selected from each group and used for determination of internal organ weights and haematological indices. Raw cassava tuber meal contained 800 ppm HCN, SCTM contained 50 ppm HCN while WSCTM contained 10 ppm HCN. The group on 100% WSCTM diet consumed significantly ($p<0.05$) less feed, gained least body weight and recorded least hen-day egg production, possibly due to very powdery nature

of the diet. Egg weight and feed conversion ratio were not affected by the treatments ($p>0.05$). Egg quality indices were also not affected by the treatments ($p>0.05$). Internal organ weights were not affected by the treatments ($p>0.05$) but the birds on cassava diets recorded significantly ($p<0.05$) more abdominal fat. The birds on cassava diets also recorded significantly ($p<0.05$) less WBC and PCV values relative to the control group. *(Asian Journal of Animal and Veterinary Advances 4 (6): 326-331, 2009; **doi:** 10.3923/ajava.2009.326.331)*

The Seroprevalence of Ovine Toxoplasmosis in Fars Province, Southern Iran

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This study determines the prevalence of ovine toxoplasmosis in Shiraz, Southern Iran. From April 2004 to May 2005, serum samples of 603 sheep were randomly collected in 18 Cities of Fars Province, Southern Iran and tested for toxoplasmosis using Indirect Fluorescent Antibody Technique (IFAT). The prevalence of toxoplasmosis was 26.5%, while the rate of seropositivities in 1/100, 1/200, 1/400 and 1/800 dilutions were 17.7, 2.8, 4.3 and 1.7%, respectively. The highest prevalence was in Abadeh (56.7%) and Nourabad (44.3%) cities and the lowest was determined Arsanjan (4.2%) whereas no infection was determined in Fasa. Considering the high prevalence of toxoplasmosis in sheep in our region, control measures need to be undertaken to prevent transmission of the infection to other animals and man by health and veterinary authorities. Therefore, it seems that standardization of techniques, hygienic standards in sheep breeding especially in cities with more migrating domestic animals and environmental health education for veterinary personnel are required to prevent human infection. *(Asian Journal of Animal and Veterinary Advances 4 (6): 332-336, 2009; **doi:** 10.3923/ajava.2009.332.336)*

The Effects of Replacing Soybean Meal with Different Levels of Rapeseed Meal on Egg Quality Characteristics of Commercial Laying Hens

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One hundred and forty four of Hy-line (W-36) laying hens from the age of 44 to 56 weeks were used to evaluate the effects of replacing different levels of

rapeseed meal with soybean meal on egg quality characteristics of commercial laying hens. The rapeseed meal was replaced with soybean meal at the levels of 0 (control), 5, 10 and 15% for 12 weeks. Hens were distributed in multi-observational completely randomized block design with 4 treatments, three replicates and 12 hens in each replicate. The parameters used to assess were haugh unit, shell thickness, shell weight, shell strength and yolk index. Results showed that addition of 10% rapeseed meal in diets increased ($p<0.05$) eggshell weight. With increasing of rapeseed meal level in diets, yolk index had showed decline ($p<0.05$). No specific trend was observed on the effect of rapeseed meal on haugh unit, shell thickness and shell strength, however these parameters were higher in groups that fed 10% rapeseed meal. We did not observe any health problems of the hens during the experiment. *(Asian Journal of Animal and Veterinary Advances 4 (6): 337-341, 2009;* ***doi:*** *10.3923/ajava.2009.337.341)*

Incidence Rate of Varroaris in Honey Bee Colonies of Eastern Azarbaijan Province, Northwestern Iran

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The aim of this study is to come to a conclusion on the seasonal existence of varroaris in the apiaries of Eastern Azerbaijan Province, Northwestern Iran and comparing the spread rate of varroaris in this region with other regions (reported in similar studies). Among 942 apiaries under study (located in 10 regions in the province) in one year, 217 apiaries were infected by varroaris. Varroaris was witnessed to be found in its lowest rate in June (7.72%) and its peak was recorded to be in March (44%). Parasitic infection in the apiaries in the area in the months of honey production, during summer and fall demonstrated an increasing procedure in a way that in the months: July, August, September and October, the percentage of infected apiaries was, respectively 9.76, 26.82, 32.92 and 40%. In January, February and March the peak of infection witnessed was, respectively: 33.33, 34.66 and 44%. It is proposed that the rate of varroaris infection is higher in cold regions such as Eastern Azarbaijan Province comparing to warm climates and its incidence and spread in the cold seasons (fall and winter) is more than warm and hot seasons (spring and summer). *(Asian Journal of Animal and Veterinary Advances 4 (6): 342-345, 2009;* ***doi:*** *10.3923/ajava.2009.342.345)*

Neospora caninum and *Toxoplasma gondii* in Lion (*Panthera leo*) from Senegal, West Africa

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The prevalence of antibodies to *Neospora caninum* and *Toxoplasma gondii* were investigated in seven lions (*Panthera leo*) from Hann's zoo of Dakar-Senegal. Seven sera samples were examined for antibodies against *Neospora caninum* (*Neospora caninum* antibodies test kit, cELISA) and *Toxoplasma gondii* (ID Screen® Toxoplasmosis Indirect ELISA). All sera were positives to *Neospora caninum* antibodies whereas 3 for 7 (42.86%) were positives to *Toxoplasma gondii*. Serological results indicate a common exposure to *Neospora caninum* and *Toxoplasma gondii* among lions (*Panthera leo*) from zoo in Senegal. *(Asian Journal of Animal and Veterinary Advances 4 (6): 346-349, 2009;* ***doi:*** *10.3923/ajava.2009.346.349)*

Influence of Essential Oils Supplementation on Digestion, Rumen Fermentation, Rumen Microbial Populations and Productive Performance of Dairy Cows

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Sixty lactating Holstein dairy cows were assigned to investigate the effect of Essential Oil Mixture (EOM) addition (mixture of eucalyptus oil 7%; menthol crystal 6.6% and mint oil 2.0%) on digestion, rumen fermentation, rumen microbial populations, milk production and milk composition. Cows were allotted into four groups (15 animals per each) and received EOM at (0, 16, 32 or 48 mg L^{-1} of drinking water) for successive eight weeks. Addition of EOM at 16 mg L^{-1} drinking water increased body weight gain, decreased feed intake and improved milk-to-feed ratio by about 7.4, 3.8 and 4.4%, respectively, across the whole experimental period when compared with the control, while moderate and higher addition levels of EOM (32 and 48 mg L^{-1} water) had variable results and not confirm the stability of animal performance. Addition of EOM had no significant effect on ruminal pH and ruminal fluid ammonia concentration and increased total Volatile Fatty Acid (VFA) by about 2.5, 2.9 and 0.7, respectively when compared with control. On the other hand, EOM (16 or 32 mg L^{-1} water) decreased molar proportion of acetate, whereas that of propionate increased compared with control and with the higher addition level (48 mg L^{-1}) of EOM receiving cows. Total viable bacteria, cellulolytic bacteria and protozoa counts

were not changed with EOM supplementation. However, protozoa counts numerically decreased with EOM addition. Apparent digestibility of dry matter, organic matter and crude protein were slightly improved ($p>0.05$) with EOM supplementation compared with control. Addition of EOM (16 mg L^{-1}) improved ($p>0.05$) milk production across the whole experimental period, while the higher levels decreased ($p>0.05$) milk production when compared with control. Lower milk fat and higher milk protein was observed for cows received EOM than control and the milk protein showed the opposite direction. Results from this study suggest that EOM addition at 16 mg L^{-1} water slightly improved milk-to-feed ratio and productive performance and had limited effect on digestion and ruminal fermentation characteristics of dairy cows while, the higher dose may have negative effect of the productivity and ruminal fermentation of dairy cows. *(Asian Journal of Animal Sciences 3 (1): 1-12, 2009; **doi:** 10.3923/ajas.2009.1.12)*

Carcass Composition of Jungle Fowl in Comparison with Broilers and Indigenous Chicken

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Carcass composition of three breed of chicken was compared: jungle fowl, broiler and Malaysian indigenous chicken. The chickens were sacrificed and were divided into forequarter and hindquarter. The forequarter was further divide into breast, wing and ribs. The muscle, bone, fat and skin of all different portions were separated, weighed and recorded. The results showed that broilers have significantly higher muscle weight compared to indigenous chicken and jungle fowl. The jungle fowl has significantly higher bone weight with least fat compared to the other two breeds The carcass composition of indigenous chicken is always in between the broiler and jungle fowl. Present results show that different habitat and feeding pattern of these chickens do contribute to these changes. *(Asian Journal of Animal Sciences 3 (1): 13-17, 2009; **doi:** 10.3923/ajas.2009.13.17)*

Supplementation of Yeast Fermented Cassava Chip as a Replacement Concentrate on Rumen Fermentation Efficiency and Digestibility of Nutrients in Cattle

S. Khampa, P. Chaowarat, R. Singhalert and M. Wanapat

Ten, one year old male cattles with initial body weight of 150±10 kg were randomly divided into two groups and received concentrate at 14% CP (T_1) and

Yeast Fermented Cassava Chip (YFCC) (T_2). The cows were offered the treatment concentrate at 1% BW and urea-treated rice straw was fed *ad libitum*. Means were compared using t-test. All animals were kept in individual pens and received free access to water. The results have revealed that replacement of YFCC on feed intake was non-significantly different, while Average Daily Gain (ADG) and digestibility of nutrients were higher ($p<0.05$) in cattle fed YFCC (T_2) treatments than received concentrate at 14% CP (T_1) (235 and 203 g day^{-1}). In addition, the ruminal pH, ammonia-nitrogen and blood urea nitrogen concentration were significantly different ($p<0.05$). The concentration of volatile fatty acid was significantly different especially the concentration of propionic acid was slightly higher in cattle receiving T_2 than T_1. Supplementation of YFCC (T_2) could improve population of bacteria and fungal zoospore, but decreased populations of *Holotrich* and *Entodiniomorph* protozoa in rumen ($p<0.05$). The results indicate that supplementation of Yeast-Malate Fermented Cassava Chip (YFCC) as a replacement concentrate at 14% CP could improve rumen fermentation efficiency and digestibility of nutrients in cattle. *(Asian Journal of Animal Sciences, 3 (1): 18-24, 2009; **doi**: 10.3923/ajas.2009.18.24)*

Economic Efficiency of Caspian Cattle Feedlot Farms

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The objective of this study was to measure Technical Efficiency (TE), Allocative Efficiency (AE) and Economic Efficiency (EE) in Caspian cattle feedlot farms. In this research, 70 farms were selected and efficiency estimated by Data Envelopment Analysis (DEA) approach. The results showed that for the case of Constant Returns to Scale (CRS), mean technical, allocative and cost efficiencies were 67.66, 80.57 and 53.5%, respectively and for the case of Variable Returns to Scale (VRS), mean technical, allocative and cost efficiencies were 87.23, 74.87 and 65.90%, respectively. crsTE were significantly affected by farm size ($p<0.05$). vrsTE were not significantly affected by farm size ($p>0.05$). crsTE and vrsTE were not significantly affected by farmer's age, farmer's education and farmer's experience ($p>0.05$). On the basis of results of this research, we can improve efficiency of Caspian cattle feedlot farms by correct using of production inputs, such as increasing length of fattening period, decreasing farm size and decreasing metabolizable energy and crude protein intake of calve. *(Asian Journal of Animal Sciences, 3 (1): 25-32, 2009; **doi**: 10.3923/ajas.2009.25.32)*

Effects of Malate and Cassava Hay in High-Quality Feed Block on Ruminal Fermentation Efficiency and Digestibility of Nutrients in Dairy Steers

S. Khampa, P. Chaowarat, S. Chumpawadee, R. Singhalert and M. Wanapat

Four, one-year old of dairy steers were randomly assigned according to a 2×2 factorial arrangement in a 4×4 latin square design to study supplementation of malate level at 500 and 1,000 g and cassava hay in high-quality feed block. The treatments were as follows: T_1 is supplementation of high-quality feed block without cassava hay+malate at 500 g; T_2 is supplementation of high-quality feed block without cassava hay+malate at 1,000 g; T_3 is supplementation of high-quality feed block with cassava hay+malate at 500 g; T_4 is supplementation of high-quality feed block with cassava hay+malate at 1,000 g, respectively. The cows were offered the concentrate and high-quality feed block at 1.3 and 0.5% BW and urea-treated rice straw was fed *ad libitum*. The results have revealed that feed-intake, rumen fermentation and blood metabolites were similar for all treatments. Apparent digestibility of nutrients were significant ($p<0.05$) for all diets. The populations of protozoa and fungal zoospores were significantly different as affected by malate level and cassava hay supplementation. In conclusion, the combined use of cassava hay and malate at 1,000 g in high-quality feed block with concentrates containing high levels of cassava chip at 65% DM could highest improved rumen ecology and digestibility of nutrients in dairy steers. *(Asian Journal of Animal Sciences, 3 (1): 33-38, 2009;* ***doi:*** *10.3923/ajas.2009.33.38)*

Quality Evaluation of Meat, Skin and Wool from Garole Sheep-a Promising Breed from India

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The aim of this study was to evaluate meat quality of Indian Garole sheep for human consumption and to provide better understanding about its skin and wool quality to stimulate its utilization and marketing. Meat production in India is much lower than the actual demand might be due to improper exploitation of animal resources particularly sheep and goat. West Bengal in India is having a unique sheep breed named as Garole with outstanding genetic potentialities. Total 60 meat, 60 skin and 200 wool samples from 12 different sources were used in this study. The meat quality parameters viz. pH, water holding capacity, refrigeration loss, muscle fiber-diameter, proximate analysis viz. moisture, protein, fat, ash and

carbohydrate contents, mineral analysis for common macro and micro minerals viz. sodium, potassium, calcium, phosphorus, magnesium, iron, cupper, zinc, manganese and chloride contents were studied in this research. The study revealed that dressing percentage (55.87%) was higher than other sheep breeds and pH (5.96) water holding capacity (43.33%) and refrigeration loss (0.86%) was comparatively better than known sheep standard. The average value of moisture, protein, fat, ash and carbohydrate contents (76.02, 18.20, 3.53, 1.65 and 0.60%, respectively) is comparable to average sheep standards with lower fat content. The macro and micro minerals contents are optimum or higher than average sheep standards indicating its higher nutritive value. The skin quality parameters viz skin length (61.43 cm), skin width (53.37 cm), skin weight (wet-1.188 kg, dry-0.59 kg), total skin area (3403 cm^2) and skin weight percentage (12.02%) was good and comparable with other sheep breed. Wool parameters like fiber length (4.95 cm), fiber diameter (54.77 μm), coefficient of variation (57.48%), type of wool (carpet type), medulation (88.13%), crimp (2.21 cm), bundle strength (7.36 g t^{-1}), elongation (29.56%) and weight of wool per shearing (308 g) are almost similar to common sheep breed of India. The high genetic potential and good quality of meat, skin and wool of Garole sheep of West Bengal, India is highly encouraging and shows a great promise for improving rural economy if proper developmental efforts are made. *(Asian Journal of Animal Sciences 3 (2): 39-46, 2009;* ***doi:*** *10.3923/ajas.2009.39.46)*

Allelic Frequency in Chicken Thyroid Hormone Responsive Spot 14 Alfa Gene (*THRSPα*)

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In this study, we describe the insertion/deletion (indel) polymorphism of the THRSP gene evaluated using 1% agarose gel and 8% polyacrylamide gel electrophoresis in a sample of (17 breeds of chicken including 3 foreign breeds and 14 chinese native breeds). For the *THRSPα* gene indel polymorphism result, allele frequencies varied, between chinese native chicken and a foreign chicken. A high frequency of allele B (0.91) and a low frequency of allele A (0.09) were observed in Leghorn chicken, which has been selected for laying performance. Based on variation in allele frequencies among populations, either the low frequency of allele A or the high frequency of allele B could be linked to fatness trait of the chicken. In conclusion, *THRSPα* gene might be used as a molecular marker in high quality broiler assistant selection breeding program. *(Asian Journal of Animal Sciences 3 (3): 85-91, 2009;* ***doi:*** *10.3923/ajas.2009.85.91)*

New Observation of Two Species of Sea Cucumbers from Chabahar Bay (Southeast Coasts of Iran)

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Although, sea cucumbers are well known animals in Eastern Asia, in Iran they are not popular marine animals. Divers recorded these animals in their dives but this is the first scientific approach in identification of holoturians in Southeast coast of Iran. All sea cucumbers were collected with SCUBA diving and species identification was done through morphological keys and review of their dermal ossicles. There are two species of sea cucumber belong to genus *Holothuria* were collected on subtidal zone of Chabahar Bay in the late of 2007. This is the first report of *H. hilla*, *H. parva* from Chabahar Bay (North of Oman Sea). This study is revealed the special characteristics of the presented species in order to just identification of them. In the studied areas, *H. parva* has known as a rare species. *(Asian Journal of Animal Sciences 3 (4): 130-134, 2009;* ***doi:*** *10.3923/ajas.2009.130.134)*