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Animal Welfare & Nutrition



Wenqing Ling - Effects of different additives on fermentation quality, microbial communities, and rumen degradation of alfalfa silage.

This study examined the effects of different additives on the fermentation quality, nutrient composition, microbial communities, and rumen degradation of ensiled alfalfa. Six treatments were employed in which additives were applied to alfalfa on a fresh weight basis: CK (no additive), FA (formic acid), CaO (calcium oxide and urea), LB (*Lentilactobacillus buchneri*), GLB (glucose and *L. buchneri*), and FLB (fucoidan and *L. buchneri*). After 60 days of ensiling, all treatments altered the bacterial communities, improved the fermentation quality, reduced dry matter (DM) and crude protein (CP) losses, and enhanced the rumen degradation of nutrients. The addition of LB increased the relative abundance of *Lactobacillus* spp., whereas GLB reduced the NH₃-N:TN ratio and elevated the concentrations of *Lactobacillus* and lactic acid content. The FA treatment reduced the pH, as well as the DM and CP degradations, while the CaO treatment increased the degradations of DM, acid detergent fiber, and neutral detergent fiber. We concluded that FA, LB, GLB, and FLB had beneficial effects on alfalfa fermentation, and that CaO increased alfalfa silage rumen degradation.

Arun Kumar Kathirvel - Exploiting the potential of new plant growth regulator melatonin in the alleviation of drought and high temperature stresses in rice (*Oryza sativa* L.).

The predicted increase in drought and heat stresses constitute a great threat to rice productivity and quality characteristics and it may affect lives of millions of the world's populations, especially in poor areas of the tropical and subtropical regions, where rice constitutes a staple food. To realize better yield under stress condition, it is necessary to develop a suitable management strategy apart from breeding tolerant genotypes. One such strategy is use of plant growth regulating substances to alleviate negative impacts of these stresses during critical growth stages. Melatonin (N-acetyl-5-methoxytryptamine), which has gained a great interest in plant science research owing to its multifaceted role in plants. It has been reported the role of melatonin in plant stress defense mechanism related to multiple abiotic stresses, mainly in activation of antioxidant system and stress specific gene expression. Hence, in the present study melatonin is employed to alleviate the adverse impacts of drought and high temperature stress in rice and will focus on the dissection of physiological, biochemical, and molecular mechanism lying under the drought and high temperature stress tolerance.

Beatrice Ngendo Nyaga - The role of private veterinarians towards improving donkey welfare in Meru County.

In Kenya, donkeys are used as beasts of burden for transporting people and goods, also used in agriculture for traction. Due to the nature of their work, they are exposed to poor working conditions, injury and malnutrition. The welfare issues arise due to cruelty, negligence, ignorance or inexperience on the part of the owners, delegation of care of the animals and hard economic times. Donkey welfare is a major issue of concern in the veterinary profession. Many veterinarians are dedicated to ensuring the safety and well-being of all animals. In many countries, veterinary professionals swear to dedicate

themselves to alleviate animal suffering and provide excellent care to all animals. In this paper, we interviewed a total 43 private veterinarians to determine the key roles they play in the donkey welfare and assessed donkey welfare issues from their perspective. We were able to point out five major roles of private veterinarians which included; offering extension services to farmers, treatment of sick or neglected donkeys, working with NGOs and self-help groups of equine owners, mentoring young veterinary professionals and working with the local government towards improving donkey welfare.

Anagha Pradeep Kumar - Kale plant response to marine-derived biostimulants.

Congcong Lu - Genome evolution of the primary endosymbiont *Buchnera aphidicola* in aphids.

This study investigates the evolutionary dynamics of the obligate symbiotic relationship between aphids and their intracellular symbiont, *Buchnera aphidicola*. Aphids heavily rely on *Buchnera* for essential nutrients, such as amino acids, which are lacking in their plant diet. Through genome analysis of *Buchnera* strains from 90 aphid species belonging to 14 subfamilies, we observed a high degree of collinearity and no genomic rearrangements among *Buchnera* genomes. Interestingly, the phylogenetic analysis revealed that the genomic evolution of *Buchnera* is not strongly correlated with their aphid hosts. With progressive evolution, the *Buchnera* genomes showed a reduction in size, particularly in the protein coding regions. However, the gene loss in *Buchnera* is not random, as essential metabolic pathways tend to be conserved while genes associated with the cell membrane exhibit varying degrees of loss. Furthermore, we found that different *Buchnera* strains from distinct subfamilies displayed variations in the number and composition of Cluster of Orthologous Groups (COG) functional genes. Overall, our study provides insights into the evolutionary patterns and mechanisms underlying the microevolution of the aphid and *Buchnera* relationship. The findings shed light on the genomic adaptations and symbiotic interactions between aphids and *Buchnera*, contributing to a better understanding of the co-evolutionary dynamics in obligate insect-symbiont associations.

Sindhu Sree Yerradoddi - Effect of sowing window and crop geometry on green fodder yield of dual purpose sorghum.

India is one of the most vulnerable countries of climate change and it has greater impact on agricultural production and livestock. Livestock sector contributes 4.11% to the GDP and 25.6% to total Agriculture GDP. Fodder requirement in India by 2025 is 1170 million tonnes (Mt) of green fodder and 650 Mt of dry fodder whereas the estimated fodder production is 411 Mt of green fodder and 488 Mt of dry fodder. There is currently a net deficiency of 35.6% green fodder, 10.95% dry fodder. (IGFRI Vision, 2050). In view of this, the present experiment was carried out in Tamil Nadu Agricultural University, Coimbatore, during the summer season, 2022-2023. with the treatments i.e., D1: Sowing during First fortnight of February, D2: First fortnight of March and D3: First fortnight of April in main plot and six different crop geometries in the subplot viz., 45 x 15 cm (S1), 45 x 10 cm (S2), 45 x 5 cm (S3), 30 x 15 cm (S4), 30 x 10 cm (S5) and 30 x 5 cm (S6). The results revealed that sowing during April I FN sowing with crop geometry of 30x 5 cm resulted in highest green fodder yield of 43.6 t/ha.

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Florence Thiakunu - Performance effects of feed supplementation on lactating camels during mating season in Isiolo, Kenya.

Camels are very resilient and animals of choice in achievement of food security and economic development in arid areas. With the effects of climate change, camel feed resources are diminishing in quality and quantity. This has resulted to decreased milk production and reproductive performance. Camels drop milk suddenly after conception. Information on effect of pregnancy and diet on milk production is scanty. The objective of this study therefore was to determine the effect of feed supplementation on productive, reproductive and economic performance. A diet containing 16.80% crude protein and 8.44 MJ/KG was supplemented to ten camels and other ten was control. Complete milking was done in the morning and milk from each camel recorded. Mean daily milk production was increased by 10% after supplementation ($P < 0.001$). There was a difference of 1.48 ± 0.95 between the pregnant supplemented and pregnant unsupplemented. Supplementation also improved reproduction parameters, milk quality and serum biochemical profiles. The study results demonstrated that supplementing camels during mating season improves production and reproduction as well as milk quality. Though not economical, it has long term effects of promoting herd growth.