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Ramesh C Gupta

Murray State University, USA

Nutraceuticals in animal health and disease, with a special reference to osteoarthritis

Currently, the nutraceutical industry is worth more than \$200 billion per year. Nutraceuticals, commonly referred to as dietary supplements, are given to humans and animals with the intent of improvement of health, and prevention/treatment of diseases. In several animal diseases (such as arthritis, dermatitis, diabetes, depression, allergies, obesity, periodontal disease; and gastrointestinal, hepatic, renal, and cardiovascular dysfunction), nutraceuticals have been found very effective. Among all chronic diseases, osteoarthritis (OA) occurs with the greatest frequency, especially in canine and equine species. In fact, one in five adult dogs or horses is inflicted with OA, and factors contributing to this crippling, chronic degenerative joint disease include aging, injury, obesity, genetics, immune status and nutritional deficiency. Until recently, OA-associated pain has commonly been managed with the use of non-steroidal anti-inflammatory drugs (NSAIDs), but due to severe side effects in hepatic, renal, and cardiovascular systems, nutraceuticals have been preferred over NSAIDs. Presently, a number of nutraceuticals (glucosamine and chondroitin, type II collagen, Terminalia chebula extract, curcumin, green-lipped mussels, Boswellia serrata extract, shilajit, krill oil fatty acids, methylsulfonylmethane, hyaluronic acid, and others) are indicated singly or in a combination to manage/treat OA in companion animals. However, nutraceutical efficacy depends on selection, source, dose and the right combination of ingredients. In general, most nutraceuticals are effective and well tolerated with a wide margin of safety. However, they have not been evaluated for their pharmacological efficacy and safety in large clinical trials. Therapeutic efficacy and safety evaluation of plant-based nutraceuticals, compared to a pure synthetic compound, is complex due to many factors. In conclusion, the future of nutraceuticals in animal health and diseases seems bright, as novel nutraceuticals will emerge and new uses of old nutraceuticals will be discovered.

Biography

Ramesh C Gupta has earned his DVM, MVSc and PhD from India and currently serves as Professor and Head of Toxicology Department. For decades, he has conducted experimental brain research in relation to pesticide toxicity. He has served the panels of NIH, CDC, NIOSH, and NAS and has published more than 350 publications, including 7 books: "Toxicology of Organophosphate & Carbamate Compounds", "Veterinary Toxicology", "Handbook of Toxicology of Chemical Warfare Agents", "Anticholinesterase Pesticides", "Reproductive & Developmental Toxicology", "Biomarkers in Toxicology and Nutraceuticals". In 2006, he has received the Murray State University's Distinguished Researcher Award. He is a Diplomate of American Board of Toxicology and Fellow of American College of Toxicology, American College of Nutrition and Academy of Toxicological Sciences.

rgupta@murraystate.edu