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PREFACE

Exogenous Enzymes in Animal Nutrition- Benefits and Limitations

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The use of exogenous enzymes in animal nutrition dates back to the mid-1920s, however, nowadays the development of interdisciplinary sciences exploiting molecular methods create new opportunities and deliver new tools to assess effectiveness of their utilization. The proper use of enzymes in animal nutrition allows to obtain maximum benefit from their action not only for the animals, but also for the environment.

The strategies of exogenous enzymes utilization in nutrition of high yielding non-ruminant and ruminant animals are intended to be published in the special issue. Effectiveness of enzymes in animal nutrition depends on (i) type, (ii) source, (iii) level of supplemented enzymes, as well as (iv) the type of diet fed, (v) animal health and (vi) animal productivity. Hence, research focused on the effect of phytase and non-phytase enzyme segments, enzymes combinations, including enzymes produced by genetically modified bacteria, protozoa and fungi, on enteric fermentation, animal health and productivity are desirable.

The current special issue covered the highlighted topics: mode of action of particular enzymes and their combinations, occurrences of synergism and antagonism reactions in relation to enzymes themselves and to dietary ingredients; the impact of enzymes on nutrient utilization including basic nutrients components, antinutritional factors, minerals and, consequently, enteric microbial populations, nutrients digestibility, growth performance; the optimum enzymes dosages as dietary supplements; optimalization of enzyme activity to make enzymes activity more effective from economic and ecological points of view; alternative use of enzymes in mixtures of other feed additives e.g. organic acids; methods of enzymes application.

The review process for this issue tended to focus on one of the topics mentioned in the objectives above, but all have in common the use of exogenous enzymes and their

impacts on rumen fermentation and/or animal welfare and/or animal performance and health as well as performance of non ruminant animals.

Guest Editors of the special issue (*i.e.*, Dr.'s A.Z.M. Salem, and Nicholas Odongo) were contacted and invited many potential authors directly. All abstracts received (46 abstracts) were assessed and were invited to submit full papers, while 29 full papers were only accepted after deep revision by two or more experts. All papers were reviewed by at least two primary reviewers chosen for their expertise in animal nutrition, especially in use of exogenous enzymes and probiotics in ruminants and non ruminant's animals. Each one of the Guest Editors has handled some manuscripts and gives the final decision with helping of the reviewer's comments and evaluations. All papers were improved as a result of the reviewers' comments, indeed some were very extensively revised, and some were rejected.

Finally, the editors are very grateful for the time and commitment given by all the reviewers involved in the evaluation of the manuscripts submitted, and would like to acknowledge the excellent review efforts of: M.A. Cerrillo-Soto, Adibe L. Abdalla, Z.L. Tan, P. Micek, A. Cieslak, T. Szwaczkowski, J. Dach, S. Świątkiewicz, D. Józefiak, J. Skomiał, J. Mazurkiewicz, G. Paci, P. Huhtanen, , D.F. Cardia, Z.M. Kowalski, S.S. Paul, N.P. Guerra, C. O'Shea, , S. Nowicki , A.S. Moura, J. Xin Liu, T. Seresinhe, D. Colombatto, H. Abubeker, J. Simbaya, H. Ben Salem, J. Rekhis, T. Norovsambuu, M. J. Ranilla, A. Abdalla, M. González-Ronquillo, M.D. Carro, M. Mellado, G.D. Mendoza, M. Cobos Peralta, M.S. Awawdeh, P. A. Hernández García, Z. Durmic, I.A. Domínguez-Vara, F. Klevenhusen, A.K. Patra, A. Kholif, A.M. Kholif, S. Gonzalez –Muñoz, Y. Rouzbehan. If any reviewer was missed, please accept our most sincere apologies.

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