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11-1390000-003293-01

Proceedings of  
The 3<sup>rd</sup> RDA and Embrapa Joint Workshop

# Strategic Research Cooperation on Horticulture and Animal Science

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March 25-29, 2013

Rural Development Administration

Labex Korea, Embrapa

Suwon, Republic of Korea

No 7126



## **Probiotic and enzymes development and applications for human and animal health and welfare**

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Related to animal production, Embrapa Swine and Poultry have been dedicated to develop management, breeding, raw material analysis, nutritional recommendations, sanitary monitoring programs and vaccine development.

In the field animal feed additives, many performance and metabolism trials have been done along decades in order to understand and better recommend its usage. Recently, a new development stage have raised, the use of National Biotech Resources to develop new feed additives, such as pro and prebiotics, enzymes and other. Complementary to these, there is as well a project to implement a sophisticated lab dedicated to analyze and characterize the Brazilian feedstuffs used in animal nutrition in terms of anti-nutritional factors.

All those efforts so far have been driven throughout an Embrapa inter-center action. However, it has been discussed to evaluate the possibility of an international cooperation with a well developed institution in this field.

The Rural Development Administration (RDA) seems to meet required knowledge and constitutes a potential partner to integrate the Applied Biotechnology area for human and animal feed additives, health and welfare.

The objective of the future collaborative project is to attend the following objectives: 1. Development of enzymes for food and feed use generated from Brazilian biodiversity, 2. Development of probiotics and prebiotics for human and animal health and welfare, 3. Development of inoculants for environmental protection and sustainability and 4. Development of a compound feed additive solution for poultry and swine

The bio prospection of Brazilian resources for new metabolites (enzymes) for food and feed application is relevant because Brazil is one of the main animal protein producer and investments in this area could work in favor of a less expensive production and/or more sustainable production systems associated to a healthier and tastier food.

The development of probiotics and prebiotics for human and animal health and welfare has the objective to evaluate of National microbes (bacteria, yeast and moulds) with potential as probiotics. Such kinds of additives have been used in favor of animal and human health improvement. Considering the enormous bioresources in Brazil, it is believed that many potential not yet discovered microbes could be identified and used for this proposal. Some Embrapa R&D Centers have been already working in this area, i.e., Embrapa Wine and Grapes, Embrapa Food Technology and others.

The use of biotechnology for prebiotic development has become more common along the last years. Additives like gums, flavors, toxin binders, gut health enhancers and others have been developed. As mentioned in the previously, it is believed that Brazil has an enormous potential in terms of biodiversity unexplored so far for this proposal.

Considering a growing demand of food and feed, it is expected that a higher output of contaminants to the environment will happen. Based on this statement a need for efficient biodegradation systems enriched with potential inoculants coming from national resources seems to be another important development area. Microbes that turn de degradation of animal manure, urban effluents, slaughter houses effluents and other processes residues faster can be of extreme benefit in the near future.

Alternatives to antibiotic growth promoters have been a concern. So far, there are no isolated natural alternatives capable to result in the same efficiency than the traditional antibiotics used in animal production. However, it has been assumed that a synergistic package of natural resources could be an alternative tool. Following this idea, one option for the future, could be the association of biotechnological products, especially combining herbal extract to fermentation products.

Based on this statement, development of a project that combines several natural resources seems very promising.