

## Probiotics for the use in the development of cattle production in Kuwait

**Tahani Al-Surrayai**

Kuwait Institute for Scientific Research, Kuwait

Dairy farms in Kuwait are facing extremely arid conditions that induce animal stress and tend to reduce energy reserves that weaken the immune system making the animal more susceptible to disease and increase animal mortality. To combat these diseases, farmers administer antibiotics to the cattle which are also used by humans. Overuse can lead to the bacteria developing resistance to these antibiotics. In addition, when dairy products from these antibiotic-ingested cattle are consumed by humans, the antibiotic residue enters their system causing them to develop resistance to those antibiotics. The main objectives of this research project were to isolate and evaluate probiotic lactic acid bacteria (LAB) during four seasons for utilization as an alternative to antibiotics in cattle production to control enteric pathogens, enhance productivity and improve food safety. The evaluation was covered by determination of antagonistic activity of LAB using *in vitro* tests and determining their tolerance to acidic pH, resistance to bile salts, resistance to antibiotics bacteriocin production, and aggregation and co-aggregations. The preliminary isolation process resulted in the isolation of 263 presumptive

Lactobacilli, and among them, 80 were confirmed to belong to the lactic acid bacteria group by means of molecular tools (16S rRNA-Polymerase Chain Reactions (PCR)-sequencing). Ten representative strains were chosen and screened for their probiotic potential. During this study, active LAB strains were isolated such as *L. fermentum*, *L. rhamnosophus* and *L. reuteri*. These strains can potentially inhibit the growth of some common pathogen (*S. enterica* and *E. coli*) and tolerate the acidic condition in the ruminant's digestive system, tolerate bile salt and have the ability to adhere to hydrocarbons. As a final result, a pool of 4 strains seemed to have the relevant probiotic potential to be further tested as agents able to reduce bacterial infections.

### Biography

Joined the Biotechnology Dept. at KISR in 1995 as a Research Assistant. During the past 22 years, she developed excellent technical skills and has actively participated in several important research projects in the area of Environmental Biotechnology. Her role in the many projects resulted successfully in the isolation, characterization and optimization of a large number of new microbial strains from the local environment. These strains have been used as an integral part of the developed sulfur amendment for enhancing soil fertility. Additionally, she leads a task in a study that focused on the screening and evaluation of PAHs degrading microorganisms for the local environment. Besides her depth of knowledge and skills in biochemistry and microbiology, she is involved in the development of probiotic bacteria for use in livestock and poultry. Accordingly, she has been leading two successful projects in probiotics fields for livestock.

faisalok.adwani@gmail.com

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