



Characterisation of coliform bacteria and Escherichia coli from fresh milk to determine the prevalence of possible pathogenic types

(PRJ-0024-2014)

University of Pretoria -

Quarter 4 2014 (October 2014 till December 2014)

Project goals

Goal 1 - Characterisation of coliforms; pathogenic and commensal E. coli from bulk milk for relatedness of strains from the various sources, their virulence, and antibiotic resistance

Achievements

Escherichia coli was isolated from in 36.4% of the samples and the numbers of samples which tested positive ranged from 5 to 37 in the regions, making it the most isolated coliform. No E. coli was isolated in 2 regions. There was a significant difference in the number of samples which tested positive for E. coli in both raw and pasteurised milk samples. All the 121 E. coli isolates tested negative for the 12 common serotypes using the agglutination test.

15% of the E. coli isolates were positive for virulence genes stx1/stx2 and 25.6% (n=121), phenotypically gave positive results for O157:H7. The intimin (eae) gene was absent in the 19 E. coli isolates which tested positive for stx1/stx2 (Table 1).

Out of the 121 E. coli isolates tested, 73% showed resistance to at least one of the 11 antibiotics. All the E. coli isolates from the milk samples showed resistance to all the 11 antibiotic tested . All Isolates from all the regions exhibited very high resistance to at least one antibiotic agent, in decreasing order, to cephalothin (51.2%) neomycin (34.7%), ampicillin (24.8%), amoxicillin (23.1%) and oxytetracycline (17.4%), however moderate and low resistance were observed to the other 6 antibiotic agents (Table 2).

Restriction amplified O-antigen gene cluster methodology was implemented in our molecular laboratory with success and all the E coli isolates subjected to the methodology. This was to determine the O-serotypes as it was earlier determined that the E. coli did not represent the 12 most common serotypes found internationally. The serotypes confirmed to date are: 02 (STEC, Shiga toxin-producing Escherichia coli infection causes severe diarrhoea, which is frequently bloody, and may result in the life threatening haemolytic uremic syndrome), 068 & 085 (EAEC Enteraggregative Escherichia coli (EAEC) was first described in 1987 and has since been linked with persistent diarrhea in children living in areas where EAEC is endemic, individuals with human immunodeficiency virus infection, and as a cause of diarrhea in travelers from industrialized countries visiting less-developed areas of the world), 0155, 043

No Non-achievements / underperformance has been reported

Goal 2 - Stochastic modelling of E. coli serotypes throughout the

processing chain, important factors affecting it and possible mitigation factors

Achievements

This goal has not been completed, will only start after goal 1 has been completed

No Non-achievements / underperformance has been reported

Income and expenditure statement

Income and expenditure statement	Expenses SA Milk Jan.xlsx
Unnecessary spending during period	No

Popular Report

No file has been uploaded

Additional documentation

[Tables January 2015 report.docx](#)

[Bulleterd progress Microbiological Quality of milk in South Africa Jan.docx](#)

Statement

Levy funds were applied only for the purposes stated in the contract	Yes
Levy funds were applied in an appropriate and accountable manner	Yes
Sufficient management and internal control systems were in place to adequately control the project and accurately account for the project expenditure	Yes
The information provided in the report is correct	Yes