

Characterisation of the anti-giardial activity of bovine colostrum

Principal Supervisor: Dr Ryan O'Handley

Email: ryan.ohandley@adelaide.edu.au

Phone: 8303 7656

Co-Supervisor: Associate Professor Natalie Keirstead

Background

Giardia duodenalis is a common protozoan parasite in a wide range of mammalian hosts, including humans. In dairy calves, the incidence of infection is close to 100% and *Giardia* may be a cause of disease and production loss. Although a common and widespread parasite in dairy calves, *Giardia* infections do not occur in calves until they are 2- 4 weeks of age. Previous research has demonstrated, bovine colostrum has activity against *Giardia*, and therefore may protect calves against infection for the first few weeks of life. By better understanding the protective mechanisms of bovine colostrum, it may be possible to develop future treatments or vaccinations for this common parasite.

Aims and Significance

The Aim of this project is to determine which components of bovine colostrum exhibit anti-giardial activity *in vitro*. Bovine colostrum contains high levels of immunoglobulin, specifically IgG, as well as active cells such as neutrophils and macrophages that secrete antimicrobial components. It is not known which of these components are responsible for the anti-giardial activity of colostrum previously observed in experimental studies.

Techniques to be used

Bovine colostrum will be collected from our affiliated dairy located in Two Wells. *Giardia* specific antibodies in the colostrum will be examined using western blots, and immunoglobulins will be purified from the colostrum using affinity chromatography. The anti-giardial activity of these purified antibodies will be assessed using an *in vitro* *Giardia* adherence assay. This work will determine if the protective effect of colostrums is due to immunoglobulins or if other components are responsible for the protective effects observed. In addition to basic immunological and protein purification techniques, the student will also learn to culture *Giardia* and work with this fascinating parasite *in vitro*.