

Dalhousie University, Faculty of Agriculture

AGRI5710 and AGRI5705: Graduate Module Course

Module Title: **Natural Bioactive Agents and their Antimicrobial Activity**

Instructor: Dr. Avik Khan

Contact information: avik\_khan@cbu.ca

Dates module will be offered: September-November 2019.

Frequency of formal classes/meetings: The module will comprise of 4 classes (2 hr each) and 3 lab works of 4 hr each. The classes will be held remotely via video conference and the lab works will be held at the Dalhousie Agricultural Campus (Truro, NS).

Module Content and Learning Objectives

Foodborne diseases are considered as potent public health concern throughout the world and pose serious health risks to consumers. They are responsible for 9.4 million illnesses, 55,961 hospitalization and 1,391 deaths each year in the United States (Scallan et al., 2011). Microbial contamination, which is considered to be the main reason for food spoilage, can drastically reduce the shelf life of foods and increase the risk of foodborne illnesses. In the context of a constantly growing population and globalization of markets, prevention of food contamination by microorganisms or pathogens, is becoming increasingly important (Khan, Vu, Riedl, & Lacroix, 2015). However, most of the commonly used food preservatives are synthetic chemicals such as, benzoates, sorbates, parabens etc. The use of natural bioactive agents represents a highly effective approach to prevent the growth of pathogenic bacteria and extend the shelf life of food products.

The module will consist of discussion on various natural bioactive agents, their antimicrobial activity and application in food systems. Students will learn the theories and master the methods commonly used to grow, inoculate, detect microorganisms; carry out microbial growth analysis, quantify the antimicrobial activity of bioactive agents and develop the skills necessary to critically assess and communicate microbiological data.

Method of Evaluation:

Presentations (25%), Lab works (25%), 1000-word final assignment (30%), participation/contribution to discussions (20%).

Any restrictions on enrollment: N/A.

Reference:

- Khan, A., Vu, K. D., Riedl, B., & Lacroix, M. (2015). Optimization of the antimicrobial activity of nisin, Na-EDTA and pH against gram-negative and gram-positive bacteria. *LWT - Food Science and Technology*, 61(1), 124–129. <http://doi.org/10.1016/j.lwt.2014.11.035>
- Scallan, E., Hoekstra, R. M., Angulo, F. J., Tauxe, R. V., Widdowson, M.-A., Roy, S. L., ... Griffin, P. M. (2011). Foodborne Illness Acquired in the United States—Major Pathogens. *Emerging Infectious Diseases*, 17(1), 7–15. <http://doi.org/10.3201/eid1701.P11101>