



**University  
of Manitoba**

**University of Manitoba  
Faculty of Agricultural and Food Sciences  
Department of Animal Science**

## **Special Topics in Animal Nutrition**

**ANSC 7510**

**Fall 2023**

**Microbial factors affecting gut health in ruminants**

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## Course Details

**Course Title:** Special Topics in Animal Nutrition

**Course Number:** ANSC 7510

**Term:** Fall 2023

**Credit Hours:** 3

**Pre-requisites:** None

**Class Times & days:** Weekly Wednesdays 1:00 - 1:50 pm. Laboratory work TBD.

**Class location:** Room 232a Animal Science

## Instructor Contact Information

**Instructor Name:** Dr. J. C. (Kees) Plaizier

Professor, Department of Animal Sciences

**Email:** [Plaizier@umanitoba.ca](mailto:Plaizier@umanitoba.ca)

Email is the preferred method of communication. Always use your UofM email account for all communications. Include course number (ANSC 7510) in the subject line followed by a brief description of your email (e.g., "ANSC 7510 - Request for Appointment"). I will reply to your emails within 48h during weekdays.

**Office location:** Room 232a Animal Science Building

**Office Phone:** (204) – 474 9500

**Office/Student/Learner Hours:** I am always happy to meet with you and chat about different subjects, including any questions or concerns you may have regarding the course material, exams and beyond. I will be available before and after each class, but if you want to have a one-by-one meeting in my office please email me to schedule a time that works best for both of us.

## Traditional Territory/Land Acknowledgment

The University of Manitoba campuses are located on original lands of Anishinaabeg, Cree, Oji-Cree, Dakota and Dene peoples, and on the homeland of the Métis Nation. We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.

## Equity and Inclusion Commitment

My most important mission in the classroom is to foster a positive, safe, and intellectually stimulating environment in which you feel comfortable to express yourself, ask questions,

participate in discussions and share ideas. This class welcomes everyone regardless of nationality, ethnicity, sexual orientation, gender identity, religion, or physical appearance. We all have the right to be treated with respect and are also expected to conduct ourselves in a respectful manner. We might have different opinions and beliefs. But we should be open to listen and learn from each other, and if in disagreement, express it in a friendly manner. Violence, negative attitudes, and microaggressions have no place in this classroom. Instead, let's help each other build a supportive and fun environment that we can all enjoy. I am always available to listen to your concerns/suggestions.

## Course Description

### U of M Course Calendar Description

#### General Course Description

A combination of lectures and laboratory work will be used to deliver course materials and broaden students' knowledge in the field of gut health in ruminants. Course activities are designed to encourage critical thinking and improve oral and written communication skills of students. Functionality and pathogenicity of gut microbiota in ruminants are key to gut health in ruminants. Hence, determining and comparing the pathogenicity of gram-negative gut bacteria is a key component of managing gut health in ruminant livestock, including dairy cows. It has been assumed that the toxicity of lipopolysaccharide endotoxin (LPS) of common gram-negative bacteria in the rumen equals that of *E. coli* LPS. The major hypotheses tested in this study is that *E. coli* LPS is more toxic than LPS of these common gram-negative bacteria.

#### Course goal:

The main goal of this course is to broaden students' knowledge of gut health in dairy cows, and the roles that the taxonomy and functionality of rumen microbiota have in maintaining that health. Next to reviewing aspects of gut health, as well as digestion and fermentation in the digestive tract of ruminants, we will compare toxicity of lipopolysaccharides (LPS) from pathogenic and commensalism gram-negative bacteria from the digestive tract. The following hypothesis will be tested: 1) Equal amounts of lipopolysaccharide endotoxin (LPS) LPS from pathogenic are more toxic than LPS from commensalism bacteria; 2) Higher toxicity of LPS is reflected by higher ratio of endotoxin units (EU) values determined by the Limulus Amoebocyte Lysate (LAL) assay and determined by an enzyme linked immunosorbent assay (ELISA). At least 3 pathogenic gram-negative bacteria and 3 commensal 3 pathogenic gram-negative bacteria will be included in the study. This study will provide novel information on gut disorders in ruminants and may provide strategies for the improvement of gut health in ruminant livestock. In addition to the scientific concepts described above, another aim of this course is to develop and improve student's technical and communication skills. Technical skills will include collation and processing of rumen fluid, bacterial culturing, extraction of LPS, LAL assay, and ELISA.

## Course Learning Outcomes

By the end of this course, student will be able to:

- Understand the etiology of gut health disorders in ruminant livestock, including subacute ruminal acidosis (SARA)
- Be able to conduct the LAL assay and ELISA, bacterial culturing, endotoxin extraction, and qPCR.
- Understand the complexity of microbial communities in the digestive tract of ruminants—both in terms of composition and functional diversity.
- Understand state-of-the-art techniques used for taxonomic and functional profiling of microbiota and endotoxins in the digestive tract of ruminant livestock.

Identify main groups of microorganisms within the gut microbiota of livestock and describe their role in immune and metabolic homeostasis.

## Course Materials

### Required Materials

There is no required textbook for this course. All the reading materials including lectures and journal articles will be either posted on UM Learn or available through UM libraries.

### Technology

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by instructor and/or the University of Manitoba Disability Services. You can use your smart phones, laptops and/or tablets to participate in class activities. However, you should not participate in personal direct electronic messaging or posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking, or gaming) during scheduled class time. Students are not to record lectures or post lectures in any online formats.

### UM Learn

Reading materials, lectures, and assignments will be posted on UM Learn in preparation for each class. Please check UM Learn regularly.

## Course Schedule

Date	Class agenda (I: Instructor)
September 6 to December 8, 2023	Weekly meetings with instructor
September 6 to December 8, 2023	Laboratory work. TBD
October 11	Literature review
November 8, 2023	Submission of draft report
December 6, 2023	Final presentation
December 13, 2023	Submission of final report

This schedule is subject to change at the discretion of the instructor and/or based on the learning needs of the students but such changes are subject to [Section 2.8 of ROASS \(https://umanitoba.ca/governance/governing-documents-academic#responsibilities-of-academic-staff-with-regard-to-students\)](https://umanitoba.ca/governance/governing-documents-academic#responsibilities-of-academic-staff-with-regard-to-students). There is no prearranged schedule. The student and instructor will meet at least weekly for 50 min. Laboratory work will be conducted at times based on arrangement between the student, the instructor, and Dr. Derakhshani.

## Important Dates and Deadlines

For a complete list of important dates, please see ‘**Important Dates and Deadlines**’ under Registrar’s Office (Student Affairs) on the university website: <http://umanitoba.ca/student/records/deadlines/>

### General Dates

- |    |   |  |
|----|---|--|
| a) | First day of classes                      | Diploma: September 9, 2023; Degree September 6, 2023 |
| a) | Last Course Drop Date:                    | September 19, 2023                                   |
| b) | Last Course Add Date:                     | September 20, 2023                                   |
| c) | National Day for Truth and Reconciliation | October 2, 2023                                      |
| d) | Fees Payment Deadline                     | October 4, 2022                                      |
| g) | Thanksgiving Day (No classes):            | October 9, 2023                                      |
| e) | Experiential Learning, Diploma            | Oct 11 to 14, 2022 (Subject to change)               |

- f) Midterm Break (No classes): November 13 – 17, 2023
- h) Remembrance Day (No classes): November 13, 2022
- i) Last Day of classes: \_\_\_\_\_ Diploma: December 9, 2022; Degree December 11, 2022

## Course Evaluation/Assessments

### Summary

Due Date:	Assessment Tool	Value of Final Grade, %
October 11	Literature review	20
December 6, 2023	Project presentation	50
December 13, 2023	Final report	30

### Assessment Descriptions

**Project report and presentation:** In consultation with the instructor, the student will write a report that includes a literature review on the role of LPS in the etiology of gut health disorders, including subacute ruminal acidosis (SARA), the methodology of the conducted experiment, a results section, and a discussion section. The written project report should include a 10-page literature review, a 4 page results section (including tables and figures), a 5 page discussion section, a conclusion section, and a section on future research. The project presentation should be tailored for academic audience not specialized in the proposed field of research (typical of NSERC grants review committees) and contain information on the important of the proposed topic, experimental design, and justification of proposed methodologies (20 min talk plus 10 min for questions and discussion). Assessment will be based on the quality of presentation, knowledge of the subject, presentation and discussion of the results, knowledge gaps it, and ability to answer questions.

## Grading

Letter Grade	Percentage out of 100	Grade Point Range	Final Grade Point
A+	95-100	4.25-4.5	4.5
A	86-94	3.75-4.24	4.0

B+	80-85	3.25-3.74	3.5
B	72-79	2.75-3.24	3.0
C+	65-71	2.25-2.74	2.5
C	60-64	2.0-2.24	2.0
D	50-59	Less than 2.0	1.0
F	Less than 50		0

## Course Policies

- **All assignments must be fulfilled to pass the course** (including written project report and project presentation).

### Academic Integrity

Each student in this course is expected to complete their coursework and programs of study with integrity by making a commitment to the six fundamental values of honesty, trust, fairness, respect, responsibility, and courage.

Please refer to these specific course requirements for academic integrity for individual and group work in this course:

- I. Unless otherwise stated, complete your assignments, quizzes, tests, and exams by yourself with no help from your class peers, family members, or from tutors that are not approved by the instructor. If you are in need of assistance, please contact the instructor immediately for support and/or to arrange for approved supports.
- II. Do not share course materials (e.g., notes, exam questions, assignment instructions, article) that have been created by the instructor or were authored by another person. Unpermitted sharing of such materials with your peers or with note-sharing companies, such as One Class, Course Hero, or Chegg (or other similar websites), is a violation of Copyright Law.
- III. Group members must ensure that a group project adheres to the principles of academic integrity. This means that all students are required to check that all sourced material has been cited and referenced.
- IV. Students should review specific instructions concerning study groups and individual assignments.
- V. Do not submit lab reports or other types of assignments already graded in another course.

Plagiarism, duplicate submission, cheating on quizzes, tests, and exams, inappropriate collaboration, academic fraud, and personation are violations of the Student Discipline Bylaw and will lead to the serious disciplinary action. Visit the Academic Calendar, Student Advocacy, and Academic Integrity web pages for more information and support.



## Accessibility

The University of Manitoba is committed to providing an accessible academic community. [Students Accessibility Services \(SAS\)](https://umanitoba.ca/student-supports/accessibility) (<https://umanitoba.ca/student-supports/accessibility>) offers academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g., mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

520 University Centre

(204) 474-7423

[Student\\_accessibility@umanitoba.ca](mailto:Student_accessibility@umanitoba.ca)

## Attendance

I expect you to attend all classes and labs. If for any reason you need to miss a class, please communicate with me in advance or shortly after the missed session ([Self-Declaration for Brief and Temporary Student Absences Policy and Procedure](#)). There will not be any make-up exercises for missed labs. If you miss a lab, it is your responsibility to communicate with other students and the instructor to obtain a copy of the lab assignment (also posted on UMLearn), complete it, and submit it to instructor before the deadline (please check our guideline for late submissions).

## Assignment Extension and Late Submission Policy

Deadline for the submission of each lab assignment will be included in the questionnaire provided to students. You are expected to respect those deadlines, late submissions without valid reasons will result in a 10% penalty within one week past the deadline, and 25% penalty afterwards.

Deadline for the submission of the case-study is the day of your presentation before the class starts. Late submissions are discouraged and may not be accepted without valid reasons. I encourage you to develop the case-study over time and meet with me in person a week or two in advance of the deadline to receive feedback on the progress and avoid last minute rush/stress. While unexpected can happen (and I respect your right for temporary absence [Self-Declaration for Brief and Temporary Student Absences Policy and Procedure](#)), I expect you to be respectful of your classmates and attend your case-study presentation on the day we have agreed upon. It is not possible to re-schedule student presentations. If you miss your presentation day, its grade will be assigned based on the average grades of your two term tests.

## Class Communication

You are required to obtain and use your University of Manitoba email account for all communication between yourself and the university.

Please note that all communication between you and myself must comply with the electronic communication with student policy:

[http://umanitoba.ca/admin/governance/governing\\_documents/community/electronic\\_communication\\_with\\_students\\_policy.html](http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html).

## Recording Class Lectures

No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part. Course materials (both paper and digital) are for the participant's private study and research.

## Referencing Style

Assignments should use the citation format adopted by the Canadian Journal of Animal Science: <https://cdnsiencepub-com.uml.idm.oclc.org/authors-and-reviewers/author-guidelines>

Make sure you cite only literature that is highly relevant and avoid multiple citations on the same point. Check each reference with the original article and refer to it in the text by the author and date. Examples of correct citations:

Following the overnight incubation, membranes were washed (6×10min) in 1×TBS with 0.1% Tween-20 and incubated at room temperature for 1 h with a secondary donkey anti-rabbit HRPconjugated IgG (1:10 000 dilution in 6% skim milk powder, Promega) (Yang et al. 2016).

Gozho et al. (2005) used a threshold of a rumen pH depression between pH 5.2 and 5.6 for at least 3 h/day, and feed intake was only reduced and inflammation only occurred at equal or greater rumen pH depressions.

Studies by Gozho et al. (2007) and Khafipoor et al. (2006) showed that grain-induced SARA also increased SAA in lactating dairy cows (Table 1).

List multiple references in the text in chronological order. Use “et al.” when there are more than two authors but give all authors in the reference list at the end of your assignment.

## Technology Use

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical, and legal manner. Please make yourself familiar with UM policies regarding all University-related activities, including those happening in online environments such as social media platforms. [Respectful Work and Learning Environment policy \(RWLE\)](https://bit.ly/3OxGtnd) (<https://bit.ly/3OxGtnd>).

## Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. I have ensured that the content I use is appropriately acknowledged and is copied in accordance with copyright laws and university guidelines. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn) or any website (e.g., Course Hero, Chegg, etc.), unless an exception to the Copyright Act applies or written permission has been confirmed. For more information, see the [University's Copyright Office website \(http://umanitoba.ca/copyright/\)](http://umanitoba.ca/copyright/) or contact [um\\_copyright@umanitoba.ca](mailto:um_copyright@umanitoba.ca).

All students are required to respect copyright as per Canada's Copyright Act. Staff and students play a key role in the University's copyright compliance as we balance user rights for educational purposes with the rights of content creators from around the world. The Copyright Office provides copyright resources and support for all members of the University of Manitoba community. Visit <http://umanitoba.ca/copyright> for more information.

## UM Policies

Please visit the following links for a full list and descriptions of University of Manitoba policies and supports in accordance with the [ROASS Policy \(https://bit.ly/3zr66BR\)](https://bit.ly/3zr66BR), [ROASS Procedures \(https://bit.ly/3MqZeY7\)](https://bit.ly/3MqZeY7), and [ROASS Schedule A \(https://bit.ly/3tk5PNs\)](https://bit.ly/3tk5PNs)

## UM Learner Supports

**Student Support Services:** Here is a list of academic supports available to students, such as the Academic Learning Centre, Libraries, and other supports as may be appropriate:

### Writing and Learning Support

The Academic Learning Centre (ALC) offers services that may be helpful to you throughout your academic program. Through the ALC, you can meet with a learning specialist to discuss concerns such as time management, learning strategies, and test-taking strategies. The ALC also offers peer supported study groups called Supplemental Instruction (SI) for certain courses that students have typically found difficult. In these study groups, students have opportunities to ask questions, compare notes, discuss content, solve practice problems, and develop new study strategies in a group-learning format.

You can also meet one-to-one with a writing tutor who can give you feedback at any stage of the writing process, whether you are just beginning to work on a written assignment or already have a draft. If you are interested in meeting with a writing tutor, reserve your appointment two to three days in advance of the time you would like to meet. Also, plan to meet with a writing tutor a few days before your paper is due so that you have time to work with the tutor's feedback.

These Academic Learning Centre services are free for U of M students. For more information, please visit the Academic Learning Centre website at: <http://umanitoba.ca/student/academiclearning/>

You can also contact the Academic Learning Centre by calling 204-480-1481 or by visiting 205 Tier Building.

### **University of Manitoba Libraries (UML)**

As the primary contact for all research needs, your liaison librarian can play a vital role when completing academic papers and assignments. Liaisons can answer questions about managing citations, or locating appropriate resources, and will address any other concerns you may have, regarding the research process. Liaisons can be contacted by email or phone, and are also available to meet with you in-person. A complete list of liaison librarians can be found by subject: <http://bit.ly/WcEbA1> or name: <http://bit.ly/1tJ0bB4>. In addition, general library assistance is provided in person at 19 University Libraries, located on both the Fort Garry and Bannatyne campuses, as well as in many Winnipeg hospitals. For a listing of all libraries, please consult the following: <http://bit.ly/1sXe6RA>. When working remotely, students can also receive help online, via the Ask-a-Librarian chat found on the Libraries' homepage: [www.umanitoba.ca/libraries](http://www.umanitoba.ca/libraries).

### **Student Counselling Centre**

Contact SCC if you are concerned about any aspect of your mental health, including anxiety, stress, or depression, or for help with relationships or other life concerns. SCC offers crisis services as well as individual, couple, and group counselling. *Student Counselling Centre:* <http://umanitoba.ca/student/counselling/index.html>

474 University Centre or S207 Medical Services

(204) 474-8592

### **Student Support Case Management**

Contact the Student Support Case Management team if you are concerned about yourself or another student and don't know where to turn. SSCM helps connect students with on and off campus resources, provides safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.

*Student Support Intake Assistant* <http://umanitoba.ca/student/case-manager/index.html>

520 University Centre

(204) 474-7423

### **University Health Service**

Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation.

*University Health Service* <http://umanitoba.ca/student/health/>

104 University Centre, Fort Garry Campus

(204) 474-8411 (Business hours or after hours/urgent calls)

## Health and Wellness

Contact our Health and Wellness Educator if you are interested in [peer support from \*Healthy U\*](#) or information on a broad range of health topics, including physical and mental health concerns, alcohol and substance use harms, and sexual assault.

Health and Wellness Educator <https://umanitoba.ca/student/health-wellness/welcome-about.html>

[britt.harvey@umanitoba.ca](mailto:britt.harvey@umanitoba.ca) 469 University Centre (204) 295-9032

## Live Well @ UofM

For comprehensive information about the full range of health and wellness resources available on campus, visit the Live Well @ UofM site:

<http://umanitoba.ca/student/livewell/index.html>

## Your rights and responsibilities

As a student of the University of Manitoba you have rights and responsibilities. It is important for you to know what you can expect from the University as a student and to understand what the University expects from you. Become familiar with the policies and procedures of the University and the regulations that are specific to your faculty, college or school.

The [Academic Calendar](http://umanitoba.ca/student/records/academiccalendar.html) <http://umanitoba.ca/student/records/academiccalendar.html> is one important source of information. View the sections *University Policies and Procedures* and *General Academic Regulations*.

While all of the information contained in these two sections is important, the following information is highlighted.

- If you have questions about your grades, talk to your instructor. There is a process for term work and final **grade appeals**. Note that you have the right to access your final examination scripts. See the Registrar's Office website for more information including appeal deadline dates and the appeal form <http://umanitoba.ca/registrar/>
- You are expected to view the General Academic Regulation section within the Academic Calendar and specifically read the **Academic Integrity** regulation. Consult the course syllabus or ask your instructor for additional information about demonstrating academic integrity in your academic work. Visit the Academic Integrity Site for tools and support <http://umanitoba.ca/academicintegrity/> View the **Student Academic Misconduct** procedure for more information.
- The University is committed to a respectful work and learning environment. You have the right to be treated with respect and you are expected conduct yourself in an appropriate respectful manner.

Policies governing behavior include the:

### **Respectful Work and Learning Environment**

[http://umanitoba.ca/admin/governance/governing\\_documents/community/230.html](http://umanitoba.ca/admin/governance/governing_documents/community/230.html)

### **Student Discipline**

[http://umanitoba.ca/admin/governance/governing\\_documents/students/student\\_discipline.html](http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html) and,

### **Violent or Threatening Behaviour**

[http://umanitoba.ca/admin/governance/governing\\_documents/community/669.html](http://umanitoba.ca/admin/governance/governing_documents/community/669.html)

- If you experience **Sexual Assault** or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The **Sexual Assault** policy may be found at: [http://umanitoba.ca/admin/governance/governing\\_documents/community/230.html](http://umanitoba.ca/admin/governance/governing_documents/community/230.html) More information and resources can be found by reviewing the Sexual Assault site <http://umanitoba.ca/student/sexual-assault/>

For information about rights and responsibilities regarding **Intellectual Property** view the policy: [https://umanitoba.ca/admin/governance/governing\\_documents/community/235.html](https://umanitoba.ca/admin/governance/governing_documents/community/235.html)

For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site <http://umanitoba.ca/faculties/>

Contact an **Academic Advisor** within our faculty/college or school for questions about your academic program and regulations <http://umanitoba.ca/academic-advisors/>

### **Student Advocacy**

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns.

<http://umanitoba.ca/student/advocacy/>

520 University Centre

204 474 7423

[student\\_advocacy@umanitoba.ca](mailto:student_advocacy@umanitoba.ca)