MANAGED GRAZING INNOVATION CENTER

CATALOG

2020
2021

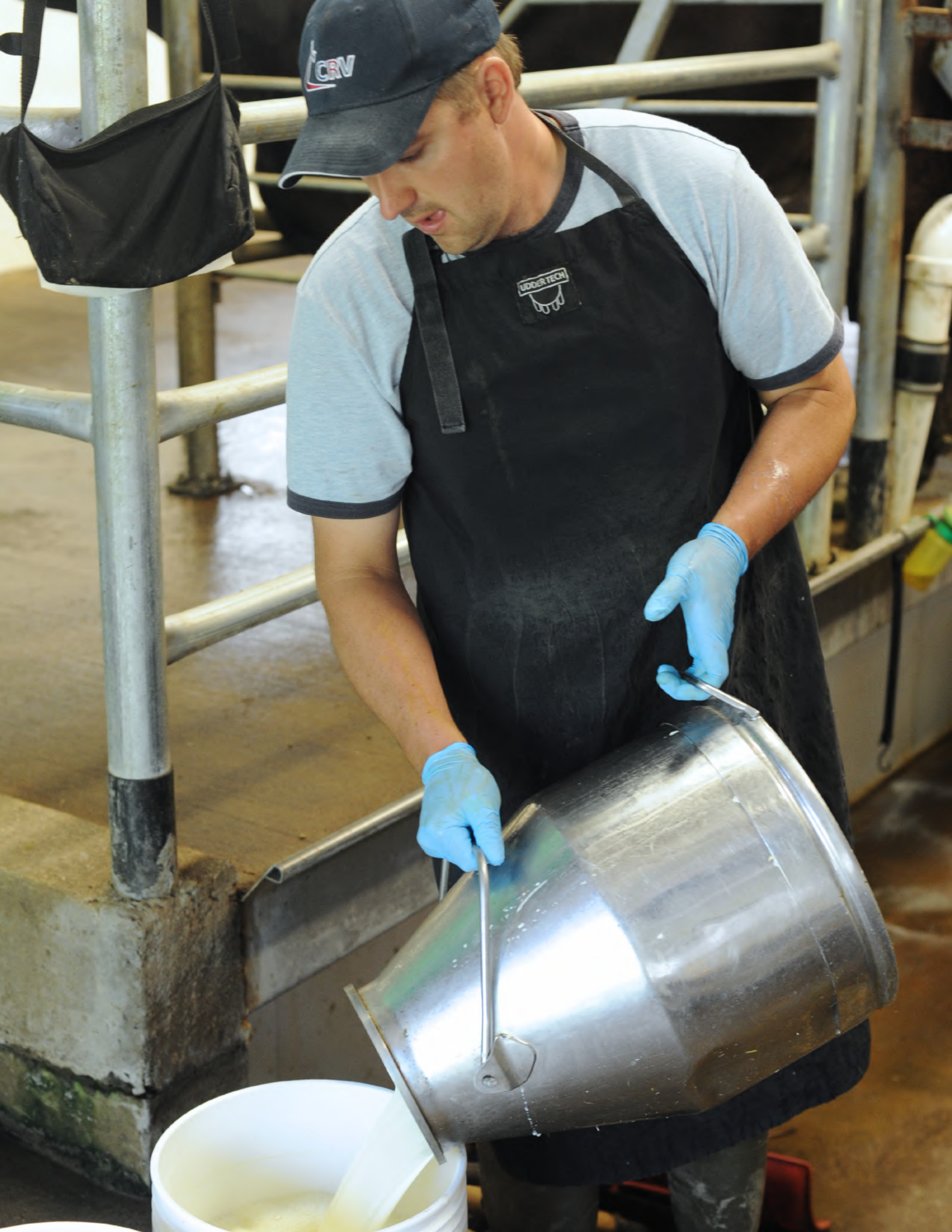
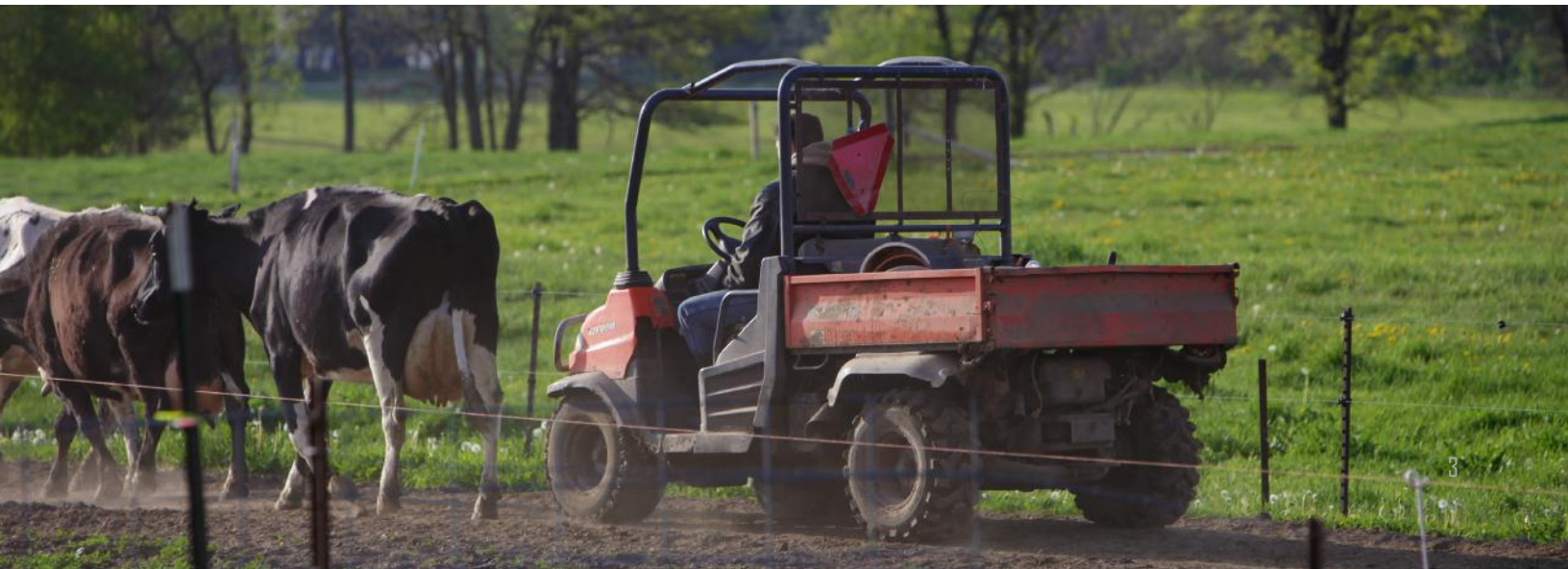

CRV
UDDERTECH

Table of Contents



General Information

The mission of the Managed Grazing Innovation Center is to provide high quality education on managed grazing production systems, farm business management, and conservation stewardship in an online format.

The Managed Grazing Innovation Center is administered by Dairy Grazing Apprenticeship (DGA). DGA is a nonprofit organization incorporated in the state of Wisconsin with a National Apprenticeship in managed grazing dairy production. The Apprenticeship, registered with the United States Department of Labor-Employment and Training Administration (DOL-ETA), consists of 4,000 hours over two years: 3,700 hours of paid, full-time, work-based training under an approved Master Dairy Grazier and 300 hours of related instruction.

The Managed Grazing Innovation Center is open to everyone and does not require participation in the Apprenticeship. All courses are open to the public, intended to enhance the knowledge base of students, and designed for planning purposes as well as for practical application on working farms. Students may take individual classes and/or complete all six within five years to earn a Managed Grazing Dairy Certificate. Students who are enrolled in the Apprenticeship are required to complete the certificate program as part of the related instruction.

Instruction is not provided on Thanksgiving Thursday or the following Friday.

Administrative Staff

Joseph Tomandl III, School Administrator
715-560-0389 | joe@dga-national.org

Angie Sullivan, Apprenticeship Director
715-553-0364 | angie@dga-national.org

Bridget O'Meara, Website Administrator
715-410-2956 | bridget@dga-national.org

Dana Paul, Administrative Assistant
715-550-6195 | admin@dga-national.org

Matthew Keesling, Veterans Liaison
715-623-6915 | matthew@dga-national.org

Faculty

Jamie Washburn, School Director and Instructor
618-559-8300 | jamie@dga-national.org

Washburn holds a Master's degree in Ruminant Nutrition and a Bachelor's in Animal Science, both from Southern Illinois University Carbondale. She has a broad background in livestock nutrition and production, research, and education. Prior to her current position, she was worked as a nutrition consultant and University of Illinois Extension.

Section II

Admissions and Entrance Requirements

The Managed Grazing Innovation Center welcomes current and aspiring dairy farmers, agricultural educators, resource managers, land owners, and all individuals who are interested in gaining practical science-based knowledge of **managed grazing dairy production** and **grazing dairy farm management**. Managed grazing is a sustainable farming method in which the majority of farm acres are in perennial forages and livestock are rotated through paddocks of high quality grasses and legumes that are allowed to rest and regrow. This farming method, which uses natural processes to improve efficiency, restores and protects natural resources, improves animal health, reduces costs, and improves farm profitability.

The center offers a slate of six, one-credit (36-hour) online courses on managed grazing dairy production and farm management and awards a **Managed Grazing Dairy Certificate** to students who successfully complete requirements for all six classes. All courses are offered once each year and are not sequenced. They can be taken in any order and must be completed within five years of start date for certificate program.

- **Dairy Cattle Health and Wellness**
- **Milk Quality**
- **Dairy Cattle Nutrition, Feeds and Feeding**
- **Soil and Water Resources Management**
- **Farm Business Management**
- **Managed Grazing Systems for Dairy Cattle**

MGIC is open to all individuals who are interested in managed grazing dairy production and have access to the Internet. No prior experience or education is required. Classes are currently taught only in English using an open-source Learning Management System (LMS) called Moodle and registration is available through the DGA website at *dga-national.org/MGIC*

Students must register **at least one week in advance of the beginning of the term**. Once a student has registered and tuition payment has been received, the individual will be enrolled in requested class or classes, will receive confirmation via email as well as notification of next steps, and will gain access to the Orientation class.

The Orientation is a two hour self-guided class that is not graded on a percent scale but is marked Complete once all tasks are completed. The first hour of Orientation, which is required for all MGIC students, provides guidance on using the Moodle LMS and lays out general expectations of students and instructors in an online learning community. The second hour, which provides information on Dairy Grazing Apprenticeship, is required for Apprentices and is optional for all non-Apprentice students.

First-time students must complete the required portion of the Orientation before they are officially enrolled in one or more MGIC courses. The Orientation will be available for review by all students at any time during the term(s) of their enrollment.

Academic Calendar

Fall Term	**September 28 to December 18, 2020**
September 18	Last day to submit transcripts for advanced standing for Fall Term
September 25	Last day to enroll in Fall Term
September 28	**Classes begin**
October 1	Last day to cancel for full tuition refund
November 26 and 27	**No class** *(no class on Thanksgiving or the following Friday)*
December 18	End of Fall Term

Spring Term	**January 11 to April 2, 2021**
December 31	Last day to submit transcripts for advanced standing for Spring Term
January 8	Last day to enroll in Spring Term
January 11	**Classes begin**
January 14	Last day to cancel for full tuition refund
April 2	End of Spring Term

Summer Session *(six-week condensed courses)*	**July 15 to August 20, 2021**
July 2	Last day to submit transcripts for advanced standing for Summer Session
July 9	Last day to enroll in Summer Session
July 12	**Classes begin**
July 15	Last day to cancel for full tuition refund
August 20	End of Summer Session

Advanced Standing

The Managed Grazing Innovation Center is designed to address the inadequacies of traditional dairy education related to grazing based production systems. Most secondary and post-secondary dairy education curriculum is designed for grain-based confinement feeding systems. While the classes at MGIC, taken individually, as part of certificate program and/or as requirement for Apprenticeship, are intended to enhance the understanding of managed grazing dairy for all students, MGIC does recognize and give credit for prior education.

MGIC offers the opportunity for advanced standing to students who have successfully completed a comparable course at another educational institution with a grade of C or above. Students seeking advanced standing must contact MGIC to apply for advanced standing and submit transcripts from previous institution(s) for relevant courses by deadline indicated in academic calendar. Requests will be reviewed and evaluated by the Apprenticeship Training Committee. Results will be communicated to student via email prior to the enrollment deadline for the upcoming term.

Credit Transfer/Equivalence

MGIC offers *one-credit* courses that focus on managed grazing systems rather than conventional confinement feeding systems and may not have direct equivalence in terms of content or credit load with traditional dairy science classes. The Apprenticeship Training Committee may request additional materials in order to assess content of previously taken courses.

MGIC does not offer a degree program. If advanced standing is approved, one credit for each content-equivalent course will be offered and additional credits in the same content area will not be transferred. Achieving advanced standing in one course has no bearing on other courses required for the Managed Grazing Dairy Certificate. All requests for advanced standing will be assessed on a case by case basis.

Apprentices in DGA must also complete the two-hour MGIC Orientation and the six required content courses for the Managed Dairy Grazing Certification in order to fulfill related instruction requirements of the Apprenticeship.

Opting Out of Advanced Standing

A student who applies for and receives advanced standing may opt to take the full course in order to gain an enhanced understanding of managed-grazing dairy systems. In such cases, students are required to enroll, pay tuition, complete all course requirements, and undergo assessments as any other student.

Student Progress

The Managed Grazing Dairy certificate program consists of six one-credit courses designed to enhance students understanding of managed grazing dairy production and farm management.

- 00–01 Dairy Cattle Health and Wellness **1 credit**
- 00–02 Milk Quality **1 credit**
- 00–03 Dairy Cattle Nutrition, Feed and Feeding **1 credit**
- 00–04 Soils and Water Management **1 credit**
- 00–05 Farm Business Management **1 credit**
- 00–06 Managed Grazing Systems for Dairy Cattle **1 credit**

All students may take one or more courses in any order and may take all six to earn the Managed Dairy Grazing Certificate. Note: Students who are Apprentices in the Dairy Grazing Apprenticeship program must complete the Orientation, Managed Grazing Dairy Certificate, guided on-farm training under an approved Master Dairy Grazier and other required related instruction components conducted outside of MGIC. Individuals who are hired for an Apprenticeship and already have a high level of knowledge and experience may seek advance standing (see MGIC Policy 1.11 on Advanced Standing).

Grading Information

Students will be asked to demonstrate competence for the skills and concepts that are necessary for successful management of a managed grazing farming operation as outlined in the Program Outcomes listed here:

1. Manage dairy cattle in a grazing system
2. Manage milking operations
3. Manage dairy cattle nutritional requirements
4. Manage pastures for optimal production
5. Manage natural resources in a grazing system
6. Manage farm business operations to meet goals

Competencies that align to the program outcomes form the framework of course-level student learning expectations. Performance assessments are based on course competencies that lead to mastery of program outcomes. (See Section XIV on Program Curriculum for further details.)

Each assignment, quiz, worksheet, participation event and project has a point value and is evaluated against the criteria established for each associated competency. The instructor provides detailed scoring guide/point values and provides information on how the score will be determined for each assessment. In addition, the instructor provides feedback on student performance as appropriate.

All six content courses are graded on the following scale:

A = 90 to 100%
B = 80 to 89%
C = 70 to 79%
D = 60 to 69%

The total points vary from course to course. All courses apply the same performance categories, which are weighted as follows:

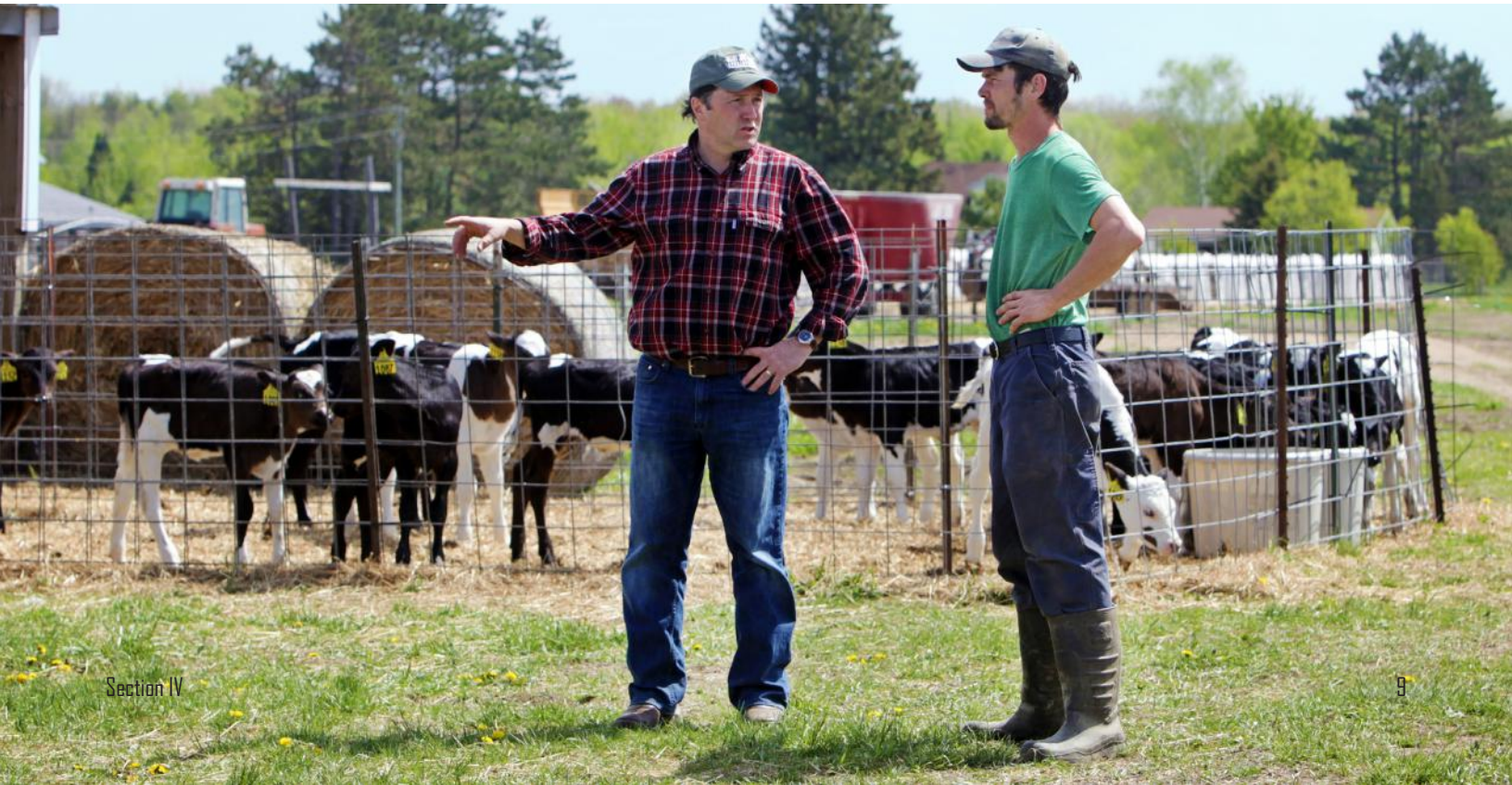
50% Formative (assignments, quizzes)
30% Summative (course project)
20% Participation

Managed Dairy Grazing Certificate

A Managed Dairy Grazing Certificate is awarded to students who complete all six courses with a passing grade (of "D" or above) and a **2.5** grade point average within five years of initial enrollment. Qualifying students receive a *Managed Dairy Grazing Certificate* via mail.

Dairy Grazing Apprenticeship after Manager Dairy Grazing Certificate

Any student who has earned a *Managed Grazing Dairy Certificate* and applies to Dairy Grazing Apprenticeship **within five years of completion** receives full credit for the six required classes and 216 related instruction hours upon official enrollment in the Apprenticeship. Before applying to DGA for the Apprenticeship, students are encouraged to take the online Orientation course, which consists of two hours of required related instruction and **must be completed before official start date** of an Apprenticeship.



Student Records

The Managed Grazing Innovation Center maintains students grade records to track progress through individual classes, through the certificate program, and for communication purposes. Records consist of the following information:

- Record Number
- First and Last Name
- Mailing Address
- Email Address
- Phone Number
- Apprentice/non-Apprentice
- Initial Enrollment Date
- Orientation Completion
- Course Enrollment
- Course Grades
- Status (enrolled, on leave, graduated, active not enrolled, inactive)
- Certificate of Completion Date

Certificates of completion will be kept permanently. Other student records will be kept for **six years from last attendance date**.

Confidentiality

Student records are kept confidential. Grades are posted online for private student access at intervals detailed in the syllabus for each individual class. Students may inquire about progress in a given class by contacting the class Instructor directly or MGIC administration at *admin@dga-national.org*. FERPA rights begin after a student has enrolled in a class.

Privacy of Student Educational Records Policy

The Family Educational Rights and Privacy Act of 1974 (FERPA) as amended, is a federal law (20 U.S.C. 1232g) that protects the privacy of a student's educational record. FERPA applies to all educational institutions receiving funds from the United States Department of Education. Managed Grazing Innovation Center makes every effort to comply with FERPA.

The U.S. Department of Education summarizes the rights afforded to students by FERPA as follows:

- The right to review their educational records
- The right to request amendment to records they believe to be inaccurate,
- The right to limit disclosure of some personally identifiable information known as directory information
- The right to file a complaint with the Family Policy Compliance Office in Washington, D.C. if they feel their FERPA rights have been violated

Section VI

Academic Probation, Dismissal and Readmittance

The Managed Grazing Innovation Center does not place students on academic probation or dismiss students for poor performance. A student whose grade drops below 60% or who has not submitted and assignment or attended a weekly meeting for more than two weeks, the instructor will intervene by attempting to contact the student directly. Student needs/situation will be addressed on a case by case basis and will result in one of the following outcomes:

- Student continues in class and makes up work by a date agreed upon by student and instructor
- Student requests a formal Extension if work completion date extends beyond term
- Student requests formal Leave of Absence
- Student effectively withdraws from class

(Please see also Section XIII Cancellation and Refunds.)

Readmittance

Any student who cancels enrollment before the term begins or withdraws from a course or who does not achieve a passing grade may take the class the next time it is offered, within the five year window for the certificate or at any time if a certificate is not sought. Regular tuition rates apply for each course registration.

Apprentices in Dairy Grazing Apprenticeship

The *Managed Grazing Dairy Certificate* is part of required related instruction for Dairy Grazing Apprenticeship. An individual Apprenticeship does not officially begin until an Apprentice is hired by a Master, and enrollment in DGA is ongoing. Classes are offered once each year and may be taken in any order. Apprentices follow individualized learning plans that typically include progress through certificate program within two years. MGIC, however, does not monitor Apprentice progress through the Apprenticeship directly. Like other students, any Apprentice who completes all six courses within five years of initial enrollment with a grade of D or above and an overall 2.5 grade point average will be awarded a *Managed Grazing Dairy Certificate*.

Non-Apprentice Students

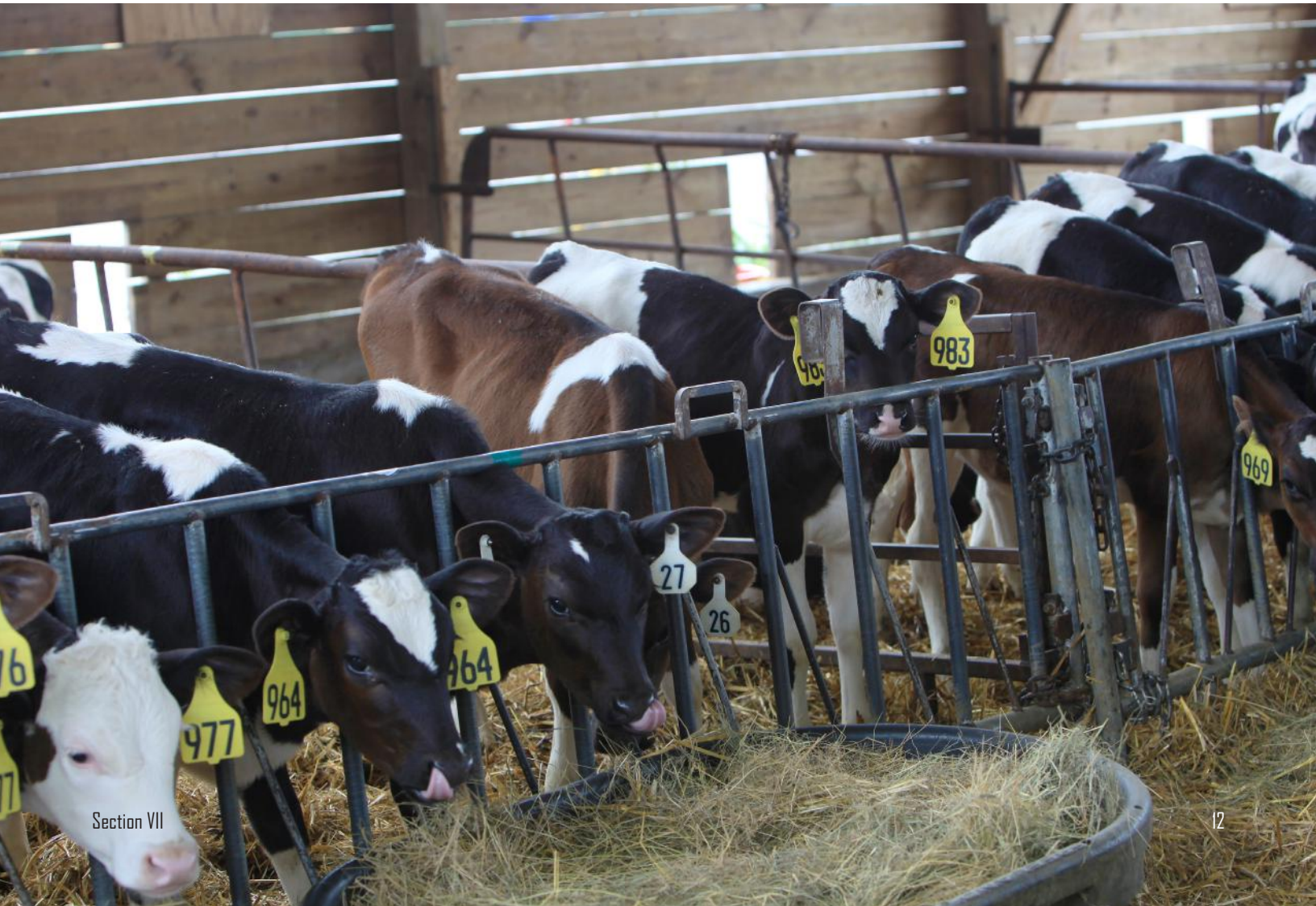
An individual who is not an Apprentice in Dairy Grazing Apprenticeship may enroll in any class or classes at the Managed Grazing Innovation Center with or without the intention of completing a Managed Grazing Dairy Certificate. The **certificate is awarded** to students who complete all six courses within five years of initial enrollment with a grade of D or above and an overall 2.5 grade point average.

Student Conduct

Managed Grazing Innovation Center is an inclusive online learning community that welcomes all students regardless of race, color, religion, national origin, sex, or sexual orientation. In all class forums, discussion groups, and personal communications, students are expected to address one another, the Instructor, and guest speakers with courtesy and respect.

Individuals will bring different experiences, values, and perspectives to discussions that may lead to conflicting views on some course material or related topics. A respectful disagreement can be a vital part of the learning process.

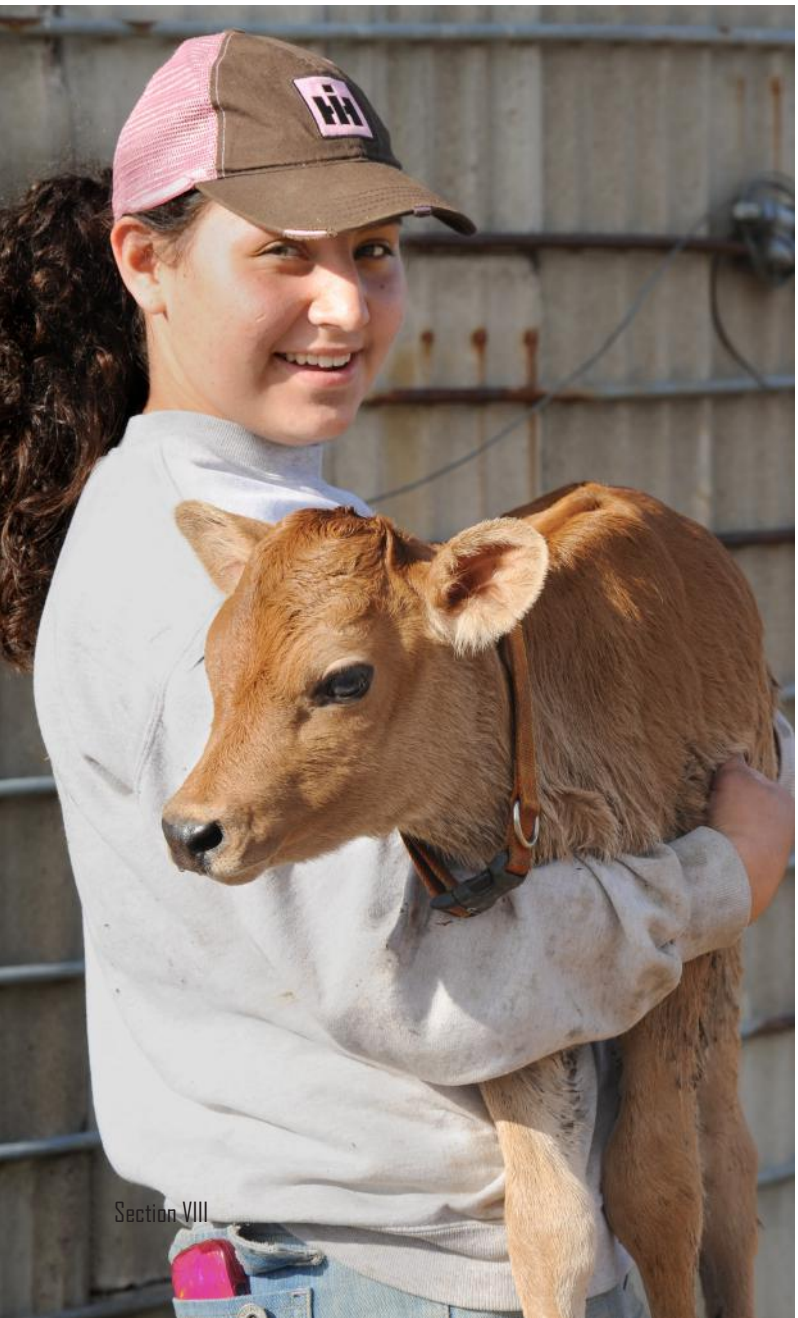
The school will not tolerate language or conduct that is deemed abusive or inciting of violence. Instances of misconduct will be assessed and addressed on a case by case basis by faculty and administrators and may be grounds for dismissal. Students may challenge dismissal by filing a complaint by filing a complaint (see Section XI on Student Complaints).

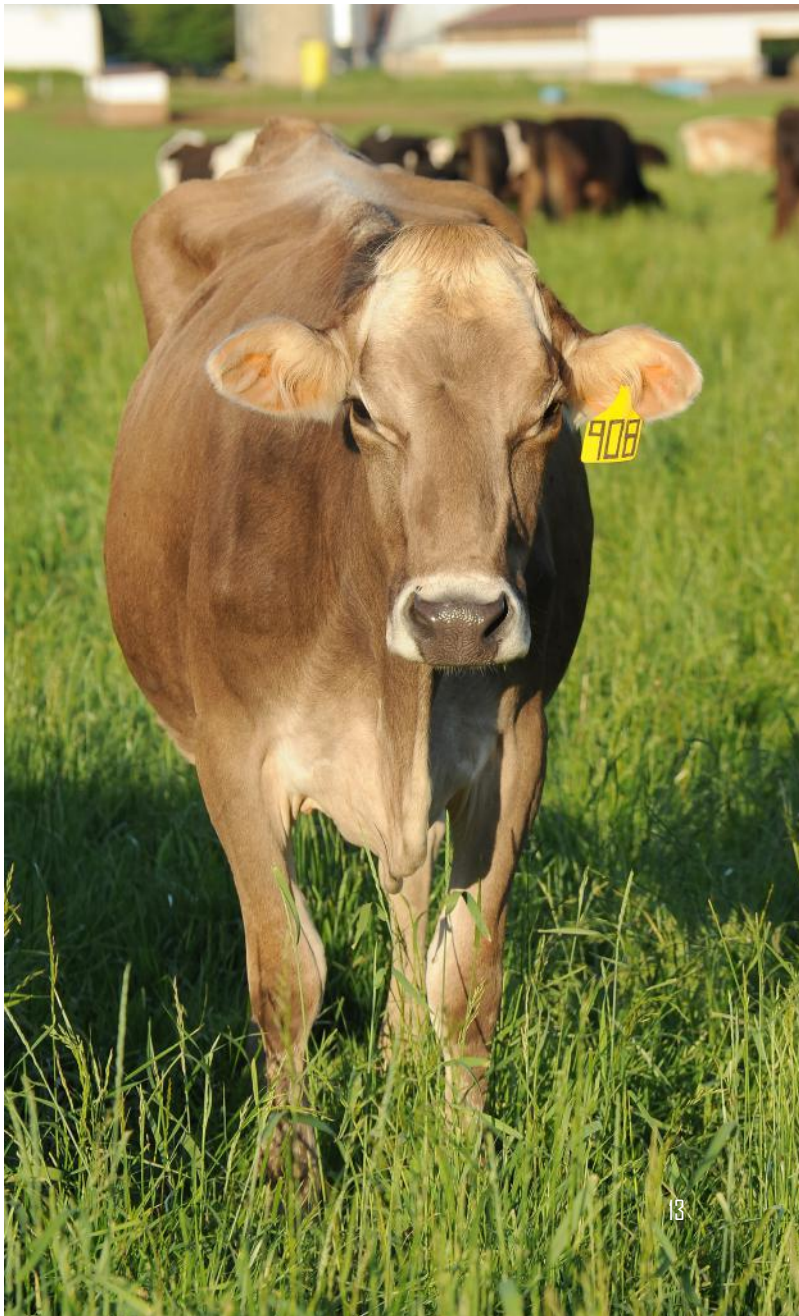


Leave of Absence

In some cases, a student enrolled in Managed Grazing Innovation Center may be unable to complete the requirements of a class or classes by the end of the term because of extenuating circumstances. A leave of absence may be requested in such cases and granted at the discretion of the instructor with administrative approval. The student has the option to re-enroll in a class or classes within two years of initial enrollment without having to go through registration process and pay tuition a second time.

A Leave of Absence form must be filled out by student and instructor and approved by MGIC administration. The student record will indicate that the individual is on leave.



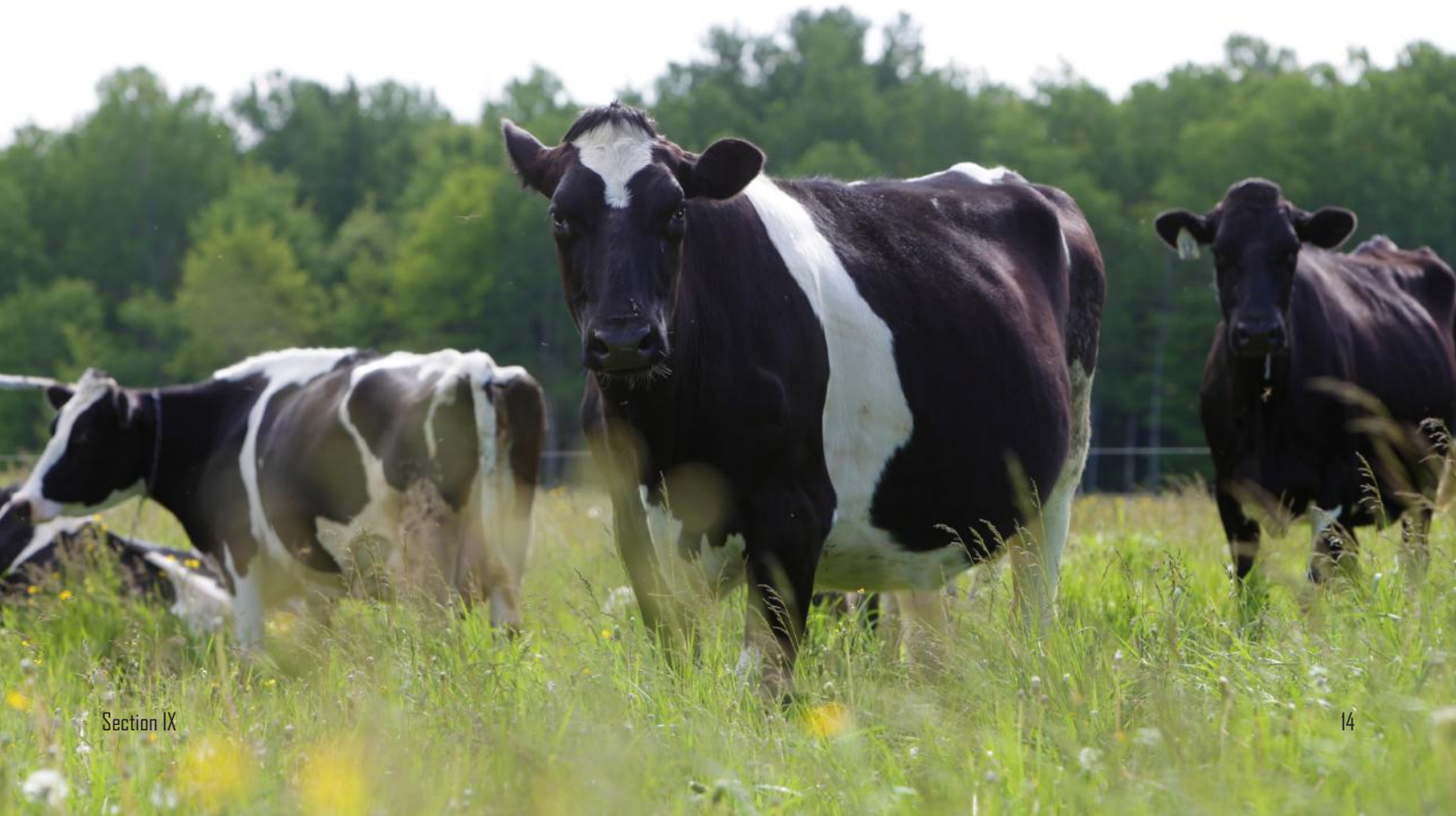


Attendance

All classes at Managed Grazing Innovation Center are taught online, based on a 12-week fall/ spring semester schedule and 6-week condensed summer session. Classes contain both asynchronous and synchronous elements. Asynchronous assignments have set due dates on the course syllabus but provide students (whether working independently or in a group) with flexibility and autonomy. Periodic synchronous activities (such as a live video demonstration/ group discussions) help to build a learning community by allowing real-time conversation and questions and, in general, require attendance.

MGIC recognizes that students may encounter circumstances beyond their control (i.e. illness, death in the family, etc.) and thus requires instructors to work with students on a case by case basis.

The authority to excuse a student's class absence from a required synchronous activity and/ or to grant a student an academic accommodation (turn in a late assignment, provide extra time on an assignment, reschedule an exam, etc.) sits with the instructor. Students are encouraged to work directly with the instructor regarding their absence(s).

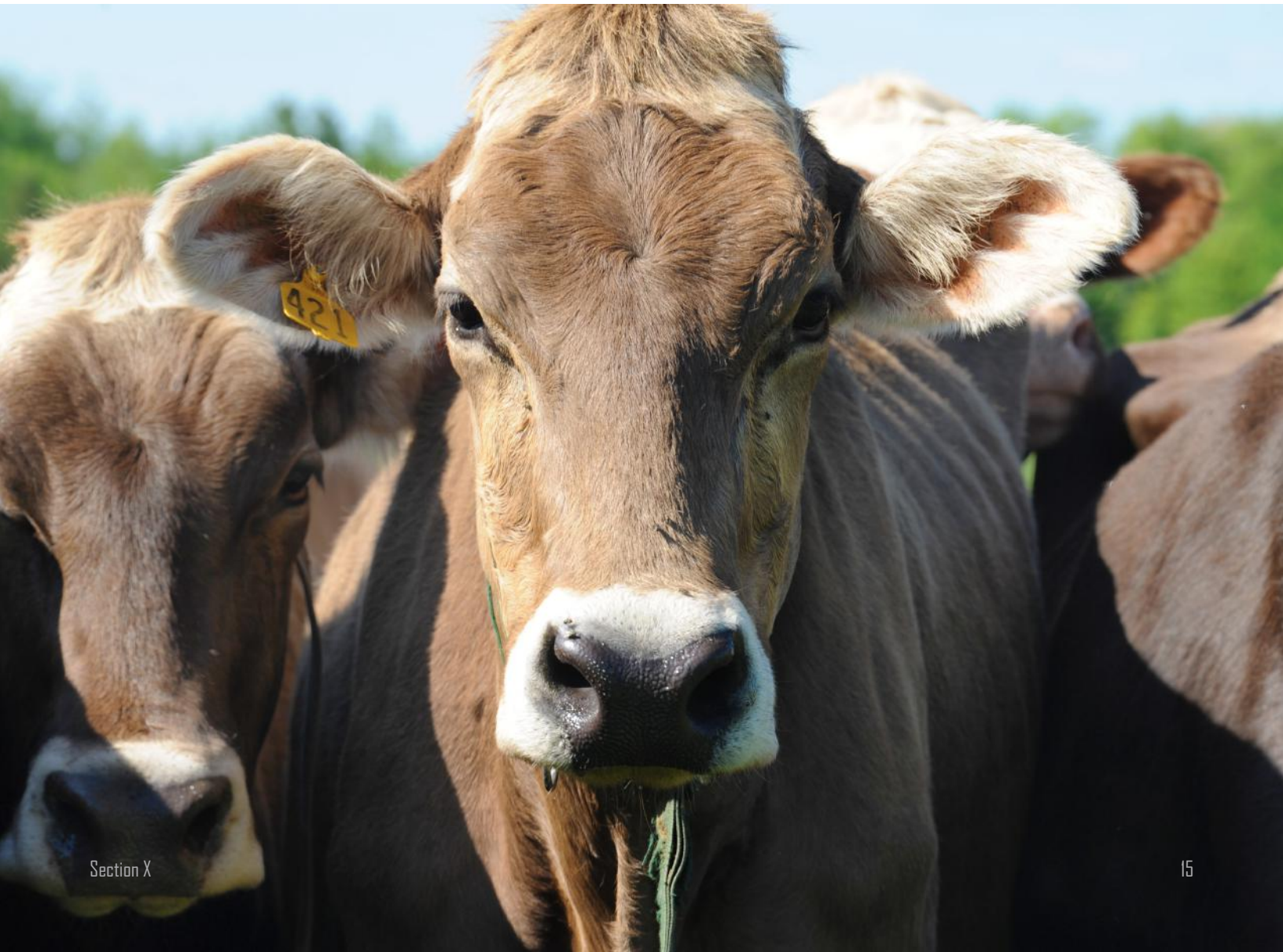


Tardiness

Students at Managed Grazing Innovation Center are expected to complete individual assignments according to the course schedule and/or syllabus, arrive on time to online meetings, and complete any task associated with the meetings on time according to the instructor's requirements.

MGIC recognizes that students may encounter circumstances beyond their control (i.e. illness, death in the family, etc.) and thus requires instructors to work with students on a case by case basis.

The authority to give credit for late arrival to online meeting, accept a late assignment, provide extra time on an assignment and/or reschedule an exam as well as to set any penalty (reduced point value, make-up assignment, etc.) for tardiness lies with the instructor. Students are encouraged to work directly with the instructor regarding circumstances and need for additional time to complete assignments.



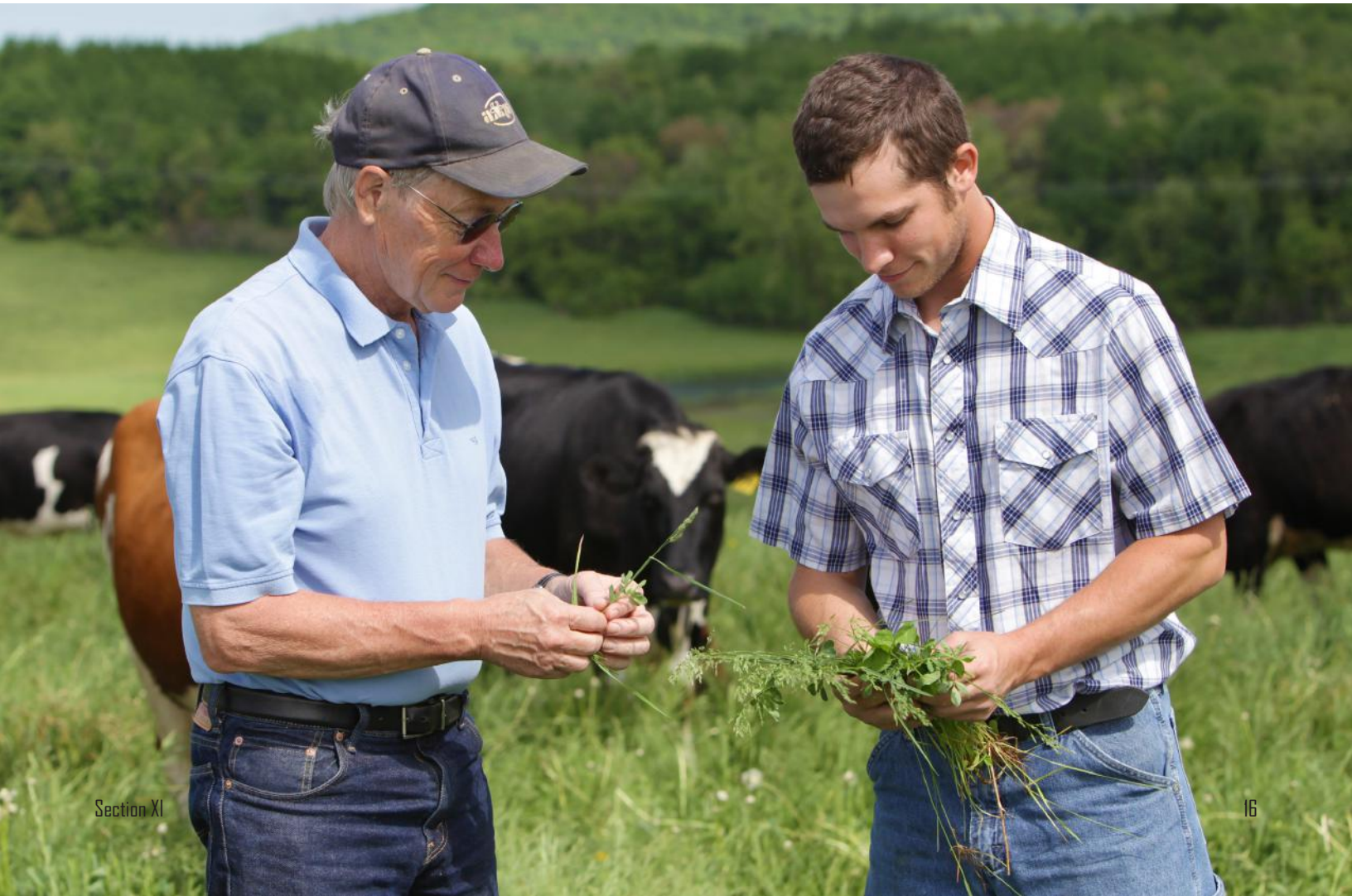
ADA and ESL Accommodations

ADA Statement

If a student has a disability that qualifies under the American with Disabilities Act (ADAAA) and requires accommodations, he/she should contact their instructor prior to the start of the course for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact the Director of the Managed Grazing Innovation Center if they are not certain whether a medical condition/disability qualifies.

ESL Statement

To support students and participants whose primary language is not English, services are available upon request. Please contact your instructor prior to the start of the course so reasonable accommodations can be made. Translation service are available on a case by case basis and must be arranged prior to the course start date. For more information, contact the Director of the Managed Grazing Innovation Center.



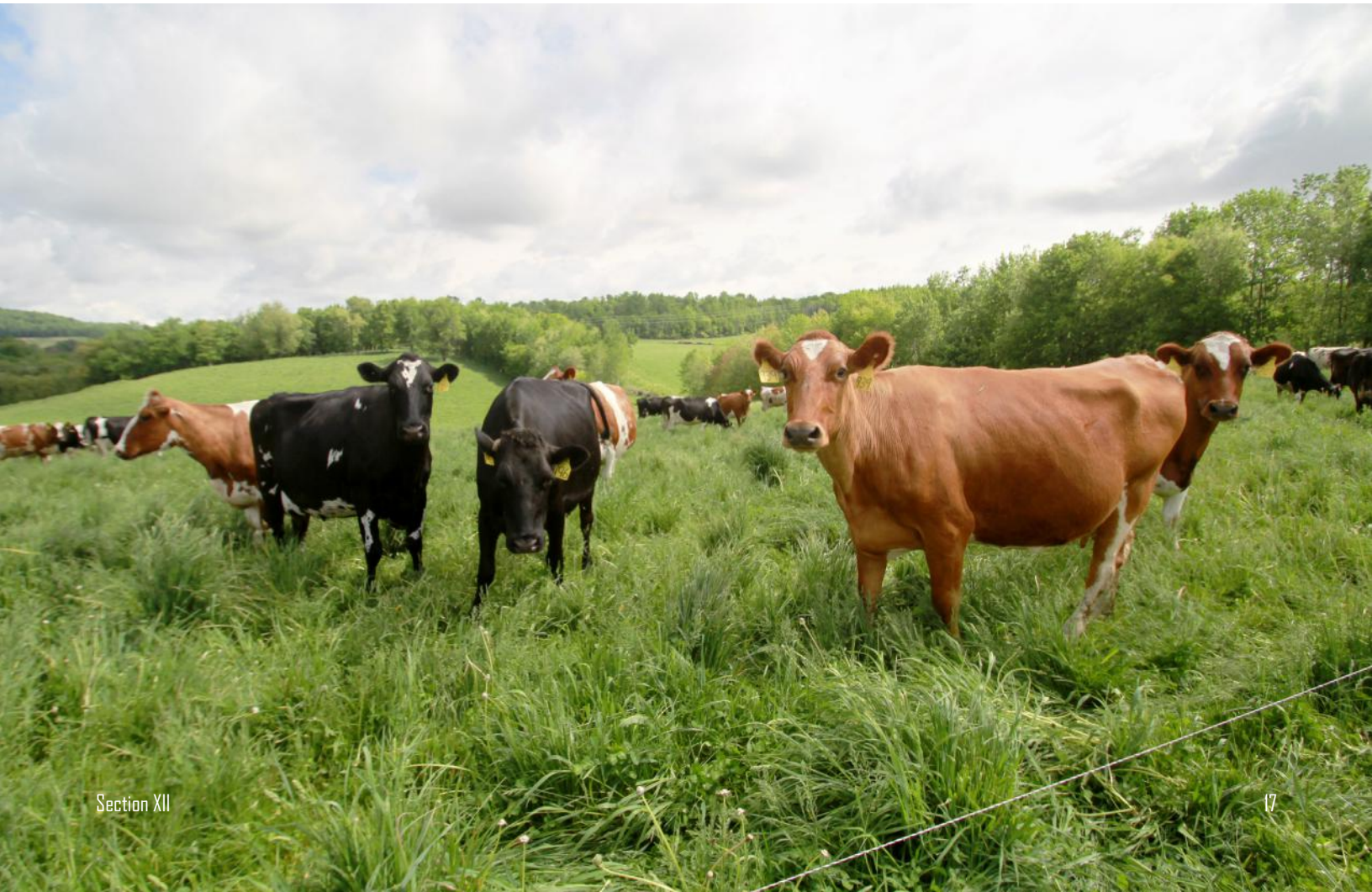
Student Complaints

Managed Grazing Innovation Center takes student complaints seriously and has a process to ensure complaints are addressed in a timely manner. Students with complaints about a particular class, assignment or grade or who have concerns about the behavior of a fellow student are encouraged to communicate directly with the Instructor or student to try to reach a resolution.

If direct communication is inappropriate or would make student uncomfortable or does not result in resolution, the student may request a Student Grievance Report to be filled out and submitted to the School Administrator via *admin@dga-national.org* for review.

School administrators assist students in finding options for resolving the issue and may seek input from all parties involved in order to address problems on a case by case basis.

The Educational Approval Program (EAP) has the authority, under EAP 4.08(2), to investigate a student complaint, negotiate a settlement, or dismiss a complaint if it is found to be inappropriate. Students may contact the EAP directly if the complaint or issue is not resolved to their satisfaction: (608) 299-1996; dspseap@wisconsin.gov



Tuition and Fees

Students at the Managed Grazing Innovation Center pay **$250 per credit** (each class is one credit/36 hours). The total cost for students to obtain a *Managed Dairy Grazing Certificate* is **$1,535**.

Students enroll and pay per course as tuition installments. Payment may be submitted online via or via regular by check and must be received before a student can be enrolled in a course. Resource materials will be available in an online format. Some additional expenses may be incurred for individual classes for printing off syllabus, resource materials or assignments. Students must also have reliable access to a computer and to the internet.

Cancellation and Refunds

A student at Managed Grazing Innovation Center receives a full refund of all money paid if the student:

1. Cancels within the three-business-day cancellation period under SPS 406.03;
2. Accepted was unqualified and the school did not secure a disclaimer under SPS 409.04;
3. Enrollment was procured as the result of any misrepresentation in the written materials used by the school or in oral representations made by or on behalf of the school.

Refunds will be made within 10 business days of cancellation.

A student who withdraws or is dismissed after attending at least one class, but before completing 60% of the instruction in the current enrollment period, is entitled to a pro rata refund as follows:

At Least	But Less Than	Refund of Tuition
1 unit/class	10%	90%
10%	20%	80%
20%	30%	70%
30%	40%	60%
40%	50%	50%
50%	60%	40%
60%	no	no refund

MGIC will retain the one-time application fee of $35. MGIC will make every effort to refund prepaid amounts for supplies and other charges. A student will receive the refund within 40 days of termination date. If a student withdraws after completing 60% of the instruction, and withdrawal is due to mitigating circumstances beyond the student's control, the school may refund a pro rata amount.

A written notice of withdrawal is not required.

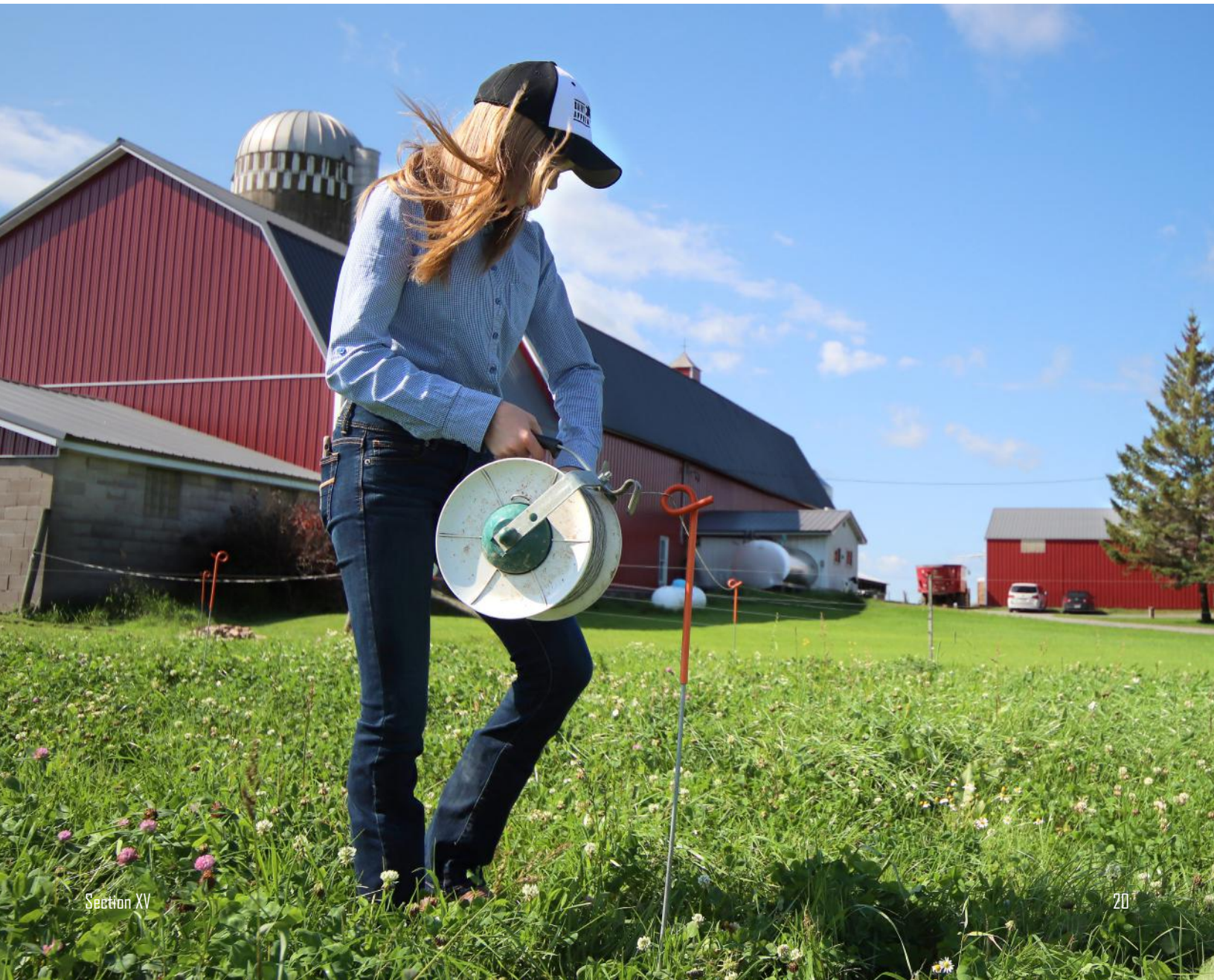
Constructive Notice of Withdrawal Policy

Students are encouraged to withdraw from a class or classes with MGIC by notifying the instructor via email and copying school administration at *admin@dga-national.org* but any mode of withdrawal will be recognized. *Unless prior arrangements have been made with the Instructor for a leave of absence, students will be administratively withdrawn after missing three of consecutive online meeting sessions.*

Program Curriculum

Students at the Managed Grazing Innovation Center pay **$250 per credit** (each class is one credit/36 hours). The total cost for students to obtain a *Managed Dairy Grazing Certificate* is **$1,535**.

Students enroll and pay per course as tuition installments. Payment may be submitted online via or via regular by check and must be received before a student can be enrolled in a course. Resource materials will be available in an online format. Some additional expenses may be incurred for individual classes for printing off syllabus, resource materials or assignments. Students must also have reliable access to a computer and to the internet.



Dairy Cattle Health and Wellness

Course Outcome Summary

Course Information

Description Students develop an understanding of the life cycle health and wellness needs for grazing dairy cattle. Students develop skills in animal health procedures and techniques needed for the dairy farm and then create a whole herd health plan. Additionally, students gain a critical understanding and recognition of disease concerns and prevention at each point in the life cycle of milking cows, replacements and breeding bulls.

Instructional Level Certificate

Total Credits 1.00

Total Hours 36.00

Program Outcomes

1. Manage milking operations
2. Manage dairy cattle nutritional requirements
3. Manage farm business operations to meet goals

Course Competencies

1. **Identify diseases throughout dairy cattle life stages**

Linked Program Outcomes

Manage dairy cattle in a grazing system
Manage dairy cattle nutritional requirements

Criteria

Your performance will be successful when:

1.1. Identify major diseases that affect grazing dairy animals at different ages of the life cycle
1.2. List the vaccines that are commonly given to dairy animals at various ages in the life cycle
1.3. Identify two categories for mastitis organisms and specific causative bacteria within each group
1.4. Explain the common health issues affecting dairy cows in the first 100 days of lactation

2. Identify strategies for transitional cow health

Linked Program Outcomes

Manage dairy cattle in a grazing system
Manage milking operations
Manage dairy cattle nutritional requirements

Criteria

Your performance will be successful when:

2.1. Describe a transition dairy cow
2.2. Identify the major health concerns for the transition dairy cow
2.3. Identify illness prevention strategies for the transition dairy cow
2.4. Identify treatments for the major health issues affecting the transitional dairy cow

3. Apply dairy herd management principles

Linked Program Outcomes

Manage dairy cattle in a grazing system
Manage farm business operations to meet goals

Criteria

Your performance will be successful when:

3.1. Compare differences between non-organic and organic health care for dairy cattle
3.2. Explain treatment options for calf disease in an organic dairy system
3.3. Describe common organic treatment options in the lactating cow for mastitis infection
3.4. Explain common organic treatment options for the treatment of metritis
3.5. Describe common organic treatment options for the treatment parasites in organic cattle
3.6. Describe a fly control plan for an organic dairy herd
3.7. Describe how to manage lameness issues in a dairy grazing herd
3.8. Describe how a cow time budget helps affects health and production
3.9. Explain the 5 Cs of calf management
3.10. Describe signs to look for indicating sickness in an animal
3.11. Compare the advantages/disadvantages of using artificial insemination vs. a bull for breeding in a dairy herd
3.12. Explain a lameness scoring system for dairy cattle
3.13. List critical herd health and numbers on a DHI report
3.14. Describe two methods of euthanizing an animal
3.15. Identify common parasite issues with replacement heifers
3.16. Identify common prevention and treatment strategies for parasite issues in replacement heifers
3.17. Explain the health impacts of feeding molding or rotten feed

4. Describe health management strategies for calves

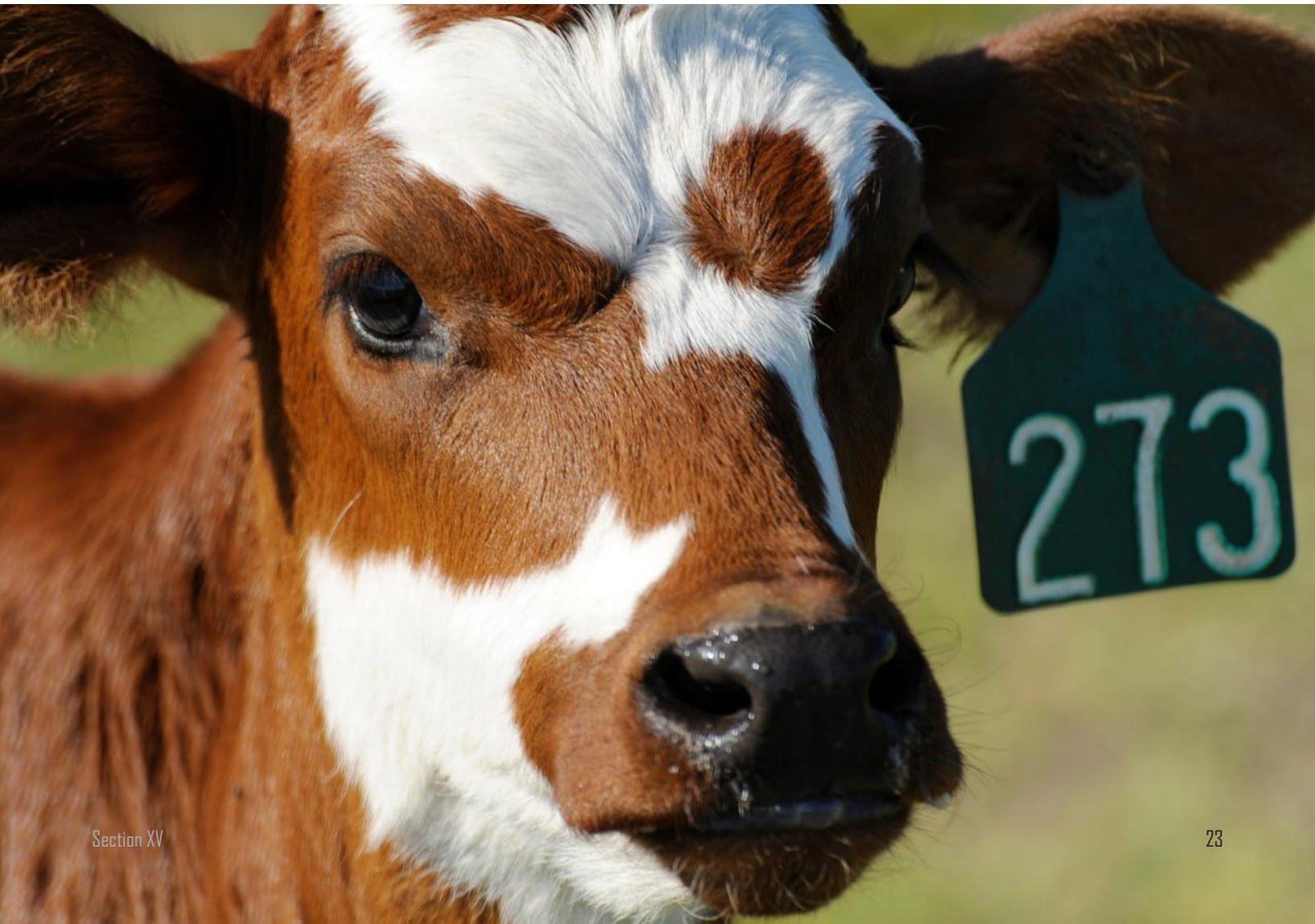
Linked Program Outcomes

Manage dairy cattle in a grazing system
Manage dairy cattle nutritional requirements

Criteria

Your performance will be successful when:

4.1. Identify common causes for calf diarrhea (scours)
4.2. Explain common prevention and treatment strategies for calf diarrhea
4.3. Identify common causes for calf pneumonia
4.4. Explain common prevention and treatment strategies for calf pneumonia
4.5. Describe signs of calf illnesses
4.6. Outlines steps for calving management to prevent disease
4.7. Outline steps for colostrum management for the new born calf



Milk Quality

Course Outcome Summary

Course Information

Description	This course provides students with an understanding of producing quality milk. Students will be introduced to parts of a milking system and components, milking procedures, udder anatomy, mastitis and somatic cell count.
Instructional Level	Certificate
Total Credits	1.00
Total Hours	36.00

Program Outcomes

1. Manage milking operations
2. Manage farm business operations to meet goals

Course Competencies

1. Explain the milking process

Linked Program Outcomes
Manage milking operations
Manage farm business operations to meet goals

Criteria
Your performance will be successful when:

1.1. Explain the goal of milking.
1.2. Describe a complete milking routine needed to obtain high quality milk
1.3. Differentiate between efficiency vs. speed in the milking process
1.4. Explain the importance of obtaining milk as quickly and cleanly as possible
1.5. Define prep lag time
1.6. Determine when peak milk flow occurs
1.7. Describe the benefits of attaching the milking unit during peak milk flow time
1.8. Explain the length of time recommended for prep lag time
1.9. Describe the goals for milking herd SCC levels
1.10. Explain the importance of SCC levels to the milk check and the creamery
1.11. Explain the importance of refrigerating milk

2. Analyze udder anatomy and milk secretion

Linked Program Outcomes

Manage milking operations

Criteria

Your performance will be successful when:

2.1. Observe variations in udder hair and removal techniques
2.2. Identify best practices regarding extra teats
2.3. Explain how to identify and treat common udder injuries
2.4. Explain the effects of common teat and udder abnormalities
2.5. Observe udder anatomy through cadaver udder dissection
2.6. Explain dairy cow milk secretion

3. Analyze the specific components of high quality milk

Linked Program Outcomes

Manage milking operations
Manage dairy cattle nutritional requirements

Criteria

Your performance will be successful when:

3.1. Describe the visual appearance of high quality milk.
3.2. Explain the importance of standard plate counts
3.3. Describe how the SCC (somatic cell count) affects milk quality
3.4. Describe how the bacteria count affects milk quality
3.5. Analyze causes for high somatic cell counts, plate counts, and bacteria counts in milk
3.6. Explain the importance of monitoring SCC for animal health

4. Examine the properties of oxytocin and the role it plays in milk production

Linked Program Outcomes

Manage milking operations
Manage dairy cattle nutritional requirements
Manage farm business operations to meet goals

Criteria

Your performance will be successful when:

4.1. Define “milk let-down”
4.2. Define oxytocin
4.3. Explain where oxytocin is released from and where it travels
4.4. Describe what causes oxytocin to be released
4.5. Describe the effects of oxytocin on the udder and the milk
4.6. Explain how a calm, quiet environment can improve milk quality
4.7. Explain how stress interferes with oxytocin

5. Analyze mastitis in dairy cattle

Criteria

Your performance will be successful when:

5.1. Define mastitis
5.2. Describe how mastitis is manifested in cows
5.3. Describe how the quality of milk is affected by mastitis
5.4. Explain the milking machine role in mastitis
5.5. Analyze the difference between subclinical vs. clinical mastitis
5.6. Describe how to perform fore-stripping on a cow
5.7. Explain how fore-stripping can help detect mastitis
5.8. Describe the properties of the first milk that is expressed
5.9. Describe how fore-stripping improves the quality of the milk
5.10. Explain how to obtain milk for a CMT test
5.11. Explain how to perform the CMT test
5.12. Define a negative, trace, 1,2, or 3 test results
5.13. Identify signs of toxic mastitis
5.14. Describe how somatic cells and the reagent make the CMT work

6. Summarize best lactation management practices for all lactation periods

Criteria

Your performance will be successful when:

6.1. Identify udder prep BMP during lactation
6.2. Analyze milking BMP during late lactation (last 2–3 months of milking)
6.3. Identify various methods used to dry off dairy cattle
6.4. Explore BMP in inspecting udder health during dry period
6.5. Explain how calving can affect milk quality
6.6. Identify causes of mastitis during the calving period (2 weeks prior and after calving)
6.7. Define how pre-dipping and thoroughly drying lowers the risk of mastitis and infection
6.8. Correlate the relationship with clean teat ends to mastitis and milk quality
6.9. Explain the reason for reducing hair on the udder
6.10. Explain the benefit of regularly cleaning alleys
6.11. Describe the benefit of properly caring for stall beds
6.12. Identify environmental factors that can affect milk quality
6.13. List benefits of sand bedding for stalls
6.14. Describe how pasture management affects mastitis infection rates

Dairy Cattle Nutrition, Feeds and Feeding

Course Outcome Summary

Course Information

Description	Students will develop an understanding of the life cycle feeding and nutrition needs for grazing dairy cattle. Students will acquire an understanding of nutrition requirements and providing optimal diets at each point in the life cycle of milking cows, replacements and breeding bulls. Developing the whole herd feed and forage needs and plan will be taught.
Instructional Level	Certificate
Total Credits	1.00
Total Hours	36.00

Program Outcomes

1. Manage dairy cattle in a grazing system
2. Manage dairy cattle nutritional requirements
3. Manage natural resources in a grazing system
4. Manage farm business operations to meet goals

Course Competencies

1. **Explain the nutrient requirements of dairy cattle**

Linked Program Outcomes

Manage dairy cattle in a grazing system
Manage dairy cattle nutritional requirements

Criteria

Performance will meet expectations when:

1.1. Understand nutrient requirements of grazing dairy animals for water, forage, energy, protein and minerals
1.2. Describe how nutrient requirements differ in dairy animals at different ages in their life cycle
1.3. Describe ruminant digestive anatomy, how a rumen develops and its basic function
1.4. Explain water needs for dairy animals of different ages and what factors affect water intake requirements
1.5. Explain which minerals are required for dairy animals
1.6. Identify the difference between a macro and a micro mineral
1.7. Describe the difference between crude protein and amino acids

1.8. Explain what microbial protein is
1.9. Describe what forage fiber is
1.10. Describe how to determine requirements of dairy animals in a grazing dairy herd
1.11. Describe how to determine dry matter intake in dairy animals
1.12. List the key requirements that need to be met for a dairy cow ration
1.13. List major metabolic diseases of dairy cattle and potential causes

2. Analyze the elements of cattle feeds and feeding

Linked Program Outcomes

Manage dairy cattle in a grazing system
Manage dairy cattle nutritional requirements
Manage farm business operations to meet goals

Criteria

Performance will meet expectations when:

2.1. Identify common feeds for grazing dairy animals
2.2. Determine dry matter content and moisture content of a feed
2.3. Describe how forage quality affects feed intake
2.4. Determine how much forage is needed to feed a herd for a year
2.5. Estimate the purchased feed cost for needed feed or forage for the year
2.6. Determine the feeding system needed for a given farm
2.7. Determine the dry matter content of silage
2.8. Describe how to make moisture adjustments to silage
2.9. Outline a plan for feeding dry cows and bulls
2.10. Describe how to determine how much grain is needed for a herd for a year
2.11. Identify calf feeding methods, needs and requirements
2.12. Explain critical temperature for calve well being and how this affects feeding
2.13. Outline a plan to feed calves up to six months of age
2.14. Outline the steps for feeding replacement heifers greater than six months of age

3. Analyze organic dairy feeding

Linked Program Outcomes

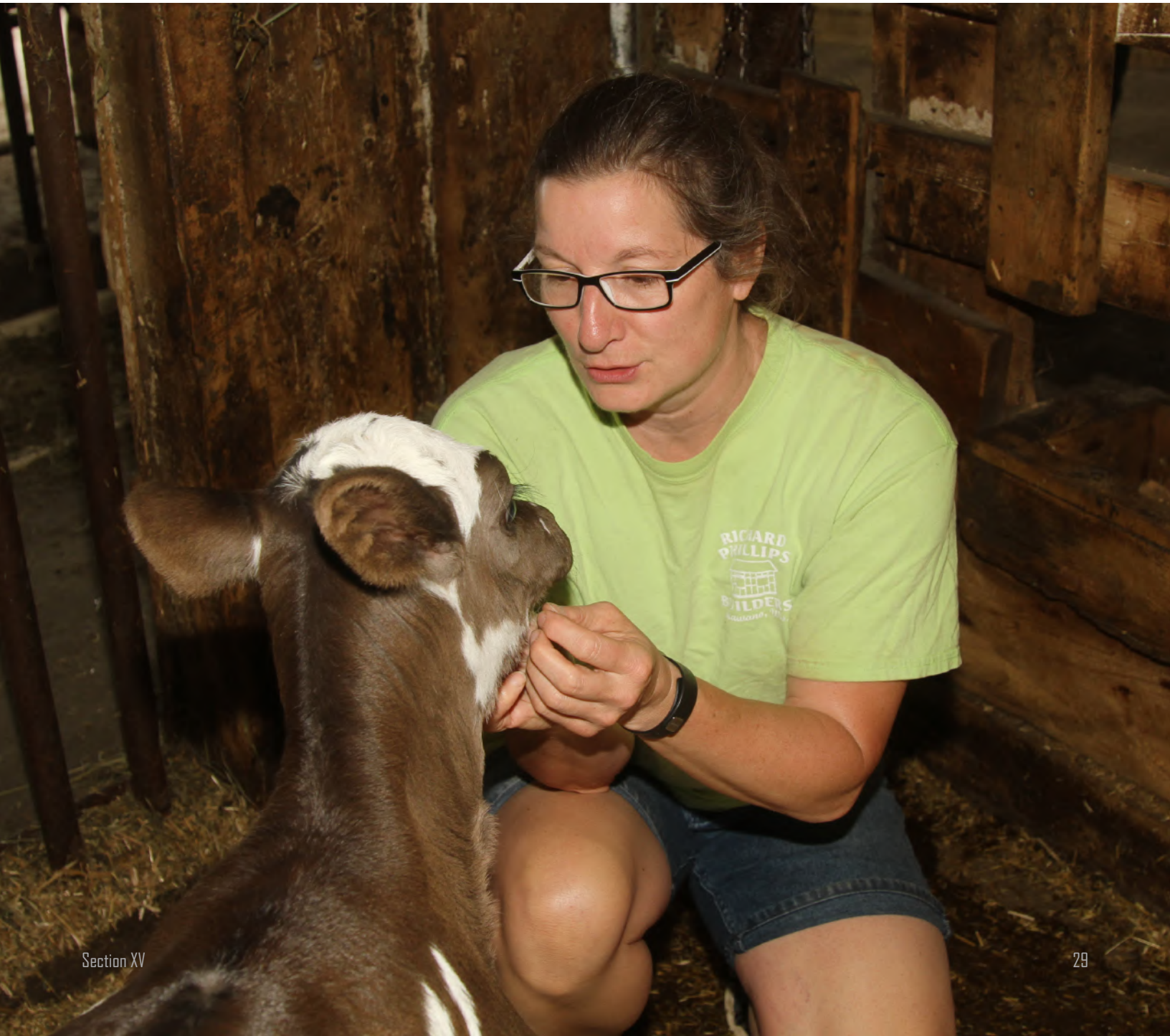
Manage dairy cattle in a grazing system
Manage dairy cattle nutritional requirements
Manage natural resources in a grazing system
Manage farm business operations to meet goals

Criteria

Performance will meet expectations when:

3.1. Compare differences between non-organic and organic feeding for dairy cattle
3.2. Describe the challenges in feeding a “grass only” dairy cow
3.3. Explain the advantages and disadvantages of different calf feeding systems for an organic dairy herd
3.4. Describe a calf feeding system for an organic dairy herd

3.5. Explain the challenges to feeding the organic dairy herd
3.6. List five feed supplements that might be fed to an conventional dairy herd that is not fed to an organic herd
3.7. Explain why kelp is fed to organic dairy animals
3.8. Create a ration for an organic milking cow and bred heifer
3.9. Determine the forage needs for a grass fed dairy herd of 100 cows for 12 months
3.10. Develop a forage chain for the 12 months for an organic grass-fed dairy herd



Soil and Water Resources Management

Course Outcome Summary

Course Information

Description	Functional soil is the foundation of a grazing dairy system. Students will develop an understanding of soil health and how organic matter, micro-organisms, and nutrient cycling build a healthy soil. Students will learn about soil testing, nutrient needs and water resources and management.
Instructional Level	Certificate
Total Credits	1.00
Total Hours	36.00

Program Outcomes

1. Manage dairy cattle in a grazing system
2. Manage dairy cattle nutritional requirements
3. Manage pastures for optimal production
4. Manage natural resources in a grazing system
5. Manage farm business operations to meet goals

Course Competencies

1. **Examine soil characteristics**

    Linked Program Outcomes
    Manage pastures for optimal production
    Manage natural resources in a grazing system
    Manage farm business operations to meet goals

    Criteria
    Performance will meet expectations when:
    1.1. Define soil chemical, physical and biological terms
    1.2. Explain how soil components act as a complex system
    1.3. Recognize biological organisms and their role in building soil
    1.4. Outline the aspects of soil that can be altered through organic management
    1.5. Describe common agricultural practices that impact soil quality
    1.6. Distinguish between conventionally managed and organically managed soils

2. Outline the role of livestock and managed grazing in relationship to soil quality

Linked Program Outcomes

Manage dairy cattle in a grazing system
Manage pastures for optimal production
Manage natural resources in a grazing system

Criteria

Performance will meet expectations when:

2.1. Outline the role of livestock manures in soil and nutrient management
2.2. Describe how managed grazing impacts soil health
2.3. Carbon sink How does pasture act as a carbon sink
2.4. How does organic matter affect soil quality and water absorption

3. Plan soil conservation and nutrient management measures

Linked Program Outcomes

Manage dairy cattle nutritional requirements
Manage pastures for optimal production
Manage natural resources in a grazing system

Criteria

Performance will meet expectations when:

3.1. Describe how soil organic matter is built or improved
3.2. Explain the importance of soil organic matter
3.3. Outline causes of soil loss
3.4. Explain why soil runoff and excessive nutrients are problems
3.5. Describe methods of conserving soil and preventing pollution by soil and nutrient loss
3.6. Describe causes and effects of soil compaction
3.7. Describe methods of conserving farm soil and preventing pollution from soil and nutrients

4. Analyze soil fertility

Linked Program Outcomes

Manage dairy cattle nutritional requirements
Manage pastures for optimal production
Manage natural resources in a grazing system

Criteria

Performance will meet expectations when:

4.1. Review the role of various plant nutrients derived from soil
4.2. Identify appropriate laboratories and tests available
4.3. Recognize limitations of soil test results as predictors of crop yields
4.4. Define soil cation exchange
4.5. Explain soil pH and how it affects soil health and function
4.6. List options to change soil pH on a farm
4.7. Describe soil mineralization and its effect on nutrient needs

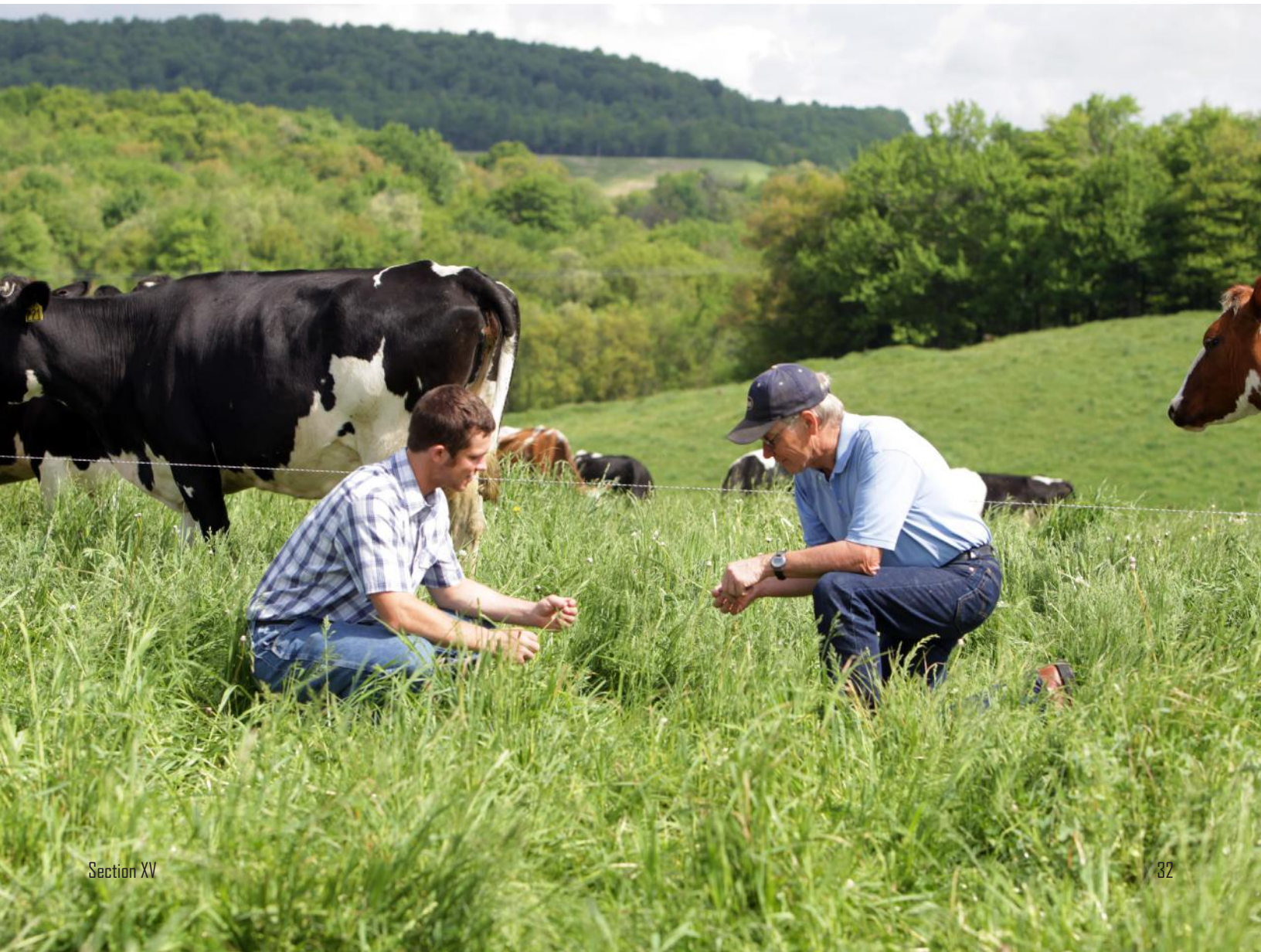
4.8. Compare the soil Cation Exchange Capacity “balancing approach” and the conventional
4.9. N-P-K approach

5. Develop options for soil fertility management

Criteria

Performance will meet expectations when:

5.1. Research sources of organic and non-organic fertilizer
5.2. Describe how organic and non-organic fertilizer sources differ in effects on soil biology
5.3. Compare differences in prices of organic and non-organic fertilizer sources
5.4. Compare nutrient analysis of cattle and hog manure
5.5. Clarify the role of compost in soil function
5.6. Describe composting techniques



Farm Business Management

Course Outcome Summary

Course Information

Description	Students will be introduced to business planning techniques, record-keeping practices and tools that can help chart progress toward personal and business goals. Students will also develop basic farm business financial statements.
Instructional Level	Certificate
Total Credits	1.00
Total Hours	36.00

Program Outcomes

1. Manage farm business operations to meet goals

Course Competencies

1. **Use a business planning process for establishing goals**

   Linked Program Outcomes
   Manage farm business operations to meet goals

   Criteria
   You will know you are successful when:
   1.1. List five year personal and business goals
   1.2. Prioritize five year personal and business goals
   1.3. Evaluate enterprise options that make best use of available resources
   1.4. Describe the agriculture markets that are going to be satisfied
   1.5. List short term goals required to meet long term goals

2. **Use a basic financial record keeping system**

   Linked Program Outcomes
   Manage farm business operations to meet goals

   Criteria
   You will know you are successful when:
   2.1. Identify how financial records are used to manage operations
   2.2. Describe the difference between bookkeeping and accounting
   2.3. Describe the difference between cash and accrual accounting

2.4. List the various sources of financial information commonly used for tracking transactions
2.5. Describe how financial records are kept and recorded
2.6. Identify the difference between single and double entry accounting
2.7. Create a list of accounts and subaccounts, or categories, that a sample of financial transactions can be broken into
2.8. List non-financial records that could be useful in evaluating and managing financial performance
2.9. List the advantages of a computer record keeping system
2.10. Compare filing systems used for financial and production records

3. Evaluate farm financial performance

Linked Program Outcomes
Manage farm business operations to meet goals

Criteria
You will know you are successful when:
3.1. Compare the differences between a balance sheet, income statement and cash-flow statement
3.2. Calculate the amount of working capital and the current ratio
3.3. Calculate the solvency ratios of debt-to-asset, equity-to-asset and debt-to-equity
3.4. Calculate net farm income
3.5. Calculate rate of return on farm assets
3.6. Calculate operating profit margin
3.7. Explain how financial efficiency ratios are calculated

4. Develop a financial plan

Linked Program Outcomes
Manage farm business operations to meet goals

Criteria
You will know you are successful when:
4.1. Develop a personal balance sheet
4.2. Define what a budget is and what it is used for
4.3. Create a family living budget
4.4. Define the farm enterprises commonly found on a dairy farm.
4.5. Create farm enterprise budgets
4.6. List items that would be part of a farm overhead budget
4.7. Diagram how cash flows through a farm business
4.8. Describe how the business will be able to meet loan payments
4.9. Explain how the farm enterprises will meet the family goals

5. Evaluate farm business record keeping software options

Linked Program Outcomes

Manage farm business operations to meet goals

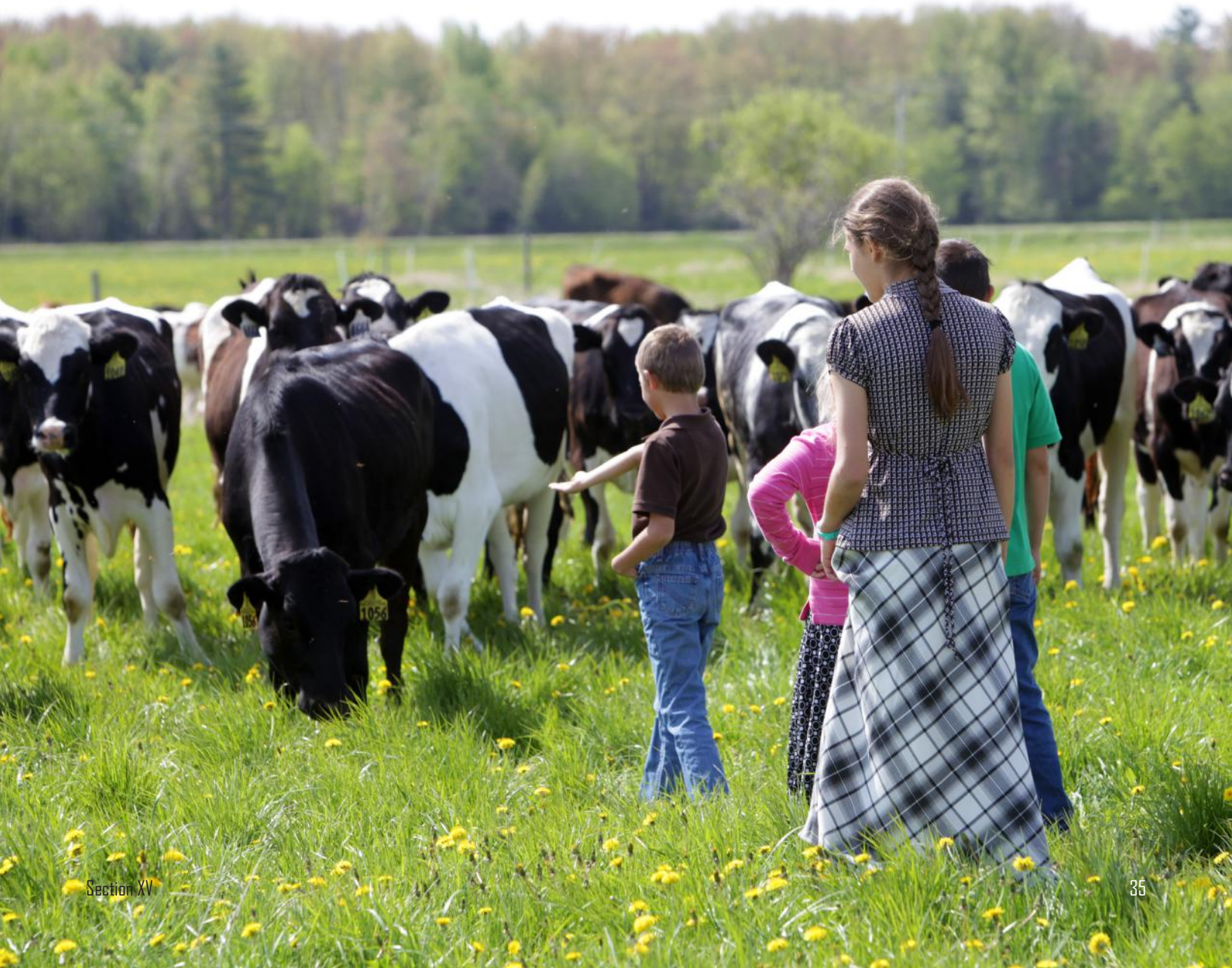
Criteria

You will know you are successful when:

5.1. Describe the financial management, bookkeeping and analysis software commonly used in agriculture

5.2. List the positive and negative attributes of each type of financial software

5.3. Demonstrate the use of a selected type of financial software



Managed Grazing Systems for Dairy Cattle

Course Outcome Summary

Course Information

Description	Students will be introduced to the various aspects of designing and managing a dairy grazing system for optimal animal and pasture performance. Students will develop a grazing plan that meets both the summer and winter feeding needs.
Instructional Level	Certificate
Total Credits	1.00
Total Hours	36.00

Program Outcomes

1. Manage dairy cattle in a grazing system
2. Manage dairy cattle nutritional requirements
3. Manage pastures for optimal production
4. Manage natural resources in a grazing system
5. Manage farm business operations to meet goals

Course Competencies

1. **Identify the components of a grazing dairy system**

   Linked Program Outcomes
   Manage dairy cattle in a grazing system
   Manage dairy cattle nutritional requirements
   Manage pastures for optimal production
   Manage natural resources in a grazing system
   Manage farm business operations to meet goals

   Criteria

   1.1. Identify all components of a grazing dairy farm system in relation to the whole farm
   1.2. Analyze the needs for water
   1.3. Determine feed, feed storage and feed handling needs
   1.4. Compare Manure storage and handling needs
   1.5. List options for facility need
   1.6. Determine machinery needs

2. Analyze grazing system infrastructure

Linked Program Outcomes

Manage dairy cattle in a grazing system

Criteria

2.1. Identify the components of a fencing system
2.2. Compare various fencing systems
2.3. Describe how an electrical fencing system works
2.4. Explain criteria for functional cattle lanes
2.5. Compare options for water delivery in summer and winter
2.6. Evaluate options for heat stress abatement
2.7. List various landscape features that could be used for cow comfort

3. Manage Pasture Productivity

Linked Program Outcomes

Manage dairy cattle in a grazing system
Manage pastures for optimal production
Manage natural resources in a grazing system

Criteria

3.1. Describe machinery needed to establish a new pasture
3.2. Compare options for renovating/rejuvenating pastures
3.3. Identify pasture plant species desirable in your region and their respective seeding rates
3.4. Describe the benefits of including legumes in a pasture
3.5. Explain various methods to measure pasture forage production
3.6. Illustrate the concept of a grazing wedge
3.7. Describe a forage chain and use of summer annuals
3.8. List contingency options that can be used during a drought
3.9. Explain the importance of soil fertility to pasture productivity
3.10. Describe the importance of residual and rest for pasture productivity
3.11. Outline ways to extend the grazing season through management

4. Optimize grazing for environmental benefits

Linked Program Outcomes

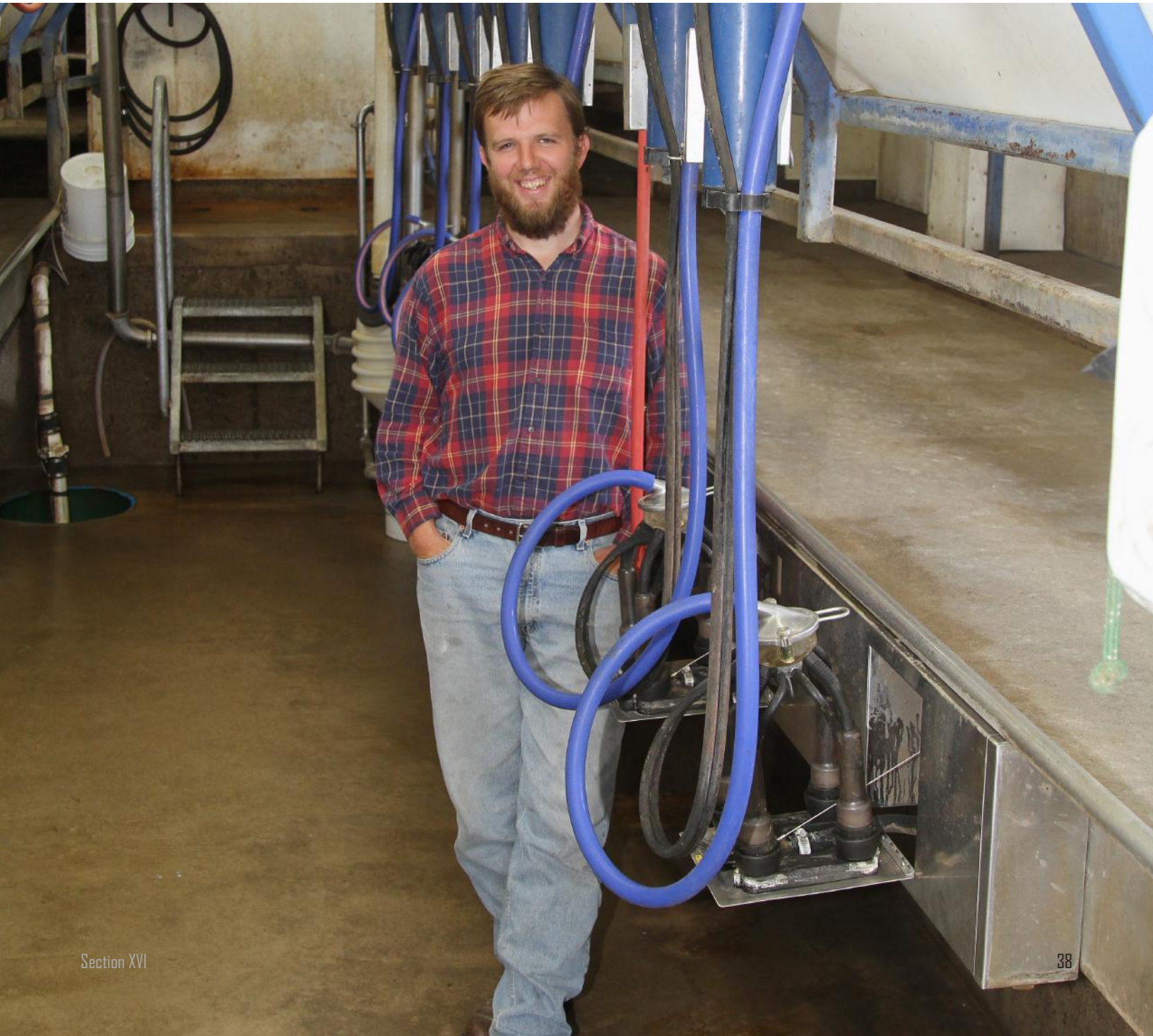
Manage dairy cattle in a grazing system
Manage natural resources in a grazing system

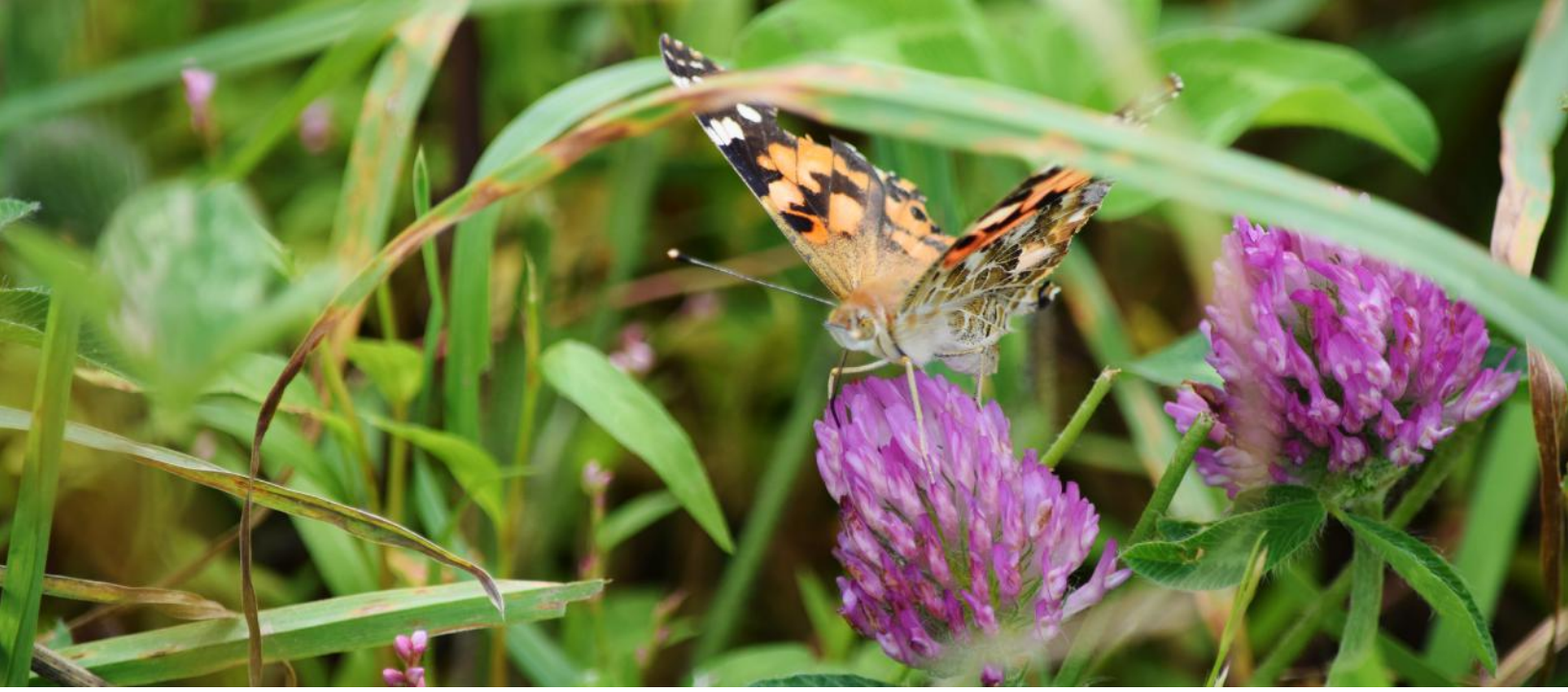
Criteria

4.1. Summarize the environmental benefits of managed grazing
4.2. Describe the risks of overgrazing on the environment
4.3. Outline strategies for optimizing nutrient distribution
4.4. Analyze impacts of managed grazing on water quality
4.5. Examine managed grazing for enhancing wildlife and pollinator habitat

Employment Services

The Managed Grazing Innovation Center does not offer employment services or guarantee employment. Because the center is operated by Dairy Grazing Apprenticeship, it connects students to a larger community of dairy graziers and provides access to full Apprenticeship, job postings, notices of livestock/ land/ equipment for sale or lease, networking opportunities, and additional resources to help them reach their goals.





MANAGED GRAZING

INNOVATION CENTER