DAIRY SCIENCE

Students majoring in Dairy Science will complete the degree requirements listed here. If desired, a student may also include the specialized option in pre-veterinary medicine. A minimum of 15 credits of animal science coursework must be earned at Iowa State University.

Student Learning Outcomes

Upon graduation, students should be able to:

- Demonstrate a comprehensive knowledge of dairy science, dairy management, and agribusiness.
- Communicate in oral and written formats.
- Describe contemporary domestic and global issues impacting dairy science.
- Contribute or lead team efforts to achieve group goals.
- Utilize effective life-long learning skills.
- Evaluate the impacts of dairy management practices on economic, sociological, and environmental sustainability.

Total Degree Requirement: 128 cr.

Only 65 cr. from a two-year institution may apply which may include up to 16 technical cr.; 9 P-NP cr. of free electives; 2.00 minimum GPA.

International Perspectives

Approved International Perspectives course	3

U.S. Cultures and Communities

Approved U.S. Cultures and Communities course	3

Communications Proficiency

English composition	6
Speech fundamentals	3
Total Credits	**9**

Communication/Library

ENGL 1500	Critical Thinking and Communication	3
ENGL 2500	Written, Oral, Visual, and Electronic Composition	3
LIB 1600	Introduction to College Level Research	1
One course from the following:		3
AGEDS 3110	Presentation and Sales Strategies for Agricultural Audiences	
COMST 2140	Professional Communication	
SPCM 2120	Fundamentals of Public Speaking	
Total Credits		**10**

Humanities and Social Sciences

Approved Humanities course	3
Approved Social Science course	3
Total Credits	**6**

Ethics

Approved Ethics course	3

Mathematics and Business

One course from the following:		3
ECON 1010	Principles of Microeconomics	
ECON 1020	Principles of Macroeconomics	
ACCT 2840	Financial Accounting	
One course from the following:		3-4
STAT 1010	Principles of Statistics	
STAT 1040	Introduction to Statistics	
STAT 2026	Introduction to Business Statistics	
One course from the following:		3-4
MATH 1400	College Algebra	
MATH 1500	Discrete Mathematics for Business and Social Sciences	
MATH 1600	Survey of Calculus	
MATH 1650	Calculus I	
Total Credits		**9-11**

Biological Sciences

BIOL 2120	Principles of Biology II	3
BIOL 2120L	Principles of Biology Laboratory II	1
BIOL 3130	Principles of Genetics	3
or GEN 3200	Genetics, Agriculture and Biotechnology	
MICRO 2010 & MICRO 3000L	Introduction to Microbiology and Introductory Microbiology Laboratory	3-4
or MICRO 3020 & MICRO 3000L	Biology of Microorganisms and Introductory Microbiology Laboratory	
Total Credits		**10-11**

Physical Sciences

A minimum of 8 credits are required. These requirements are specific to option and are listed with each option below.

Dairy Sciences Option

ANS 1010	Working with Animals	2
ANS 1100	Orientation in Animal Science and ISU	1
ANS 1140	Survey of the Animal Industry	2
ANS 2100	Career Preparation in Animal Science	1
ANS 2110	Issues Facing Animal Science	1

ANS 2140	Domestic Animal Physiology	3
ANS 2140L	Domestic Animal Anatomy and Physiology Lab	1
ANS 2350	Dairy Cattle Science	3
ANS 2700 & 2700L	Foods of Animal Origin and Foods of Animal Origin Laboratory	3
or FSHN 1010	Food and the Consumer	
ANS 3190	Animal Nutrition	3
ANS 3200	Animal Feeds and Feeding	3
ANS 3310	Domestic Animal Reproduction	3
ANS 3370	Lactation	3
ANS 3520	Genetic Improvement of Domestic Animals	3
ANS 4110	Addressing Issues in Animal Science	1
ANS 4340	Dairy Systems Management	3
ANS 4350	Applied Dairy Farm Evaluation	3
CHEM 1630 & 1630L	College Chemistry and Laboratory in College Chemistry	5
or CHEM 1770 & 1770L	General Chemistry I and Laboratory in General Chemistry I	
CHEM 3310	Organic Chemistry I	3
or BBMB 2210	Structure and Reactions in Biochemical Processes	
Four credits (minimum) from the following:		4
AGRON 3340	Forage Crop Management	
ANS 3160	Equine Reproduction Lab	
ANS 3360	Domestic Animal Behavior and Well-Being	
ANS 3450	Growth and Development of Domestic Animals	
ANS 3600	Fresh Meat Science and Applied Muscle Biology	
ANS 4150	Equine Systems Management	
ANS 4190	Advanced Animal Nutrition	
ANS 4240	Companion Animal Systems Management	
ANS 4250	Swine Systems Management	
ANS 4260	Beef Cattle Systems Management	
ANS 4290	Sheep Systems Management	
ANS 4600	Science and Technology of Value Added Meat Products	
ECON 3320	Cooperatives	
FSHN 3050	Food Quality Management and Control	
FSHN 4030	Food Laws and Regulations	
FSHN 4100	Food Analysis	
MICRO 3100	Medical Microbiology	
MICRO 3530	Introductory Parasitology	
MICRO 3740	Insects and Our Health	
MICRO 4020	Microbial Genetics and Genomics	
MICRO 4070	Microbiological Safety of Foods of Animal Origins	
FSHN 4200	Food Microbiology	
MICRO 4200	Food Microbiology	
MICRO 4750	Immunology	
VDPAM 4870	Livestock Disease Prevention	
Total Credits		**51**

Additional free electives for the Dairy Sciences option 26-29

Pre-Veterinary Medicine Option

ANS 1010	Working with Animals	2
ANS 1100	Orientation in Animal Science and ISU	1
ANS 1140	Survey of the Animal Industry	2
ANS 2100	Career Preparation in Animal Science	1
ANS 2110	Issues Facing Animal Science	1
ANS 2140	Domestic Animal Physiology	3
ANS 2140L	Domestic Animal Anatomy and Physiology Lab	1
ANS 2350	Dairy Cattle Science	3
ANS 2700 & 2700L	Foods of Animal Origin and Foods of Animal Origin Laboratory	3
or FSHN 1010	Food and the Consumer	
ANS 3190	Animal Nutrition	3
ANS 3200	Animal Feeds and Feeding	3
ANS 3310	Domestic Animal Reproduction	3
ANS 3370	Lactation	3
ANS 3520	Genetic Improvement of Domestic Animals	3
ANS 4110	Addressing Issues in Animal Science	1
ANS 4340	Dairy Systems Management	3
ANS 4350	Applied Dairy Farm Evaluation	3
BIOL 2110	Principles of Biology I	3
BIOL 2110L	Principles of Biology Laboratory I	1
CHEM 1770	General Chemistry I	4
CHEM 1770L	Laboratory in General Chemistry I	1
CHEM 1780	General Chemistry II	3
CHEM 3310	Organic Chemistry I	3
CHEM 3310L	Laboratory in Organic Chemistry I	1
BBMB 3010	Survey of Biochemistry	3
or BBMB 3160	Principles of Biochemistry	
or BBMB 4040	Biochemistry I	
PHYS 1310 & 1310L	General Physics I and General Physics I Laboratory	5
Four credits (minimum) from the following:		4
AGRON 3340	Forage Crop Management	
ANS 3360	Domestic Animal Behavior and Well-Being	
ANS 3160	Equine Reproduction Lab	

ANS 3450	Growth and Development of Domestic Animals
ANS 3600	Fresh Meat Science and Applied Muscle Biology
ANS 4150	Equine Systems Management
ANS 4190	Advanced Animal Nutrition
ANS 4240	Companion Animal Systems Management
ANS 4250	Swine Systems Management
ANS 4260	Beef Cattle Systems Management
ANS 4290	Sheep Systems Management
ANS 4600	Science and Technology of Value Added Meat Products
ECON 3320	Cooperatives
FSHN 4030	Food Laws and Regulations
FSHN 4100	Food Analysis
MICRO 3100	Medical Microbiology
MICRO 3530	Introductory Parasitology
MICRO 3740	Insects and Our Health
MICRO 4020	Microbial Genetics and Genomics
MICRO 4070	Microbiological Safety of Foods of Animal Origins
MICRO 4210	Food Microbiology Laboratory
Total Credits	**67**

Additional free electives for the Pre-Veterinary Medicine Option	11-14

* The Iowa State University College of Veterinary Medicine academic requirements are met by completion of this option (http://vetmed.iastate.edu/academics/prospective-students/admissions/academic-requirements (http://vetmed.iastate.edu/academics/prospective-students/admissions/academic-requirements/)).

Dairy Science, B.S. - General

Freshman

Fall	Credits	Spring	Credits
ANS 1100	1	ANS 1140	2
ANS 1010	2	CHEM 1770 or 1630	4
BIOL 2110	3	CHEM 1770L or 1630L	1
BIOL 2110L	1	Humanities - elecitve list	3
ENGL 1500	3	SPCM 2120, AGEDS 3110, AGEDS 3270, or COMST 2140	3
LIB 1600	1	STAT 1010, 1040, or 2026	3-4
MATH 1400, 1500, 1600, or 1650	3-4		
Social Science - elective list	3		
	17-18		**16-17**

Sophomore

Fall	Credits	Spring	Credits
ANS 2110	1	ANS 2100	1
ANS 2350	3	ANS 2700 & 2700L or FSHN 1010	3
BIOL 2120	3	ANS 2140	3
BIOL 2120L	1	ANS 2140L	1
BBMB 2210	3	ENGL 2500	3
ECON 1010	3	MICRO 2010 or 3020	2-3
Free Elective	3	MICRO 3000L	1
		Free Elective	3
	17		**17-18**

Junior

Fall	Credits	Spring	Credits
ANS 3190	3	ANS 3200	3
ANS 3310	3	ANS 3520	3
GEN 3200 or BIOL 3130	3	ANS 3370	3
U.S. Cultures and Communities - elective list	3	Free Elective	3
Free Elective	3	Ethics - elective list	3
	15		**15**

Senior

Fall	Credits	Spring	Credits
ANS 4110	1	ANS 4350	3
ANS 4340	3	International Perspectives - elective list	3
ANS Elective	3	ANS Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	4
Free Elective	3		
	16		**16**

Important Note: This is only one of many equally-sound schedule sequences.

Free electives and specified group electives are often chosen to complement the student's career focus. The student's academic advisor assists with developing scheduling schemes that prepare students individually for careers in the animal industry. They are explained fully in ANS 1100 and through appointments with the student's advisor in Dairy Science. Typical career areas include Advanced Degree in Dairy Science, Business and Finance, Agriculture Promotion and Information, Dairy Food Industry, Agricultural Sales and

Marketing, International Agriculture, Animal Production and General Agribusiness and Pre-Veterinary Medicine.

Dairy Science, B.S. - Pre-Veterinary Medicine option

Freshman

Fall	Credits	Spring	Credits
ANS 1100	1	ANS 1140	2
ANS 1010	2	CHEM 1770	4
BIOL 2110	3	CHEM 1770L	1
BIOL 2110L	1	Humanities - elective list	3
ENGL 1500	3	SPCM 2120, AGEDS 3110, AGEDS 3270, or COMST 2140	3
LIB 1600	1	STAT 1010, 1040, or 2026	3-4
MATH 1400, 1500, 1600, or 1650	3-4		
Social Science - elective list	3		
	17-18		**16-17**

Sophomore

Fall	Credits	Spring	Credits
ANS 2110	1	ANS 2100	1
ANS 2350	3	ANS 2700 & 2700L or FSHN 1010	3
BIOL 2120	3	ANS 2140	3
BIOL 2120L	1	ANS 2140L	1
CHEM 1780	3	CHEM 3310	3
ECON 1010	3	CHEM 3310L	1
Ethics - elective list	3	ENGL 2500	3
		Free Elective	3
	17		**18**

Junior

Fall	Credits	Spring	Credits
ANS 3190	3	ANS 3200	3
ANS 3310	3	ANS 3520	3
GEN 3200 or BIOL 3130	3	ANS 3370	3
CHEM 3320	3	BBMB 3010, 3160, or 4040	3
MICRO 2010 or 3020	2-3	U.S. Cultures and Communities - elective list	3
MICRO 3000L	1		
	15-16		**15**

Senior

Fall	Credits	Spring	Credits
ANS 4110	1	ANS 4350	3
ANS 4340	3	International Perspectives - elective list	3
ANS Elective	3	ANS Elective	3
PHYS 1310	4	Free Elective	3
PHYS 1310L	1	Free Elective	4
Free Elective	4		
	16		**16**

* Credits currently required for application to Veterinary Medicine program at ISU (55 credits)
General Chemistry with lab (7)
Organic Chemistry with lab (4)
Biochemistry (3)
General Physics with lab (4)
General Biology with lab (8)
Genetics/Animal Breeding (3)
Mammalian Anatomy and/or Physiology (3)
English Composition (6)
Oral Communication (3)
Humanities and/or Social Science (8)
Other Electives (8)