

DAIRY SCIENCE

Students majoring in Dairy Science will complete the degree requirements listed here (<http://catalog.iastate.edu/previouscatalogs/2023-2024/collegeofagricultureandlifesciences/dairyscience/#curriculumtext>). 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.
- Exhibit effective communication skills
- Integrate information to solve problems
- Effectively employ skills as a self-learner
- Participate as team leaders and team builders
- Demonstrate awareness of contemporary issues that drive change in animal industries

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. Diversity

Approved U.S. Diversity course 3

Communications Proficiency

English composition 6

Speech fundamentals 3

Total Credits 9

Communication/Library

ENGL 150 Critical Thinking and Communication 3

ENGL 250 Written, Oral, Visual, and Electronic Composition 3

LIB 160 Introduction to College Level Research 1

One course from the following: 3

AGEDS 311 Presentation and Sales Strategies for Agricultural Audiences

AGEDS 327 Survey of Agriculture and Life Sciences Communication

COMST 214 Professional Communication

SP CM 212 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 101 Principles of Microeconomics

ECON 102 Principles of Macroeconomics

ACCT 284 Financial Accounting

One course from the following: 3-4

STAT 101 Principles of Statistics

STAT 104 Introduction to Statistics

STAT 226 Introduction to Business Statistics I

One course from the following: 3-4

MATH 140 College Algebra

MATH 150 Discrete Mathematics for Business and Social Sciences

MATH 160 Survey of Calculus

MATH 165 Calculus I

Total Credits 9-11

Biological Sciences

BIOL 211 Principles of Biology I 3

BIOL 211L Principles of Biology Laboratory I 1

BIOL 212 Principles of Biology II 3

BIOL 212L Principles of Biology Laboratory II 1

BIOL 313 Principles of Genetics 3

or GEN 320 Genetics, Agriculture and Biotechnology

MICRO 201 Introduction to Microbiology 3-4
& 201L and Introductory Microbiology Laboratory

or MICRO 302 Biology of Microorganisms
& 302L and Microbiology Laboratory

Total Credits 14-15

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

AN S 101 Working with Animals 2

AN S 110 Orientation in Animal Science and ISU 1

AN S 114 Survey of the Animal Industry 2

AN S 210 Career Preparation in Animal Science 1

AN S 211	Issues Facing Animal Science	1	MICRO 402	Microbial Genetics and Genomics	
AN S 214	Domestic Animal Physiology	3	MICRO 407	Microbiological Safety of Foods of Animal Origins	
AN S 214L	Domestic Animal Anatomy and Physiology Lab	1	FS HN 420	Food Microbiology	
AN S 235	Dairy Cattle Science	3	MICRO 420	Food Microbiology	
AN S 270 & 270L	Foods of Animal Origin and Foods of Animal Origin Laboratory	3	MICRO 475	Immunology	
or FS HN 101	Food and the Consumer		VDPAM 487	Livestock Disease Prevention	
AN S 319	Animal Nutrition	3	Total Credits		51
AN S 320	Animal Feeds and Feeding	3	Additional free electives for the Dairy Sciences option		26-29
AN S 331	Domestic Animal Reproduction	3	Pre-Veterinary Medicine Option		
AN S 337	Lactation	3	AN S 101	Working with Animals	2
AN S 352	Genetic Improvement of Domestic Animals	3	AN S 110	Orientation in Animal Science and ISU	1
AN S 411	Addressing Issues in Animal Science	1	AN S 114	Survey of the Animal Industry	2
AN S 434	Dairy Systems Management	3	AN S 210	Career Preparation in Animal Science	1
AN S 435	Applied Dairy Farm Evaluation	3	AN S 211	Issues Facing Animal Science	1
CHEM 163 & 163L	College Chemistry and Laboratory in College Chemistry	5	AN S 214	Domestic Animal Physiology	3
or CHEM 177 & 177L	General Chemistry I and Laboratory in General Chemistry I		AN S 214L	Domestic Animal Anatomy and Physiology Lab	1
CHEM 331	Organic Chemistry I	3	AN S 235	Dairy Cattle Science	3
or BBMB 221	Structure and Reactions in Biochemical Processes		AN S 270 & 270L	Foods of Animal Origin and Foods of Animal Origin Laboratory	3
Four credits (minimum) from the following:		4	or FS HN 101	Food and the Consumer	
AGRON 334	Forage Crop Management		AN S 319	Animal Nutrition	3
AN S 332	Laboratory Methods in Animal Reproduction		AN S 320	Animal Feeds and Feeding	3
or AN S 333	Embryo Transfer and Related Technologies		AN S 331	Domestic Animal Reproduction	3
AN S 336	Domestic Animal Behavior and Well-Being		AN S 337	Lactation	3
AN S 345	Growth and Development of Domestic Animals		AN S 352	Genetic Improvement of Domestic Animals	3
AN S 360	Fresh Meat Science and Applied Muscle Biology		AN S 411	Addressing Issues in Animal Science	1
AN S 415	Equine Systems Management		AN S 434	Dairy Systems Management	3
AN S 419	Advanced Animal Nutrition		AN S 435	Applied Dairy Farm Evaluation	3
AN S 424	Companion Animal Systems Management		CHEM 177	General Chemistry I	4
AN S 425	Swine Systems Management		CHEM 177L	Laboratory in General Chemistry I	1
AN S 426	Beef Cattle Systems Management		CHEM 178	General Chemistry II	3
AN S 429	Sheep Systems Management		CHEM 331	Organic Chemistry I	3
AN S 460	Science and Technology of Value Added Meat Products		CHEM 331L	Laboratory in Organic Chemistry I	1
ECON 332	Cooperatives		BBMB 301	Survey of Biochemistry	3
FS HN 305	Food Quality Management and Control		or BBMB 316	Principles of Biochemistry	
FS HN 403	Food Laws and Regulations		or BBMB 404	Biochemistry I	
FS HN 410	Food Analysis		or BBMB 420	Mammalian Biochemistry	
MICRO 310	Medical Microbiology		PHYS 131 & 131L	General Physics I and General Physics I Laboratory	5
MICRO 353	Introductory Parasitology		Four credits (minimum) from the following:		4
MICRO 374	Insects and Our Health		AGRON 334	Forage Crop Management	
			AN S 332	Laboratory Methods in Animal Reproduction	

or AN S 333 Embryo Transfer and Related Technologies

AN S 336	Domestic Animal Behavior and Well-Being
AN S 345	Growth and Development of Domestic Animals
AN S 360	Fresh Meat Science and Applied Muscle Biology
AN S 415	Equine Systems Management
AN S 419	Advanced Animal Nutrition
AN S 424	Companion Animal Systems Management
AN S 425	Swine Systems Management
AN S 426	Beef Cattle Systems Management
AN S 429	Sheep Systems Management
AN S 460	Science and Technology of Value Added Meat Products
ECON 332	Cooperatives
FS HN 403	Food Laws and Regulations
FS HN 410	Food Analysis
MICRO 310	Medical Microbiology
MICRO 353	Introductory Parasitology
MICRO 374	Insects and Our Health
MICRO 402	Microbial Genetics and Genomics
MICRO 407	Microbiological Safety of Foods of Animal Origins
MICRO 421	Food Microbiology Laboratory

Total Credits **63**

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
AN S 110	2	1 AN S 114	2
AN S 101	4	2 CHEM 177 or 163	4
BIOL 211	1	3 CHEM 177L or 163L	1
BIOL 211L	3	1 Humanities - elective list	3
ENGL 150	3	3 SP CM 212, AGEDS 311, AGEDS 327, or COMST 214	3
LIB 160	3-4	1 STAT 101, 104, or 226	3-4
MATH 140, 150, 160, or 165	3-4		
Social Science - elective list	3		

17-18

16-17

Sophomore

Fall	Credits	Spring	Credits
AN S 211	1	AN S 210	1
AN S 235	3	AN S 270 & 270L or FS HN 101	3
BIOL 212	3	AN S 214	3
BIOL 212L	1	AN S 214L	1
BBMB 221	3	ENGL 250	3
ECON 101	3	MICRO 201 or 302	2-3
Free elective	3	MICRO 201L or 302L	1
		Free elective	3
	17		17-18

Junior

Fall	Credits	Spring	Credits
AN S 319	3	AN S 320	3
AN S 331	3	AN S 352	3
GEN 320 or BIOL 313	3	AN S 337	3
US diversity - elective list	3	Free elective	3
Free elective	3	Ethics - elective list	3
	15		15

Senior

Fall	Credits	Spring	Credits
AN S 411	1	AN S 435	3
AN S 434	3	International perspective - elective list	3
AN S elective	3	AN S 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 AN S 110 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

Free elective	4
	16

Freshman

Fall	Credits Spring	Credits
AN S 110	1 AN S 114	2
AN S 101	2 CHEM 177	4
BIOL 211	3 CHEM 177L	1
BIOL 211L	1 Humanities - elective list	3
ENGL 150	3 SP CM 212, AGEDS 311, AGEDS 327, or COMST 214	3
LIB 160	1 STAT 101, 104, or 226	3-4
MATH 140, 150, 160, or 165	3-4	
Social Science - elective list	3	
	17-18	16-17

* 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)

Sophomore

Fall	Credits Spring	Credits
AN S 211	1 AN S 210	1
AN S 235	3 AN S 270 & 270L or FS HN 101	3
BIOL 212	3 AN S 214	3
BIOL 212L	1 AN S 214L	1
CHEM 178	3 CHEM 331	3
ECON 101	3 CHEM 331L	1
Ethics - elective list	3 ENGL 250	3
	Free elective	3
	17	18

Junior

Fall	Credits Spring	Credits
AN S 319	3 AN S 320	3
AN S 331	3 AN S 352	3
GEN 320 or BIOL 313	3 AN S 337	3
CHEM 332	3 BBMB 301, 316, 404, or 420	3
MICRO 201 or 302	2-3 US diversity - elective list	3
MICRO 201L or 302L	1	
	15-16	15

Senior

Fall	Credits Spring	Credits
AN S 411	1 AN S 435	3
AN S 434	3 International Perspective - elective list	3
AN S elective	3 AN S elective	3
PHYS 131	4 Free elective	3
PHYS 131L	1 Free elective	4