

# Agriculture & Feed Safety Careers



**Activity Time:** 50 Minutes.

## Lesson Plan Summary:

In this lesson, students will review career descriptions and necessary qualifications for agriculture/biotechnology careers that are relevant to the field of animal feed safety. Students will complete an exercise in which they match career titles to career descriptions to understand the diversity of career opportunities in the field of agriculture/biotechnology and animal feed safety.

## STUDENT UNDERSTANDINGS

### Big Idea & Enduring Understanding:

- **Agriculture/Biotech (ag-biotech) Careers:** There are a wide variety of career opportunities in the field of agriculture/biotechnology and animal feed safety; each career has a unique description and education requirement.

### Essential Question:

- What are the possibilities and potential career paths leading to a career in agriculture/ biotechnology, specifically those related to animal feed safety?

### Learning Objectives:

*Students will know...*

- There are ag-biotech feed safety careers for high school and college graduates, and for individuals with master's, doctorate, and professional degrees.
- Feed safety practices are essential to protecting animals and the public from diseases such as Bovine spongiform encephalopathy and salmonellosis.

*Students will be able to...*

- Connect diverse career paths to animal feed safety.
- Associate their personal interests with potential ag-biotech careers.
- List a variety of careers available in the field of ag-biotech and animal feed safety.

## Vocabulary:

- Agronomist
- Entomologist
- Hazard Analysis and Critical Control Points (HACCP)
- Hydrologist

## Standards Alignment:

This lesson addresses the following Washington State Career and Technical Education (CTE) model frameworks for Agriculture, Food, and Natural Resources (AFNR):

- **ABS.02.04.01.b:** Determine appropriate human resources for AFNR businesses. Level II.
- **ABS.02.04.01.c:** Write career descriptions for specific positions in an AFNR business. Level III.

## Common Student Preconceptions:

- Ag-biotech careers today are limited to traditional farming.
- I don't have the skills or interests to help protect the feed/food supply.

## TEACHER PREPARATION

### Materials:

Item	Quantity
Classroom computer with projector and Microsoft® PowerPoint® software	1 per class
Envelopes to hold the clippings for the career match activity	6–8 envelopes
Scissors	1 per class
<i>Ag-Biotech Career Match</i> Student Handout	1 per group (6 to 8 total)
<i>Careers in the Ag-Biotech Field</i> Student Handout	1 per student or per group
<i>Ag-Biotech Career Match</i> Teacher Answer Key	1 per class

## Preparation:

- Divide students into 6 or 8 groups.
- Make one copy of the *Ag-Biotech Career Match* Handout per student group.
- Cut out each career description from the *Ag-Biotech Career Match* Handout into little slips of paper and clip them all together. Then, cut out each career title and clip them all together. Put a set of career descriptions and career titles into each envelope. There should be as many envelopes (with sets of career descriptions and titles) as student groups.
- Make copies of the *Careers in the Ag-Biotech Field* Handout, one per student or group.
- Download the American Veterinary Medical Association (AVMA) career resources PowerPoint® presentation “The Road Less Traveled” from the following website:

### AVMA Veterinary Careers

<https://ebusiness.avma.org/EBusiness50/ProductCatalog/CareerPowerPoint.aspx>

- Review the presenter’s notes for the AVMA PowerPoint® presentation (see the *Resources* section of this lesson plan).
- **Optional:** Invite your school’s career counseling staff to join the class for the last few minutes to answer students’ questions about ag-biotech careers.

## PROCEDURE

### Preconceptions:

1. Ask students to conduct a quick Think-Pair-Share, trying to list one or two careers in the field of ag-biotech. During the “Share” portion of the activity, record the list of careers provided by the students using a document camera or whiteboard.
2. As a group, ask the students to consider what knowledge would be needed for an individual to be successful in each of the careers included on the class list. Record their ideas in a second list. For example:

Ag-Biotech Careers	Required Knowledge/Skills
Rancher	Animal husbandry Knowledge of feed, additives, supplements, etc. Business skills
Farmer	Plant and soil science Machinery operation Business skills
Veterinarian	Math and science Surgery techniques Compassion for animals

3. Challenge the class to think of personal interests they have that were not already mentioned and included on the second list. What are their interests and special skills? Record their ideas in a third list. For example:

Students' Interests and Skills
History
Foreign language
Biology
Working outdoors
Working with animals/pets
Working with other people
Working individually
Working with numbers
Traveling
Surfing web sites
Tutoring
Fixing machinery
Building things

## Hook:

4. Show students the AVMA PowerPoint®. This presentation features a variety of careers in the field of animal health, agriculture, and feed/food safety. All of the people featured in this presentation have an educational background in veterinary studies.

### AVMA Veterinary Careers, "The Road Less Traveled"

<https://ebusiness.avma.org/EBusiness50/ProductCatalog/CareerPowerPoint.aspx>

5. Lead a class discussion about the careers that were mentioned in the PowerPoint®. Were any of these careers new to the students? What careers sounded the most interesting?

## Activity Procedure:

6. Divide students into 6 or 8 groups.
7. Give each group one envelope (containing the slips of paper).
8. Ask each group to work together for 10 minutes to match the career descriptions with the career titles.  
**Optional:** Provide students with blank paper and tape so they can attach each career description and its matching title to the blank paper.
9. Read one career description aloud. Ask each group to respond with what they think is the career title that matches the description. Once you have heard from all the student groups, read the correct title and see how many groups were correct. Repeat with the remaining career descriptions.
10. Lead a class discussion about the careers profiled on the list. Were any of these careers new to the students? What careers sounded the most interesting?
11. Pass out copies of the *Careers in the Ag-Biotech Field* Handout, either one per student or one per group. The handout provides a more complete list of careers. Ask students to examine the list and identify any additional careers that sound interesting to them. Remind them of the list of interests and skills that they created in the *Preconceptions* portion of the lesson.

12. Ask students what qualifications are important for the careers they identified. You may want to add their ideas to the list that you created in the *Preconceptions* portion of the lesson.
13. **Optional:** Encourage students to respond to the career paragraph prompt provided in the *Extension Activities* section of this lesson plan.

### Wrap-up:

14. Lead a discussion about the best way to prepare for interesting ag-biotech careers. Discuss high school coursework, internships, volunteer opportunities, and summer employment.
15. **Optional:** Invite your school's career counseling staff to join the class for the last few minutes to answer students' questions about ag-biotech careers.

### Assessment Opportunities:

- Assess students' contributions to class discussions and group work. Proficiency is measured by degree of individual and group participation.
- Assess students' career paragraphs (prompt is found in the *Extension Activities* section of this lesson plan). Proficiency is measured by the degree to which students provided information related to a brief description of the career (including common qualifications), their reasons for being interested in the career, what courses would prepare them for the career, what out of school learning opportunities might prepare them for this career, and whom they might interview in the community to learn more about this career.

### Student Metacognition:

- Ask students to reflect on whether the exposure to ag-biotech careers has inspired them to consider a career direction they had not previously considered.
- The class discussions in the *Preconceptions*, *Activity Procedure*, and *Wrap-up* portions of the lesson help identify students' preconceptions and demonstrate their growing awareness of ag-biotech careers.

### Extension Activities:

- Challenge students to pair up and interview one another regarding their interests in feed safety and ag-biotech careers.
- Students can interview exemplar ag-biotech and feed safety practitioners in their community.
- Provide time in the computer lab for students to research one ag-biotech career. Assign the research activity by placing the Career Exploration instructions below on the document camera. Tell the students that they can find the information they need for the assignment using the websites provided in the *Resources* section of this lesson plan.

#### **Career Exploration:**

Write a brief paragraph (200 words) that identifies an ag-biotech or feed safety career that interests you. Your paragraph must include:

- A brief description of the career (including common qualifications).
- The reason for your career interest.
- Types of courses and learning experiences that might prepare you for this career.
- Whom you might interview in the community to learn more about this career.

## Adaptations:

- The career match activity can be modified to be an individual, rather than group, activity. In this case, do not cut up the *Ag-Biotech Career Match* Handout. Instead, pass out one handout to each student. Challenge students to work individually to complete the handout by writing the corresponding career title letter next to each career description.

## TEACHER BACKGROUND & RESOURCES

### Background Information:

Background information on ag-biotech careers can be found at the websites listed in the *Resources* section below.

### Resources:

#### AVMA Career PowerPoint® Presentations

<https://ebusiness.avma.org/EBusiness50/ProductCatalog/CareerPowerPoint.aspx>

#### The Road Less Traveled: Alternate Careers in Veterinary Medicine—Presenter’s Notes

[https://ebusiness.avma.org/EBusiness50/Files/ProductDownloads/presenters\\_notes\\_9-college.pdf](https://ebusiness.avma.org/EBusiness50/Files/ProductDownloads/presenters_notes_9-college.pdf)

#### Future Farmers of America Career Explorer

<https://www.ffa.org/APPCTR/Pages/CareerExplorer.aspx>

#### Food, Agriculture, and Natural Resources Careers

<http://www.agriculture.purdue.edu/USDA/careers/index.html>

#### Feed/Animal Health Careers

[http://www.ag-careers.com/animal\\_health\\_careers.html](http://www.ag-careers.com/animal_health_careers.html)

#### Cargill® Experienced Opportunities – North America

<http://www.cargill.com/careers/search-apply/experienced-professionals/north-america/index.jsp>

(search “Animal Nutrition”)

#### USA Jobs Database

<https://my.usajobs.gov/>

#### Career Guide to Industries (A–Z Search)

[http://www.bls.gov/oco/cg/cgi\\_index.htm](http://www.bls.gov/oco/cg/cgi_index.htm)

## Credit:

Lesson written by Nona Clifton of the Washington Global Health Alliance.

*Student Handout* photograph courtesy of USDA Natural Resources Conservation Service.

Career descriptions on the *Ag-Biotech Career Match* Handout are from the following websites:

FFA Career Explorer, <https://www.ffa.org/APPCTR/Pages/CareerExplorer.aspx>.

Food, Agriculture, and Natural Resources Careers, <http://www.agriculture.purdue.edu/USDA/careers/index.html>.

Feed/Animal Health Careers, [http://www.ag-careers.com/animal\\_health\\_careers.html](http://www.ag-careers.com/animal_health_careers.html).

Cargill® Experienced Opportunities – North America, <http://www.cargill.com/careers/search-apply/experienced-professionals/north-america/index.jsp> (search “Animal Nutrition”).

USA Jobs, <http://www.usajobs.gov>.

Global Transport Specialists, <http://www.globaltransport.com/>.

Bureau of Labor Statistics, <http://www.bls.gov/oco/cg/>.

Indeed.com, <http://www.indeed.com>.





# Ag-Biotech Career Match

## Student Handout

Match the career titles with their corresponding career descriptions. Write the letter for each career title in the table with the career descriptions.



Credit: USDA NRCS.

### Career Titles

<b>A</b>	Hydrologist	<b>I</b>	Sales/Business Development Manager
<b>B</b>	Purchasing Manager	<b>J</b>	Lab Facilities Construction
<b>C</b>	Federal Grain Inspector	<b>K</b>	HACCP Specialist
<b>D</b>	Quality Assurance Specialist	<b>L</b>	Agronomist
<b>E</b>	Feed Ration Developer	<b>M</b>	Transportation Specialist
<b>F</b>	Agricultural Attaché	<b>N</b>	Agricultural Establishment Inspector
<b>G</b>	Entomologist	<b>O</b>	Vertebrate Pest Management Specialist
<b>H</b>	Feed Operations Manager	<b>P</b>	Veterinary Toxicologist

Career Title Letter	Career Description
	Responsible for safety and maintenance programs, coordination of quality control and regulatory programs, personnel supervision, budgeting, and business plans for animal feed operations.
	Apply policies and develop procedures, minimum standards, and continuous improvement programs in the areas of HACCP (Hazard Analysis and Critical Control Points), product quality, product safety, and regulatory compliance. Ensure alignment to Customer, Region, BU, and Corporate requirements.
	Study the ecology of insects and their interactions in the world. Find ways to harness and control insects both beneficial and harmful to humankind. Work for government agencies in fields such as agriculture and food inspection, or teach and conduct research. Employed by insecticide and pest control companies.
	Inspect agriculturally related establishments for adherence to laws and environmental considerations concerning disposal of wastes and storage of products.

Career Title Letter	Career Description
	Treat water to ensure that it is safe to drink for animals and humans. Specialize in wells, rivers, streams, and reservoirs. Expert in harmful materials, chemicals, plant life, and microorganisms that could potentially harm a water supply used for drinking, irrigation, landscaping, farming, and everyday life in the city and beyond. Work in a lab testing for chemicals, on a computer monitoring automated systems and determining how to address problems, in the field reading and interpreting gauges and meters, in an office applying pertinent laws and regulations, or abroad building new water systems in developing countries.
	Build industrial lab and manufacturing spaces to ensure safety when handling dangerous equipment or toxic chemicals. May take union or employer-sponsored Occupational Safety and Health Administration safety training. Maintain a creative physical working environment and the overall appearance of the organization.
	Buy raw materials, machinery, equipment, supplies, and services used in feed production and required by business, industry, or government to produce goods or offer services.
	Strive to inform and educate the public, private practice veterinarians, and veterinary medical students about toxicologic hazards (e.g., biological, chemical, environmental, pharmaceutical, and radiological) to pets, livestock, and wildlife. Additionally, when feed is associated with animal illness, advise animal feed specialists to test for probable toxins.
	Help develop agricultural government programs and policy abroad working with embassies. Work with ministers of agriculture to secure policy and programs in other countries and protect agricultural interests.
	Work with field crop production and soils management to develop higher yields, better crop varieties, and higher quality products while maintaining or improving the environment.
	Analyze and inspect grain products and grade them on various federal standards that determine the price.
	Specialize in the transport and inspection of equipment or goods in connection with moving feed cargo or people. Includes rail transport inspectors, freight inspectors, car inspectors, rail inspectors, and other non-precision inspectors of other types of transportation vehicles. When transporting biological goods, special safety precautions are needed and are maintained by a variety of regulatory mechanisms. Work with all types of machines that transport items.
	Work for an American or international company. Responsible for market development and sales of company products. Candidate must have excellent relationship building skills, extensive integrator network, and entrepreneurial skill set to develop direct sales and an active dealer network. Travel required.
	Formulate rations for use by feed mixing companies that meet nutritional requirements for animals in a cost-effective manner.
	Responsible for inspecting, analyzing, and writing reports about production quality.
	Responsible for the lethal and non-lethal control of pests (e.g., rats and mice) that spread disease and contaminate food.



# Careers in the Ag-Biotech Field

## Student Handout

Career	Career Description
<b>Agricultural Association Executive<sup>1</sup></b>	Agricultural Association Executives are responsible for managing and analyzing programs and services provided by agricultural associations and vehicles for implementing financial, policy, insurance, and cooperative services.
<b>Agricultural Attaché<sup>1</sup></b>	Agricultural Attachés help develop agricultural government programs and policy abroad working with embassies. They work with ministers of agriculture to secure policy and programs in other countries and to protect agricultural interests.
<b>Agricultural Consultant<sup>1</sup></b>	Agricultural Consultants audit and appraise agricultural-related businesses and makes suggestions on improvements.
<b>Agricultural Corporation Executive<sup>1</sup></b>	Agricultural Corporation Executives direct corporation programs and manage financial and personnel decisions. Ultimately responsible for corporation feasibility and profitability.
<b>Agricultural Establishment Inspector<sup>1</sup></b>	Agricultural Establishment Inspectors inspect agriculturally related establishments for adherence to laws and environmental considerations concerning disposal of wastes and storage of products.
<b>Agricultural Lawyer<sup>1</sup></b>	Agricultural Lawyers focus on law as applied to agricultural contexts.
<b>Agriculturalist<sup>1</sup></b>	Agriculturalists are general scientists who deal with the art of cultivating the soil, producing crops, raising livestock, and preparing these products for human use and disposal.
<b>Agriculture Education Teachers<sup>2</sup></b>	Agricultural Science and Business Teachers prepare middle and high school students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems.
<b>Agriculture Engineer<sup>1</sup></b>	Agricultural Engineers design and develop systems, equipment, and products for agricultural production, food and feed processing, natural resources, conservation, environmental protection, and other biological systems.
<b>Agronomist<sup>1</sup></b>	Agronomists work with field crop production and soils management to develop higher yields, better crop varieties, and higher quality products while maintaining or improving the environment.
<b>Animal Nutritionist<sup>1,2</sup></b>	Animal Nutritionists study the absorption of and effects nutrients have on animal systems and find ways to improve or manipulate the nutritive health of animals. Animal nutrition is a science that combines chemistry, physics, biochemistry, mathematics, animal behavior, economics, and food processing with animal production techniques. Animal Nutritionists formulate diets for food animals, companion animals, and zoo animals.
<b>Animal Physiologist<sup>1</sup></b>	Animal Physiologists study the physical and chemical processes that occur in animals and the way these processes work together.

<b>Animal Scientist (FDA)<sup>5</sup></b>	<p><b>Sample Career Offering:</b></p> <ul style="list-style-type: none"> <li>• Conduct scientific reviews of complex animal nutritional, biochemical, and physiological data for use in the development and approval of new animal food ingredients. Deliver findings in written reports.</li> <li>• Conduct scientific reviews of data and prepare written scientific reports on the toxic principles of substances/contaminants present in animal food.</li> <li>• Review, comment, and offer opinions on technical aspects of programs, policies, and guidelines relating to medicated feeds.</li> <li>• Prepare documents related to potential or actual adverse effects of drugs used in feeds, or substances/contaminants present in animal food.</li> <li>• Confer with feed manufacturer representatives and others about various issues relating to the manufacture of medicated feeds, including but not limited to safe drug use, further mixing of feeds, and handling of drug carryover in feed.</li> </ul>
<b>Animal Scientist<sup>1</sup></b>	Animal Scientists conduct research to develop improved methods for feeding, housing, and breeding farm livestock and domestic pets.
<b>Biochemist<sup>2</sup></b>	Biochemists explore the chemical events that cause biological phenomena in living organisms. The knowledge that biochemists gain in their research provides a basic understanding of the marvelous workings of the vast array of life forms.
<b>Biological Engineer<sup>2</sup></b>	Biological engineering is a new, rapidly developing discipline that uses scientific principles involving the life sciences to create products and processes to meet human needs in a profitable, effective manner.
<b>Cash Grain Farmer<sup>1</sup></b>	Cash Grain Farmers produce grains for selling on a cash basis to mills, grain elevators, or businesses. Work on a cash basis, as opposed to a futures basis where prices are set at a predetermined point.
<b>Commodity Broker<sup>1</sup></b>	Commodity Brokers trade products and cash based on stock market and futures projections.
<b>Entomologist<sup>9</sup></b>	Entomologists are biological scientists who study insects. Some entomologists study the ecology of insects and their interactions in the world. Others direct their research toward finding ways to control insects harmful to humankind, while others explore the use of insect traits for our betterment (e.g., many human-made products include chitin). About one-third of all entomologists work for government agencies in fields such as agriculture and food inspection. Others are employed by colleges and universities to teach and conduct research. Insecticide companies, pest control companies, medical centers, and museums also employ entomologists.
<b>Farm Consultant<sup>4</sup></b>	<p><b>Sample Career Offering:</b></p> <ul style="list-style-type: none"> <li>• Reaching sales objective in defined market area.</li> <li>• Providing nutritional service to customers.</li> <li>• In-barn monitoring of production performance.</li> <li>• Selling key feeders on the benefit of management, health, and nutritional programs.</li> <li>• Increasing sales contacts through Feeder Meetings and demonstrations.</li> </ul>

<b>Federal Grain Inspector<sup>1</sup></b>	Grain Inspectors analyze and inspect grain products and grade them on various federal standards that determine the price.
<b>Feed Department Manager<sup>3</sup></b>	<b>Sample Career Offering:</b> Profitable, aggressive cooperative looking for experienced Feed Department Manager. Position will lead feed team in sales administration/training, budgeting, business plan, action plan, mill operation, marketing programs, inventory, margins, and profitability of the feed department. Competitive compensation and benefit program.
<b>Feed Mill Operator<sup>1</sup></b>	Feed Mill Operators manage all feed mill operations, including purchasing, milling, storing, and selling grain, while also ensuring that government standards are met. They are also responsible for mill personnel and business decision making.
<b>Feed Operations Manager<sup>3</sup></b>	<b>Sample Career Offering:</b> Aggressive ag retailer looking for experienced Feed Operations Manager. Position will be responsible for safety and maintenance programs, coordination of quality control and regulatory programs, personnel supervision, budgeting, and business plan for department.
<b>Feed Mill Production Manager<sup>3</sup></b>	<b>Sample Career Offering:</b> Cooperative looking for experienced Feed Mill Production Manager. Must have supervisory experience, understand mill efficiencies, distribution logistics, general feed milling procedures, and have strong leadership skills. Company is planning on increasing production 40% to meet demand. Excellent opportunity with competitive compensation and benefit package.
<b>Feed Ration Developer<sup>1</sup></b>	Feed Ration Developers formulate rations for use by feed mixing companies that meet nutritional requirements for animals in a cost-effective manner.
<b>Feedlot Manager<sup>1</sup></b>	Feedlot Managers oversee the buying and selling of feeder cattle, nutrition considerations, and environmental conditions of a feedlot.
<b>Field Sales Representative, Animal &amp; Feed Production<sup>1</sup></b>	Sales Representatives sell animal and feed products to businesses, farmers, retailers, or any company that uses agricultural products.
<b>Food Inspector<sup>1</sup></b>	Food Inspectors are responsible for inspection at shipping and terminal points; determination of grade, quality and condition of meat and produce; observation of carriers and cargo at loading and sealing points; and administration of certificates and records.
<b>Food Law Lawyer<sup>4</sup></b>	<b>Sample Career Offering:</b> Provide food law counseling to U.S. and global businesses, including counsel on the application of food laws and regulation (primarily U.S. laws) to U.S. and global operations; preventive law training and education; and guidance on compliance with company policies and procedures.
<b>Food Process Engineer<sup>2</sup></b>	Food Process Engineers (FPEs) research and develop new and existing products and processes.
<b>Food Safety Specialist<sup>2</sup></b>	Food Safety Specialists preserve our food supply by assuring that it is wholesome, sound, and safe.
<b>Food Scientist<sup>2</sup></b>	Food Scientists preserve our food supply by assuring its flavor, color, texture, nutritional quality, and safety.

<b>Global Food Safety, Quality and Regulatory Director<sup>4</sup></b>	<b>Sample Career Offering:</b> This position will manage the execution of the Animal Nutrition Food Safety, Quality, and Regulatory (FSQR) strategies. Oversee Business Unit (BU) work to ensure compliance with Corporate Food Safety Policies and applicable regulations. Lead the corporate FSQR organization through its linkages to the QRA leads embedded in each regional business.
<b>Grain Elevator Operator<sup>1</sup></b>	Grain Elevator Operators purchase grain from farmers and store it until purchased or shipped to companies or industries that use the grain in foods, feeds, or oils.
<b>HACCP Specialist<sup>4</sup></b>	<b>Sample Career Offering:</b> Our Northeast Region in the U.S. is seeking a HACCP Specialist. This position is accountable for applying policies and developing procedures, minimum standards, and continuous improvement programs for the Region in the areas of HACCP (Hazard Analysis and Critical Control Points), product quality, product safety, and regulatory compliance. The specialist must ensure alignment to Customer, Region, Business Unit, and Corporate requirements through a cost-competitive and engaged Quality Management organization.
<b>Hydrologist/Water Quality Specialist<sup>8</sup></b>	Water Quality Specialists treat water to ensure that it is safe to drink for animals and humans. They specialize in wells, rivers, streams, and reservoirs. They are experts in harmful materials, chemicals, plant life, and microorganisms that could potentially harm a water supply, whether used for drinking, irrigation, landscaping, farming, everyday life in the city and more. Hydrologists can be found in a lab testing for chemicals, on a computer monitoring automated systems and determining how to address problems, in the field reading and interpreting gauges and meters, in the office applying pertinent laws and regulations, or abroad building new water systems in developing countries. Public health practices have greatly improved, but water-borne diseases like cholera are still around and Water Quality Specialists continue to work on new methods to keep people safe.
<b>Lab Facilities Construction<sup>7</sup></b>	In addition to basic construction skills, building safe industrial lab and manufacturing spaces requires specialized training and experience. Workers who use dangerous equipment or handle toxic chemicals usually receive specialized safety training. Apprenticed laborers who remove hazardous materials are required to take union or employer-sponsored Occupational Safety and Health Administration (OSHA) safety training. Facility workers maintain a creative physical working environment and maintain the overall appearance of an organization.
<b>Nutritionist/Dietician<sup>2</sup></b>	Nutritionists/dietitians help people look and feel well by making the connection between food, nutrition, and health.
<b>Production Supervisor – Animal Nutrition<sup>4</sup></b>	Production Supervisors supervise other employees as well as manage programs and processes related to the safe manufacturing and shipment of goods.
<b>Purchasing Manager<sup>1</sup></b>	Purchasing Managers buy raw materials, machinery, equipment, supplies, and services required by business, industry, or government to produce goods or offer services.
<b>Quality Assurance Specialist<sup>1</sup></b>	Quality Assurance Specialists are responsible for inspecting, analyzing, and writing reports about production quality.
<b>Quality Control Supervisor<sup>1</sup></b>	Quality Control Supervisors inspect and enforce rules on matters such as health, safety, food, licensing, or finance.
<b>Range Manager<sup>2</sup></b>	Range Managers care for our country's vast rangelands. From those lands, they produce a sustained yield of such things as plants for forage, wildlife for aesthetics and hunting, meat, and clean water.

<b>Research Engineer – Agricultural<sup>1</sup></b>	Agricultural Engineers research and design systems, equipment, and products for agricultural production, food and feed processing, natural resource conservation, environmental protection, and other biological systems.
<b>Sales/Business Development Manager<sup>3</sup></b>	<b>Sample Career Offering:</b> A Netherlands based company looking for experienced National Sales/Business Development Manager to be located in Midwest United States. Responsible for market development and sales of state-of-the-art Electronic Sow Feeding Systems. Candidate must have excellent relationship building skills, extensive integrator network, and entrepreneurial skill set to develop direct sales and an active dealer network. Travel required.
<b>State Director of Nutrition (California)<sup>3</sup></b>	<b>Sample Career Offering:</b> The State Director of Nutrition is responsible for providing tech support to all sales and producers. Also responsible for managing promotional and educational activities, managing relationships with independent consulting nutritionists, and overseeing design and implementation of Quality Assurance/Quality Control (QA/QC) programs. Masters degree or PhD with minimum of 5 years related industry experience. Fluency in Spanish helpful.
<b>Swine Account Manager<sup>4</sup></b>	<b>Sample Career Offering:</b> The Swine Account Manager carries primary responsibility for sales of our products, consulting, and providing technical support to swine producers in an area. Our customers are looking for competent people who have a passion for agribusiness. An active interest in the business world and a desire to be recognized for success by peers and customers is essential. We will provide you with extensive training and coaching to help you succeed. This is a unique career opportunity in a fast paced working environment.
<b>Transportation Specialist<sup>6</sup></b>	Transportation Specialists specialize in the transport and inspection of equipment or goods in connection with moving cargo or people. Includes rail transport inspectors, freight inspectors, car inspectors, rail inspectors, and other non-precision inspectors of other types of transportation vehicles. When transporting biological goods, special safety precautions are needed and regulations are enacted to maintain these precautions. If you like machines that transport items, this is a career for you.

#### Endnotes

<sup>1</sup> Retrieved from <https://www.ffa.org/APPCTR/Pages/CareerExplorer.aspx>.

<sup>2</sup> Retrieved from <http://www.agriculture.purdue.edu/USDA/careers/index.html>.

<sup>3</sup> Retrieved from [http://www.ag-careers.com/animal\\_health\\_careers.html](http://www.ag-careers.com/animal_health_careers.html).

<sup>4</sup> Retrieved from <http://www.cargill.com/careers/search-apply/experienced-professionals/north-america/index.jsp> (search “Animal Nutrition”).

<sup>5</sup> Retrieved from <http://www.usajobs.gov/GetJob/ViewDetails/2411539>.

<sup>6</sup> Retrieved from <http://www.globaltransport.com/>.

<sup>7</sup> Retrieved from <http://www.bls.gov/oco/cg/cgs003.htm>.

<sup>8</sup> Retrieved from <http://www.indeed.com/salary/q-Environmental-Engineer-Water-Quality-Specialist-Irvine,-CA.html>.

<sup>9</sup> Retrieved from <http://www.bls.gov/oco/ocos047.htm>.



# Ag-Biotech Career Match

## Teacher Answer Key



Career Title Letter	Career Description
<p><b>H</b></p> <p><b>Feed Operations Manager</b></p>	<p>Responsible for safety and maintenance programs, coordination of quality control and regulatory programs, personnel supervision, budgeting, and business plans for animal feed operations.</p>
<p><b>K</b></p> <p><b>HACCP Specialist</b></p>	<p>Apply policies and develop procedures, minimum standards, and continuous improvement programs in the areas of HACCP (Hazard Analysis and Critical Control Points), product quality, product safety, and regulatory compliance. Ensure alignment to Customer, Region, BU, and Corporate requirements.</p>
<p><b>G</b></p> <p><b>Entomologist</b></p>	<p>Study the ecology of insects and their interactions in the world. Find ways to harness and control insects both beneficial and harmful to humankind. Work for government agencies in fields such as agriculture and food inspection, or teach and conduct research. Employed by insecticide and pest control companies.</p>
<p><b>N</b></p> <p><b>Agricultural Establishment Inspector</b></p>	<p>Inspect agriculturally related establishments for adherence to laws and environmental considerations concerning disposal of wastes and storage of products.</p>
<p><b>A</b></p> <p><b>Hydrologist/ Water Quality Specialist</b></p>	<p>Treat water to ensure that it is safe to drink for animals and humans. Specialize in wells, rivers, streams, and reservoirs. Expert in harmful materials, chemicals, plant life, and microorganisms that could potentially harm a water supply used for drinking, irrigation, landscaping, farming, and everyday life in the city and beyond. Work in a lab testing for chemicals, on a computer monitoring automated systems and determining how to address problems, in the field reading and interpreting gauges and meters, in an office applying pertinent laws and regulations, or abroad building new water systems in developing countries.</p>
<p><b>J</b></p> <p><b>Lab Facilities Construction</b></p>	<p>Build industrial lab and manufacturing spaces to ensure safety when handling dangerous equipment or toxic chemicals. May take union or employer-sponsored Occupational Safety and Health Administration safety training. Maintain a creative physical working environment and the overall appearance of the organization.</p>
<p><b>B</b></p> <p><b>Purchasing Manager</b></p>	<p>Buy raw materials, machinery, equipment, supplies, and services used in feed production and required by business, industry, or government to produce goods or offer services.</p>
<p><b>P</b></p> <p><b>Veterinary Toxicologist</b></p>	<p>Strive to inform and educate the public, private practice veterinarians, and veterinary medical students about toxicologic hazards (e.g., biological, chemical, environmental, pharmaceutical, and radiological) to pets, livestock, and wildlife. Additionally, when feed is associated with animal illness, advise animal feed specialists to test for probable toxins.</p>

Career Title Letter	Career Description
<p style="text-align: center;"><b>F</b></p> <p style="text-align: center;"><b>Agricultural Attaché</b></p>	<p>Help develop agricultural government programs and policy abroad working with embassies. Work with ministers of agriculture to secure policy and programs in other countries and to protect agricultural interests.</p>
<p style="text-align: center;"><b>L</b></p> <p style="text-align: center;"><b>Agronomist</b></p>	<p>Work with field crop production and soils management to develop higher yields, better crop varieties, and higher quality products while maintaining or improving the environment.</p>
<p style="text-align: center;"><b>C</b></p> <p style="text-align: center;"><b>Federal Grain Inspector</b></p>	<p>Analyze and inspect grain products and grade them on various federal standards that determine the price.</p>
<p style="text-align: center;"><b>M</b></p> <p style="text-align: center;"><b>Transportation Specialist</b></p>	<p>Specialize in the transport and inspection of equipment or goods in connection with moving feed cargo or people. Includes rail transport inspectors, freight inspectors, car inspectors, rail inspectors, and other non-precision inspectors of other types of transportation vehicles. When transporting biological goods, special safety precautions are needed and are maintained by a variety of regulatory mechanisms. Work with all types of machines that transport items.</p>
<p style="text-align: center;"><b>I</b></p> <p style="text-align: center;"><b>Sales/ Business Development Manager</b></p>	<p>Work for American or international company. Responsible for market development and sales of company products. Must have excellent relationship building skills, extensive integrator network, and entrepreneurial skill set to develop direct sales and an active dealer network. Travel required.</p>
<p style="text-align: center;"><b>E</b></p> <p style="text-align: center;"><b>Feed Ration Developer</b></p>	<p>Formulate rations for use by feed mixing companies that meet nutritional requirements for animals in a cost-effective manner.</p>
<p style="text-align: center;"><b>D</b></p> <p style="text-align: center;"><b>Quality Assurance Specialist</b></p>	<p>Responsible for inspecting, analyzing, and writing reports about production quality.</p>
<p style="text-align: center;"><b>O</b></p> <p style="text-align: center;"><b>Vertebrate Pest Management Specialist</b></p>	<p>Responsible for the lethal and non-lethal control of pests (e.g., rats and mice) that spread disease and contaminate food.</p>