**The relationship between agriculture and animals**

**Pillar 3 B. Discover specific strategies farmers use to keep animals healthy and safe in livestock production operations**

(9th – 12th Grade)

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| **Website:** <http://old.pork.org/filelibrary/youthpqaplus/2014/ypqahandbook.pdf>  **Hands On:** <http://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=564&author_state=0&grade=9&search_term_lp=livestock>  **Video:** Growing Today for Tomorrow <https://www.youtube.com/watch?v=ym6biFbr3GQ> |

**Agricultural Production Regions in the United States**

**Purpose**

Students will investigate US crop and livestock production and analyze the relevance of land use models in contemporary agricultural production.

**Materials**

* [*Growing Today for Tomorrow*](https://www.youtube.com/watch?v=ym6biFbr3GQ) video
* [World Population Clock](http://www.census.gov/popclock/)

**Activity 1**

* [USDA Farm Resource Regions](https://www.ers.usda.gov/webdocs/publications/42298/32489_aib-760_002.pdf?v=42487)
* *US Farm Resource Regions Map*, 1 per student
* [Food and Farm Facts](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=22&search_term_cr_cr_cr_cr_cr=facts)booklet and map insert from American Farm Bureau Federation
* [ERS State Fact Sheets](http://www.ers.usda.gov/data-products/state-fact-sheets.aspx) (select a state and click on “Top Commodities” link)
* [State Agricultural Facts](http://agclassroom.org/kids/ag_facts.htm)
* Colored pencils

**Activity 2**

* Map #1, American Agriculture in 1922 from [*40 Maps That Explain Food in America*](http://www.vox.com/a/explain-food-america)

**Activity 3**

* Blank sheets of letter-sized white paper, 1 per student

**Essential Files (maps, charts, pictures, or documents)**

* [Rural Land Use Models Handout](http://naitc-api.usu.edu/media/uploads/2017/03/03/rural_land_use_models.pdf)
* [US Farm Resource Regions Map](http://naitc-api.usu.edu/media/uploads/2017/02/27/US_Farm_Region_Map_blank_1.pdf)

**Vocabulary**

**Boserup, Ester:** Danish agricultural economist who observed human-environment relationships

**Census of Agriculture:** a complete accounting of US farms and ranches and the people who operate them; taken once every five years by US Department of Agriculture’s (USDA) National Agricultural Statistics Service (NASS)

**Farm Resource Region:** US regions map constructed by US Department of Agriculture’s (USDA) Economic Research Service to portray geographic distribution of US farm production

**Sauer, Carl:** an influential cultural geographer who believed that humans control nature and develop their cultures out of that control

**Commodity:** a raw material or primary agricultural product that is bought and sold as an input in the production of goods; the quality of a given commodity may differ slightly, but it is essentially uniform across producers

**Commodity chain:** the production, sale, and distribution points of a raw agricultural product (e.g. corn, wheat, cattle, coffee) that is used to make consumer products

**Family farm:** a farm in which ownership and control of the farm business is held by a family of individuals related by blood, marriage, or adoption

**Farm:** any place from which $1,000 or more of agricultural products were produced and sold during the year

**Von Thünen, Johann Heinrich:** farmer and economist who studied the relationships between land costs and transportation costs

**Did you know? (Ag Facts)**

* The current world population is approximately 7.3 billion people. By 2050, it is predicted that world population could reach more than 9 billion people.1
* The top five states in 2012 agriculture sales were California, Iowa, Texas, Nebraska, and Minnesota, respectively.2
* The state of Texas has the most farms and largest farm acreage of all 50 states.2
* Cattle and calves ranked highest in terms of market value of US livestock agriculture products sold in 2012; corn ranked first for crop products sold.2

**Background Agricultural Connections**

The US farmer is the most productive in the history of the world. Interestingly, The [World Factbook of the CIA](https://www.cia.gov/library/publications/the-world-factbook/) reports that farming, fishing, and forestry represent only 0.7% of the US labor force. Food is more affordable, more abundant, and is safer in the United States than in any other developed country in the world. Although there is a trend toward fewer farms producing an increasing share of agricultural products in this country, US agriculture is positioned to provide for food and fiber needs on a global scale.

**Interest Approach – Engagement**

1. [](https://www.youtube.com/watch?v=ym6biFbr3GQ)
2. Show students the video [*Growing Today for Tomorrow*](https://www.youtube.com/watch?v=ym6biFbr3GQ). Let them watch it the first time without taking notes (it is brief—3 minutes, 30 seconds).
3. Watch it a second time and instruct students to take notes on some of the specific information presented.
4. Following the viewings, ask students the following questions:
   * What did you find most interesting about the information presented in the video?
   * What agricultural challenges face our planet in the coming years?
   * Will farmers be able to keep pace with agricultural production in regards to a growing world population? *(Show the* [*World Population Clock*](http://www.census.gov/popclock/)*)*

**Procedures**

**Activity 1:**

1. Distribute a blank *US Farm Resource Regions Map* to each student, and assign one of the nine farm resource regions to each student.
2. Either project the [USDA Farm Resource Regions](https://www.ers.usda.gov/webdocs/publications/42298/32489_aib-760_002.pdf?v=42487) PDF for student viewing, or distribute a printed copy of the regions to each student. Using this map as well as the [Food and Farm Facts](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=22&search_term_cr_cr_cr_cr_cr=facts) map insert from Farm Bureau, the [ERS State Fact Sheets](http://www.ers.usda.gov/data-products/state-fact-sheets.aspx) and/or the [State Agricultural Facts](http://agclassroom.org/kids/ag_facts.htm), instruct students to identify the five major agricultural products produced in their assigned region.
3. Using their blank maps, instruct students to draw images in their assigned farm resource regions that depict the five products identified in Step 3. Students should create legends for their maps.
4. Use a Think-Pair-Share strategy and ask students to discuss the following question with their partner: What geographic factors influence the production of the major crops of your farm resource region?
5. Conduct a class discussion in which students share their thoughts on the aforementioned question. Also ask students, “If you could only eat foods *local* to your farm resource region, what foods would you miss the most from those you typically eat?”

**Activity 2:**

1. Use a projection system or print copies of Map #1, American Agriculture in 1922 from [*40 Maps That Explain Food in America*](http://www.vox.com/a/explain-food-america). Instruct students to compare the agricultural products currently produced in their assigned regions to the products produced in 1922.
2. Ask students to share their responses to the following questions:
   * What specific agricultural products have changed over the past nine decades?
   * Why has the production of certain agricultural products of a particular region changed?
   * What forecasts regarding future agricultural production might be made in terms of economics, labor, and geographical locations?

**Activity 3:**

1. Review the three rural land use models described in the background information. This information is also provided in the *Rural Land Use Models*handout, which you may choose to provide to students as a reference.
2. With the same partners from Activity 1—or new partners, if desired—instruct students to use sheets of white paper to answer the following questions (students may use words and/or pictures):
   1. Considering Carl Sauer’s cultural history theory, what human-environment impacts are evident in regards to the agricultural products produced in your farm resource regions?
   2. What agricultural production technologies are responsible for supporting Ester Boserup’s theory of population and food supply?
   3. Draw a diagram of von Thünen’s rural land use model and identify where the agricultural products of your regions fit into that model by drawing icons of the products in their respective rings.
3. Conduct a class discussion in which students can share their thoughts on questions 1 and 2 above. Ask students, “Does von Thünen’s model of rural land use still apply to contemporary agricultural production in your farm resource regions? Why or why not?”

**Concept Elaboration and Evaluation**

* Production and distribution of food is affected by the relationships between geography, politics, and economics.
* Physical geography is closely connected to agricultural practices.
* Agricultural production regions can be associated with ecological regions or bioclimatic zones.

**Enriching Activities**

* Direct students to the [2012 Census Ranking of Market Value of Ag Products Sold](https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Rankings_of_Market_Value/). Instruct students to look at specific states that are included in their assigned farm resource regions. How do the market values of these products compare to the production numbers of these same projects?
* Using a projection system, show students Map #6, Which Crops are Harvested Where?, from [*40 Maps That Explain Food in America*](http://www.vox.com/a/explain-food-america). What might be the risks and/or benefits of growing monocultures such as corn and soybeans?
* Look at the [Level II Ecoregions of North America](ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/cec_na/NA_LEVEL_II.pdf) map provided on the [EPA](https://www.epa.gov/eco-research/ecoregions-north-america) website with your students. Using their *US Farm Resource Region Maps*, instruct students to identify the main ecological region(s) associated with their assigned farm resource region and label it on their map. What relationships exist between the ecological regions and the agricultural products produced in students’ specific farm resource regions?
* Using a projection system, show students Map #5, Where are People Making Money from Crops and Where from Livestock?, from [*40 Maps That Explain Food in America*](http://www.vox.com/a/explain-food-america). Are there geographical factors that influence this economic activity?

**Suggested Companion Resources**

* [2012 Census of Agriculture Infographics](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=759) (Poster, Map, Infographic)
* [40 Maps that Explain Food in America](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=536) (Poster, Map, Infographic)
* [Interactive Map Project](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=452) (Poster, Map, Infographic)
* [Growing Today for Tomorrow Video](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=411) (Multimedia)
* [How Does it Grow? Video Series](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=472) (Multimedia)
* [Planet Money Makes a T-shirt](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=567) (Multimedia)
* [Population, Sustainability, and Malthus: Crash Course World History video](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=760) (Multimedia)
* [Food and Farm Facts Booklet](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=22) (Booklets & Readers)
* [Ag Census Web Maps](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=758) (Website)

**Sources/Credits**

1. <http://www.un.org/en/development/desa/news/population/2015-report.html>
2. <https://www.agcensus.usda.gov/Publications/2012/>