

Agricultural Biotechnology (2021-)

Assess factors that have influenced the evolution of biotechnology in agriculture. [AFNR.HS.2.1](#)

- a** Summarize the evolution of biotechnology in agriculture. [AFNR.HS.2.1.A](#)
- b** Summarize current work in biotechnology and the added value to agriculture and society. [AFNR.HS.2.1.B](#)
- c** Compare and contrast the benefits and risks of biotechnology and conventional approaches to improving agriculture. [AFNR.HS.2.1.C](#)

Evaluate the scope and implications of bioethics, law, and public perceptions of biotechnology in agriculture. [AFNR.HS.2.2](#)

- a** Compare and contrast global regulatory systems for biotechnology in agriculture. [AFNR.HS.2.2.A](#)
- b** Summarize the emergence, evolution, and implications of bioethics associated with biotechnology in agriculture. [AFNR.HS.2.2.B](#)
- c** Describe the significance and impacts of legal issues related to biotechnology in agriculture. [AFNR.HS.2.2.C](#)
- d** Investigate the impact of public perceptions on the application of biotechnology in different agriculture, food and natural resources (AFNR) systems. [AFNR.HS.2.2.D](#)

Apply appropriate laboratory skills to complete tasks in a biotechnology research and development environment (e.g., standard operating procedures, record keeping, aseptic technique, equipment maintenance). [AFNR.HS.2.3](#)

- a** Maintain and interpret records documented in a laboratory to ensure data accuracy and integrity (e.g., avoid bias, record any conflicts of interest, avoid misinterpreted results). [AFNR.HS.2.3.A](#)
- b** Categorize and identify laboratory equipment according to its purpose in scientific research. [AFNR.HS.2.3.B](#)
- c** Apply standard operating procedures for the safe handling, management, and disposal of biological and chemical materials in a laboratory according to standard operating procedures. [AFNR.HS.2.3.C](#)
- d** Identify the steps necessary to perform simple genetic modification. [AFNR.HS.2.3.D](#)

Apply concepts of biotechnology to solve problems in Agriculture, Food, and Natural

- a** Identify biotechnology principles, techniques, and processes to create transgenic species through genetic engineering. [AFNR.HS.2.4.A](#)

Resources (AFNR) systems (e.g., bioengineering, food processing, waste management, horticulture, forestry, livestock, crops). [AFNR.HS.2.4](#)

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- b Explain biotechnology principles, techniques, and processes to enhance the production of food through the use of microorganisms and enzymes.** [AFNR.HS.2.4.B](#)
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- c Apply biotechnology principles, techniques, and processes to protect the environment and maximize use of natural resources (e.g., biomass, bioprospecting, industrial biotechnology).** [AFNR.HS.2.4.C](#)
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- d Apply biotechnology principles, techniques, and processes to enhance plant and animal care and production (e.g., selective breeding, pharmaceuticals, biodiversity).** [AFNR.HS.2.4.D](#)
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- e Apply biotechnology principles, techniques and processes to produce biofuels (e.g., fermentation, transesterification, methanogenesis).** [AFNR.HS.2.4.E](#)
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- f Apply biotechnology principles, techniques, and processes to improve waste management (e.g., genetically modified organisms, bioremediation).** [AFNR.HS.2.4.F](#)