



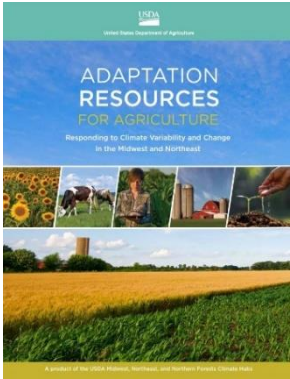
Southeast Climate Hub

U.S. DEPARTMENT OF AGRICULTURE

Adaptation Resources for Agriculture

A Case Study: Southeastern Mississippi Poultry and Beef Farm

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The [USDA Climate Hubs](#) and USDA NRCS jointly developed the [Adaptation Resources for Agriculture Workbook](#) to support producers, service providers, and educators managing climate change. The workbook helps producers consider both short-term adaptive management actions (<5 yrs) and long-range strategic plans (5 to 20 yrs, subject to farm type). This workbook promotes adaptation through multiple resources, including a “menu” of adaptation strategies/approaches and example tactics for cropping and forages, confined livestock, grazing, orchards, and small fruit and vegetable production systems. Recent efforts by the USDA Climate Hub NRCS Liaisons focused on increasing the number of examples and documenting them as Case Studies. These Case Studies demonstrate producers using the **5-step process** in the workbook to document their management choices to reduce climate change impacts on their operations.

Southeastern Mississippi Poultry and Beef Farm

The five-step adaptation workbook process was tested using a 90-acre beef and poultry farm in southeastern Mississippi. Cattle/calves are a \$282 million industry in Mississippi and include nearly one million head across almost 16,000 farms. Mississippi’s \$2.42 billion poultry/egg industry includes 1,237 broiler farms and 234 farms with 100-plus egg layers. The farming operation in this case study includes six commercial broiler houses on 10 acres, pasture on 60 acres, and woodlands on 10 acres. Family income is solely dependent on poultry and beef cattle production. The poultry operation sells five flocks of commercial broilers (~460,000 total heads) per year. There are ~40 head of beef cattle on the property with plans to expand to 50 head. Plans also include clearing an additional five acres of woods to increase available pastureland.

1 DEFINE: The management goals for this southeastern Mississippi poultry farm are to increase family income by reducing cooling water use during the summer, using poultry litter more efficiently, improving bird weight gain, reducing feed conservation ratio, and reducing labor requirements. In addition, the management goals for the beef production farm include increasing herd size, matching genetics and forage programs to climate, improving soil conditions, establishing paddock grazing to improve forage efficiency, and reducing the farm’s overall environmental footprint.

2 ASSESS: Climate change and variability have the potential to affect poultry and beef operations in several ways. These changes for poultry farms include more days of extreme heat that will require more energy and water to keep the birds cool and reduce heatstroke. Keeping fewer birds to reduce heat losses will also reduce income. For beef cattle systems, the most significant impact would be changing rainfall patterns (heavier rain events followed by more extended dry periods) during the growing season that negatively impact erosion and forage quality and

quantity. In addition, more days of extreme heat will increase stress on cattle and forage, especially during droughts. This stress will result in slower weight gain, longer times for calves to reach market weight, and additional costs for supplemental feeding.



Litter from the poultry houses is used to fertilize pastures grazed by beef cattle

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3 EVALUATE: What management challenges or opportunities may occur due to climate change? In the table below, management challenges and opportunities that may occur due to climate change are recorded with the feasibility of meeting those management objectives under the current farm management objective listed.

Step 3: EVALUATE Management Objectives Given Projected Impacts and Vulnerabilities			
Land Unit	Objectives	Challenges to Meeting Objective with Climate Change	Opportunities for Meeting Objective with Climate Change
Poultry Farm	Increase poultry production and income	<p><i>More water will be needed to alleviate increased heat stress on the birds</i></p> <p><i>More days with extreme heat will increase the heat load in poultry houses and require additional electricity</i></p>	Upgrading facilities with new feeder and water systems will lead to better environmental conditions for the flock, increased sustainability, and a smaller carbon footprint through reduced water usage
Beef Farm	Improve pasture and livestock production	<p><i>Changing rainfall patterns and more days with extreme heat will increase stress on animals and forage, especially during droughts</i></p>	<p>Improved quality, quantity, and sustainability of forages when species are adaptive</p> <p>A longer growing season could result in increased forage consumption and growth duration</p>

4 IDENTIFY: The fourth step is to brainstorm tactics farmers can implement to enhance a farm's ability to adapt to climate change and meet management goals. For example, tactics for the poultry farm include 1) taking annual litter samples to determine the appropriate amount to apply to pastures, 2) installing a sprinkler system that uses less water, and 3) replacing brooders with modern direct-spark infrared brooders. Cattle farm tactics include 1) improving soils with timely litter applications to increase forage quality and herd size, 2) matching forage program and livestock genetics to climate change, and 3) intensifying pasture management with

cross-fencing, paddock grazing, and shelters to better utilize pastureland and increase forage quality and quantity.

5 MONITOR: As the climate changes, this Mississippi beef and poultry farm will continually monitor their management decisions and how those decisions impact challenges and opportunities in production agriculture and farm health. Specifically, for the poultry farm, they will 1) measure and monitor feed conversion ratios and average

flock market weight to determine the effectiveness of feeding systems, and 2) record water meter usage and heat-related deaths to determine the effectiveness of new water systems. Monitoring on the beef farm will include 1) recording and comparing herd size weight gains and related deaths for different genetic groups, 2) recording the start and end of the grazing season to see if it is getting longer, 3) measuring and comparing weights and fiber contents of hay bales between years, and 4) tracking annual costs of hay and supplements for comparison between years.

The Take-Away

Changing rainfall patterns and more days with extreme heat are some of the significant challenges faced by farmers in Mississippi. However, responding to changing climatic conditions through adaptive forage crop and breed selections, upgrading facilities for more efficient and better environmental conditions, and monitoring how these changes impact livestock weights and health and forage quality and production will be crucial to building resilience to changing climate conditions and assessing the benefits of these measures.

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