

# Weather and Climate Considerations: Dairy

## AGRICULTURAL AND NATURAL RESOURCE CONSERVATION



How does the changing climate impact dairy operations, and what can dairy farmers do to adapt?

### Elements of dairy that are changing

Increased heat stress in dairy livestock can reduce feed intake, milk production, and livestock fertility. For a Southern Pennsylvania farm, average annual losses in milk production from excess heat<sup>1</sup> were projected to be 1% to 2% by mid-century, and as much as 7% by 2100. Increasing the cooling capacity of existing barns, and using modeled temperature projections when planning new structures can avoid losses.

Risk of soil erosion, compaction, and nutrient loss will increase. Increased rainfall amounts and storm intensities could increase field nutrient losses as much as 40% by mid-century<sup>2</sup> and 87% by 2100. The use of winter cover crops and double crops can maintain ground cover for most of the year, which can increase crop uptake, and reduce leaching and surface run-off. Routing water away from manure containment structures will remain important.

Pasture production will likely change. Summer production might decrease due to more heat and drought stress, while cool season winter pasture production may see increases due to warmer and wetter winters. In the Northeast, opportunities to extend the grazing season will increase.

Control of weeds, invasives, and pests may become more challenging. Warmer winters will likely allow more southern weeds and pests to survive and thrive.

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Hertzler cows grazing in springtime. Image by Kathy Soder, ARS.

### Changes in our climate



Average temperatures are going up. Temperatures could increase 3 – 6 °F by mid-century (2041-2070).



More days with temperatures > 95 °F increase animal heat stress.



More rainfall, especially in winter and spring.



More heavy downpours are increasing runoff and flooding.



The growing season is getting longer.



Brown Swiss cows at Shelburne Farms.

#### Climate projections from the 2014 National Climate Assessment

1. Rotz CA, et al. (2016) Farm simulation can help dairy production systems adapt to climate change. In: Hatfield J, Fleisher D (eds) *Advances in Agricultural Modeling*, Vol. 7.

2. Rotz CA, et al. (2016) Evaluating greenhouse gas mitigation and climate change adaptation in dairy production using farm simulation. *Trans ASA*