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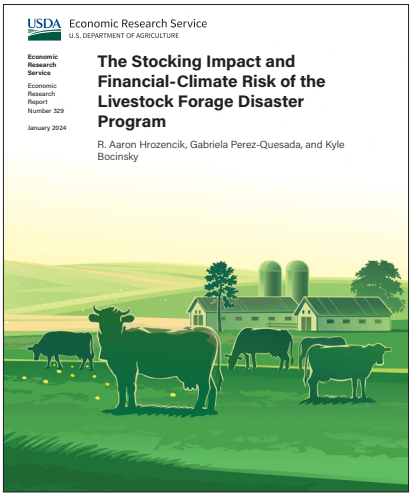
The Stocking Impact and Financial-Climate Risk of the Livestock Forage Disaster Program

R. Aaron Hrozencik, Gabriela Perez-Quesada, and Kyle Bocinsky



What Is the Issue?

Drought conditions, depending on the severity, extent, and duration, can cause a range of adverse impacts to the U.S. agricultural sector, from diminished crop yields and grazing conditions to widespread crop failures. The effects of drought are particularly pronounced for livestock producers as many of their operations rely on precipitation to grow forage crops to feed their herd. The U.S. Department of Agriculture (USDA) operates a range of programs designed to help mitigate the costs imposed by drought on livestock producers. Among these programs, the USDA, Farm Service Agency's (FSA) Livestock Forage Disaster Program (LFP) provides payments to producers whose forage production is diminished by drought. Despite the program disbursing more than $12 billion (in 2022 dollars) to producers between 2008 and 2022, no analysis has been conducted assessing how the program affects livestock producer herd retention and liquidation decisions. LFP also constitutes a potential financial-climate risk for the Federal Government (i.e., budgetary risks associated with administering programs and policies) as climate change is expected to increase the frequency and severity of drought conditions.

What Did the Study Find?

- The change in county beef cattle herd size in drought affected counties that received LFP payments was the same as it was in counties with less severe drought that did not receive an LFP payment.
- Modeling results suggest that program payments allow beef cattle producers in drought affected regions to make similar herd stocking and liquidation decisions as producers in regions experiencing less severe drought.
- In the moderating and middle-of-the-road greenhouse gas (GHG) emission scenarios, modeling results indicate that Federal Government expenditures on LFP will increase by 45 percent and 65 percent (in 2022 dollars), respectively, by the end of the 21st century compared with average expenditures between 2014 and 2022.

- Under high and accelerating emission scenarios, results suggest that Federal Government expenditures on the program will increase by more than 100 percent (in 2022 dollars) by the end of the 21st century compared with average expenditures between 2014 and 2022.
- How drought is defined and possibly updated over time under a changing climate could significantly alter the modeled financial-climate risk of LFP.

How Was the Study Conducted?

The study leveraged a mix of survey, administrative, and climatic data to assess the financial-climate risk of the Livestock Forage Disaster Program (LFP) and determine if the program achieved similar livestock herd retention and liquidation outcomes in drought-affected program-eligible counties as in counties not eligible for the LFP. Specifically, administrative data obtained from the USDA, Farm Service Agency on county-level program payments and eligibility periods were combined with survey data collected by USDA, National Agricultural Statistics Service (NASS) on county-level beef cattle herd size and data characterizing county-level drought conditions reported by the U.S. Drought Monitor. These data were used to sort counties into groups that were eligible for LFP versus those counties that were nearly eligible for the program. Aggregate county herd size outcomes for beef cattle were then compared between these two groups using a matching panel data econometric model to estimate how subsequent herd sizes compare between the two groups.

To model the financial-climate risk of LFP, this report used outputs from an ensemble of climate models to project future drought conditions under a range of emission scenarios. These modeling outputs were combined with econometric estimates of the relationship between county-level LFP payments and herd sizes based on different program eligibility thresholds. Climate projections and econometric model estimates were used together to simulate future program payments across a range of emission scenarios and methodologies for defining drought.