



U.S. DEPARTMENT OF AGRICULTURE



USDA AGRI-FOOD SUPPLY CHAIN ASSESSMENT: PROGRAM AND POLICY OPTIONS FOR STRENGTHENING RESILIENCE



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Introduction

As a nation, we are fortunate to have a highly productive agricultural system, a vigorous private agribusiness sector, extensive infrastructure, and supportive public policies and institutions that together work to provide a dependable, affordable, and diverse food supply. However, recent events – especially the COVID-19 pandemic and the on-going pandemic recovery – have revealed serious cracks in this system. Addressing these vulnerabilities to strengthen the resilience of our country’s agri-food supply chains is what this report is about.

As we work to address these vulnerabilities, there are at least two timeframes that must be considered in the context of U.S. agri-food supply chain challenges. The first is an immediate timeframe that involves addressing the impact of the current heavy demand outstripping current supply as the country and world reemerge from the economic disruptions caused by the pandemic. The second timeframe is longer term and relates to weak links in the supply

chain that existed even before the pandemic (although not fully appreciated at the time) and will continue to threaten our supply chains after we are fully past COVID-19.

In the immediate timeframe, the USDA has helped soften the impact of near-term supply chain disruptions. One set of critically important USDA actions are efforts to assist schools in meeting student nutritional needs and the additional support given to food banks and pantries to ensure access to food by our most vulnerable populations during a period of high demand. Other recent immediate actions include efforts to facilitate trade and transport of essential agri-food products. To ease port congestion, the USDA recently announced plans to increase capacity at the Port of Oakland, California, and improve services for shippers of U.S. grown agricultural commodities.

However, other vulnerabilities have been of longer-term concern, such as the risks posed by the nation’s aging transportation infrastructure, cybersecurity

threats, impacts of climate change on farm production and resources, animal disease outbreaks that affect supply, food safety related recalls that can disrupt marketing channels, workforce health and pre-pandemic labor supply challenges facing farms and food industries, and unequal access to agri-food markets by historically disadvantaged groups and underserved communities. From the long-term perspective, there is a lack of basic resiliency in the agricultural system. To tackle these challenges, the USDA will be working closely with other Federal agencies, with State, local, tribal and territorial governments, and with the private sector to strengthen our agri-food supply system. Rebuilding resiliency across this system will enable us to withstand a major disruptive event without a significant breakdown of the supply chain in the future. Throughout this report, most of the proposed recommendations to address vulnerabilities focus on this second, longer-term timeframe as a path forward to achieve much needed resiliency.

Background and Summary

On 24 February 2021, Executive Order 14017: America's Supply Chains directed the USDA to conduct a 1-year assessment of risks and resilience of U.S. agri-food supply chains and identify potential solutions to address vulnerabilities. This agri-food supply chain covers an integrated system from “farm to fork” including food production, processing, distribution, and consumption, including the inputs needed at each of these steps.

The U.S. agri-food system faces many of the same challenges as other sectors in delivering reliable, accessible, and affordable products, as well as unique or amplified vulnerabilities. Common vulnerabilities include transportation bottlenecks from aging infrastructure, labor shortages, cyber security threats, and competition issues resulting from market concentration in business sectors. In addition, the agri-food system possesses at least two features that cause it to

have unique or amplified supply chain vulnerabilities. First, even temporary disruptions to food supply chains immediately affect nearly every American household, as food needs to be frequently purchased and consumed daily. Second, agricultural production is seasonal and highly exposed to (abiotic and biotic) environmental stresses, and products are often highly perishable. These features warrant both general and specific measures to strengthen agri-food supply chain resilience both domestically and abroad.

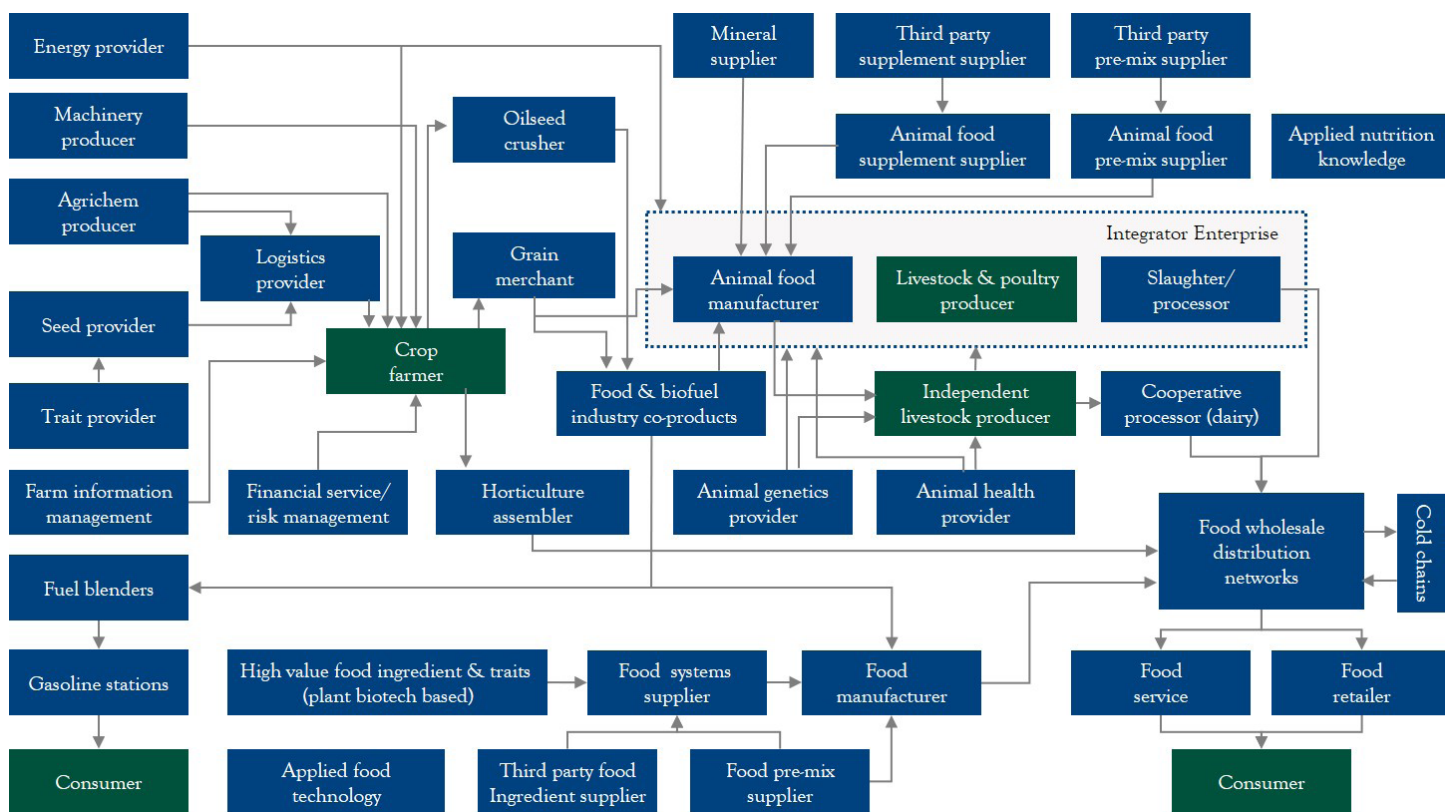
U.S. agri-food supply chains operate in complex global economic networks (Figure 1). The interdependent nature of the food system can mean that small disruptions in one segment can result in large ripple effects that may not be readily apparent or predictable without detailed supply chain analysis. Producers draw on a range of manufactured inputs and services to produce crop and animal commodities

for further processing in food, biofuel, and other industries, ultimately reaching different consumers as shown below. These farms and affiliated industries rely on sophisticated technology and knowledge inputs for innovation and efficiency and are highly integrated into global supply chains. About one-third of U.S. farm production is exported, with a nearly comparable share of food consumed imported.

Agri-food supply chain complexity can be illustrated by an example of a soybean farmer in the Midwest. He/she must obtain financing, insurance, and farm management advice, and purchase inputs such as seed (selecting the appropriate genetic traits), fertilizers, and pesticides from input providers well in advance of the production season. Concurrently, the farmer arranges marketing with a grain merchant or broker who will then purchase soybeans once harvested. Harvested soybeans are then transported by truck,



Figure 1: Agri-food supply chains are complex, integrated networks



rail and waterways to foreign and domestic crushers to produce oil and meal, which may be further processed into a variety of food, biofuel, animal food and other industrial and consumer products. Soybean meal is formulated with other ingredients by animal food manufacturers into species- and age-specific animal food rations and provided to livestock producers, often as part of vertically integrated enterprises where farmers produce animals under contract with the integrator firms. End products are marketed through retail and food service channels (with distinct size and packaging requirements for each) to finally reach the consumer.

The COVID-19 pandemic exposed vulnerabilities as well as sources of resilience in U.S. agri-food supply chains. These chains adapted to changing circumstances such as significant workforce strains and a shift almost overnight from foodservice and restaurant sales toward grocery delivery and “eat at home” consumption. The current COVID-19 crisis has illustrated how any future pandemic will likely to lead to significant food supply chain disruptions

and imbalances. Food production and distribution in the 21st Century still largely relies on human labor and pandemic-related illnesses will result in food and agriculture worker absences, which will naturally affect food supply chain continuity and product availability. Other vulnerabilities have been of longer-term concern, such as the risks posed by the nation’s aging transportation infrastructure, cybersecurity threats, impacts of climate change on farm production and resources, animal disease outbreaks that affect supply, food safety related recalls that can disrupt marketing channels, workforce health and pre-pandemic labor supply challenges facing farms and food industries, and unequal access to agri-food markets by historically disadvantaged groups and underserved communities. This report describes the outcomes of a USDA assessment to identify priority vulnerabilities in U.S. agri-food supply chain resilience and potential measures or “actions” that the Federal government could take to reduce these risks and vulnerabilities and improve equitable access to agri-food markets. This assessment involved extensive input and review by USDA subject matter specialists,

consultations with other Federal agencies, and recommendations obtained through a public comment process.

The assessment identifies six priority vulnerabilities facing U.S. agri-food supply chains (the order of the list below does not imply rank of priority):

- Priority 1:** Concentration and Consolidation in Agri-Food Production, Manufacturing, and Distribution
- Priority 2:** Labor Needs
- Priority 3:** Ecological and Climate Risks to Crops
- Priority 4:** Livestock and Poultry Disease Threats
- Priority 5:** Transportation Bottlenecks
- Priority 6:** Trade Disruptions

For each of these priority areas, the report briefly describes key vulnerabilities and proposes specific actions that can address them. Many of these actions can be carried out using USDA’s existing set of supply chain tools and capacities,

including using funding from the American Rescue Plan; others will require additional Congressional authorization and appropriations, and still others would require coordination with or come under the purview of other Federal agencies. The actions proposed in this report are designed to complement other ongoing USDA and Federal initiatives which will also strengthen resilience of the nation's agricultural and food sectors, namely:

1. [USDA Action Plan for Climate Adaptation and Resilience](#) (USDA's response to the January 27, 2021, EO 14008 [Tackling the Climate Crisis at Home and Abroad](#)),
2. The July 9, 2021, EO 14036: [Promoting Competition in the American Economy](#), and associated January 3, 2022, [Biden-Harris Administration Action Plan for a Fairer, More Competitive, and More Resilient Meat and Poultry Supply Chain](#); and
3. [DOT Action Plan to Accelerate Investments in Ports, Waterways and Freight Networks](#).

4. December 16, 2021, [Biden-Harris Administration Trucking Action Plan to Strengthen America's Trucking Workforce](#)

The next section of this report provides an overview of USDA's main tools and capacities for securing the nation's agri-food supply chains. This is followed by the main body of the assessment, which takes each Priority in turn, describing the key vulnerabilities, and proposing specific Federal actions to reduce risks and improve equity in agri-food supply chains and markets.

In summary, the key recommendations contained in this report include actions to:

- Strengthen data and market intelligence to enhance USDA's understanding of supply chains and address disruptions early, reducing impacts on individuals and communities;
- Diversify critical supply chain infrastructure, expand local and regional programs, and enable more and better markets for producers and consumers;

- Support a level playing field to enable competition;
- Improve working conditions and overcome critical labor shortages in farm and affiliated agri-food industries;
- Help farmers adapt to climate change;
- Strengthen response preparedness to animal and crop pest and disease threats;
- Rebuild critical transportation infrastructure for moving bulk commodities and specialty products;
- Boost agricultural exports, which stimulates local economic activity, helps maintain our competitive edge globally, and supports producers' bottom lines; and
- Embed equity principles throughout our actions to ensure that our programs, services and decisions reflect the values of equity and inclusion.

A full listing of all recommendations is provided as an Appendix of this report.





USDA Supply Chain Tools and Capacities

Federal agencies have complementary program and regulatory responsibilities in agri-food supply chains (Figure 2). A primary focus of the USDA has been the producers and affiliated industries, the supply chains through which farm commodities are marketed and bulk processed, and the consumer through USDA’s food and nutrition programs. The USDA also works closely with several input-supply industries, particularly for crop and animal genetics and health.

The USDA and other federal agencies possess a significant array of tools and capacities to support agri-food supply chains.

Six existing principal USDA capacities that can be directed to help reduce vulnerabilities and improve equitable access in these supply chains include:

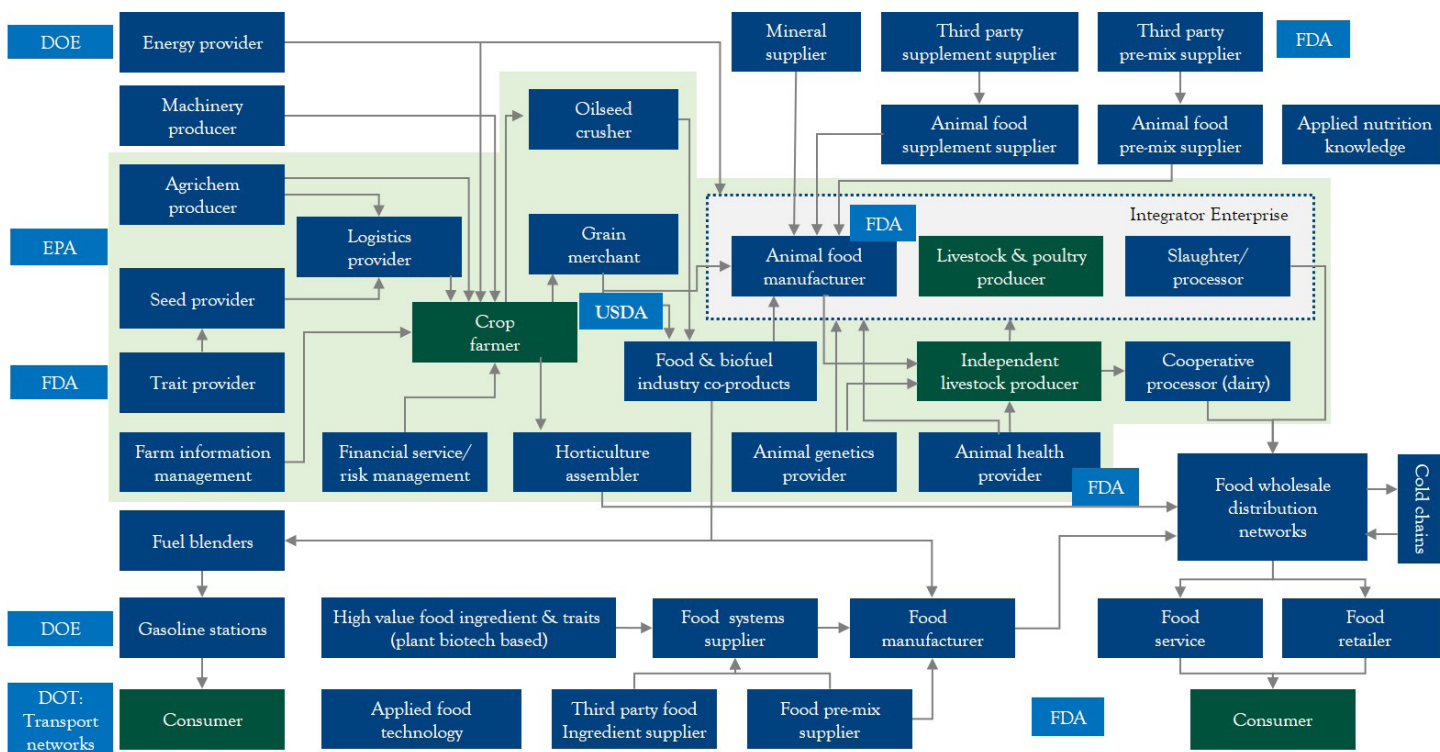
1. **Provision of timely economic information and market intelligence** to help guide farm and business enterprises in their investment, production, and marketing operations;
2. **Direct supply chain investment**, through grants, loans, and loan guarantees, in private business enterprises and nonprofit organizations to provide specific goods and services to help meet social or policy objectives;
3. **Direct procurement of agricultural commodities, food products, and other goods and services** to support domestic and international food security;
4. **Regulatory authorities**, to assure transparency and fair competition in commodity markets and product safety in meat products, animal vaccines, and biotech traits;
5. **Technical assistance and workforce training**, through educational and cooperative extension programs¹;
6. **Science and technology development** through intramural and extramural research.

Summarized below are selected tools and programs under each of these six capacities involving the following USDA agencies and offices:

- Agricultural Marketing Service (AMS),
- Agricultural Research Service (ARS),
- Animal and Plant Health Inspection Service (APHIS),
- Economic Research Service (ERS),
- Farm Service Agency (FSA),
- Food and Nutrition Service (FNS),

1. In partnership with state and local governments and the Land-Grant Universities, USDA NIFA funds and supports the Cooperative Extension System. This system provides training and educational programs for farmers, ranchers, youth, families, and communities throughout the nation.

Figure 2: Federal agencies have complementary program and regulatory responsibilities in agri-food supply chains; Shaded area shows parts of the agri-food supply chain of primary focus for the USDA and this report. Not all Federal agencies with important program and regulatory responsibilities are shown in the Figure. For example,



DOE = Department of Energy; DOT = Department of Transportation; EPA = Environmental Protection Agency; FDA = Food and Drug Administration

the Department of Labor has responsibilities in labor and workforce issues, the Department of Homeland Security Custom and Border Protection in protecting against the introduction of foreign plant and animal diseases, the U.S. Trade Representative in trade policy, and the Department of Commerce in general market regulation.

- Food Safety and Inspection Service (FSIS),
- Foreign Agricultural Service (FAS),
- National Agricultural Statistical Service (NASS),
- National Institute of Food and Agriculture (NIFA),
- Natural Resource and Conservation Service (NRCS),
- Office of Chief Economist (OCE),
- Rural Development (RD).

1 Provision of Timely Economic Information and Market News & Intelligence

Economic information and market intelligence form a critical knowledge base for anticipating both urgent and longer-term supply chain vulnerabilities as well as conducting real-time monitoring when supply chain challenges are experienced. Numerous information sources currently exist and are summarized below. Moving forward, enhancing the connection and

real-time monitoring of these varied data sources will provide a more wholistic and actionable picture of food and agriculture supply chains.

Commodity production and prices.

Through a variety of economic tools, OCE routinely monitors key items that might indicate disruptions in the agriculture and food supply chain. USDA economists track live animal prices against wholesale meat prices and retail meat prices to identify any anomalies that might signal a fundamental disruption or constraint on the sector's supply chain. OCE also tracks critical data around inputs relevant for agriculture such as gasoline consumption and its relation to ethanol and natural gas seasonal stock builds. The same type of analysis is done in aggregate looking at the producer price index (PPI) for the agriculture sector as compared to the consumer price index (CPI) for food. Finally, USDA operates the World Agricultural Outlook Board (WAOB), which serves as the focal point for economic intelligence and the commodity outlook for U.S. and world agriculture. It coordinates, reviews, and approves the monthly *World Agricultural Supply and*

Demand Estimates (WASDE) report, as well as the Department's annual, ten-year agricultural commodity market projections. The WAOB also releases annual projections covering agricultural commodities, trade, and aggregate indicators of the sector for the next decade. The monthly [World Agricultural Supply and Demand Estimates Report](#) and the long-run projections are available in the [Agricultural Baseline Report](#).

Market News. AMS routinely provides free, unbiased price and sales information to assist in the marketing and distribution of farm commodities. Each year, [Market News](#) issues thousands of reports, providing the industry with key wholesale, retail and shipping data. The reports give farmers, producers and other agricultural businesses the information they need to evaluate market conditions, identify trends, make purchasing decisions, monitor price patterns, evaluate transportation equipment needs and accurately assess movement. Commodities covered include cotton and tobacco, dairy and milk products, specialty crops, livestock, meat, poultry, eggs, hay, grain, organic products, and local/regional products.

Transportation: AMS maintains an online open data platform, called [AgTransport 3.0](#), which assists USDA customers in making data driven decisions about transporting agricultural goods domestically and internationally – whether by rail, truck, barge, or ocean. The platform’s interactive format allows customers to view, access and download data related to several transportation reports, including the weekly Grain Transportation Report. The platform provides a rail dashboard with expanded data, maps, and analysis featuring 14 years of Surface Transportation Board Public Waybill data, an ethanol transportation dashboard, selected grain price and basis data, volume and price data for refrigerated truck movements of fruits and vegetables, ocean vessel fleet data for bulk and container shipments, information on multi-commodity geographic flow movements, digitized ocean port profiles, and digitized and updated modal share dataset for transportation of U.S. grains. AMS also conducts a variety of research and monitoring functions, including analyses in partnership with Department of Transportation (DOT) and universities relating to priority infrastructure for agricultural transportation. Finally, we engage on regulatory issues of importance to agricultural supply chains.

Cold storage inventories: NASS conducts hundreds of surveys every year and prepares reports covering virtually every aspect of U.S. agriculture. As one example, the monthly [Cold Storage Report](#) has been widely used during the COVID-19 pandemic to provide information on the food supply. The report contains the regional and national end-of-month stocks of meats, dairy products, poultry products, fruits, nuts, and vegetables in public, private and semi-private refrigerated warehouses. The file also contains the record high years and quantities of frozen

fruit and juice, vegetables, potatoes, red meat, and commodities in cold storage.

International assessments of supply chain vulnerabilities. Since 2018, USDA’s FAS has monitored trade in products related to food and agriculture that depend upon Chinese suppliers. FAS’s supply chain analysis was specific to China due to concerns regarding China’s retaliation against U.S. trade actions. The analysis illuminated that active ingredients of pesticides are the most essential inputs from China, with import value of more than \$2 billion annually. These include the primary ingredients in some commonly used pesticides such as glyphosate. China provides more than 70% of imports of several pesticide ingredients, and many of these are not available domestically. Because of environmental regulations, it is unclear that new pesticide ingredient production can be established in other countries. For other food and agricultural products, low labor costs are the primary motivator for China being the predominant supplier. Many of these jobs are difficult or unpleasant; a few examples include seafood processing (filleting U.S.-caught fish) and the production of sausage casings (cleaning U.S. hog intestines). Farmers and farm machinery producers depend upon low-tech parts from China such as tractor tires; hydraulic pumps; solenoids; valves; bearings; fasteners; and wire harnesses.

2 Direct Supply Chain Investments

USDA provides several grant and loan opportunities to support individual businesses, supply chain actors (aggregation, processing, distribution), and market development functions to ensure a diversity of scales and types of entities are able to get food from farm to market. Through these investments, USDA facilitates market

development and aims to assist farmers in accessing emerging markets (such as direct-to-consumer markets, institutions, and more cooperative, transparent supply chains like food hubs or regional distribution networks) and diversify their market mix/portfolios. Many of the programs are designed to benefit smaller-scale businesses, new/beginning producers, and socially disadvantaged farmers and ranchers, and underserved communities.²

Research, education, and technical assistance grants and cooperative agreements allow USDA to leverage university research and extension programs and non-profit partnerships to build skills, analyze market channel strategies, and ensure access to USDA programs to underserved producers and communities. Farm loans and microloans assist farmers to get started, grow, and compete in the marketplace. For example, FSA’s [Farm Storage Facility Loans](#) (FSFL) can assist producers to invest in essential market access infrastructure, from grain silos to produce wash stations to cold storage and refrigerated trucks to improve food safety and market appeal of products as farms invest in capacity to get their products from field to market. Since FSFL’s inception in May 2000, more than 33,000 loans have been issued for on-farm storage, increasing U.S. storage capacity by 900 million bushels.

Grants across USDA fund supply chain research and development. One such grant program, USDA’s Local Agriculture Markets Program (LAMP), has invested between \$50M and \$90M each year, depending on funding levels, in local and regional food systems. LAMP includes [Farmers Market](#) and [Local Food Promotion Program](#) grants (administered by AMS) that support direct to consumer and intermediated supply

2. Socially Disadvantaged producers. Socially Disadvantaged Farmer or Rancher is a farmer or rancher who is a member of a Socially Disadvantaged Group. A Socially Disadvantaged Group is a group whose members have been subject to discrimination on the basis of race, color, national origin, age, disability, and, where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual’s income is derived from any public assistance program.

Underserved communities are those defined in accordance with Exec Order 13985, Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, Jan 20, 2021: Sec. 2. Definitions. For purposes of this order: (a) The term “equity” means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. (b) The term “underserved communities” refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list in the preceding definition of “equity.”

chain development, [Value Added Producer Grants](#) (administered by RD) to fund producers and producer-owned mid-tier value chains to partake in processing, marketing, and other activities that add value to agricultural commodities, and [Regional Food Systems Partnership Grants](#) (administered by AMS) to fund the critical planning and convening functions necessary for a variety of stakeholders and multi-level government actors to coordinate development and enhancement of regional food systems, ensuring more intentional decision-making to benefit producers and contribute to a secure food supply. FNS operates the MarketLink grant program which supports payments technology for farmers selling direct-to-consumer. Additional key programs to support local and regional food supply chains include the [Dairy Business Innovation Initiatives](#), [Meat and Poultry Inspection Readiness Grants](#), and [Specialty Crop Block Grants](#). USDA agencies have collaborated over time to identify programs best suited

to support diversified and resilient local and regional food systems, guiding our stakeholders through [USDA's Programs in The Local Food Supply Chain, Updated February 2021](#).

3 Direct Procurement of Agricultural Commodities, Food Products, and Other Goods and Services

Nutrition Programs. The USDA operates the Web Based Supply Chain Management (WBSCM) system to coordinate, track, and support the federal government's domestic and international food and nutrition programs. WBSCM is an integrated, internet-based commodity acquisition, distribution, and tracking system. Three USDA agencies (FNS, AMS, and FAS), and the United States Agency for International Development (USAID) utilize WBSCM. Several federal programs run through WBSCM, including the National School

Lunch Program (NSLP), the Emergency Food Assistance Program (TEFAP), and Food Distribution Program on Indian Reservations (FDPIR). Together, these programs serve over 30 million Americans and are administered through State Distributing Agencies (SDAs), supporting over Recipient Agency (RA) school districts, food banks, feeding centers, and Indian Tribal Organizations (ITOs), which deliver food directly to program participants.

Household-level programs, such as Commodity Supplemental Food Program (CSFP), TEFAP, and FDPIR, provide food and/or serve meals to food insecure groups such as senior citizens, Native Americans, and other income-eligible individuals. International programs, which include Food for Peace, Food for Progress, and Food for Education, serve over 280 million people in over 65 countries with aid provided through the United Nations World Food Program and over 30 foreign



governments, and approximately 70 private voluntary organizations. Finally, [USDA Foods](#) procured and distributed through WBSCM account for 10-15 percent of the value of school meals. On a yearly basis, WBSCM directly supports the order, procurement, and delivery of over 6.5 billion pounds of American farm food commodities with a value in excess of \$4 billion; on average, delivery is approximately 2.5 billion pounds.

National Veterinary Stockpile (NVS).

APHIS operates a NVS program providing support to States, Tribes, and Territories responding to outbreaks of animal diseases. Established in 2004 by a Presidential Directive³, the NVS helps protect the Nation's food supply by quickly providing necessary resources during an animal disease outbreak. Within 24 hours, the NVS can provide veterinary countermeasures—including certain types of animal vaccines, antivirals, supplies, equipment, and response support services—to animal health officials in affected areas. This allows animal health officials to deliver a rapid and effective disease response. With NVS support, officials can set up immediate measures to contain and eradicate the disease, minimizing the animal losses, market disruptions, and other economic damages that result from an outbreak. In addition to providing resources and materials when outbreaks occur, NVS personnel help States, Tribes, and Territories prepare for future outbreaks through advance planning, staff training, and hands-on simulations. The goal is to ensure the rapid request, receipt, processing, and distribution of NVS resources during an actual emergency.

National Animal Vaccine and Veterinary Countermeasures Bank (NAVVCB).

Established through the 2018 Farm Bill, APHIS also operates the NAVVCB to increase preparedness in case of a Foot and Mouth Disease (FMD) outbreak in livestock. The NAVVCB is a U.S.-only bank and supplements the North American Foot-and-Mouth Disease Vaccine Bank (NAFMDVB). In July 2020, APHIS announced a \$27.1 million initial purchase

of FMD vaccine for the NAVVCB. In June 2021, APHIS announced plans to purchase an additional \$14.9 million in FMD vaccine for the NAVVCB, which the agency would use in the event of an FMD outbreak.

4 Regulatory and Oversight Authorities

USDA utilizes numerous regulatory authorities to bolster supply chain resilience. This is not intended to provide a comprehensive list, but rather examples such as our support for fair and competitive markets to manage risks to the supply chain from concentration, protection of plant and animal health, and ensuring food safety across meat, poultry, and egg products. For fair and competitive markets, authorities include monitoring and enforcement activities by the AMS Packers and Stockyards Division as it affects relevant markets within their jurisdiction, and the regulatory aspects of AMS Market News under the Livestock Mandatory Reporting Act. USDA's work in these areas also support the regulatory and enforcement work of other Federal, state, and territorial agencies, such as providing information and analyses on structural changes in agri-food industries and implications for concentration and competition in agricultural supply chains. As one example, AMS partners with Department of Justice (DOJ) when taking legal action against those violating the Packers and Stockyards Act, a statute to promote fair business practices and competitive environments to market livestock, meat, and poultry. Indeed, AMS and DOJ recently launched a new initiative—[FarmerFairness.gov](#)—to make it easier for farmers, ranchers, and others to report potential violations of the competition laws, including but not limited to the Packers and Stockyards Act.

Under other authorities, the Animal and Plant Health Inspection Service (APHIS) safeguards U.S. agriculture and natural resources against the entry, establishment, and spread of economically and environmentally significant pests, and facilitates the safe trade of agricultural products. To protect plant health, APHIS

also implements regulations for certain organisms developed using genetic engineering that may pose a risk to plant health. APHIS coordinates these responsibilities along with the other designated federal agencies as part of the Federal Coordinated Framework for the Regulation of Biotechnology. And, as another example, Food Safety and Inspection Service (FSIS) serves as the public health agency within USDA responsible for protecting the public's health by ensuring the safety of the nation's commercial supply of meat, poultry, and processed egg products. FSIS ensures food safety through the authorities of the Federal Meat Inspection Act (FMIA) and the Poultry Products Inspection Act (PPIA), as well as humane animal handling through the Humane Methods of Slaughter Act.

Finally, agencies beyond USDA have a role in food regulation. For example, FDA has regulatory oversight throughout agri-food supply chains, from primary production on farms to retail food establishments, which provides data sets that broadly cover food supply chains and are unique in nature, including data from food facility registration, which have been utilized in assisting COVID-19 response efforts. The FDA works closely with its State, local, Tribal, and territorial regulatory partners in gathering data and reviewing records during inspections of regulated foreign and domestic food establishments in its inventory. FDA also collaborates with U.S. Customs and Border Protection on the entry of food into the U.S, including prior notice of food shipments offered for import. As another example, for any pesticide used in producing food, EPA regulates the amount that may remain in or on foods by setting limits, or tolerances, for pesticidal residues under the Federal Food, Drug, and Cosmetic Act (FFDCA).

5 Technical Assistance and Workforce Training

Availability of an agriculturally aware, educated and trained population and workforce is a critical component of the food and agricultural supply chain. Through

3. Homeland Security Presidential Directive-9 Defense of United States Agriculture and Food (2004).

USDA investments, NIFA supports programs and activities that provide technical assistance to the population (BFRDP, EDEN, SARE) and contribute to safeguarding the national food supply (VLRP, PDDN, AHLN). Via formula funding to the Land Grant University System and investments in Regional Rural Development Centers as well as the Aquaculture Centers, USDA enhances the link between the research and educational outreach capacity of the nation's public universities with communities, local decision-makers, entrepreneurs, families, and farmers and ranchers to help address a wide range of rural development issues. Furthermore, USDA supports formal and nonformal education programs that contribute to the training or retraining for current and future workforce via the investment of funds in competitively awarded education and workforce development projects. These projects take place at academic and non-academic institutions and organizations where activities support youth development through higher education training.

AMS works to improve market access for producers and develop new markets. For example, through its roles as a researcher, a convener, and a technical assistance provider, the AMS Marketing Services Division conducts research in partnership with USDA agencies, and external partners which are, typically land-grant universities. Through one recent project, [Local and Regional Food Systems Response to COVID-19](#), AMS partnered with the University of Kentucky to lead two additional research universities and 17 local and regional food system (LRFS) organizations to enrich existing efforts within local and regional food systems communities of practice which provide essential support to local food producers. During this moment of simultaneous disruption and rapid innovation, the project supported LRFS communities of practice by assessing impacts and needs in each sub-sector, documenting, and disseminating innovations and best practices developed on the ground and drawing on LRFS thought leaders to frame research on COVID-19-related shifts to LRFS markets with the aim of supporting long term resilience.

NIFA operates a robust extension network through which land-grant institutions reach out to offer their resources to address public

needs. By educating farmers on business operations and on modern agricultural science and technologies, NIFA's extension work contributes to the success of countless farms, ranches, and rural business. Further, their services improve the lives of consumers and families through nutrition education, food safety training, and youth leadership development. Additionally, both NIFA and NRCS support nation-wide agricultural and community extension programs that provide technical assistance and training in the use of new technologies and best management practices for improving climate-smart farm production and natural resource conservation.

USDA's Climate Hubs is a unique cross-agency program that develops and delivers science-based, region-specific information to producers, stakeholders, and USDA staff to reduce climate risks and enable climate-informed decision making. The Climate Hubs translate USDA's research and science, especially on climate impacts on supply chain vulnerabilities (e.g., disseminating a new Ranch Drought Monitoring Dashboard), into management and action on-the-ground linking with extension, natural and agricultural resource managers, and USDA field staff.

USDA also recognizes there are programs operated by our Federal partners that provide critical support related to food and agriculture in the technical assistance and workforce development space. Outside USDA, for example, the Centers for Disease Control and Prevention (CDC) NIOSH Centers for Agriculture Safety and Health conduct research, education, and prevention projects to address the nation's pressing occupational health and safety problems for workers in the agriculture industry. Geographically, the Centers are distributed throughout the nation to be responsive to the health and safety issues unique to the different regions, but collaborate on national events and projects such as the Centers' [YouTube channel](#).

Science and Technology Development

USDA supports grants in the technology and manufacturing space through NIFA's [Small Business Innovation Research](#)

(SBIR) program and [Agriculture and Food Research Initiative \(AFRI\)](#). For example, SBIR seeks innovation in manufacturing, which can include supply chain integration and distribution. And, AFRI's Sustainable Agricultural Systems program seeks systems-based approaches to alleviate labor challenges across agricultural supply chains through automation, artificial intelligence, and predictive analytics/decision tools. AFRI's other program areas have similar opportunities for grants and research related to supply chain tools.

Strengthening USDA and Federal Market Information and Monitoring Systems

USDA policies and tools help producers manage risks and respond to changing circumstances all along the supply chain. The USDA has a central role in providing timely market information, including detailed price and production statistics and short- and long-run market forecasts. USDA farm safety programs are another important measure to assist farmers to manage production and market risks and remain financially viable. Strengthening the USDA tool set is an important part of efforts to enhance agri-food supply change resilience.

As has been demonstrated through the Biden-Harris Administration's [Short-Term Supply Chain Disruption Task Force](#), of which Secretary of Agriculture Vilsack is a co-chair, data and close communication with supply chain stakeholders are keys to identifying and addressing market transparency issues and existing or potential supply chain disruptions. Today, more data is digitized than ever before, providing greater opportunities for real-time data analysis. Diverse data sets can be used to monitor factors that may impact supply chain continuity. Focused and collaborative efforts across government are needed to realize the potential of data and analytical tools more fully. At this time, there are numerous data sets and analysis tools spread throughout the Federal government based on the authorities, expertise, and resources of individual agencies. While some data sharing agreements have been established, most systems are not interconnected or catalogued and there is not uniformity in data structure, making it difficult to share information or analytical findings across

agencies. In recent years, there have been attempts to improve awareness of various data sets and tools through cross-agency workgroups, such as the USDA-led Data Analytics Working Group set up during the COVID-19 pandemic. However, more is needed to improve the ability to detect and respond to ongoing or potential supply chain disruptions.

To be most effective, the Federal Government needs an interconnected dynamic food supply chain monitoring platform where multiple government data sets, and potentially external data sets, could be integrated, analyzed, and monitored in real time to better understand potential challenges, dependencies, and projections. Such a platform can better support supply chain monitoring, bolster protection against cyberattacks, and ensure data integrity and confidentiality across agency partners. In addition to informing real-time response, utilization of an interconnected dynamic platform could also be used for longer-term assessments of supply chain vulnerabilities and metrics. Data sets could include the FDA 21 *Forward* Platform, the USDA AMS Agricultural Transportation Open Data Platform, and the USDA COVID-19 Dashboards as examples. Further, data sets related to worker health and data sharing that includes public health agencies as integral components to resilient, functional food and agriculture supply chains should be fully integrated into this effort – such data has been important in efforts to mitigate COVID-19 in the food and agriculture workforce and would be relevant in other public health emergencies since worker health is a critical component for maintaining supply chains. It would be critical to have a dedicated staff to oversee the platform and monitor supply chain information in real-time. Triggers could be established for when developing situations should be flagged for consideration of response actions by appropriate decision-makers across government.

Consideration should also be given to how cross-government monitoring functions and utilization of existing, robust public-private relationships and associated information sharing would report findings to an empowered decision-making group to address current or anticipated

supply chain challenges. Coordination is especially important across agencies as the relevant authorities governing many agri-food supply chain root problems span the breadth of the Federal government. Recognizing this, a new or revitalized interagency coordination structure should be formalized to provide clear direction on prioritization and coordination across Federal government entities. Such a group could also be informed by existing entities, functions, or policies, such as the Food and Agriculture Sector, which could provide direct connections to private sector partners and facilitate industry-based concerns and/or Emergency Support Function #11, which could help provide operational support for the execution of decisions made at higher leadership levels. Finally, many of these considerations may be addressed through a forthcoming National Security Memorandum “Strengthening the Security and Resilience of United States Food and Agriculture” which seeks to bolster interagency coordination, communication, and information sharing cross the Federal Government.

Below are a set of proposed actions to strengthen USDA and Federal market information systems and learn lessons from the COVID-19 pandemic to improve future Federal response to agri-food market exigencies.

USDA Action: Review and strengthen USDA agri-food market intelligence and forecasting capacities.

USDA Action: Explore feasibility of establishing government-wide “indicators” for monitoring impacts of macro-economic shocks specifically on the food and agriculture sector.

USDA Action: Conduct additional research on supply chain constraints, including those related to market concentration and just-in-time procurement approaches.

USDA Action: Conduct additional research and increase data analysis and sharing related to food hubs, farmers markets, and other markets where information is not commonly captured or reported.

USDA Action: Research the impacts of supply chain organization and disruptions

on equity and access to food systems, including impacts on occupations, underserved communities, tribal, territories, and insular areas

Other Federal Action: Develop and implement federal data sharing, communication, and governance systems that would enable agencies and signal the business sector to address emerging supply chain threats prior earlier, leveraging USDA data reporting in concert with advancements made during the COVID-19 pandemic such as FDA’s 21 *Forward* Platform.



Key Vulnerabilities and Proposed Actions to Strengthen Agri-Food Supply Chains

PRIORITY 1: Concentration and Consolidation in Agri-Food Production, Manufacturing, and Distribution



Resilience in agri-food supply chains depends on having access to reliable and diverse sources to meet supply and demand. Weak links in supply chains occur at “choke points” in food production, manufacturing, and distribution. In some agribusiness sectors like meatpacking, a small number of facilities accounts for a large share of regional or national food processing capacity. Even temporary shutdowns of one or more of these facilities (from fire, electricity disruption, labor shortages, cyber-attacks, worker illness, etc.) can threaten significant supply chain

disruption. For example, a May 2021 cyber-attack on the second largest meat processing firm in the U.S. forced a three-day closure of 25 percent of beef and 20 percent of pork processing capacity nationally. In August 2019, a fire at one large beef processing facility in Holcomb, Kansas, resulted in a three-month shutdown. During the COVID-19 pandemic, meat processing supply chains came under stress when several large meat processing facilities were forced to close due to illness among workers. Such incidents temporarily caused major disruptions to supply chains

and led to price volatility. And, while the meatpacking sector experienced some of the most significant disruptions during the COVID-19 pandemic, reduced production capacity was widespread throughout the food sector.

A second type of vulnerability from concentration in agri-food supply chains can arise from the market power exercised by firms controlling large shares of production, processing or distribution capacity. Significant structural changes that have occurred in the meat packing industry, the crop seed sector, and in food retail sectors have raised concerns about how concentration in ownership may be affecting farm and consumer prices

and market competition. Measures of concentration in ownership are generally larger than measures of concentration in facilities, since one firm may own multiple production or processing facilities.

This section of the report touches on three relevant examples (the meat and poultry sector, crop seeds, and specialty crops) where industry structure, including concentration and consolidation, impact supply chain resiliency. The importance of strengthening local and regional food systems to diversify the number of food businesses and reduce concentration in agri-food manufacturing is discussed. This section also identifies measures that can be taken to help support supply chains that are either unlikely to diversify further or that may experience challenges while further diversification is taking place. Additional measures to reduce vulnerability to market concentration are taken up in other sections of the report, especially [PRIORITY 2: Labor Needs](#) on addressing worker and public health issues, [PRIORITY 5: Transportation Bottlenecks](#) on reducing vulnerabilities in commodity and food distribution systems, and [PRIORITY 6: Trade Disruptions](#), on diversifying and lowering barriers to domestic and international trade.

Industry structure and vulnerabilities in meat and poultry sector

Livestock and poultry farms are located regionally, driven by availability of animal food, environmental conditions, and processing capacity. Currently, 61 percent of the U.S. beef cow herd is located in the northern and southern plains states. Pork production is concentrated in the Midwest and North Carolina. Sixty-eight percent of U.S. chicken production in 2020 occurred in seven states in the Southeast with another 9 percent in the Delmarva peninsula shared by Delaware, Maryland, and Virginia.

Currently, the U.S. meat and poultry manufacturing facilities are also highly concentrated. While nationally there are more than 700 federally-inspected beef slaughter establishments, the 10 largest facilities account for 47 percent and the 20 largest facilities account for 72 percent of average daily beef slaughter. Figures for pork processing facilities are similar.

Chicken processing is comparatively less concentrated; the 10 largest processing plants have combined capacity equal to 13 percent of daily slaughter, and the 20 largest account for 23 percent of daily chicken slaughter.

Since one company may own several processing facilities, ownership concentration by the largest firms may be even higher than concentration in facilities. Consolidations in the meat processing industry has resulted in a few firms controlling most of the nation's meat processing capacity. In 2019, the four largest fed cattle processing companies accounted for 85 percent of the total U.S. annual slaughter; the four largest hog processing companies accounted for 67 percent of the total annual hog slaughter; and the four largest chicken processing companies accounted for 53 percent of the total annual slaughter. In addition, some large firms are active across animal sectors. The growing concentration of ownership in these industries has given rise to concerns about market power and the potential for excessive price spreads (differences in prices received by farmers for animals and paid by consumers for meat products). And, final products at retail for meat and poultry are vulnerable, similar to all other food products, to increasing concentration in food retailing, especially among the largest grocery retailers.

Growing concentration in meat packing sectors has also been accompanied by significant structural change in farm livestock production. Poultry and hog production is mostly done under contract with large “integrator” firms, which control animal genetics and nutrition as well as processing. Animal production has moved to significantly larger, fewer, and more specialized farm operations. In beef production, there has been relatively little change in the organization of cow-calf operations, but there have been significant changes since 2005 in fed cattle marketing, with much greater reliance on marketing contracts and specific branded programs. Cash/negotiated cattle accounted for 52.1% of the National market 15 years ago, today it accounts for 20.0%. The majority of these negotiated cattle moved to a formula contract, or alternative marketing agreements, which account for 61.6% of

fed cattle sales in 2021. Approximately 20-25% of the wholesale beef marketed domestically is done so under a branded program. In addition, across the dairy sector, the number of dairy farms has declined by 60 percent since 2002, with most remaining dairies having milking herds of 1,000 cows or more (and herds of 10,000-20,000 are not uncommon). Significant shares of U.S. chicken (20%), pork (29%), beef (13%) and dairy (16%) production are exported.

Industry structure and vulnerabilities in crop seeds

The past few decades have witnessed significant consolidation and increased concentration in the U.S. crop seed sector. Motivating the restructuring of the U.S. seed industry were opportunities to commercialize genetically modified (GM) traits in crop seed, which became eligible for patent protection in the 1980s. In seed markets dominated by GM seed, like corn, soybean, and cotton, the four-firm concentration ratios for crop seed are currently around 80-90%. Moreover, seed prices have grown faster than crop prices, and for several major U.S. field crops, seeds costs have risen as a share of total costs. Higher seed sales have also been accompanied by higher R&D spending and innovation by the seed industry.

Dominance of a few firms in seed markets could allow firms to exercise market power to raise seed prices, limit the scope of product innovation, and create barriers to entry for new firms. Accompanying the rise in private-sector crop breeding has been a decline in public-sector R&D on crop improvement. Regulatory costs of bringing crops with GM traits to market are also high, which can discourage new firms from entering the industry.

Industry structure and vulnerabilities in specialty crops

Specialty food crops include vegetables, fruits, and tree nuts. Unless grown under Controlled Environment Agriculture (CEA) such as greenhouses or vertical farming, production of specialty crops tends to be concentrated in regions where climate and soil conditions are most favorable. According to the 2017 Census of Agriculture, California led all states in specialty crop production, with 50 percent

on non-citrus tree fruit production, nearly 80 percent of tree nut acreage, and 27 percent of vegetable harvested area (and 35 percent if potatoes are excluded). Florida led the nation in citrus fruit acreage with nearly 58 percent of the U.S. total, with another 38 percent in California. California also accounted for 82 percent of grape acres harvested and 61 percent of total U.S. strawberry acreage.

Imports are also an important source of fresh fruits and vegetables. Imports account for 32 percent of the volume of fresh vegetables consumed domestically. Of the top 20 fresh fruits consumed in the U.S., nearly 43 percent of the volume is sourced from foreign nations. Imports make a wider variety of fresh produce available to consumers year-round and reduce the risk of supply chain disruptions.

Exports are also a critical source of farm income for many specialty crop producers. For example, three quarter of all U.S. tree nuts are exported and U.S. producers of perishable crops like apples, oranges, and grapes depend on access to foreign markets to take up U.S. supply during harvest. By supporting these additional sales, trade helps sustain larger U.S. production volumes and support more economic activity in rural America.

Marketing of domestic fruit and vegetable production is increasingly being done under contract. Many wholesale buyers and packers of specialty crops use marketing contracts with growers to manage the price, quantity, timing and location of delivery, and product quality attributes of purchases. According to the 2016 USDA ARMS, 39% of the value of fruit sales and 37% of vegetable sales were produced under a marketing contract. Marketing contracts are more widely used for vegetables destined for processing than for fresh markets and help producers manage risk. However, an increasing degree of buyer control written into some contracts may lock producers to a particular buyer. Moreover, many buyers have preferences for larger growers, citing lower transactions costs when dealing with fewer, larger growers. This can lead to disadvantages for smaller growers and limit their opportunities in obtaining contracts to market their produce. For some specialty crops (e.g., almonds and raisins), farmer marketing cooperatives currently help to provide countervailing market power between farmers and downstream buyers. Part of the specialty crop supply chain is committed by contracts to either the food-away-from-home channel or the grocery retail channel. It is often difficult to switch between food channels, as highlighted during the COVID-19 pandemic. The

COVID-19 pandemic sharply curtailed demand from the foodservice sector and significantly increased grocery store sales, including sales of specialty crops. Initially, demand at supermarkets increased dramatically and, with initial consumer panic buying, supermarkets quickly faced shortages and empty shelves. Many fresh produce suppliers are specialized in supplying foodservice with packing lines, and with sizes and types of packaging designed to meet the needs of that sector. This level of dedicated infrastructure made the shift from foodservice to retail very challenging. Some fresh produce suppliers that were heavily focused on the foodservice sector were able to shift resources to supply retail stores. Others were not and suffered financially due to the drastically reduced foodservice market.

Consolidation and concentration related vulnerabilities threatening specialty crops supply chains include:

- Erosion of traditional wholesalers toward direct marketing contracts between growers and retail chains due to increased centralization of food procurement systems.
- Increasing concentration in food retailing, especially among the largest grocery retailers.
- Consolidated distribution infrastructure in freight rail and ocean shipping, all of



which are required consistently and timely due to the perishable nature of specialty crops.

There are also non-competition related factors in the specialty crops sector, particularly significant due to crop perishability and reliance on local growing conditions, that pose additional risks especially when paired with these consolidation and concentration issues. These factors include:

- Access to a workforce, which is typically seasonal in nature and shifts geographically over time.
- Climate change and the increased frequency of extreme weather events such as frosts in Florida and the recent mega-drought in the western U.S. pose significant threats, which are exacerbated when market players are concentrated or consolidated geographically or within a subsector. Excessive heat could lead to results similar to what occurred in the Pacific Northwest in 2021 with blueberries drying on the bushes and sweet cherries drying on the trees. Too much warm weather in winter could disrupt the dormant period many fruit trees require to set the crop for the next year, with limited diversification to access significant seasonal supply elsewhere. Stress on fruits can lead to increased risk of disease and crop failures.

- Market and trade shocks which may impose barriers on imports or reduce opportunities for exports, such as when countries impose trade restrictions in response to domestic food price inflation or enter into trade agreements that exclude the United States.

Local and regional food systems as a means for diversification

Locally and regionally produced foods are a small but growing part of U.S. agriculture sales, providing much needed diversification in an otherwise consolidated system. According to the 2017 Census of Agriculture, locally and regionally produced food sales reached \$11.8 billion or 3 percent of the total value of U.S. agriculture production, growing from \$8.7 billion in 2015. An increasing number of producers, especially small producers, have gravitated toward local and regional markets due to market accessibility and the promise of a greater portion of the food dollar, which has significantly declined in mainstream markets over the past 50 years. Producers receive a greater share of retail prices in local food supply chains than they do in mainstream chains, and, based on a 2010 study, producer net revenue per unit in local chains ranges from about equal to more than seven times the price received in mainstream chains.⁴ About 23 percent of beginning farmers and ranchers sell directly through local and regional markets. Poultry,

cattle, and dairy represent more than half of the production value for beginning farmers and ranchers. CEA production also contributes to local and regional food systems, as it allows for production in areas that may not have the most favorable climate and soil conditions. This brings production to cities, former brownfields, and other areas that historically were not agriculturally productive. Finally, organic production and markets play a critical, expanding role in further diversifying food systems. Consumer demand for organically produced goods continues to show double-digit growth, providing market incentives for U.S. farmers across a broad range of products. Organic sales account for over 4 percent of total U.S. food sales and organic products are now available in nearly 20,000 natural food stores and nearly 3 out of 4 conventional grocery stores. During the pandemic, local and regional food systems were recognized for their ability to be flexible and adapt to shifting market needs and offer a critical consumer and producer safety net. Producers that sold to institutions, restaurants, and hotels quickly adjusted to other outlets as consumers shifted their food purchases away from the foodservice sector to grocers, supermarkets, and online sources. Many local food farmers and ranchers, including small and mid-sized meat and poultry producers and processors, expanded direct markets, and offered online stores and other adaptations to meet



4. Comparing the Structure, Size, and Performance of Local and Mainstream Food Supply Chains (usda.gov). (2010)



consumer demands, but demand often exceeded availability. Food retailers and other purchasers such as school districts exhibited supply chain flexibility by shifting purchases toward smaller local suppliers. Some tribal communities, mostly rural and often isolated from other regional support, were able to integrate local production into community food supplies very quickly. The opportunity for expanding Tribal production, processing, and distribution of food is important for these rural communities.

Strengthening local and regional production, distribution, and processing contributes to a less concentrated and more diversified, and equitable agri-food system. The USDA can enhance local and regional agri-food systems through its technical assistance capabilities, loan and grant funding mechanisms, procurement policies, and through other efforts to tailor programs to better serve the needs of producers selling into local and regional markets. Existing efforts are described in the earlier Supply Chain Tools and Capacities Section and new opportunities are detailed in the proposed actions below. Upon implementation, USDA can continue to evaluate the impact of these actions on the growth of local and regional food systems by leveraging USDA data such as our local food marketing practices survey. Such evaluation would support our ongoing efforts under the Evidence-Based Policymaking Act of 2018.

ACTION STEPS FOR CONCENTRATION AND CONSOLIDATION IN AGRIFOOD PRODUCTION, MANUFACTURING, AND DISTRIBUTION

Below we identify a number of USDA and other Federal government policy and program actions to reduce concentration and diversify market participation in U.S. agri-food supply chains. A key element is to address competition in agri-food industries (including meat and poultry processing, crop seeds, and specialty crops). Other Actions relate to promotion of local food businesses through direct investment, Federal procurement approaches to increase flexibility and diversify sources of supply, and other interventions needed for urgent and emerging supply chain issues.

COMPETITION IN AGRIFOOD INDUSTRIES

Executive Order 14036: Promoting Competition in the American Economy, directed the USDA to assess competition issues in agri-food sectors. In coordination with this effort, the USDA Supply Chain study commissioned the USDA Economic Research Service to undertake analytical reviews of economic research of competition in meat processing, crops seeds, and food retailing. The results of those analytical reviews will be published in a forthcoming ERS Economic Information Bulletin.

USDA Action: Execute competition related actions outlined in the January 2022 Biden-

Harris Action Plan for the Meat and Poultry Supply Chain. Actions include, but are not limited to:

- Invest \$1 billion in diversifying meat and poultry processing capacity, workforce development, research and innovation, and technical assistance
- Issue new, stronger rules under the Packers and Stockyards Act to provide greater clarity and strengthen enforcement under the Act.
- Work with the Federal Trade Commission to prepare a report on access to retail and competition’s role in protecting new market entrants in meat processing.
- Issue new “Product of USA” labeling rules to ensure consumers understand where their meat comes from.
- Collaborate with DOJ to better coordinate efforts, such as launching a new portal for reporting concerns about potential violations of competition laws.

USDA and other Federal Action: Support antitrust and unfair business practices enforcement by of Federal partners including the U.S. Department of Justice, Federal Trade Commission, Commodities Futures Trading Commission, and state attorneys general.

PROMOTION OF LOCAL AGRIFOOD BUSINESSES

USDA Action: Investing \$4B in to strengthen critical supply chains in the food system by, for example, prioritizing grants, loans, and complementary support to promote regional/

local and diverse food processing, aggregation, distribution, and other necessary capacity and purchases from domestic firms to the maximum extent possible consistent with the law. Specific activities include:

- Expand independent meat and poultry processing capacity, supporting workers, providing technical assistance, and promoting innovation as outlined in the [January 2022 Biden-Harris Action Plan for the Meat and Poultry Supply Chain](#).
 - This includes deploying additional Consolidated Appropriations Act funds to support the Meat and Poultry Inspection Readiness Grant (MPIRG) Program to help processing businesses cover improvement costs needed to achieve a Federal Grant of Inspection or to operate under a state’s Cooperative Interstate Shipment program, which facilitates interstate commerce and opens new markets.
- Backing private lenders through the Food Supply Chain Guaranteed Loan Program which leverages \$100 million of American Rescue Plan Act funding to provides more than \$1 billion for qualified lenders to finance food systems projects, specifically for the start-up or expansion of activities in the middle of the food supply chain.
- Identify ways to increase targeted investments to socially disadvantaged farmers and ranchers who diversify the supply chain with small and mid-size food businesses. Institute support through section 1006 of ARP to provide technical assistance to underserved producers, connecting them more fully with USDA programs and services. Integrate these efforts with the January 20, 2021, [EO on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government](#).

USDA and other Federal Action: Prioritize support for workforce development and safety programs and increase technical assistance across the broader food production/processing sector.

USDA Action: Support the development of cooperative aggregation and processing facilities, including retrofitting or expanding existing facilities, for locally grown produce meant for institutional markets, food hubs, food banks, schools, etc.

USDA and Other Federal Action: Increase technical assistance for small scale and new entrants into food processing for both USDA and FDA-regulated products.

FLEXIBILITY IN FOOD PROCUREMENT POLICIES

USDA Action: Coordinate with the Council of Environmental Quality (CEQ) as it responds to Section 208 of the December 8, 2021, Executive Order 14057 “Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability” and establishes Federal food procurement policies to reduce associated greenhouse gas emissions (GHGs) and drive sustainability in the Federal food supply chain.

Other Federal Action: Utilize HUBZone authorities to develop solicitations for procurement targeting historically underutilized communities.

Other Federal Action: The Office of Management and Budget’s Made in America Office, in consultation with the Federal Acquisition Regulatory Council, should consider limiting the resale exception to the Buy American Act to promote the purchase of Made in America foods in commissaries on Federal property.

Congressional and Other Federal Action: Enact and promote policies that allow sourcing of “values-based foods,” such as locally produced and processed foods, organic foods, and climate-smart foods, for food procurements

Congressional and Other Federal Action: Provide authority to revise the Federal Acquisition Regulation (FAR) to allow the use of “local” and other value-based criteria as a specification in Federal food procurement for nutritional assistance programs and provide an optional preference for local, small-batch, and tribal source procurement; provide more support for small and mid-sized producers interested in becoming vendors for USDA Foods.

PURCHASING OPTIONS FOR HOUSEHOLDS RECEIVING FOOD ASSISTANCE

USDA Action: Expand the availability of mobile Electronic Benefit Transfer readers to agricultural enterprises that do

not currently engage farmers’ markets, particularly in food deserts where farmers markets are not accessible.

USDA Action: Explore opportunities to strengthen the Senior and Women, Infant, and Children (WIC) Farmers’ Market Nutrition Programs, which both match nutrition benefits with local food access, by reviewing ways to promote innovations to modernize program delivery and improve the customer experience.

IMMEDIATE GOVERNMENT INTERVENTION FOR NEAR-TERM ASSISTANCE AND SUPPLY CHAIN CONTINUITY

The actions identified previously will strengthen local and regional production, distribution, and processing, contributing to a less concentrated and more diversified food system. However, due to a diverse array of factors, there are some segments of the food industry for which diversification is more challenging. In addition, some supply chain challenges, such as raw material shortages, can have ripple effects regardless of the degree of supply chain diversification. Given these realities, there are additional supports that the Federal government can continue or initiate to provide near-term assistance and support supply chain continuity as new challenges are encountered.

USDA and other Federal Action: Build on efforts initiated during the COVID-19 pandemic to ensure Food and Agriculture Sector workers are prioritized for worker health and safety measures such as prioritized access for vaccination and other prophylactic treatments, testing, and PPE during public health emergencies.

USDA and other Federal Action: Explore mechanisms for improving assistance to commodity sectors experiencing challenges accessing essential raw materials, particularly for products whose production could have severe public health consequences should they become unavailable.

Congressional, USDA, and other Federal Action: Explore the feasibility of expanding strategic national stockpiles to increase the availability of worker health and safety equipment to a broad array of essential workers during public health emergencies.

PRIORITY 2: Labor Needs



The agri-food supply chain has historically experienced a tight labor market as the ongoing decline in rural population exacerbates difficulties in finding qualified workers for difficult, often lower wage and sometimes hazardous, jobs in farm production, processing, distribution, and transportation. A recent survey by Purdue University and CME reported that 66 percent of agricultural employers are having difficulty finding workers to fill agricultural jobs. This mismatch between workforce needs and workers existed prior to COVID-19; in 2015, a Purdue University study estimated that 40 percent of new agricultural jobs go unfilled each year. At the same time, workers need adequate health and safety protections with a free ability to organize. This section first focuses on U.S. farm labor and hired workers as a distinct subset of the agri-food supply chain workforce. Second, the labor shortages and conditions for the broader affiliated agri-food workforce, and wage considerations (including for farmworkers) are discussed. The section concludes with recommendations on how to strengthen workforce programs across the whole agri-food supply chain.

Key vulnerabilities in U.S. farm labor and hired workers

The U.S. farm labor workforce consists of self-employed and unpaid family workers and hired workers. Although hired farmworkers make up less than 1 percent of all U.S. workers, they play an essential role in American agriculture. According to the U.S. Bureau of Labor Statistics, there were 1.24 million hired agricultural workers in 2020, an increase of about 9 percent since 2010. Hired workers are especially important in labor-intensive specialty crop production (fruits, vegetables and melons, nurseries and greenhouses). Combined, specialty crops accounted for 44 percent of all farmworkers hired in the United States, according to the 2017 Agricultural Census. Many specialty crops require substantial labor at every stage of production from planting to harvest and post-harvest. Labor requirements are particularly high during the harvest season because many delicate specialty crops must be harvested by hand

to avoid bruising and to identify ripeness. The 2017 USDA Agricultural Resource Management Survey (ARMS) survey indicated that labor costs accounted for 41 percent of the total expenses to produce fruits and vegetables. Hired workers are also used extensively in animal production, especially dairy. The dairy cattle and milk production industry is often cited as sensitive to fluctuations in the population of immigrant workers, has the second highest labor cost as a proportion of total expenses.

In recent years, securing sufficient numbers of hired workers has posed a significant challenge for labor-intensive sectors in agriculture. Farm labor is physically difficult, with workers often exposed to challenging environmental conditions. Moreover, the jobs can be unattractive due to the seasonal variability of hours worked and a relatively low wage that often fails to meet the U.S. cost of living.

Farm laborers have lower levels of educational attainment and are less likely to be citizens than both workers in other occupations in agriculture and the U.S. wage and salary workforce as a whole. As fewer young immigrants are entering agriculture, the average age of foreign-born farmworkers has risen (41.6 years old in 2019), pulling up the average for the farm workforce as a whole. The average age of immigrant farmworkers rose by 6 years between 2006 and 2019. In contrast, the average age for U.S.-born farmworkers (36.7 years old in 2019) has remained roughly constant over this period. Taken together, the aging workforce, poor wages, and work conditions driven labor shortages in agricultural production.

Raising wages, providing better and safer working conditions, and increasing union density in the sector can address labor supply challenges and worker turnover. Another approach farmers are taking to address these challenges is to substitute labor with capital through increased mechanization. Although mechanical harvesters and sorters are heavily used in certain sectors (e.g., row crops, tree nuts,

processed fruit, and vegetables), mechanical harvesters for many specialty crops are not yet technologically or economically viable.

Another option farmers can take is to hire temporary foreign labor through the H-2A Agricultural Guest Worker program, a nonimmigrant visa program that allows U.S. producers to hire foreign labor for short-term contracts, when there is a shortage of available domestic workers who are able, willing, and qualified to fill seasonal agricultural jobs, after which the worker must return to their native country. The current terms of the H-2A visa do not allow its use for year-round work such as dairy production.

Foreign workers have long played an important role in meeting demand for agricultural labor. It is of utmost importance that any visa programs ensure fair and adequate protections and pay for workers; labor organizations have been critical in advancing this conversation in Congress. Legislative changes to the H-2A program and passage of the Farm Workforce Modernization Act would likely have the greatest impact on reducing agri-food hired labor shortages.

Key vulnerabilities across processing and transportation

In addition to shortages of hired workers generally, the COVID-19 pandemic exposed the significant impacts that a public health emergency has on the broader agricultural workforce (particularly for workers who must work in close proximity due to the nature of their jobs), the implications for the food supply, and the need to strengthen prevention and treatment of illness among workers engaged in agricultural production, food processing, distribution, transportation, and retail. This vulnerability was seen across workers in every area of the supply chain including farms, production facilities, truckers, railroad crews, river barge crews, distribution facilities/warehouses, grocery stores, school nutrition workers, and the restaurant industry. During the COVID response, the lack of detailed, and in some cases, any occupational data specific to localized food and agricultural industry impacts limited the government's ability to target response activities and have early impacts that would have been beneficial

for interventions (ex. vaccine planning and administration). Increasing and integrating public health data and response into food and agriculture supply chain considerations moving forward will be critical to the overall integrity of the U.S. food supply when faced with future emergencies.

Similar to farm labor, securing sufficient numbers of meat and poultry processing workers and truck drivers has proven difficult, especially during the COVID-19

pandemic. Exacerbated by the current health concerns, these industries (like farm labor) also have physically demanding jobs, under difficult conditions, requires specialized training, and pays relatively low wages. Since 2021, the processing industry has routinely reported 10-20% absenteeism. With respect to trucking, shortages have existed prior to the pandemic. In the past decade, the average driver turnover rate was over 90 percent. The onset of the pandemic posed further challenges to driver

recruitment and retention, which impact on-time truck delivery and shipping rates. Truck drivers, on average, are aging, and fewer younger drivers are seeking these jobs due to the hard nature of the job, long hours, extended time away from family, and low pay for entry-level drivers in comparison to other industries such as construction. In terms of wages for key agricultural sectors, the table below shows wages are relatively low across the board when compared to other occupations,

Occupation	Description	BLS Code	2018 Median Hourly Wage	2019 Median Hourly Wage	2020 Median Hourly Wage	# Employed (2020)
All Occupations		00-0000	\$18.58	\$19.14	\$20.17	139,099,570
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	Manually plant, cultivate, and harvest vegetables, fruits, nuts, horticultural specialties, and field crops. Use hand tools, such as shovels, trowels, hoes, tampers, pruning hooks, shears, and knives	45-2092	\$11.69	\$12.23	\$13.78	293,910
Farmworkers, Farm, Ranch, and Aquacultural Animals	Attend to live farm, ranch, open range or aquacultural animals that may include cattle, sheep, swine, goats, horses and other equines, poultry, rabbits, finfish, shellfish, and bees. Attend to animals produced for animal products, such as meat, fur, skins, feathers, eggs, milk, and honey.	45-2093	\$12.77	\$13.38	\$14.01	36,820
Slaughterers and Meat Packers	Perform nonroutine or precision functions involving the preparation of large portions of meat including specialized slaughtering tasks, cutting standard or premium cuts of meat for marketing, making sausage, or wrapping meats. Excludes "Meat, Poultry, and Fish Cutters and Trimmers" (51-3022) who perform routine meat cutting.	51-3023	\$13.59	\$14.05	\$14.76	77,980
Meat, Poultry, and Fish Cutters and Trimmers	Use hands or hand tools to perform routine cutting and trimming of meat, poultry, and seafood.	51-3022	\$12.96	\$13.51	\$14.51	147,760

Source: U.S. Bureau of Labor Statistics National Data Tables: May 2018, May 2019, May 2020

contributing to a lack of entry and interest in these jobs. Efforts to improve hourly wages, support training for skill development, and improve overall working conditions are all strategies needed to address the agri-food supply chain labor shortages.

Finally, there are affiliated, critical roles such as veterinarians and food inspectors that support the health, safety, and quality of the U.S. food supply. Workers trained in veterinary medicine, animal science, or plant health often emerge college with

significant educational debt, which is misaligned with the starting pay for these positions. At a Federal level, the importance of ensuring a robust federal veterinary and inspection workforce cannot be overstated and USDA is employing numerous strategies to meet this need, including veterinarian tuition assistance and those identified below.

ACTION STEPS TO ADDRESS LABOR NEEDS

In general, USDA will continue to work with our Federal partners (Department of

Labor, Department of Health and Human Services, and others) to support safe and fairly compensated jobs across the agri-food supply chain. Specific recommendations to strengthen the resilience of agri-food supply chains include the following:

Congressional Action: Pass the Farm Workforce Modernization Act.

USDA Action: Make available \$1.4B in grants through the Pandemic Response and Safety Grant program and the Farm and Food Worker Relief Grant program to

support measures, including for personal protective equipment, for producers, processors, and workers across the agri-food supply chain in response to COVID-19.

USDA Action: Utilize research, extension, and land-grant university networks and community colleges to train individuals attending these institutions and utilize skills-based apprenticeship opportunities in local communities to build skills in effective farm and land management practices, agribusiness strategies, and food safety. Continued support for USDA's National Institute of Food and Agriculture (NIFA) workforce development programs such as the Agricultural Education and Workforce Development grants.

USDA Action: Deploy \$100M in ARP funding to support development of a well-trained workforce, safe workplaces, and good-paying, quality jobs by working closely with partner organizations, including labor unions, with expertise in workforce

development and worker health and safety (as part of the \$1B ARP investment in meat and poultry actions referenced in PRIORITY 1: Concentration and Consolidation).

USDA Action: Deploy a multi-agency effort for recruiting and retaining veterinarians including through the Animal and Plant Health Inspection Service (APHIS) 2022 recruitment strategy for veterinarians, the Food Safety and Inspection Service (FSIS) In-Plant Public Health Veterinarian (PHV) Retention Incentive Plan and the NIFA Veterinary Medicine Loan Repayment Program (VMLRP) and Veterinary Services Grant Program.

USDA and other Federal Action: Engage with Department of Labor (DOL) on how to further leverage USDA's existing programs in workforce development and more closely partner on DOL programs such as the Susan Harwood Training Grant program and DOL and DOT's Registered

Apprenticeship [programs for drivers](#) to support food and agricultural needs.

USDA and other Federal Action: Engage with CDC NIOSH Office of Agriculture Safety and Health and the NIOSH Centers for Agriculture Safety and Health to further leverage occupational safety and health outreach and prevention projects to address the nation's pressing occupational health and safety problems for workers in the agriculture industry.

Other Federal Action: Implement recommendations from the [White House Task Force on Worker Organizing and Empowerment](#) to support good-paying, safe jobs with the free and fair choice to join a union.

Measures to address labor constraints facing the trucking industry are addressed in [PRIORITY 5: Transportation Bottlenecks](#).



PRIORITY 3: Ecological and Climate Risks to Crops



Agriculture and fisheries are highly vulnerable to severe weather events and climate change, including droughts, floods, severe storms, heat waves, pests and disease, and disruption of harvest patterns. Shortages of water for irrigation in western states especially threaten vegetable, fruit, and dairy production. The Corn Belt suffered one of the worst droughts on record in 2012, major flooding in 2019, and significant wind damage (derecho storm) in 2020. Drought in southern plains states in 2011-2013 reduced the beef cow herd to its lowest level since 1952 and led to historically high prices. Both heavy rains and drought can severely disrupt inland waterways on which much bulk commodity and fertilizer shipments depend. Loss of electrical power can cause total losses to perishable foods in cold storage.

Climate change and rising temperatures also affect health of farm workers, especially those working outdoors and exposed to natural elements. Increased water temperatures also affect human illness and the frequency and seasonality of disease outbreaks.

The [USDA Action Plan for Climate Adaptation and Resilience](#) describes how the USDA will prepare for current

and future impacts of climate change on agriculture. Additionally, the USDA Climate Hubs play an integral role in climate adaptation through regionally tailored outreach activities. These Climate Hubs work across USDA Mission Areas to connect climate adaptation science and practice. Most recently, in February 2022, USDA announced a \$1 billion investment in partnerships to support America's climate-smart farmers, ranchers and forest landowners. The new [Partnerships for Climate-Smart Commodities](#) opportunity will finance pilot projects that create market opportunities for U.S. agricultural and forestry products that use climate-smart practices and include innovative, cost-effective ways to measure and verify greenhouse gas benefits. Additionally, USDA-certified organic production already serves as an example of producers using climate-smart practices every day, and a market premium existing for organic products. Organic can be an example of adaptation to and mitigation of climate change impacts – and all farmers can benefit from the experience of organic producers and research. USDA investments in supporting the organic sector, and supporting increased transition to organic, are a critical part of our efforts on climate-smart agriculture.

Complementary to the USDA Action Plan for Climate Adaptation and Resilience, the supply chain risk assessment identified the following priority ecological and climate-related risks of immediate concern to crop production resilience:

1. Drought and irrigation water scarcity
2. Emergence of new crop and seedborne pests and diseases
3. Ongoing needs related to Good Agricultural Practices (GAPs) for Food Safety
4. Loss of pollinators and pollinator services essential for crop production
5. Need to diversify specialty crops production to adapt to changing conditions

ACTION STEPS TO ADDRESS ECOLOGICAL AND CLIMATE RISKS TO CROPS ACROSS 5 RISK AREAS

DROUGHT AND IRRIGATION WATER SCARCITY

USDA supports enhanced resilience to drought and water scarcity through a range of program initiatives. Outlined below are various measures, underway and proposed, that could increase the effectiveness of USDA Natural Resource Conservation Service (NRCS) programs, USDA Climate Hubs, and other USDA climate initiatives that support resilience in irrigated and rainfed cropping systems. Department wide efforts to protect and enhance



water quality also have implications for ensuring the continued availability of downstream water availability and may have implications for the safety of food crops grown for human consumption.

USDA Action: Prioritize financial and technical assistance for irrigation organizations and water delivery system improvements through NRCS conservation programs.

USDA Action: Prioritize financial and technical assistance toward irrigation water supply augmentation and improved management, including on-farm and off-farm water retention ponds and storage/regulating reservoirs supported under EQIP and NRCS' Small Watershed Program (PL-566), as well as managed aquifer recharge.

USDA Action: Continue directing financial and technical assistance toward dryland field management practices that increase water infiltration and soil health, including cover cropping, mulching and conservation tillage, as well as those that augment effective water available from natural precipitation, such as drainage water management, snow fencing, rainwater harvesting systems, floodwater catchments, and field terracing/contouring.

USDA Action: Direct funding under USDA working lands programs to promote drainage water management practices that enhance drought resilience on rainfed and tile-drained cropping systems, utilizing science-based tools to effectively target investments.

USDA Action: Research on strengthening agricultural resilience to drought and long-term water scarcity, including CEA production. Currently, USDA funds a broad array of applied field research supporting resilience to drought and water-scarcity through ARS projects (*National Program 211 – Water Availability and Watershed Management*) and NIFA grants to non-federal partners (*AFRI Water for Agriculture Challenge Area*). Research areas address water-use efficient practices, advanced irrigation management systems, crop cultivar development for drought and heat tolerance, managed aquifer recharge strategies, water-supply enhancement strategies, and conserving land covers.

Research on socio-economic and behavioral factors driving practice adoption is similarly important. However, more research is needed, for example, to understand complex interactions involving conservation practice/cover crop adoption, soil moisture effects, and drought resilience. Research findings help inform USDA financial and technical assistance initiatives and Climate Hub outreach activities.

USDA Action: Expand and develop advanced decision-support tools for soil and water resource planning and management to support producers and resource managers in planning for and responding to water-limited conditions.

USDA and other Federal Action: Resource management on public forest and rangelands to enhance water retention/storage and basin water yield. As context, public lands administered by the Forest Service and other Federal land management agencies are an important source of water flows supplying irrigated agriculture and other sectors. Continuing resource management initiatives to enhance resilience to drought and long-term water scarcity is critical and include removal of water-consuming invasive plant species, forest fire management that preserve forested headwaters, restoration of wetlands, and expansion of small-scale water retention and storage facilities on public lands.

USDA and other Federal Action: Expanded availability of effective treatment methods for irrigation water for food crops. Non-traditional water sources may be a potential response to increased water scarcity for irrigation uses. There is an urgent need to expand the availability of effective treatment methods for irrigation water used for growing produce, consistent with applicable food safety standards and environmental requirements. USDA and other Federal agencies should coordinate to expand available treatment methods for organisms of public health significance in irrigation water for produce crops, consistent with applicable food safety and environmental requirements.

USDA and other Federal Action: Coordination with EPA to identify opportunities to mitigate impact of water scarcity and drought to farmers, such as the

Water Reuse Program. Additionally, federal programs which are voluntary could be included which support water safety, such as nutrient management programs which also have impact to water availability and could disrupt the supply chain.

USDA Action: Develop emergency provisions for working lands conservation contracts to provide greater drought resiliency that parallels Conservation Reserve Program (CRP) contract provisions. Currently, USDA's Conservation Reserve Program includes emergency haying and grazing provisions that allow CRP enrollees to get forage benefits from their conservation land during extreme droughts. This flexibility provides an important source of resiliency for producers when yields on traditional forage crops – such as hay and corn silage – decline during drought. Similar emergency provisions could be developed for other conservation practices and programs, for example, adding similar grazing provisions to EQIP and CSP contracts that include cover crops. A key feature would involve adjusting financial assistance level (cost share) for participants that choose to harvest or graze a cover crop during a drought period. Additional flexibilities could be considered to allow for contract modifications to adjust practices or enhancements, without needing to terminate a contract, based on specific drought or emergency conditions.

USDA Action: Increase irrigated acreage enrolled under the CRP and CREP in priority surface and groundwater basins facing persistent water shortages to reduce water demands in fully and over-appropriated river basins subject to periodic water-supply shortfalls.

USDA Action: Expand use of the Regional Conservation Partnership Program (RCPP) and other conservation programs to strengthen basin-scale resilience to drought and long-term water scarcity. While irrigated area has declined across much of the arid western U.S. over the last several decades, irrigated area has expanded in traditionally rainfed production areas of the eastern U.S. Much of this involves 'supplemental irrigation' intended to offset soil-moisture deficits during dry periods. Projected increases in the severity and intensity of drought suggest the potential

for continued irrigation investment in the eastern U.S. where water supplies are sufficient. USDA financial and technical assistance could expand local water storage infrastructure; existing USDA programs to promote adoption of high-efficiency irrigation systems could be expanded and available conservation activities could be further promoted. From an 'agricultural supply chain' perspective, increasing water scarcity in the West is likely to have the greatest impact on irrigated specialty crops—fruits, vegetables, and nuts—reliant heavily on drought-prone surface water supplies and declining groundwater resources. Specialty crop expansion in the East may offset some portion of production losses in California and other western States.

Congressional Action: Expand the use of non-traditional water sources for agriculture. USDA and the FDA are engaged in an EPA-led Federal/State initiative referred to as the National Water Reuse Action Plan (WRAP). Non-traditional water supplies, including recycled and reclaimed water, currently account for a small portion of U.S. irrigation withdrawals. But expanded use of non-traditional water sources may be a potential response to increased water scarcity in some local settings and for appropriate uses, consistent with applicable food safety standards. In particular, support research and development to address the urgent need for additional treatment methods for organisms of public health significance in irrigation water for produce crops.

CROP AND SEEDBORNE PESTS AND DISEASES

The introduction of exotic pests and diseases and other invasive species causes significant economic and environmental harm and disrupts trade in agricultural and food products. Introductions of harmful plant pests and diseases often occur through importation of host materials, such as fresh fruits and vegetables, seeds and planting cuttings, and shipping materials. In the United States, the EPA regulates the use of pesticides, seed additives and plant regulators for control of agricultural pests and diseases, while APHIS maintains the regulatory authority for safeguarding agriculture and natural resources by eradicating or controlling the spread of

invasive pests and—through the inspection and the regulation of imports—preventing their introduction. The APHIS Plant Protection and Quarantine (PPQ) program safeguards U.S. agriculture and natural resources against the entry, establishment, and spread of economically and environmentally significant pests, and facilitates the safe trade of agricultural products. Key vulnerabilities facing PPQ include:

- The effect of climate change on the entry, establishment, and management of pests and diseases; and the ongoing need for data to support such analyses.
- Laboratories are experiencing supply chain issues, such as shortages of the same PCR molecular testing materials as those used in COVID-19 testing and transportation delays for time-sensitive research supplies, that impact critical program activities.
- Shortage in Limited Appointment employees to conduct field surveys due to higher paid opportunities available.
- Airline reduction in routes causes delays in receiving sterile insect pupae at U.S. facilities. These reductions limit PPQ's ability to release sufficient numbers within specified time periods; thereby impacting sterile insect release operations that protect U.S. agriculture and natural resources against exotic fruit flies.
- Critical data systems – PPQ relies on several data/information systems which are critical for executing its mission. Protecting these systems from threats, including cyber security threats, is essential to prevent the introduction, spread and establishment of regulated pathogens in the U.S which could result in agriculture losses and disrupt trade and the environment. These systems include the Automated Commercial Environment (ACE) system, Agriculture Risk Management (ARM) system, and ePhyto.
- Fraud relating to export and import of fruits and vegetables, which could lead to misrepresented shipments and potential increased risk of plant pests and diseases.
- Laboratories - If laboratories such as the PPQ S&T Plant Pathogen Confirmatory Diagnostics Laboratory went offline, delays in completing

confirmatory diagnostic testing that is a key component of preventing the introduction, spread and establishment of regulated pathogens in the U.S could result in agriculture losses and affect trade and the environment.

- Plant Inspection Stations (PIS) clear plants for planting rather than products that are directly used for consumption. In the event of one or more PISs becoming non-functional, there would not be an immediate impact on food supply. In the longer term, there could be impacts in the production of certain commodities that are used for food that would be cleared through PISs, such as tomato plantlets or fruit tree stock. In addition, if products were allowed to enter without clearance through a PIS, then that allows for the potential introduction of plant pests and diseases, including select agents such as *Ralstonia solanacearum* race 3 biovar 2.
- Sterile insect facilities – many of these facilities are aging and past their life cycle. These facilities are critical in sterile insect rearing, eclosion, and release. Loss of these facilities would impact PPQ's ability to release sterile insects which are critical to the successful control of invasive pests such as exotic fruit fly, navel orangeworm, and emerald ash borer.

Actions that can strengthen the capacity of PPQ to safeguard against the introduction and spread of foreign agricultural pests and disease include:

USDA Action: Continue to fund and refurbish critical APHIS assets, including plant inspections stations, pathogen diagnostics laboratories, sterile insect facilities, and data systems.

USDA Action: Continue to fund and refurbish APHIS capacity to mass produce and distribute sterile insects.

USDA Action: Improve capability for incorporating climate change predictions into risk analysis and pest forecasting to help PPQ take appropriate and timely action to changing pest risk.

USDA Action: Strengthen biosurveillance capability to enable pro-active policymaking and planning for more effective pest exclusion and response.

USDA Action: Develop improved survey methods, decision support tools, web-based identification tools, and guidelines for a faster and more effective monitoring of and response to new pest detections.

USDA Action: Implement the PPQ Regulatory Framework for Seed Health (ReFreSH), a public-private collaboration to manage pest risk in the international movement of seeds.

USDA Action: Continue to fully implement Sec. 7721 of the Plant Protection Act (PPA 7721), which supports projects that enhance and safeguard agricultural trade in crop seed.

Other Federal Action: Bolster airline routes available for transit of key materials (e.g., insect pupae) for sterile insect release programs.

ADOPTION OF GOOD AGRICULTURAL PRACTICES (GAPs) FOR FOOD SAFETY

GAPs are voluntary audits that verify that fruits and vegetables are produced, packaged, handled, and stored to minimize risks of microbial food safety hazards. USDA currently has underway a cooperative agreement project which will:

- Create a pilot outreach program to increase awareness of, participation in, USDA GAP programs

- Analyze barriers to farmers (including small enterprises and underserved groups), auditors, buyers, state regulators
- Develop strategies to remove the barriers.
- Launch a pilot program in certain states, and evaluate the impact

In future years, the program will expand to additional states. Lessons learned from the Cooperative Agreement pilot program will be applied.

USDA and other Federal Action: Reduce Barriers to Food Safety Certification by encouraging expanded use of USDA Good Agricultural Practices (GAPs) and Harmonized GAPs as well as partnering with FDA to provide technical assistance and education on produce safety and the FDA Food Safety Modernization Act.

LOSS OF POLLINATORS AND POLLINATOR SERVICES

Pollination services from honey bees and other pollinators are essential to ensuring our diets are diverse and plentiful with fruits, nuts, and vegetables. In all, there are over 100 crops grown in the United States that depend on pollination, with honey bee pollination alone adding more than \$15 billion in value to domestic crop production each year.

Commercial beekeepers in the United States manage honey bees and in some cases

other types of bees to pollinate pollination-dependent crops and/or to produce honey and other products of the hive. Typically, commercial beekeepers that are providing pollination services are migratory, and can visit as many as six different crops across the country in a single season. Increased import competition, especially imports of adulterated honey, has forced U.S. honey prices lower, which has led to pollination service contracts now accounting for more than half of a typical commercial beekeeper's revenue. Managed honey bees have been severely affected by pests and diseases, most notably the parasitic Varroa mite and the viruses they vector, which has increased typical overwintering colony mortality from historical losses of 10-15 percent to 30-40 percent annually. The industry is widely recognized to be facing economic decline not only due to industry stressors such as low honey prices and increased input costs, but also due to risks from a lack of habitat, forage, and nutrition; increased pests and pathogen pressures; increased environmental stressors, such as potential pesticide exposure and climatic stress; and reduced genetic diversity.

USDA Action: Review existing programs to evaluate existing flexibilities to cover climate-related pollinator losses.

USDA Action: Support research to understand how climate change affects pollinators, pollinator forage and pollination rates for crop yield production purposes



USDA Action: Create a repository on the effect of climate stress on the nutritional value of flowers for bees (e.g., the [NRCs PLANTS database](#)) as both a plant species-specific and landscape-level research reference.

USDA Action: Increase NRCs Plant Material Centers efforts to evaluate and promote commercial availability of wildflower species and selections that support pollinator forage in climate-stressed landscapes.

USDA Action: Expand the work of the Office of Urban Agriculture and Innovative Production to provide additional support for pollinator and beneficial insect habitat conservation including in historically underserved and on urban and small farms.

Other Federal Action: Coordinate with U.S. Customs and Border Protection to require honey packers to abide by well-defined product standards and standardized testing methodologies to ensure the authenticity, quality, and accuracy of country-of-origin labeling, and prevent fraud and adulteration.

USDA Action: Loan guarantees are available through [Rural Development's Food Supply Chain Guaranteed Loan Program](#) to support the domestic honey

industry should they opt to apply to establish their own packing facilities.

USDA and other Federal Action: Support research to address and mitigate impacts from current pests and pathogens (e.g., the *Varroa* mite, viruses, and brood diseases, as well as emerging pests and pathogens, such as the Asian Giant Hornet, *Tropilaelaps* parasitic mite), and develop and register new miticides and other pest management tools for beekeepers.

ADAPTATION FOR SPECIALTY CROPS PRODUCTION

USDA Action: Expand research and extension to encourage Controlled Environment Agriculture (CEA) and urban agriculture to reduce climate constraints from specialty crop production.

USDA Action: Continue to encourage investments through USDA's Specialty Crop Block Grant Program (SCBGP) toward projects that address climate adaptation and mitigation research and practices that will enhance the competitiveness of U.S. or U.S. territory-grown specialty crops.

USDA Action: Continue to encourage investments through USDA's Organic Research and Education Initiative (OREI)

toward projects that strengthen organic crop propagation systems to improve resilience to drought, flood, and disrupted seasonal patterns resulting from climate change.

USDA Action: Support increased adoption of organic practices through investment in cross-Department programs to incentivize transition to organic.

USDA Action: Work across the Department to ensure programs (loans, grants, research, etc.) are accessible to and utilized by organic and other climate-smart producers; if not, identify and remove barriers to access.

USDA Action: Ensure that Department efforts on climate-smart agriculture include a clear crosswalk for organic producers to be able to access and inform those efforts. Two programs could be expanded:

- *Low and High Tunnels:* Tunnels or greenhouses extend the growing season, protect plants from harsh weather, and provide other benefits.
- *Urban, Indoor, and Emerging (UIE) Agriculture Competitive Research and Extension Grants* to support research, education, and extension activities for facilitating UIE development, including production, harvesting, transportation, aggregation, packaging, distribution, and markets.



PRIORITY 4: Livestock and Poultry Disease Threats



Livestock and poultry are vulnerable to biosecurity and disease threats. An outbreak of a virulent animal disease can spread quickly and cause devastating losses to the industry and disrupt food supply chains. In 2015, an outbreak of Highly Pathogenic Avian Influenza in the Upper Midwest caused the loss of 11 percent of the U.S. commercial turkey flock and 10 percent of the commercial table egg layer flock in a 3-month period. In China, a 2019 outbreak of African Swine Fever killed 40 percent of that nation's swine herd. An outbreak of Foot and Mouth Disease (FMD) in the United Kingdom in 2001 caused economic losses of \$12-\$18 billion, and would likely be an order of magnitude larger if FMD were to appear in the United States.

Because animal diseases can spread so readily and cause enormous economic losses, the Federal government, especially the USDA Animal and Plant Health Inspection Service (APHIS), plays a central role in coordinating and regulating animal disease prevention, management, and eradication. USDA investments in agricultural research and extension and private sector provision of animal health products and veterinary services also help farmers manage and control of endemic animal pests and diseases.

Key vulnerabilities facing animal health
Priority animal diseases and disease threats to the United States include but are not limited to:

1. African Swine Fever (ASF)

ASF is highly contagious and some forms are 100% fatal in pigs. There is no treatment or vaccine available for this disease. At present, the method for stopping the spread of this disease is to depopulate all affected or exposed swine herds. ASF has never been detected in the United States and strong prevention is our best defense. In a U.S. ASF outbreak of any size, beyond specific economic losses to pork producers, there would be immediate disruptions to international exports of pork, pork products, and byproducts of swine and other animal food exports

such as pet food and food for livestock animals. There would also be losses from disruptions to interstate commerce and production due to the industry's highly integrated animal agriculture which relies on rapid and just-in-time movements. These disruptions of animal and product movement could interrupt food supply chains in both the short- and long-term.

2. Foot and Mouth Disease (FMD)

Foot-and-mouth disease (FMD) is a severe and highly contagious viral disease. The FMD virus causes illness in cows, pigs, sheep, goats, deer, and other animals with divided hooves. Like ASF, FMD is not a public health or food safety threat. It is also not related to hand, foot, and mouth disease, which is a common childhood illness caused by a different virus.

The United States has been FMD-free since 1929. Like ASF, an outbreak of FMD would cause immediate disruptions to international and domestic trade in live animals and animal products. Given the large number of species susceptible to FMD, FMD poses a significant threat to U.S. agri-food supply chains.

3. Avian Influenza (AI)

Avian influenza Type A viruses occur naturally among wild aquatic birds worldwide and can infect domestic poultry and other bird and animal species. New strains periodically enter the United States through migratory flocks and other venues. An outbreak of Highly Pathogenic Avian Influenza (HPAI) in the United States in 2014-2015 resulted in the costliest animal health disaster in U.S. history.

African Swine Fever (ASF)

ASF—first described in Kenya in the 1920s—is a contagious hemorrhagic disease of wild and domestic pigs. ASF is spread by contact with infected animals' body fluids. It can be spread by ticks that feed on infected animals. People are also a source of spread as they can move the virus on vehicles or

clothing. The disease is often characterized by high morbidity and mortality rates. There is no effective treatment for ASF-infected swine, nor is there a vaccine. Currently, the best way to stop this deadly disease is to depopulate all affected or exposed swine herds. However, ASF is not zoonotic (it does not affect human health or the health of other animals). ASF is currently widespread and endemic in sub-Saharan Africa, parts of West Africa, and Sardinia. In the last decade, ASF has spread through Eastern Europe and the Caucasus. In the last few years, the disease has continued to spread in the European Union, primarily in wild boar. In August 2018, China reported the first ASF detections in their domestic swine population and the virus has since devastated that country's national swine herd. ASF is now widely distributed in Southeast Asia. July 2021 brought the first detection of ASF in the Western Hemisphere in the Dominican Republic and Haiti.

Although ASF has never been detected in the United States, international travel and trade pose a substantial risk for viral incursion into the country. Illegal entry of swine products and byproducts (where the virus can persist) presents the largest potential pathway for entry of ASF virus into the United States. ASF is a critical threat to the United States due to the recent global spread, millions of susceptible swine in the United States, including feral swine, and the potential for severe economic impacts. The lack of a vaccine makes prevention of disease entry and early detection of utmost importance, and thorough preparation for an emergency response is crucial.

Due to the continued expansion of ASF throughout Asia, Europe, and now also to the Western Hemisphere, heightened preparedness planning efforts are underway. USDA is working closely with other Federal, State and territorial agencies, the swine industry, producers, and international partners to prepare for and prevent an occurrence in North America. Since 2018, USDA has participated in a series of trilateral (Canada, Mexico, and the United States) ASF Forums, and initiated an ASF-specific exercise program to coordinate efforts. Preparedness and response exercises

help ensure our Nation's readiness and provides an ideal, no-fault learning environment to discuss, practice, and implement plans, procedures, and processes in advance of an actual event. As a result of these ASF preparedness activities, gaps have been identified and improvements made, such as the release of this new [ASF Response Plan](#). This plan provides updated progress in preparedness and response efforts; however, it is imperative to maintain vigilance and continue stakeholder collaborations in order to effectively protect U.S. swine and the U.S. economy from ASF.

As of December 1, 2021, the USDA National Agricultural Statistics Service identified an inventory of 74.2 million hogs and pigs in the United States. An ASF outbreak may also involve feral pigs. Estimates of the feral pig population in the United States range from 6-10 million distributed among 35 states. For all forms of the disease, morbidity rates are very high. Mortality rates vary by form. For the peracute form, mortality can reach 100 percent and occur in the absence of any clinical signs within 7-10 days after exposure to the virus. The acute form is also associated with mortality rates that approach 100 percent, often with death occurring within 6-13 days post exposure. The mortality rate for the subacute form is dependent on the age of the affected populations; and for the chronic form of ASF, mortality is typically low.

In an ASF outbreak of any size, there would be immediate disruptions to U.S. exports of pork, pork products, and byproducts of swine and other animal food exports such as pet food and food for livestock animals. There would also be losses from disruptions to interstate commerce and production due to the industry's highly integrated animal agriculture which relies on rapid and just-in-time movements. These disruptions (e.g., movement standstill orders) of animal and product movement could interrupt food supply chains in both the short-and long-term.

The direct costs of controlling an outbreak would be high: indemnity payments could be large, and activities such as depopulation and humane euthanasia activities for animal welfare, carcass disposal, and disinfection

are resource and personnel intensive. In addition to direct costs, there are numerous indirect costs and impacts, including unemployment and losses or disruptions in related industries (such as grain, other animal food products, tourism, etc.). A study from Iowa State University found that an outbreak of ASF in the United States could cost the U.S. economy \$15 billion if the effects could be contained to two years and \$50 billion if the effects extended a decade. It would likely cause domestic prices of live hogs to drop 40-50 percent as export markets for pork closed. Significant industry downsizing and job loss would occur if effects persisted.

Given the rapid clinical progression, high morbidity, and high mortality of ASF in naïve swine populations, clinical detection of initial ASF cases generally occurs in moribund or dead animals. In a large-scale surveillance program or outbreak response effort, collecting large numbers of individual animal samples to achieve effective sampling coverage is time-consuming and requires significant testing resources, including trained sample collectors.

Foot and Mouth Disease (FMD)

Although the United States has been FMD-free (without vaccination) since 1929, international travel and trade pose a substantial risk that the virus could enter the country. The disease is a critical threat to the United States because of the country's millions of susceptible cloven-hoofed livestock and wild animals, including feral swine. The FMD virus (FMDV) can be transmitted over long distances by animal products, fomites, people, and other mechanical vectors. One of the ways FMDV spreads is via aerosol transmission under favorable environmental conditions. Pigs, particularly, excrete large amounts of virus through their respiratory tract, which can lead to infectious aerosols that can be inhaled by other nearby animals (especially cattle, due to their large inspiratory capacity). FMDV has also been known to spread through windborne transmission, where the virus infects naïve animals located some miles from known infected animals without any history of contact. The distance of windborne transmission over land surfaces depends on the atmospheric conditions and the amount of virus emitted into the air by the infected animals. Because

of its contagiousness, the virus is considered a potential agent for agricultural terrorism. FMD is one of the most devastating diseases of livestock and poses a significant economic threat to U.S. animal agriculture given the approximately 180 million domesticated cattle, pigs, sheep, and goats susceptible to FMD virus. One of the most highly contagious diseases of cloven-hoofed livestock, FMD circulates widely in Asia, Africa, and parts of the Middle East. There are also pockets of infection recurring in South America, but the last outbreak in North America was in Canada in 1952.

An outbreak of FMD in the United Kingdom in 2001 had an estimated economic impact between \$12 billion and \$18 billion. Studies have estimated that an outbreak contained to California could cost \$6-14 billion; while economic losses from nation-wide agroterrorism attack could reach \$228 billion. The estimated economic impact depends primarily on (i) the duration and geographic extent of the outbreak; (ii) the extent of trade embargoes on U.S. products; and (iii) the reaction of consumers to the disease and control measures. The value of lost exports would be a substantial detriment to the economy. In addition, an FMD response effort would involve direct costs for depopulation, indemnity payments, animal disposal, disinfection, and movement control measures, as well as vaccine, if chosen as a disease control measure. Additional indirect costs would be incurred by consumers and related sectors of the economy, such as feed producers and suppliers. Any FMD outbreak in the United States would likely have a sizeable and lingering economic impact.

Since vaccination against FMD during an outbreak is a key tool for rapid containment and eradication, several studies have provided estimates of the number of vaccine doses needed if FMD were detected in the United States. While previous U.S. policy had been to eradicate the disease with either no or only a minimal amount of vaccine, it is increasingly apparent, due to the expansion and concentration of livestock populations as well as environmental and societal considerations associated with eradication policies, that vaccine will be a critical component of any FMD response strategy. Estimated vaccine doses needed to

be banked to mitigate an FMD outbreak in the United States range from 2.5 million doses to 50 million doses (depending on FMD disease type and extent of spread).

Avian Influenza (AI)

In 2014-2015, outbreaks of avian influenza in the United States constituted the costliest avian health disaster in U.S. history. This series of outbreaks were driven in part by introduction of Asia-origin influenza viruses into North America during autumn bird migration. As these viruses reassorted with North American strains, confirmed detections occurred across 21 different states.

Emergency disease control efforts removed about 42 million egg-laying hens and pullets (70% and 12% of the total number of birds culled, respectively), 7 million turkeys (14%), and 2 million non-commercial poultry (chickens, ducks, and other exotic species represented 4% of the total number of birds culled) from production. In the two states with the greatest quantity of infected poultry, Iowa and Minnesota, HPAI resulted in the death of 33 million birds and 9 million birds, respectively. Compounding response challenges, at the outbreak peak simultaneous response activities were required on multiple farms. In May 2015, approximately 86 new farms were detected with a total of 25 million birds that would be culled during May and

June 2015 – an average of 409,836 birds per day. Overall, depopulation costs for all species combined were \$47.1 million. The cost of response activities for disposal performed by responders totaled \$126.5 million, while cleaning and disinfection cost \$225.3 million.

Emergency disease control efforts established movement restrictions that prohibited birds, table eggs, or individual pasteurized eggs from infected premises from moving off-farm or entering commerce. Eggs from some infected premises had managed movements that permitted controlled liquid egg pasteurization, under the authority of State Animal Health Officials and USDA officials. Controlled or managed movement restrictions were also placed on non-infected poultry premises within a 10km control area around each infected flock—presumptive and confirmed—for egg and bird movements.

In addition to the decrease in eggs produced because of bird mortalities, bilateral trade restrictions limited the international demand for U.S. poultry products from the affected areas. These trade restrictions varied geographically, ranging from national trade restrictions put in place by a small number of countries to more common state and control zone trade restrictions. The United States exports a relatively small percentage of its annual egg production but lost over

10% of the national laying-hen inventory to the AI outbreak. In aggregate, the 2015 AI outbreak restricted the supply of eggs on the market, leading to the highest egg prices observed in more than 30 years, after adjusting for inflation.

In February 2022, avian influenza was found in wild birds as well as commercial poultry in the United States. USDA, impacted states, and other partners are responding swiftly to these cases and continue to urge good biosecurity practices for all poultry producers.

ACTION STEPS TO ADDRESS LIVESTOCK AND POULTRY DISEASE THREATS

ANIMAL HEALTH RESPONSE

USDA and other Federal Action:

Strengthen animal disease monitoring, surveillance and prevention:

- Strengthen disease monitoring and prevention, regulatory control and response, training and extension of best management practices, and animal health research for priority animal diseases.
- Enhance a “One Health” approach that considers animal, human, and environmental contributions to disease surveillance and response in wildlife and domestic animals.



- Strengthen global disease and vector monitoring and conduct vulnerability assessments to identify opportunities to prevent entry of transboundary and emerging diseases to US animal populations.
- Enhance risk-based surveillance in both wildlife and domestic livestock and poultry populations for early detection of disease and prevention of disease transmission between vulnerable populations.

USDA Action: Continued emphasis on the development of business continuity plans for livestock and poultry which can support the safe movement of animals and animal-related products during an outbreak.

USDA Action: Strengthen preparedness posture by evaluating the on-hand equipment and supplies necessary to respond to an animal disease outbreak in wildlife and domestic animals.

USDA Action: Continue international engagement in animal disease control:

- Through the OIE standards setting process, work to ensure that international animal health standards are science-based and broadly supported and adopted by trading partners; and

- Strengthen traceability of meat/meat products to meet export certification with negotiated zoning protocols and animal health language with foreign governments and trade partners.

Notification of a foreign animal disease outbreak to the World Organisation for Animal Health (OIE) may lead importing countries to restrict or prohibit U.S. exports. This will result in shipments during the initial days of the outbreak to be returned to the United States. As these meat/meat products return, we must be able to identify possible affected products and provide options for domestic use or implement mitigations such as move to cooking facilities or possible destruction at port of arrival. Traceability will help to assure products originate only from outside a control zone, and segregation must occur between meat or meat products originating from animals located within the control zone from animals located outside the control zone.

USDA Action: Continue operation of the National Detector Dog Training Center (NDDTC) to ensure ongoing high quality canine pest inspection teams from APHIS, U.S. Customs and Border Protection, Florida Fish and Wildlife, the Florida Department of Agriculture and Consumer Services, and the California Department of Food and Agriculture, enabling them to inspect passenger baggage, cargo, and parcels for prohibited agricultural items

(e.g. prohibited, high-risk fruits, vegetables, and meats) that could carry harmful pests and diseases into the U.S.

AFRICAN SWINE FEVER PREPAREDNESS

USDA Action: USDA is investing up to \$500 million in announced Commodity Credit Corporation funding to prevent the spread of African Swine Fever via robust expansion and coordination of monitoring, surveillance, prevention, quarantine, and eradication activities.

This funding is allowing the USDA to expand existing safeguards to protect the United States from the threat of ASF. It is also allowing for increased surveillance, testing, laboratory, and response preparations on the mainland, in Puerto Rico, and in the U.S. Virgin Islands. The USDA will continue to coordinate with both the Dominican Republic and Haiti (where ASF was detected in 2021) to ensure a robust Western Hemisphere response.

USDA Action: Continue research into the development of vaccines for ASF.

Other Federal Action: Support the FDA's Center for Veterinary Medicine commitment to working with sponsors to help facilitate the development and approval of products, such as animal drugs or animal food additives, intended to prevent ASF infection and spread.



PRIORITY 5: Transportation Bottlenecks



ACTION STEPS TO ADDRESS TRANSPORTATION BOTTLENECKS

INLAND WATERWAYS

The nation's extensive transportation system is of paramount importance for an efficient, competitive, and flexible agri-food system. Transportation enables food to move from our farms to our tables, and to ports for export to foreign markets. It also ensures American producers receive the lowest prices on inputs and the highest prices for their crops while ensuring American consumers pay less for the food on their tables. Together, the four major modes—barges, ocean vessels, trucks, and railroads—operate as a seamless network, both complementing and competing with one another, to deliver products efficiently and economically within ever-changing domestic and global markets. This system of inland waterways, ocean ports, containers, highways and bridges, trucking, and railroads, has enabled the United States to become the world's largest exporter, as well as one of the largest importers of food and agricultural products.

Agriculture is the largest user of the freight transportation system in the United States, and the need for transportation services will only continue to increase as agricultural production, exports, incomes, trade, and world

population continue to grow. Thus, a modern, efficient, reliable, and competitive transportation system is necessary to the continued success of American agriculture. Passage of the Infrastructure Investment and Jobs Act provides long overdue and much needed investment to maintain and improve the capacity and reliability of U.S. agri-food market chains, which remain vulnerable from historically inadequate Federal investment. This section emphasizes where that investment is critically needed to benefit agriculture. In addition, this section discusses other challenges beyond infrastructure, such as coordinating data sharing, addressing trucking regulations, and confronting competition issues in ocean and rail, that together will ensure a more robust and reliable transportation system for agriculture. Ocean ports are addressed below but ocean carriers are discussed in [PRIORITY 6: Trade Disruptions](#). USDA is also currently developing policy options to invest \$500M in Commodity Credit Corporation (CCC) funds to help address the myriad agricultural transportation and material shortages being experienced across the agri-food industry.

The inland waterways are an integral component of the Nation's freight transportation system and are especially important for the movement of bulk commodities like grains, oilseeds, lumber, and fertilizers, as they provide the lowest cost means of transportation for such goods. In 2020, more than 40 million tons of downbound bulk grains moved through the Mississippi River locking system to the U.S. Gulf for export, and, overall, the Mississippi River System moves about 57 percent of U.S. corn and 59 percent of soybean exports (by volume) annually. The inland waterways are also America's cleanest transportation mode with the lowest carbon and greenhouse gas emissions for many goods. Modernizing locks and dams and deepening crucial waterway chokepoints will help reduce congestion on the Nation's roads and railways and reduce carbon emissions. Additionally, modernizing the locks will reduce transportation costs for American farmers. As climate change increases uncertainty, the odds of unscheduled closures also potentially increase as some urgent, high-risk conditions may not be resolved until too late. Over time, such disruptions could become increasingly



unsustainable burdens on the U.S. grain and food supply chain.

The overall condition of the inland waterways has slightly improved since 2010 as evidenced by the downward trend in the number of instances of lock closures due to preventable mechanical breakdowns and failures lasting longer than one day and lasting longer than one week. However, USACE states that the lock closures that still occur can result in substantial delays to shippers, carriers, and users, and are a factor in the cost of shipping commodities on these waterways.⁵ Similarly, ASCE reports that between 2010 and 2014, the inland waterways experienced almost 18,000 hours of unscheduled closures, but they experienced 5,000 hours of unscheduled maintenance closures between 2015 and 2019. Increased funding for the inland waterways over the past decade have helped improve system performance compared to the peak of unscheduled lock closures in 2010, but 5,000 hours of unscheduled maintenance closures still represents a significant cost that erodes agricultural export competitiveness. Of all closures, unscheduled closures are typically the most disruptive and costly to commercial lock users.⁶ Agricultural stakeholders express worry that without grade “A”, or world-class waterways infrastructure, they will continue to lose their competitive edge in global markets. This is an increasing worry for stakeholders as major grain and oilseed competitors to the U.S., such as Brazil, have made significant investments in their waterways and transportation infrastructure in recent years, which has lowered their transportation costs relative to the U.S.

Agricultural stakeholders continue to advocate for increased funding to modernize and improve the inland waterways system reliability, which will lower their transportation costs and increase farmer profitability. USDA estimates current Mississippi River delays are estimated to cost approximately \$44 million per year and could impact corn and soybeans up to \$0.25 per bushel.

These delay costs are “paid” by farmers who get a lower cash price. Transportation costs are a major component in setting local cash prices. As transportation costs increase, farmers receive lower cash prices. Transportation disruptions, such as a lock outage, lower cash prices to farmers as elevator shipping rates rise. Changes in barge rates can also influence cash prices, indicating that higher transportation costs negatively impact farm income. Due to cost savings, grain shippers located within 50 miles of the Upper Mississippi River typically move 13 million tons by river compared to 5 million tons by rail and virtually none by truck. When the river is unavailable to transport grain, the prices farmers receive significantly decrease, from \$4.89/metric ton for corn (\$8.25 for soybeans) during a short closure to \$8.15/mt for corn (\$16.33 for soybeans) during a year-long closure. Local grain prices are higher along the Mississippi River because of barge transportation options. For example, prices are roughly 10 cents more per bushel of corn in East Iowa with river access versus West Iowa with rail access.

However, some sections, such as key lock chambers along the Upper Mississippi River and Illinois Waterway, are outdated, unable to handle the largest (and most efficient) barges, and unscheduled closures significantly disrupt transport of a large part of the nation’s agricultural commerce. A need remains to allocate resources that could support deepening channels and waterways, resulting in improved cargo flow and increased ability for agricultural shippers to load vessels to optimal capacity. Additionally, many locks and dams require major rehabilitation to restore their reliability and performance. There is a long backlog of authorized modernization projects to construct crucially-needed new locks that are waiting for appropriations (funding) necessary to start work. Climate change has further complicated navigation issues and underscores the need to replace and upgrade aging infrastructure.

Sufficient resources for operation and maintenance (O&M) and depth dredging are necessary to support priority port and waterways projects. In addition to channel and waterway deepening, O&M appropriations are required for the inland waterways to ensure system reliability. The locks and dams in the US were built primarily in the 1930s and the vast majority are over 70+ years old. As locks age and components wear or deteriorate, closer monitoring of the infrastructure is increasingly needed. However, despite aging lock infrastructure, routine maintenance, lock dewaterings, and inspections sometimes occur less frequently than in the past due to fiscal limitations.⁶ Consequently, the repair backlog is increasing at some locations, leaving gates to operate in less-than-optimal condition. Although critical repairs are prioritized, delayed maintenance increases the risk of operational or catastrophic failure that results in lock closures.⁷ Agricultural stakeholders recognize that increased funding over the past decade has improved lock reliability, but they express concern about the ability to keep up with the growing challenges of aging infrastructure, threats from climate change (such as increasingly severe and more frequent droughts and flooding), and increased demand for navigation services.

Agricultural stakeholders stated that continued investment in improvements on the inland waterways are necessary to reduce risk of failure and increase reliability. The Bipartisan Infrastructure Law (BIL) provides USACE with \$2.5 billion for work on construction projects as well as additional funding that can be used to accelerate major maintenance that will improve the reliability and longevity of inland navigation projects. One BIL project is full funding for a new 1,200-foot lock at Lock and Dam 25—one of the most significant sections of waterways infrastructure to agriculture, which carries nearly every bushel of grain from five States transported on the Mississippi River for export through the Gulf of Mexico. Adding a second lock will improve the efficiency and resiliency of the system by eliminating

5. [FY 2021 United States Army Corps of Engineers Agency Financial Report](#)

6. Foltz, Stuart. [Investigation of Mechanical Breakdowns Leading to Lock Closures](#). U.S. Army Engineer Research and Development Center (ERDC) Construction Engineering Research Laboratory (CERL). June 2017.

7. Ibid.

8. Burton, Mark. [Barge Traffic Disruptions and Their Effects on Shipping Costs in Agricultural Freight Corridors](#). University of Tennessee, Knoxville. December 2019.

the potential risk of a single point of failure posed by the single 600-foot lock. If the lock closes, all traffic stops until the lock is re-opened. The estimated cost of an unplanned closure of Lock and Dam 25 to the farm economy is around \$1.57 billion, impacting 132 counties in 17 States. Currently, a 12-month disruption to Lock and Dam 25 could impact 18.5 million tons of grain.⁸ The cost increase would be nearly \$947 million to reach more distant barge terminals by truck. But a complete river closure could increase shipping costs by nearly \$1.8 billion for a rail-only alternative. These estimates assume flexibility of rail service and no changes from the current rail and truck rates. Realistically, rail carriers would not be able to quickly add service and are unlikely to be willing to add services for short-term situations, resulting in the inability to move grain. Furthermore, the environmental impacts of a river closure would generate significant CO₂ emissions. Railroads generate 30 percent more CO₂ emission per ton-mile than barges and trucks generate 1,000 percent (one-thousand percent) more than barges.

While agricultural stakeholders applaud funding for Lock and Dam 25, six other agriculturally-significant lock improvement projects await funding. These six projects are part of the Navigation-Ecosystem

Sustainability Program (NESP), which is a long-term program of ecosystem restoration and navigation improvement for the Upper Mississippi River System. The current 600-foot lock chambers at these six locations are undersized and cannot efficiently handle modern-day 15-barge tows (typically, 1,200-foot long). In fact, many inland locks lack the capacity or redundancy for optimal barge traffic configuration.⁹ A system designed with single points of failure, such as the current single 600-foot lock chambers along the Upper Mississippi River System, is not resilient. An extended closure of a single lock at these locations could put into jeopardy roughly half of all U.S. grain and soybean exports, which are carried by barge, because insufficient rail capacity exists in the Gulf region to absorb diverted grain and soybeans from the waterways. NESP would restore the ecosystem and improve navigation through construction of six new, modern 1,200-foot lock chambers to support rising transportation demand and add resiliency through the addition of a second set of locks at these critical agricultural gateways. These six lock chamber projects (authorized in 2007) await appropriation to begin construction. Waterways stakeholders rank NESP as their top priority and believe their benefits are undercounted, and USDA and agricultural stakeholders believe NESP is the single most important piece of

waterways infrastructure for agriculture. **Federal Action:** Complete projects in the Budget and FY 2022 IJA spend plan to create a modern, efficient, and resilient system for the reliable and low-cost transport of agricultural products, which would boost U.S. farm export competitiveness.

OCEAN PORTS

The U.S. economy depends on reliable and resilient freight transportation to move U.S. goods efficiently and to remain competitive globally. Over the past decade, the average size of vessels in the container vessel fleet has grown substantially. But as a nation as a whole, America's ocean ports, container terminals, and connecting inland infrastructure have not expanded comprehensively or commensurately with global container vessel capacity growth, unlike those of our global trading partners and competitors. This mismatch, together with 2021's nearly 18 percent demand-driven growth in inbound container tonnage over 2019, has caused temporary landside congestion overwhelming terminals, local storage, truck service, and rail operations, further slowing port operations. (Issues related to consolidation in ocean carrier shipping are addressed *infra*, in **PRIORITY 6: Trade Disruptions**.)



9. [State of the Infrastructure: A Joint Report by the Bureau of Reclamation and the U.S. Army Corps of Engineers](#), December 2019.

Port disruptions can severely stress every aspect of the supply chain, including warehousing, trucking, rail service, inland and ocean terminals, container and truck chassis availability, and vessel service. As one example, some ocean carriers require their containers to be carried only on chassis owned by a particular company, leading to system inefficiencies. When that company's chassis are not available, even if other brands are nearby or a trucker has his or her own chassis, the trucker must seek out the "right" chassis, while the container sits idle. In addition to truck driver and chassis shortages, there is also a shortage of storage space at near-port distribution centers, further delaying national supply chains' ability to accept and process massive volumes of import cargo and move it to its end users. Notably, import containers that cannot be picked up are languishing on terminals or at distribution centers and storage locations, creating havoc in trying to move containers back to the terminals or even out of the area. Such disruptions are significantly delaying freight traffic for days, weeks, or months, and increasing shipping and supply chain costs. These factors, combined, are resulting in supply chain interruptions, production stoppages, increased costs, and lost revenue, which lead to significant inflation and economic and industry growth consequences in the short run. In addition, hurricanes, sea level rises, and other severe weather events are increasingly impacting supply chain

and overall freight movement. A resilient ocean and inland transportation system is crucial to our Nation's – and our agriculture industry's - ability to recover from these weather and infrastructure-related supply chain disruptions.

Exacerbating this situation is a lack of digital integration among various segments of the supply chain, such as ocean carriers, ocean ports, chassis providers, truckers and trucking firms, railroads, warehousing, freight forwarders, third-party logistics, importers, and exporters. This fragmentation of data prevents optimization of supply chain logistics, leading to increased costs and compounded delays. The digital connection and integration of all nodes needs to take place to improve the efficiency and competitiveness of agricultural exports.

Federal Action: Utilize funding for port infrastructure modernization from the Infrastructure Investment and Jobs Act. USDA could consult with DOT and USACE to determine best funding program(s) and amounts to target that specifically address bottlenecks for agricultural exports. In addition, ports need funding for dredging projects to increase port depth to accommodate larger ships.

USDA Action: Provide training, education, and funding to support agricultural exporters and their service providers to update legacy technology systems to

incorporate the sharing of real-time data through API integration. The Federal Government should support a "technology as infrastructure approach" to address current shortcomings in supply chain logistics. Supply chain stakeholders should be encouraged to digitize and share end-to-end cargo status and movement data, following best practices from the Digital Container Shipping Association that encourage widespread adoption of common digital technology standards. In addition, ports need to implement better data sharing and transparency through API integration of real-time data to improve scheduling of rail, chassis, and trucking appointments.

SHIPPING CONTAINERS

Ocean carriers make capacity and service decisions based on the needs of the headhaul (import) containers. Because agricultural exports are the backhaul movement for ocean container carriers serving the United States, exporters often struggle to gain access to ocean container shipping services, which has severely worsened during the current supply chain disruptions. Furthermore, agricultural production is often located in rural areas long distances from seaports. Exporters have limited access to imported containers that make their way inland to serve agricultural production regions because most imported containers are delivered to warehouses and businesses near the seaports.



Congressional Action: Support investments and programs that build more inland container loading and unloading facilities.

More inland container loading and unloading facilities are needed throughout the central portion of the United States to give exporters located inland more options for accessing container service. In addition, more inland port facilities, also called dry ports, are needed near West Coast ports. These facilities operate as an inland distribution point and typically haul 1 or more trains of containers to and from the seaport each day. These facilities reduce traffic and emissions around the typically congested port regions. Because the investment and coordination required to develop inland container loading facilities and dry ports is so substantial, many regional and State-level attempts have failed. Instead, a Federal government interagency taskforce could spearhead these efforts through coordination of priorities and funding among vested parties at different levels of government including national, State, and local as well as with the private sector. Coordination could be led by a Federal champion, such as the Port Envoy to the Supply Chain Disruptions Task Force, who would involve relevant parties to identify suitable locations, identify and coordinate regulatory hurdles, and allocate funding for land purchases – which could be subsidized through Federal investment or through cost sharing with States or local authorities, as applicable. The Federal Champion would ensure feasibility and buy-in from relevant parties in the private sector such as ocean shipping lines, railroads, trucking companies, labor, agricultural stakeholders, and port authorities.

HIGHWAYS AND BRIDGES

Trucks move more agricultural freight than any other transportation mode. Almost every agricultural freight trip includes at least one movement by truck in the full journey from farm to final destination. Low transportation costs is one way that the U.S. agriculture industry has remained competitive with low-wage international competitors who have lower costs of production. Maintaining the performance of highways, which are often the most expensive leg of the journey on a per ton-mile basis, is essential to keeping

freight costs low and supporting producers operating under tight profit margins. Currently, the majority of roads in poor and mediocre conditions tend to be on agriculturally-important urban and rural connectors and the non-interstate system. Should transportation costs increase, the United States could lose this competitive advantage, particularly if other countries continue to lower transportation costs by improving their infrastructure. One of the reasons investments in these agriculturally-important sections of highways lag behind is due to the seasonal nature of agricultural use. During harvesting and planting season, these sections of highways experience high volumes over short periods of time. However, annualized traffic data tends to mask the importance of these highways when compared against other sections of highways that see higher overall traffic volumes year-round. In addition, agricultural highway corridors can span multiple regions or States, whereas planning and investment is often optimized within regions or States, discounting the needs of a larger agricultural network.

Federal Actions: Deploy relevant Bipartisan Infrastructure Law (BIL) authorities and other financial support, such as through State Infrastructure Banks (SIBs), to strengthen the nation’s highway infrastructure. Under the FAST Act, SIBs may establish a Rural Projects Fund, and make loans to both public and private entities. Investments in smaller projects for local first/last mile freight infrastructure specific to agricultural needs could be funded through existing discretionary and formula programs, while prioritizing and accounting for the unique needs of agricultural traffic.

Other Federal Action: Establish an agricultural freight secure data commons.

Better data is needed to identify areas for infrastructure investment that will benefit agriculture. Data on the condition and performance of local roads are often lacking and anecdotal evidence suggests these roads tend to be in worse overall condition than arterials, and that in rural areas, bridge closures and outdated design standards contribute to longer and less reliable shipping routes. Local and arterial roads tend to be the most critical for agriculture,

but not captured by current data assessments that annualize usage statistics which may miss peak usage and critical windows during harvest. Current data collection efforts used to rank investment needs may either discount or miss the needs of agriculture.

A secure data commons could be established in partnership with USDOT or the Transportation Secure Data Center run by USDOE’s National Renewable Energy Laboratory. A secure data commons can compile sensitive agricultural freight data for research and planning purposes but be protected from disclosure to the public or competitors. In addition, it should sponsor research to develop multimodal and multi-state models of agricultural supply chains based on data from the industry, to inform enhanced agricultural freight planning and investments.

Other Federal Action: Encourage and coordinate regional infrastructure planning among States. Most agricultural movements are across State lines, but Federal planning regulations do not require States to cooperate across State lines for freight planning or other topics outside of urban areas. Thus, agricultural infrastructure networks are inefficient and incomplete. The BIL, Section 21106, includes a program to encourage States to establish multistate freight compacts and establishes a grant program to fund those operations. The Federal government should develop incentives for State DOTs to work together better under this program on agricultural freight planning at a megaregion scale to encourage more regional-scale or industry-scale freight planning to optimize infrastructure investment along agricultural freight networks.

Where private investment can be part of the financing mix, regional coordination may be helped by bringing in regional infrastructure exchanges, such as the West Coast Infrastructure Exchange or similar organizations that promote best practices for project finance and operations, pre-screen and prioritize projects, and connect projects with private capital.

Longer term, a Federal financing authority decentralized to the regional level that could leverage, or overlay State Infrastructure Banks, and could screen/

prioritize projects at the regional level would be beneficial, by optimizing the mix of projects to regional characteristics (i.e. instead of financing projects individually, maximize complementarity across alternative investments).

TRUCKING SERVICES

The availability of trucking services for food and agricultural products has been, as previously discussed in [PRIORITY 2: Labor Needs](#), adversely affected by high driver turnover, low pay and benefits, and inadequate facilities for safe truck parking. This shortage is further exacerbated by the requirements of the food and agriculture produce sector for cold storage and perishable trucking. Truck parking shortages are a national safety concern. Commercial truck drivers need access to safe, secure, and accessible truck parking. With the projected growth of truck traffic, the demand for truck parking will continue to outpace the supply of public and private parking facilities and will only worsen the truck parking problems experienced in many regions. Truck parking shortages are still a major problem in every state and region with 98 percent of truck drivers reporting problems. Problems are reported at all times of day, week, and year, but mostly overnight and weekdays. And, truckers have identified “detention time”, that is any time spent waiting to load or unload in excess of two hours, as an ongoing strain against the efficient movement of goods; as a result, section 23022 of the BIL requires a study of driver compensation with a specific look at detention time.

A further constraint on the supply of trucking services is a shortage of intermodal truck chassis, critical to the movement of containers. Chassis shortages are contributing to land-side congestion at many ports around the country as well as at inland rail hubs such as Chicago, Memphis, and Kansas City. Chassis supply are likely to remain stressed through late 2022. In addition, U.S. manufacturers have not been able to produce sufficient chassis to substitute for imports. And, as referenced earlier, constraints on chassis supply are further complicated by requirements of ocean carriers to use their chassis to pick up containers, rather than whatever chassis is readily available and most efficient.

USDA and Other Federal Action: Implementation of the Biden-Harris Administration Trucking Plan. Continue ongoing collaboration and information sharing with DOT and DOL to address trucking challenges in agriculture. Support the Drive-SAFE Act, designed to find ways to let younger people enter the industry, as well as reach out to underrepresented demographics, including women and minorities, to open trucking as a career path.

RAILROAD REGULATION

Between 1980 and 2000, railroads consolidated from 30 Class I railroads to only 7, with one additional merger currently pending. In recent years, the top 2 railroads accounted for 68 percent of originated Class I grain carloads. Because of the rail industry’s consolidation, railroad market power has increased, and many grain shippers are “captive” to a single railroad, with no access to competitive rail options or alternative transportation options. Following a series of mergers in the 1990s, railroad rates between 2000 and 2019 generally increased while rail service and rail access declined. The Surface Transportation Board’s annual rail rate index study shows that grain shippers have disproportionately born the costs of past rail mergers and deregulation, with grain rail rates above their levels prior to deregulation – in stark contrast to other commodities. The lack of effective rail competition is reflected in increased crop-input and feedstock prices paid by farmers, livestock operations, poultry operations, biofuel operations, feed mills, food processors, and other agricultural operations that depend on rail service. For example, rail rates to ship anhydrous ammonia, which is a key ingredient for 75% of the essential fertilizers utilized by farmers, have increased over 200% in the past 20 years.

Other Federal Action: The Surface Transportation Board should implement regulatory changes to enhance competition within the consolidated industry and improve the rate dispute process, including:

1. Competitive switching – increasing competition among existing carriers.
2. Final Offer Rate Review (arbitration) as an alternative to formal rate challenge processes – this approach is less costly and more accessible to agricultural shippers for challenging excessive rates in captive markets.
3. Strengthen partnership with Department of Justice on rail mergers and acquisitions and apply stronger antitrust principles.
4. Enhance Common Carrier Obligation: Collect and make available additional data in order to assess Common Carrier Obligation through shipment-level data on service quality; excessive demurrage and accessorial charges; and first-mile/last-mile service metrics.
5. Revoke intermodal traffic from regulation exemption to allow container shippers by rail to challenge detention and demurrage fees imposed by railroads.
6. Mandate data collection on first-mile/last-mile service metrics.
7. Use any other appropriate tools to promote fair competition in rail shipping.

PRIORITY 6: Trade Disruptions



U.S. agri-food supply chains are highly integrated into global markets, with a substantial share of agricultural and food products both exported and imported. Trade improves the efficiency and performance of the agri-food sector. It enables commodities, intermediate goods, and final consumer products to be sourced from where they can be grown or manufactured at the lowest cost. Trade also increases the diversity and year-round availability of food products and helps cushion the shock of local or regional supply shortfalls due to bad weather or other disruptions (assuming transportation issues are addressed).

The United States normally runs a trade surplus in agricultural products. In 2021, U.S. exports of agricultural products reached an all-time high of \$177 billion, topping the 2020 total by 18 percent and eclipsing the previous record, set in 2014. U.S. imports of agricultural products in 2021 amounted to \$171 billion, a 17 percent increase over 2020. The United States' top 10 export markets all saw gains in 2021, with six of the 10

– China, Mexico, Canada, South Korea, the Philippines and Colombia – setting new records. Worldwide exports of many U.S. products, including soybeans, corn, beef, pork, dairy, distillers grains and pet food, also reached all-time highs. China remained the top export destination, with a record \$33 billion in purchases, up 25 percent from 2020, while Mexico inched ahead of Canada to capture the number two position with a record \$25.5 billion, up 39 percent from last year.

The largest destinations for U.S. agricultural exports are United States-Mexico-Canada Agreement (USMCA) partners and East Asia. USMCA countries are also the largest sources of agricultural imports into the United States. The threat of market closure within the USMCA is low. However, exports to our single largest market, China, are vulnerable to trade disruptions.

While the United States is often a net exporter of agricultural goods, it has been a net importer of fruits and vegetables since the mid-1990s. One-quarter of 2020

imports were horticultural food products (vegetables, fruits, and tree nuts, fresh and processed, including juices). Imports of fresh fruits totaled \$14 billion and fresh vegetables \$10 billion. Mexico and Canada are the largest foreign suppliers of fruit and vegetables to the United States.

Key vulnerabilities to agricultural trade

- Production and manufacturing of many critical agricultural inputs and food products rely on components produced in foreign countries. Dependence on single-source or unreliable foreign sources for critical materials and products is a potential vulnerability to U.S. agri-food supply chains should that source be disrupted.
- Heavy reliance on one or few foreign market destinations for U.S. agricultural exports creates risks of shocks to producers and supply chains if access to those markets becomes limited. Over the past four years, the dynamic policy environment with China demonstrated these risks. Similarly, some U.S. products such as chicken feet and meat variety products (e.g., beef tongues and livers) are almost exclusively exported to East Asia, as there is little demand in the U.S. or other countries for these products. Exports



such as these contribute substantially to agri-food sector revenues but are particularly vulnerable when trade with these markets is disrupted. Trade partners often react to U.S. actions to implement federal trade statutes designed to remedy injury to domestic industry and respond to unfair or unreasonable trade practices with unjustified retaliation against U.S. agricultural exports. Regaining market share in foreign markets for U.S. products is often difficult. Current rules and practices do not sufficiently help U.S. agricultural exporters respond to these forms of unjustified retaliation. The risk of retaliation against U.S. agricultural exporters highlights the need to support export promotion's efforts to expand markets to enhance trade diversity and resiliency.

- **Lack of Preferential Access.** U.S. agricultural exporters increasingly face unequal market access as our competitors continue to enter into new bilateral and regional trade agreements with key markets.
- **Sanitary and Phytosanitary (SPS)** measures and other non-tariff barriers. The USDA, Department of Commerce, and USTR continuously engage with foreign governments and international standard-setting bodies (such as the Codex Alimentarius Commission and the World Organization for Animal Health). These engagements allow for (1) resolving concerns including SPS and other non-tariff barriers that hinder U.S. agricultural exports and (2) developing standards based on scientific principles and evidence that protect human, animal, or plant life or health without unnecessarily restricting or impacting trade. SPS barriers can be erected quickly, often appear to lack a scientific or risk basis, and can pose a serious threat to U.S. agricultural exports. Furthermore, as U.S. exporters develop new production technologies to address climate challenges, some markets may begin to apply new unjustified restrictions on their products without any scientific basis or evidence. Such restrictions would not only reduce U.S. exports but would stifle innovation and adoption of technologies needed to develop climate-smart agriculture.

- Transportation bottlenecks arising from truck driver shortage, port congestion, aging or outdated infrastructure, and inspection operations. Food and agricultural products that require refrigeration or that have a short shelf life, such as certain meat and poultry products, and fresh fruits and vegetables, are especially vulnerable to transportation delays due to refrigeration costs and spoilage.
- Ability to maintain global competitiveness of U.S. production. Competitiveness depends on continued innovation to support improved production methods, develop new products, and achieve greater supply chain efficiencies. Specialty crops are characterized by great diversity among U.S. growing regions, with significant regional differences in competitiveness. Imports are complementary to specialty crop production in some regions and competitive in others. U.S. producers' competitiveness is also affected by the labor, environmental, and other standards applied to import supply chains.

ACTION STEPS TO ADDRESS TRADE DISRUPTIONS

To support increased resiliency across U.S. agri-food supply chains relative to potential trade disruptions, four core areas were identified (export promotion, SPS issues, shortages in packaging, transport materials and certain ingredients, and ocean shipping) under which a variety of actions could be implemented.

EXPORT PROMOTION

USDA Action: To strengthen and diversify U.S. exporters across the supply chain, improve access by small exporters from diverse backgrounds to USDA export promotion programs:

- Evaluate whether cost-share requirements in export promotion programs serve as barriers to providing services to new-to-export firms owned by people of color or located in underserved communities.
- Explore statutory and regulatory changes that support additional forms of outreach to small, disadvantaged exporters through the State Regional Trade Groups that provide USDA export promotion matching funds for small, disadvantaged exporters.

- Evaluate whether export readiness training is needed to assist small businesses owned by people of color or located in underserved communities to access USDA export promotion services.
- Provide outreach that identifies underserved companies to join USDA-sponsored Agricultural Trade Missions and Virtual Trade Events.
- Increase targeted company participation in domestic trade shows by providing education, information, and funding opportunities to participate

SANITARY AND PHYTOSANITARY ISSUES

Many countries, including the United States, require an official sanitary and phytosanitary certificate for imports of certain plant and animal products. Key vulnerabilities include mycotoxin and microbial contamination of fresh fruits, vegetables and tree nuts and inadequately trained and qualified workforce and inspection staff.

In some countries, the absence of an official certificate in hard copy is a reason for a delay or refusal of importation. Many exporting firms routinely send the original hard copy certificates via air courier services to avoid risks of lost or damaged original certificates. When the COVID-19 pandemic began, there were no commercial flights and there were no previously established mechanisms to facilitate electronic delivery of certificates or receipt by many countries. To address this problem, USDA worked to establish emergency protocols for foreign countries to accept electronic copies of official certificates for certain commodities when an original paper certificate was not available at the time of import. Though the use of electronic copies of paper certificates (PDFs) was an effective temporary measure, the pandemic exposed the need for more resources to promote and accelerate implementation of government-to-government eCert data exchange, in the U.S. and globally, to improve the resilience of U.S. import and export supply chains. Science and innovation investments are needed not only for technical advances but also for improved market transparency and analysis for decision-making. This is particularly important for small and mid-

size, and diverse agricultural operations. A number of specialty crops have small national volumes, but high value and economic importance in local or regional areas.

USDA Action: Support investment in science and innovation (and improved data collection) to bolster US specialty crop competitiveness.

USDA Action: Accelerate the adoption of electronic certification (e-Cert) for phytosanitary and sanitary import and export certificates.

Other Federal Action: Increase the capacity of laboratories to test imported crop seed for pathogens and pests and prioritize access to testing materials.

SHORTAGES IN PACKAGING, TRANSPORT MATERIALS, AND CERTAIN INGREDIENTS

During the pandemic, several components of the food and agricultural sectors were affected by shortages in key inputs, particularly those related to packaging and transportation of the goods.

Examples include:

- **Wooden pallets and shipping containers.** Transportation and trade in fresh vegetables was affected by shortages in wooden pallets and shipping containers. Inability to obtain pallets has in some cases resulted in crops going unharvested.
- **Food-grade steel and aluminum.** Metal shipping containers arriving in Southern California are often held for days before they can deliver their cargo to the port. Even on land, containers may have to wait in storage while waiting for available truck or train space.
- **Shipping Containers.** Less than 10% of total U.S. grain exports are handled via container, but containers are needed for identity-preserved grains. Throughout 2021, expanded trade increased global demand for shipping containers, which severely strained access to available containers for agricultural exporters. In addition, industry reported concerns about both real and anticipated challenges accessing certain ingredients for processed foods that are primarily sourced from

abroad. Examples include gluten, vitamins, minerals, amino acids, stabilizers, and some spices. Although many of these ingredients make up a small component of processed human and animal foods, they can have a significant impact on the nutritional value, functionality, and shelf life of products.

USDA Action: Convene a public/private taskforce at the national level to provide recommendations and strategies to prevent future occurrences of shortages in pallets, packaging and other shipping containers, and essential raw ingredients for food processing in collaboration with FDA, and to explore increased domestic sourcing for these items.

USDA Action: Explore creation of a Strategic Reserve of Shipping Containers and Pallets. This reserve could help ensure that prioritized goods, such as perishable produce and agricultural inputs, are available when they are needed.

OCEAN SHIPPING

Since 2016, the number of major ocean carriers in the U.S. East-West trade routes dropped from around 15 to fewer than 10. In addition, the remaining ocean carriers are organized into three alliances that control about 80 percent of the global shipping market and 95 percent on the critical East-West trade lanes. Only 2 U.S. ocean container carriers remain in service. These companies provide very limited service to Asia and represent an extremely small market segment of US flagged carriers. This leaves most shippers of U.S. products depending on foreign-owned carriers. These carriers tend to be more responsive to demands of their foreign owners than the needs of U.S. exporters. Some shippers are “captive” to certain carriers particularly in trade lanes with smaller volumes. Multiple rounds of consolidation have prompted repeated expressions of concern by shippers to the Federal Maritime Commission. Carriers may charge unfair detention and demurrage fees when delivery or pick up of a container is not possible. Many of the issues impacting U.S. exporters during current supply chain disruptions have been on-going, to a lesser extent, for many years. Most recently, shippers have noted these longstanding issues have worsened as rising U.S. demand

for many commodities has strained supply chains, causing long delays in ocean transportation. USDA spends hundreds of millions of dollars on the development of export markets, but ocean carrier practices are putting these markets in jeopardy. Since 2020, demand to move consumer products from Asia to the United States has been so high, carriers have repeatedly returned containers to Asia empty to serve the lucrative import cargo more quickly while leaving agricultural exports stranded. Agricultural exporters are concerned about a permanent loss in market share and the degradation of the U.S. global reputation due to the unreasonable and unfair practices of foreign-owned ocean carriers.

USDA Action: USDA should continue to work with the Federal Maritime Commission (FMC) to support use of its full regulatory power authorities to promote free and fair competition through 1) reviewing existing carrier alliances to determine if they decrease service, increase transportation costs, or reduce competition, 2) improving transparency in service contract rates, 3) address unfair detention and demurrage fees, and 4) using any other appropriate tools to promote fair competition in ocean freight shipping.

USDA and other Federal Action: Engage with DOC to obtain information and coordinate actions based upon recommendations about national freight infrastructure and freight policy from the Advisory Committee on Supply Chain Competitiveness.

Congressional Action: Work with Congress to increase resources for the FMC and to provide the FMC an updated toolbox to protect exporters, importers, and consumers from unfair practices.

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Appendix

List of Proposed Actions by Priority Area

PRIORITY 1 – CONCENTRATION AND CONSOLIDATION IN AGRI-FOOD PRODUCTION, MANUFACTURING, AND DISTRIBUTION	
Policy Recommendation	Actor(s)
1.1 COMPETITION IN AGRI-FOOD INDUSTRIES	
<ul style="list-style-type: none"> • Execute competition related actions outlined in the January 2022 Biden-Harris Action Plan for the Meat and Poultry Supply Chain. Actions include, but are not limited to: • Invest \$1 billion in diversifying meat and poultry processing capacity, workforce development, research and innovation, and technical assistance • Issue new, stronger rules under the Packers and Stockyards Act to provide greater clarity and strengthen enforcement under the Act. • Work with the Federal Trade Commission to prepare a report on access to retail and competition’s role in protecting new market entrants in meat processing. • Issue new “Product of USA” labeling rules to ensure consumers understand where their meat comes from. • Collaborate with DOJ to better coordinate efforts, such as launching a new portal for reporting concerns about potential violations of competition laws. 	USDA Action
Support antitrust and unfair business practices enforcement by of Federal partners including the U.S. Department of Justice, Federal Trade Commission, Commodities Futures Trading Commission, and state attorneys general.	USDA and Other Federal Action
1.2 PROMOTION OF LOCAL AGRI-FOOD BUSINESSES	
<p>Invest \$4B in to strengthen critical supply chains in the food system by, for example, prioritizing grants, loans, and complementary support to promote regional/local and diverse food processing, aggregation, distribution, and other necessary capacity and purchases from domestic firms to the maximum extent possible consistent with the law. Specific activities include:</p> <ul style="list-style-type: none"> • Expand independent meat and poultry processing capacity, supporting workers, providing technical assistance, and promoting innovation as outlined in the January 2022 Biden-Harris Action Plan for the Meat and Poultry Supply Chain.. <ul style="list-style-type: none"> – This includes deploying additional Consolidated Appropriations Act funds to support the Meat and Poultry Inspection Readiness Grant (MPIRG) Program to help processing businesses cover improvement costs needed to achieve a Federal Grant of Inspection or to operate under a state’s Cooperative Interstate Shipment program, which facilitates interstate commerce and opens new markets. • Backing private lenders through the Food Supply Chain Guaranteed Loan Program which leverages \$100 million of American Rescue Plan Act funding to provides more than \$1 billion for qualified lenders to finance food systems projects, specifically for the start-up or expansion of activities in the middle of the food supply chain. • Identify ways to increase targeted investments to socially disadvantaged farmers and ranchers who diversify the supply chain with small and mid-size food businesses. Institute support through section 1006 of ARP to provide technical assistance to underserved producers, connecting them more fully with USDA programs and services. Integrate these efforts with the January 20, 2021, EO on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. 	USDA Action
Prioritize support for workforce development and safety programs and increase technical assistance across the broader food production/processing sector.	USDA and Other Federal Action

PRIORITY 1 – CONCENTRATION AND CONSOLIDATION IN AGRI-FOOD PRODUCTION, MANUFACTURING, AND DISTRIBUTION	
Policy Recommendation	Actor(s)
Support the development of cooperative aggregation and processing facilities, including retrofitting or expanding existing facilities, for locally grown produce meant for institutional markets, food hubs, food banks, schools, etc.	USDA Action
Increase technical assistance for small scale and new entrants into food processing for both USDA and FDA-regulated products.	USDA and Other Federal Action
1.3 FLEXIBILITY IN FOOD PROCUREMENT POLICIES	
Coordinate with the Council of Environmental Quality (CEQ) as it responds to Section 208 of the December 8, 2021, Executive Order 14057 “Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability” and establishes Federal food procurement policies to reduce associated greenhouse gas emissions (GHGs) and drive sustainability in the Federal food supply chain.	USDA Action
Utilize HUBZone authorities to develop solicitations for procurement targeting historically underutilized communities.	Other Federal Action
The Office of Management and Budget’s Made in America Office, in consultation with the Federal Acquisition Regulatory Council, should consider limiting the resale exception to the Buy American Act to promote the purchase of Made in America foods in commissaries on Federal property.	Other Federal Action
Enact and promote policies that allow sourcing of “values-based foods,” such as locally produced and processed foods, organic foods, and climate-smart foods, for food procurements	Congressional and Other Federal Action
Provide authority to revise the Federal Acquisition Regulation (FAR) to allow the use of “local” and other value-based criteria as a specification in Federal food procurement for nutritional assistance programs and provide an optional preference for local, small-batch, and tribal source procurement; provide more support for small and mid-sized producers interested in becoming vendors for USDA Foods.	Congressional and Other Federal Action
1.4 PURCHASING OPTIONS FOR HOUSEHOLDS RECEIVING FOOD ASSISTANCE	
Expand the availability of mobile Electronic Benefit Transfer readers to agricultural enterprises that do not currently engage farmers’ markets, particularly in food deserts where farmers markets are not accessible.	USDA Action
Explore opportunities to strengthen the Senior and Women, Infant, and Children (WIC) Farmers’ Market Nutrition Programs, which both match nutrition benefits with local food access, by reviewing ways to promote innovations to modernize program delivery and improve the customer experience.	USDA Action
1.5 IMMEDIATE GOVERNMENT INTERVENTION FOR NEAR-TERM ASSISTANCE AND SUPPLY CHAIN CONTINUITY	
Build on efforts initiated during the COVID-19 pandemic to ensure Food and Agriculture Sector workers are prioritized for worker health and safety measures such as prioritized access for vaccination and other prophylactic treatments, testing, and PPE during public health emergencies.	USDA and Other Federal Action
Explore mechanisms for improving assistance to commodity sectors experiencing challenges accessing essential raw materials, particularly for products whose production could have severe public health consequences should they become unavailable.	USDA and Other Federal Action
Explore the feasibility of expanding strategic national stockpiles to increase the availability of worker health and safety equipment to a broad array of essential workers during public health emergencies.	Congressional, USDA, and Other Federal Action
PRIORITY 2 – LABOR NEEDS	
Policy Recommendation	Actor(s)
Pass the Farm Workforce Modernization Act.	Congressional Action
Make available \$1.4B in grants through the Pandemic Response and Safety Grant program and the Farm and Food Worker Relief Grant program to support measures, including for personal protective equipment, for producers, processors, and workers across the agri-food supply chain in response to COVID-19.	USDA Action

PRIORITY 2 – LABOR NEEDS	
Policy Recommendation	Actor(s)
Utilize research, extension, and land-grant university networks and community colleges to train individuals attending these institutions and utilize skills-based apprenticeship opportunities in local communities to build skills in effective farm and land management practices, agribusiness strategies, and food safety. Continued support for USDA's National Institute of Food and Agriculture (NIFA) workforce development programs such as the Agricultural Education and Workforce Development grants.	USDA Action
Deploy \$100M in ARP funding to support development of a well-trained workforce, safe workplaces, and good-paying, quality jobs by working closely with partner organizations, including labor unions, with expertise in workforce development and worker health and safety (as part of the \$1B ARP investment in meat and poultry actions referenced in PRIORITY 1: Concentration and Consolidation).	USDA Action
Deploy a multi-agency effort for recruiting and retaining veterinarians including through the Animal and Plant Health Inspection Service (APHIS) 2022 recruitment strategy for veterinarians, the Food Safety Inspection Service (FSIS) In-Plant Public Health Veterinarian (PHV) Retention Incentive Plan and the NIFA Veterinary Medicine Loan Repayment Program (VMLRP) and Veterinary Services Grant Program.	USDA Action
Engage with Department of Labor (DOL) on how to further leverage USDA's existing programs in workforce development and more closely partner on DOL programs such as the Susan Harwood Training Grant program and DOL and DOT's Registered Apprenticeship programs for drivers to support food and agricultural needs.	USDA and Other Federal Action
Engage with CDC NIOSH Office of Agriculture Safety and Health and the NIOSH Centers for Agriculture Safety and Health to further leverage occupational safety and health outreach and prevention projects to address the nation's pressing occupational health and safety problems for workers in the agriculture industry.	USDA and Other Federal Action
Implement recommendations from the White House Task Force on Worker Organizing and Empowerment to support good-paying, safe jobs with the free and fair choice to join a union.	Other Federal Action
PRIORITY 3 – ECOLOGICAL AND CLIMATE RISKS TO CROPS	
Policy Recommendation	Actor(s)
3.1 DROUGHT AND IRRIGATION WATER SCARCITY	
Prioritize financial and technical assistance for irrigation organizations and water delivery system improvements through NRCS conservation programs.	USDA Action
Prioritize financial and technical assistance toward irrigation water supply augmentation and improved management, including on-farm and off-farm water retention ponds and storage/regulating reservoirs supported under EQIP and NRCS' Small Watershed Program (PL-566), as well as managed aquifer recharge.	USDA Action
Continue directing financial and technical assistance toward dryland field management practices that increase water infiltration and soil health, including cover cropping, mulching and conservation tillage, as well as those that augment effective water available from natural precipitation, such as drainage water management, snow fencing, rainwater harvesting systems, floodwater catchments, and field terracing/contouring.	USDA Action
Direct funding under USDA working lands programs to promote drainage water management practices that enhance drought resilience on rainfed and tile-drained cropping systems, utilizing science-based tools to effectively target investments.	USDA Action
Research on strengthening agricultural resilience to drought and long-term water scarcity, including CEA production.	USDA Action
Expand and develop advanced decision-support tools for soil and water resource planning and management to support producers and resource managers in planning for and responding to water-limited conditions.	USDA Action
Resource management on public forest and rangelands to enhance water retention/storage and basin water yield.	USDA and Other Federal Action
Expanded availability of effective treatment methods for irrigation water for food crops.	USDA and Other Federal Action

PRIORITY 3 – ECOLOGICAL AND CLIMATE RISKS TO CROPS	
Policy Recommendation	Actor(s)
Coordination with EPA to identify opportunities to mitigate impact of water scarcity and drought to farmers, such as the Water Reuse Program.	USDA and Other Federal Action
Develop emergency provisions for working lands conservation contracts to provide greater drought resiliency that parallels Conservation Reserve Program (CRP) contract provisions.	USDA Action
Increase irrigated acreage enrolled under the CRP and CREP in priority surface and groundwater basins facing persistent water shortages to reduce water demands in fully and over-appropriated river basins subject to periodic water-supply shortfalls.	USDA Action
Expand use of the Regional Conservation Partnership Program (RCPP) and other conservation programs to strengthen basin-scale resilience to drought and long-term water scarcity.	USDA Action
Expand the use of non-traditional water sources for agriculture.	Congressional Action
3.2 CROP AND SEEDBORNE PESTS AND DISEASES	
Continue to fund and refurbish critical APHIS assets, including plant inspections stations, pathogen diagnostics laboratories, sterile insect facilities, and data systems.	USDA Action
Continue to fund and refurbish APHIS capacity to mass produce and distribute sterile insects.	USDA Action
Improve capability for incorporating climate change predictions into risk analysis and pest forecasting to help PPQ take appropriate and timely action to changing pest risk.	USDA Action
Strengthen biosurveillance capability to enable pro-active policymaking and planning for more effective pest exclusion and response.	USDA Action
Develop improved survey methods, decision support tools, web-based identification tools, and guidelines for a faster and more effective monitoring of and response to new pest detections.	USDA Action
Implement the PPQ Regulatory Framework for Seed Health (ReFreSH), a public-private collaboration to manage pest risk in the international movement of seeds.	USDA Action
Continue to fully implement Sec. 7721 of the Plant Protection Act (PPA 7721), which supports projects that enhance and safeguard agricultural trade in crop seed.	USDA Action
Bolster airline routes available for transit of key materials (e.g., insect pupae) for sterile insect release programs.	Other Federal Action
3.3 ADOPTION OF GOOD AGRICULTURAL PRACTICES (GAPs) FOR FOOD SAFETY	
Reduce Barriers to Food Safety Certification by encouraging expanded use of USDA Good Agricultural Practices (GAPs) and Harmonized GAPs as well as partnering with FDA to provide technical assistance and education on produce safety and the FDA Food Safety Modernization Act.	USDA and Other Federal Action
3.4 LOSS OF POLLINATORS AND POLLINATOR SERVICES	
Review existing programs to evaluate existing flexibilities to cover climate-related pollinator losses.	USDA Action
Support research to understand how climate change affects pollinators, pollinator forage and pollination rates for crop yield production purposes.	USDA Action
Create a repository on the effect of climate stress on the nutritional value of flowers for bees (e.g., the NRCS PLANTS database) as both a plant species-specific and landscape-level research reference.	USDA Action
Increase NRCS Plant Material Centers efforts to evaluate and promote commercial availability of wildflower species and selections that support pollinator forage in climate-stressed landscapes.	USDA Action
Expand the work of the Office of Urban Agriculture and Innovative Production to provide additional support for pollinator and beneficial insect habitat conservation including in historically underserved and on urban and small farms.	USDA Action
Coordinate with U.S. Customs and Border Protection to require honey packers to abide by well-defined product standards and standardized testing methodologies to ensure the authenticity, quality, and accuracy of country-of-origin labeling, and prevent fraud and adulteration	Other Federal Action

PRIORITY 3 – ECOLOGICAL AND CLIMATE RISKS TO CROPS	
Policy Recommendation	Actor(s)
Loan guarantees are available through Rural Development’s Food Supply Chain Guaranteed Loan Program to support the domestic honey industry should they opt to apply to establish their own packing facilities.	USDA Action
Support research to address and mitigate impacts from current pests and pathogens (e.g., the <i>Varroa</i> mite, viruses, and brood diseases, as well as emerging pests and pathogens, such as the Asian Giant Hornet, <i>Tropilaelaps</i> parasitic mite), and develop and register new miticides and other pest management tools for beekeepers.	USDA and Other Federal Action
3.5 ADAPTATION FOR SPECIALTY CROPS PRODUCTION	
Expand research and extension to encourage Controlled Environment Agriculture (CEA) and urban agriculture to reduce climate constraints from specialty crop production.	USDA Action
Continue to encourage investments through USDA’s Specialty Crop Block Grant Program (SCBGP) toward projects that address climate adaptation and mitigation research and practices that will enhance the competitiveness of U.S. or U.S. territory-grown specialty crops.	USDA Action
Continue to encourage investments through USDA’s Organic Research and Education Initiative (OREI) toward projects that strengthen organic crop propagation systems to improve resilience to drought, flood, and disrupted seasonal patterns resulting from climate change.	USDA Action
Support increased adoption of organic practices through investment in cross-Department programs to incentivize transition to organic.	USDA Action
Work across the Department to ensure programs (loans, grants, research, etc.) are accessible to and utilized by organic and other climate-smart producers; if not, identify and remove barriers to access.	USDA Action
Ensure that Department efforts on climate-smart agriculture include a clear crosswalk for organic producers to be able to access and inform those efforts. Two programs could be expanded: <ul style="list-style-type: none"> • <i>Low and High Tunnels</i>: Tunnels or greenhouses extend the growing season, protect plants from harsh weather, and provide other benefits. • <i>Urban, Indoor, and Emerging (UIE) Agriculture Competitive Research and Extension Grants</i> to support research, education, and extension activities for facilitating UIE development, including production, harvesting, transportation, aggregation, packaging, distribution, and markets. 	USDA Action
PRIORITY 4 – LIVESTOCK AND POULTRY DISEASE THREATS	
Policy Recommendation	Actor(s)
4.1 ANIMAL HEALTH RESPONSE	
Strengthen animal disease monitoring, surveillance and prevention: <ul style="list-style-type: none"> • Strengthen disease monitoring and prevention, regulatory control and response, training and extension of best management practices, and animal health research for priority animal diseases. • Enhance a “One Health” approach that considers animal, human, and environmental contributions to disease surveillance and response in wildlife and domestic animals. <ul style="list-style-type: none"> – Strengthen global disease and vector monitoring and conduct vulnerability assessments to identify opportunities to prevent entry of transboundary and emerging diseases to US animal populations. – Enhance risk-based surveillance in both wildlife and domestic livestock and poultry populations for early detection of disease and prevention of disease transmission between vulnerable populations. 	USDA and Other Federal Action
Continued emphasis on the development of business continuity plans for livestock and poultry which can support the safe movement of animals and animal-related products during an outbreak.	USDA Action
Strengthen preparedness posture by evaluating the on-hand equipment and supplies necessary to respond to an animal disease outbreak in wildlife and domestic animals.	USDA Action

PRIORITY 4 - LIVESTOCK AND POULTRY DISEASE THREATS	
Policy Recommendation	Actor(s)
Continue international engagement in animal disease control: <ul style="list-style-type: none"> • Through the OIE standards setting process, work to ensure that international animal health standards are science-based and broadly supported and adopted by trading partners; and • Strengthen traceability of meat/meat products to meet export certification with negotiated zoning protocols and animal health language with foreign governments and trade partners. 	USDA Action
Continue operation of the National Detector Dog Training Center (NDDTC) to ensure ongoing high quality canine pest inspection teams from APHIS, U.S. Customs and Border Protection, Florida Fish and Wildlife, the Florida Department of Agriculture and Consumer Services, and the California Department of Food and Agriculture, enabling them to inspect passenger baggage, cargo, and parcels for prohibited agricultural items (e.g. prohibited, high-risk fruits, vegetables, and meats) that could carry harmful pests and diseases into the U.S.	USDA Action
4.2 AFRICAN SWINE FEVER PREPAREDNESS	
Invest up to \$500 million in announced Commodity Credit Corporation funding to prevent the spread of African Swine Fever via robust expansion and coordination of monitoring, surveillance, prevention, quarantine, and eradication activities.	USDA Action
Continue research into the development of vaccines for ASF.	USDA Action
Support the FDA's Center for Veterinary Medicine commitment to working with sponsors to help facilitate the development and approval of products, such as animal drugs or animal food additives, intended to prevent ASF infection and spread.	USDA Action
PRIORITY 5 - TRANSPORTATION BOTTLENECKS	
Policy Recommendation	Actor(s)
5.1 INLAND WATERWAYS	
Complete projects in the Budget and FY 2022 IJA spend plan to create a modern, efficient, and resilient system for the reliable and low-cost transport of agricultural products, which would boost U.S. farm export competitiveness.	Federal Action
5.2 OCEAN PORTS	
Utilize funding for port infrastructure modernization from the Infrastructure Investment and Jobs Act. USDA could consult with DOT and USACE to determine best funding program(s) and amounts to target that specifically address bottlenecks for agricultural exports. In addition, ports need funding for dredging projects to increase port depth to accommodate larger ships.	Federal Action
Provide training, education, and funding to support agricultural exporters and their service providers to update legacy technology systems to incorporate the sharing of real-time data through API integration.	USDA Action
5.3 SHIPPING CONTAINERS	
Support investments and programs that build more inland container loading and unloading facilities.	Congressional Action
5.4 HIGHWAYS AND BRIDGES	
Deploy relevant Bipartisan Infrastructure Law (BIL) authorities and other financial support, such as through State Infrastructure Banks (SIBs), to strengthen the nation's highway infrastructure.	Federal Action
Establish an agricultural freight secure data commons.	Other Federal Action
Encourage and coordinate regional infrastructure planning among States.	Other Federal Action
5.5 TRUCKING SERVICES	
Implementation of the Biden-Harris Administration Trucking Plan. Continue ongoing collaboration and information sharing with DOT and DOL to address trucking challenges in agriculture. Support the Drive-SAFE Act, designed to find ways to let younger people enter the industry, as well as reach out to underrepresented demographics, including women and minorities, to open trucking as a career path.	USDA and Other Federal Action

PRIORITY 5 – TRANSPORTATION BOTTLENECKS	
Policy Recommendation	Actor(s)
5.6 RAILROAD REGULATION	
<p>The Surface Transportation Board should implement regulatory changes to enhance competition within the consolidated industry and improve the rate dispute process, including:</p> <ol style="list-style-type: none"> 1. Competitive switching – increasing competition among existing carriers. 2. Final Offer Rate Review (arbitration) as an alternative to formal rate challenge processes – this approach is less costly and more accessible to agricultural shippers for challenging excessive rates in captive markets. 3. Strengthen partnership with Department of Justice on rail mergers and acquisitions and apply stronger antitrust principles. 4. Enhance Common Carrier Obligation: Collect and make available additional data in order to assess Common Carrier Obligation through shipment-level data on service quality; excessive demurrage and accessorial charges; and first-mile/last-mile service metrics. 5. Revoke intermodal traffic from regulation exemption to allow container shippers by rail to challenge detention and demurrage fees imposed by railroads. 6. Mandate data collection on first-mile/last-mile service metrics. 7. Use any other appropriate tools to promote fair competition in rail shipping. 	Other Federal Action
PRIORITY 6 – TRADE DISRUPTIONS	
Policy Recommendation	Actor(s)
6.1 EXPORT PROMOTION	
<p>To strengthen and diversify U.S. exporters across the supply chain, improve access by small exporters from diverse backgrounds to USDA export promotion programs:</p> <ul style="list-style-type: none"> • Evaluate whether cost-share requirements in export promotion programs serve as barriers to providing services to new-to-export firms owned by people of color or located in underserved communities. • Explore statutory and regulatory changes that support additional forms of outreach to small, disadvantaged exporters through the State Regional Trade Groups that provide USDA export promotion matching funds for small, disadvantaged exporters. • Evaluate whether export readiness training is needed to assist small businesses owned by people of color or located in underserved communities to access USDA export promotion services. • Provide outreach that identifies underserved companies to join USDA-sponsored Agricultural Trade Missions and Virtual Trade Events. • Increase targeted company participation in domestic trade shows by providing education, information, and funding opportunities to participate 	USDA Action
6.2 SANITARY AND PHYTOSANITARY ISSUES	
Support investment in science and innovation (and improved data collection) to bolster US specialty crop competitiveness.	USDA Action
Accelerate the adoption of electronic certification (e-Cert) for phytosanitary and sanitary import and export certificates.	USDA Action
Increase the capacity of laboratories to test imported crop seed for pathogens and pests and prioritize access to testing materials.	Other Federal Action
6.3 SHORTAGES IN PACKAGING, TRANSPORT MATERIALS, AND CERTAIN INGREDIENTS	
Convene a public/private taskforce at the national level to provide recommendations and strategies to prevent future occurrences of shortages in pallets, packaging and other shipping containers, and essential raw ingredients for food processing in collaboration with FDA, and to explore increased domestic sourcing for these items.	USDA Action

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Policy Recommendation	Actor(s)
Explore creation of a Strategic Reserve of Shipping Containers and Pallets. This reserve could help ensure that prioritized goods, such as perishable produce and agricultural inputs, are available when they are needed.	USDA Action
6.4 OCEAN SHIPPING	
USDA should continue to work with the Federal Maritime Commission (FMC) to support use of its full regulatory power authorities to promote free and fair competition through 1) reviewing existing carrier alliances to determine if they decrease service, increase transportation costs, or reduce competition, 2) improving transparency in service contract rates, 3) address unfair detention and demurrage fees, and 4) using any other appropriate tools to promote fair competition in ocean freight shipping.	USDA Action
Engage with DOC to obtain information and coordinate actions based upon recommendations about national freight infrastructure and freight policy from the Advisory Committee on Supply Chain Competitiveness.	USDA and Other Federal Action
Work with Congress to increase resources for the FMC and to provide the FMC an updated toolbox to protect exporters, importers, and consumers from unfair practices.	Congressional Action

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