



Regenerative Agriculture and Population Health

Examining how regenerative agriculture can support healthier food systems and better health outcomes

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KEY POINTS

- Regenerative agriculture can enhance food quality and reduce harmful exposures through improved soil biology, biodiversity, and ecosystem health, yielding downstream benefits for agriculture, food systems, and human health.
- Regenerative agriculture may improve profitability through greater land resilience and lower input costs and may deliver benefits to farms, farmers, communities, and the broader environment.
- More research is warranted to understand the full range of potential health benefits of regenerative agriculture.

INTRODUCTION

This issue brief provides background on regenerative agriculture, summarizes selected research on its potential economic and health impacts, describes opportunities to study its effects on health outcomes, and highlights innovative models for integrating it into national health initiatives to improve population health and prevention. This report aims to raise awareness of regenerative agriculture within programs of the United States Department of Health and Human Services (HHS) as an emerging innovation that could bolster the production of nutrient-dense foods that ultimately may improve health outcomes. The United States Department of Agriculture (USDA)'s Regenerative Pilot Program offers one pathway to increase adoption of these practices on farms across the United States^a while improving understanding of their potential ecological and economic benefits.

Advances in public health, such as the massive decline in infectious disease mortality, often require a comprehensive, holistic approach. More robust nutrition, safer food supplies, and improved wastewater

^a To learn more about the U.S. Department of Agriculture's Regenerative Pilot Program, please visit <https://www.nrcs.usda.gov/programs-initiatives/regenerative-pilot-program>.

and water purification systems, among other factors, all contributed to a large reduction in risk from the infectious diseases that were prevalent in the nineteenth and early twentieth centuries.¹

Today, increasing chronic disease rates are a major public health issue, and a multi-faceted response is essential in order to heal a population devastated by this array of deadly conditions. The adoption of regenerative agriculture likewise has the potential to play a role in sustaining a healthier nation through the supply of nutritious food.

With pilot initiatives supporting regenerative agriculture and increasing minimally processed, locally grown, and nutrient-dense foods, there are more opportunities for HHS programs to integrate regenerative agriculture into innovative chronic disease prevention strategies.

Understanding regenerative agriculture as an upstream health innovation motivates this issue brief's focus on (a) describing its potential to improve food quality, reduce harmful exposures, and support farmer and community well-being; (b) examining the economic factors and barriers shaping adoption; and (c) identifying opportunities to strengthen the evidence base and integrate these practices into federal health and nutrition initiatives.

BACKGROUND

Regenerative agriculture holds the potential to influence human health through multiple pathways, including effects on soil health, nutrient cycling, food production practices, food quality, environmental exposures, and food-system resilience. Because agricultural production practices shape the foods available to consumers, interest in regenerative agriculture extends beyond farming approaches to questions about food quality, dietary patterns, food access, and population health.

Regenerative agriculture has gained increasing attention as an approach to improving soil health, ecosystem function, farm resiliency, farmer profitability, and resource stewardship, though no single definition has been universally adopted.

Defining regenerative agriculture and differentiating it from other terms, such as sustainable agriculture, remains a point of discussion among academic, regulatory, and farming communities.^{2,3,4} Regenerative agriculture involves a wide range of practices, tailored to individual farms through holistic assessment, that support soil health, enhance biodiversity, and strengthen ecosystems.^{3,5,6,7} Some of the practices associated with regenerative agriculture are described further in the Appendix (See Table 2).

Regenerative agriculture promotes agricultural practices that are environmentally beneficial and that can both reduce reliance on herbicides, pesticides, and synthetic fertilizers and improve overall biodiversity and ecology.^{3,8,9} These agricultural practices can also involve integration of plant and animal agriculture through grazing management strategies; for example, rotational grazing practices that involve rotating livestock (e.g., cattle, sheep or poultry) through a series of pasture subdivisions.^{10,11} Several positive soil characteristics, such as improved soil bulk density and organic carbon have been associated with this practice.^{11,12}

Central to regenerative agriculture is the premise that management practices that improve soil health and ecosystem function can create downstream benefits for agricultural productivity, food systems, and potentially human health.

Foods produced in these systems can include fruits, vegetables, and grains as well as animal products, such as eggs, milk, and livestock.¹³ Peer-reviewed research studying several regenerative agricultural practices and the effects on soil health and the farm environment is more extensive, while links between regenerative agricultural practices, increased nutritional value in foods, and improvements in human health have more limited evidence that may grow with time. Some studies have found higher levels of nutrients in crops, vegetables, and meat from regenerative agriculture systems.^{14,15} However, the heterogeneity of regenerative practices and the limited availability of regenerative production systems for large-scale scientific research can present challenges to study design¹⁶ and measuring statistically significant differences.^{5,6,15} One study estimated that regenerative agriculture represents 1% of farmed acreage globally.³ If regenerative agricultural practices grow, opportunities to rigorously examine their impacts on foods and human health will also increase.

The impacts of regenerative agriculture are designed to benefit the farm, the farmer, and the environment more broadly.

Additionally, regenerative agriculture offers opportunities to increase the availability of locally and regionally grown foods, strengthening consumer access to domestically grown products. This is in alignment with the Trump administration's "Eat Real Food" message, released with the updated Dietary Guidelines for Americans, that encourages Americans to consume more fresh and minimally processed fruit and vegetables. Regenerative agriculture systems can include large-scale and small-scale farming operations, and the resulting foods are available through retail markets and local, direct-from-farmer sales.¹⁷ Increasing access to nutritious foods in local and regional markets advances long-term nutrition and health goals. Additionally, there are opportunities for these food products to minimize food deserts in certain regions and strengthen local and regional communities and economies.^{3,17} The potential long-term benefits of regenerative agricultural practices for human health warrant continued support for scientific investigation. The opportunities for positive impacts for American foods, consumer health, farmers, and the environment are promising.

Regenerative farms can achieve higher profits through lower input costs.

Many regenerative agricultural practices seek to improve nutrient cycling, water retention, and biological ecosystem functions, thereby reducing dependence on externally sourced agricultural inputs and associated production costs. Water and nutrient availability are limiting factors in crop production, and emphasis on farming approaches to manage these resources continues to increase.^{8,18,19} Soil management practices used on regenerative farms include conservation crop rotation, contour farming, contour orchards or other perennial crop, cover crops, mulching, nutrient management, stripcropping, and reduced or no-till residue and tillage management systems (See Appendix).^b Water management can include practices such as related irrigation and drainage to increase water retention and reduce waste. Other strategies, such as grazing management, pest management conservation systems, forage harvest management, and forest stand improvement can also be included.⁷ Farms operating integrated regenerative systems have been found to allocate substantially lower shares of gross income to purchased inputs than conventional operations. A peer-reviewed comparison of regenerative and conventional corn farms in the Northern Plains found that regenerative farms allocated 12% of gross income to seed and fertilizer inputs, compared to 32% for conventional farms, and achieved 78% higher profits despite 29% lower grain yields. Profit across farms in the study was correlated with soil particulate organic matter rather than yield.²⁰ Using nationally representative Agricultural Resource Management Survey data, USDA Economic Research Service (ERS) found that conservation tillage is associated with lower total operating costs and higher corn yields.²¹ USDA's Sustainable Agriculture Research Education (SARE) program has documented conditions under which cover crops reduce input requirements over time, including through improved soil moisture retention and reduced fertilizer dependence, with profitability gains emerging as soil health builds across successive years of management.²²

A financial analysis of wheat farming in Kansas found a positive business case for regenerative systems emerging within three to five years of transition, with upfront investment costs estimated

^b <https://www.nrcs.usda.gov/programs-initiatives/regenerative-pilot-program>

at approximately \$40 per acre in the short term, with profits after the third year of 70 to over 120%.²³ The European Alliance for Regenerative Agriculture examined 78 regenerative farms in 14 countries from 2021 to 2023 and found that regenerative farmers achieve 20% more margin per hectare, 75% less pesticide use, and 61% less nitrogen use than traditional farms.²⁴ Data from farms certified by Regenified™,^c which operates a practice and outcome-based verification system, reflect similar findings.

Soil health practices that improve water infiltration and soil structure have also been associated with greater crop resilience during drought and flooding events. Ninety-seven percent of farmers participating in a multi-state study of soil health management systems reported that their system increased crop resilience to extreme weather, citing improved water retention in dry conditions and better field access following heavy rain events as primary mechanisms.²⁵ USDA ERS found that soil health improvements are associated with reduced vulnerability to weather variability at the field level.²¹

Major food companies including General Mills, Nestlé, Danone, and PepsiCo have incorporated regenerative supply chain commitments and are actively developing sourcing programs from farms using regenerative practices, representing a growing downstream market signal for farmers who can document adoption.²⁹

Direct-to-consumer (DTC) marketing channels such as farmers markets and community supported agriculture (CSA) represent an additional avenue through which farms with diversified production systems can access premium prices and stabilize cash flow. The 2022 Census of Agriculture documented \$17.5 billion in food sold through direct marketing channels nationally, a 25% increase over the 2017 Census.²⁶ A peer-reviewed synthesis of farmers market and CSA research found that CSA share prices provide farmers financial benefits, and that both channel types generate economic returns for participating producers.²⁷ CSA arrangements can help stabilize farm income and reduce exposure to specific crop failures by shifting some production risk to consumers through advance subscription payments. The distribution of regenerative agricultural products through local and regional markets can increase consumer access to nutrient-dense fruits and vegetables and support local and regional economies.

Several third-party certification frameworks have emerged to help farmers credibly document regenerative practices and access premium markets.^{29,28,29,29,30} Some verification and certification systems include measurements of environmental indicators.^{5,17} Soil health and quality can be measured in a variety of ways that include biological, chemical and physical attributes.^{9,31} Verification and certification systems could incorporate nutrient density food product testing⁵ to increase data available for evaluations. Additionally, scientific studies with structured study design and collection of relevant meta-data—such as soil health measures and weather conditions during growing cycles—are also important to advance evaluation of nutrient density for regenerative agricultural products. Studying regenerative agricultural practice impacts on agricultural products can be challenging because farms are

^c To learn more about Regenified's 6-3-4™ Verification program, please visit: regenified.com.

multi-faceted systems that can have high variability among practices and external influences across production years;¹⁸ the study of these complex systems takes time.

Transition and Federal support

Meta-analysis of cover crop effects on soil organic carbon (SOC) in corn production systems found that SOC response is significantly influenced by both years under management and cover crop biomass production, meaning that short-duration or low-biomass cover cropping produces substantially smaller soil health gains than sustained, high-quality management.³² However, existing federal farm support structures, including crop insurance, credit programs, and commodity subsidies, are tied to production volume and acreage rather than land stewardship outcomes. This can create a financial disincentive for transitioning to practices that may reduce short-term yields or require changes to the production system, regardless of long-term economic merit.³³

Knowledge and awareness affect conservation practice adoption decisions.³⁴ Areas with more accessible technical assistance, more coordinated extension infrastructure, and active farmer peer networks show higher rates of conservation practice uptake and persistence.³³ Maximizing the benefits of adopting regenerative practices requires managing highly complex and interrelated aspects of farm systems. Evidence indicates that systems-level integration of regenerative practices produces stronger economic and soil health outcomes than adoption of individual practices within otherwise conventional production models.²⁰

The Environmental Quality Incentives Program (EQIP) is USDA's primary working lands conservation program, providing financial cost-share and technical assistance to agricultural producers for installing conservation practices on active farming operations, including cover cropping, nutrient management, and reduced tillage. The Conservation Stewardship Program (CSP) provides financial assistance to farmers for maintaining and enhancing existing conservation performance across a broader range of practices and outcomes, with payments based on conservation stewardship rather than single practice installation. Both programs use Natural Resources Conservation Service (NRCS) conservation practice standards as their technical framework and accept applications on a continuous basis.³⁵

The Regenerative Pilot Program, announced on December 10, 2025, by Secretary of Agriculture Brooke Rollins, Health and Human Services Secretary Robert F. Kennedy, Jr., and Centers for Medicare & Medicaid Services Administrator, Dr. Mehmet Oz, provides \$700 million to farmers to adopt regenerative agricultural practices.³⁶ Participants in this program must:

- complete a whole-farm assessment covering all resource concerns, with the goal of establishing an integrated conservation plan addressing soil, water, and land vitality together;
- implement at least one primary regenerative management practice from a NRCS-defined list covering soil health, water quality, and habitat vitality; and

- complete soil health testing at the beginning and end of their minimum five-year contract, using NRCS's standardized Crop Evaluation and Monitoring Activity (CEMA-216), with NRCS covering testing costs for all participants.⁷

Applications for both EQIP and CSP are consolidated into a single regenerative application process, and the program is open to producers at all experience levels across all 50 states and territories.⁷

POTENTIAL IMPLICATIONS FOR POPULATION HEALTH

Regenerative agriculture has been proposed as one potential strategy to support healthier food systems and improve population health outcomes. Several pathways have been hypothesized through which regenerative agricultural practices could influence health, including changes in nutrient composition, dietary quality, microbial exposures, and exposure to potentially harmful agricultural chemicals. Regenerative practices that improve soil biological activity and biodiversity may be associated with increased concentrations of selected micronutrients and bioactive compounds in foods, including vitamins, minerals, polyphenols, and other antioxidant compounds.³⁷ Practices that influence soil organic matter and soil microbial communities may affect nutrient composition through specific biological pathways. Mycorrhizal fungi and soil bacteria can facilitate plant uptake of mineral micronutrients and influence phytochemical production in plants.³⁷ Furthermore, some evidence suggests lower concentrations of pesticide residues and nitrates in some regeneratively produced foods.³⁷ A growing body of evidence suggests a plausible pathway through which regenerative agriculture may influence human health by improving food quality and reducing exposure to potentially harmful contaminants. However, additional longitudinal and intervention-based research that directly links regenerative production systems to measurable human health outcomes is warranted.

Micronutrients and bioactive molecules.

Micronutrient deficiencies across the American population, driven by the consumption of highly processed foods, have been linked to impaired immune defense, inflammatory response, metabolism, cognition, mental health, and cardiovascular health.^{38,39} They also increase the overall risk of chronic disease. These deficiencies could be resolved by the increased consumption of foods rich in select vitamins, minerals, and phytochemicals. Regenerative practices aim to increase soil health and thereby improve the nutrition—most significantly, the micronutrient density—of regeneratively grown foods, leading to improved health outcomes for Americans who regularly consume them.

Due chiefly to the proliferation of calorically dense, nutrient-poor foods, many Americans fail to consume adequate amounts of essential micronutrients. In the US population, some micronutrient deficiencies and insufficiencies may be increasing over time, while others are relatively stable or decreasing.⁴⁰ For example, the prevalence of vitamin D insufficiency, while decreasing, remains high at over 20%, and vitamin C deficiency and insufficiency have hovered around 5-7% and 14-17% over time respectively.⁴⁰ Regenerative agriculture could help to close this gap. For example, in one study, chickens raised with high exposure to sunlight (free-range) produced eggs with three- to fourfold vitamin D₃ compared to traditionally indoor-raised chickens.⁴¹ Another study of conventionally grown tomatoes and those

organically grown—a farming system with some shared practices with regenerative agriculture—found that organic tomatoes contained significantly more vitamin C, an immune-support nutrient.¹⁴

Since humans cannot synthesize vitamin C, they rely on the consumption of plants to meet the demand.⁴² This nutrient is not contained in the soil; rather, they are synthesized by the plants themselves through a process that can be modulated by adjustments to soil composition. While the mechanism by which upregulation might occur warrants further study, changes to the rhizosphere—the biodynamic zone surrounding a plant’s roots—probably alter crops’ gene expression and, by extension, their ability to synthesize vitamins.^{43,44}

One paired-farm analysis compared the micronutrient profiles of crops from nine regenerative farms with those of crops grown on nine conventional farms. Averaged across the nine farm pairings, one or more of the regenerative crops contained significantly higher amounts of vitamins B1, B2, C, E, and K. The multiple regenerative crops also contained higher levels of select minerals, such as potassium, and phytochemicals.¹⁵

Surveys consistently show that Americans consume less potassium than recommended, leading to an unbalanced relationship between potassium and sodium intake and therefore increased cardiovascular risk.^{45,46} Regenerative practices such as no-till, crop rotation, and crop diversification have been shown to modulate soil’s potassium content.⁴⁷ Furthermore, systems which prioritize soil biodiversity have been shown to increase the bioavailability of essential minerals to crops, as well as the mineral content of the final product.^{48,49}

Furthermore, some studies have also observed elevated concentrations of phytochemicals, including phenolics, phytosterols, and carotenoids. These compounds possess antioxidant and anti-inflammatory properties and may increase when plants activate natural defense and stress-response pathways within more biologically diverse production systems.³⁷

Similar observations of potential improvements in micronutrients and phytochemicals have been made in other food products grown or raised using regenerative or organic farming practices. Additional research is needed to reproduce findings and determine whether differences in food composition translate into meaningful population-level health benefits.

Macronutrients, fiber, and animal-sourced foods.

Beyond micronutrients, soil health and nutrient cycling have led to improved macronutrient content of foods. This includes balanced protein accumulation in these crops, as well as enhanced carbohydrate composition and fiber content, for example, in root and tuber crops.³⁷ These compounds contribute to digestive health and metabolic balance in human diets.

Differences in nutrient composition have also been observed in animal-sourced foods. The nutrient density of vitamins and healthy fats in pasture-raised animals can be higher than those of conventionally raised animals.^{52,50} Meat and dairy products from regeneratively managed livestock systems may exhibit more favorable lipid profiles, including higher levels of omega-3 fatty acids,³⁷ which has been associated with improved cardiovascular metrics.⁵¹ Studies of pasture-finished beef have also reported higher

concentrations of phytochemicals, carotenoids, phenolic compounds, and more favorable omega-6 to omega-3 fatty acids ratios compared to conventionally produced beef.^{52,53} Research examining soil, forage, and animal systems has suggested that soil health indicators and forage phytochemical diversity may influence the nutritional composition of beef products.⁵⁴ Pasture grazing has also been associated with increased concentrations of omega-3 fatty acids, conjugated linoleic acid (CLA), β -carotene, vitamin A, and vitamin E in milk compared with indoor feeding systems.⁵⁵ Increased exposure of chickens to sunlight through free-range farming practices may improve the vitamin D content of eggs.⁴¹

Microbiome and heavy metals.

Another proposed pathway linking regenerative agriculture and human health involves interactions between agricultural microbiota and the human microbiome.⁵⁶ Regenerative agricultural practices may promote greater soil biological activity and microbial diversity, potentially increasing the diversity and abundance of potentially health-promoting microbial species associated with agricultural products and food environments. For example, organic apples have been shown to have a more diverse microbiota than their conventional counterparts.⁵⁷ Some researchers have hypothesized that exposure to a broader range of environmental microorganisms may support a more diverse and resilient human gut microbiome.⁵⁶ Emerging evidence suggests that variability in gut microbiome composition may contribute to differences in individual responses to diet, highlighting its potential relevance for precision nutrition.⁵⁸ Additional research is also needed to determine whether differences in soil and food microbial composition result in clinically meaningful health outcomes.

In addition to increasing the concentrations of certain beneficial micronutrients, regenerative practices also appear to reduce human exposure to toxins detrimental to gut health, such as certain heavy metals.^{63,59} Heavy metal exposure has also been linked to allergic⁵⁹ and carcinogenic⁶⁰ health issues in humans. Exposure to heavy metals through food can be meaningfully regulated by select regenerative techniques. Nickel exposure, for instance, is the most frequent cause of contact allergy worldwide, resulting in gastrointestinal symptoms.^{61,62} Regenerative practices have been shown to reduce nickel content across various crops, as well as reduce the heavy metal content of amaranth leaves and seeds, compared to synthetic fertilization.⁶³ Heavy metal uptake by plants is pH-sensitive. Long-term synthetic fertilization increases soil acidity; many regenerative practices rebalance soil pH, reducing the bioavailability of heavy metals.⁶⁴ Cadmium, another heavy metal, has been found to induce oxidative stress in plants and is a recognized carcinogen in humans.^{65,66} Whereas excessive application of nitrogen fertilizers has been shown to increase plants' uptake of cadmium, improving soil health through increased microbial diversity has been shown to reduce cadmium accumulation.⁶⁷

Agricultural chemical and environmental contaminants

Regenerative agricultural practices may also reduce human exposure to certain agricultural chemicals and environmental contaminants.³⁷ By reducing or eliminating synthetic pesticide use, regenerative systems may lower measurable pesticide residues in food and decrease human exposure to compounds that have been associated with endocrine disruption, neurological effects, and increased cancer risk.³⁷ Although exposure levels and health effects vary substantially across compounds and populations, reducing unnecessary pesticide exposure is generally considered beneficial from a public health

perspective. As mentioned above, some studies have also reported lower concentrations of toxic metals, including cadmium and nickel, in foods produced under regenerative management. Exposure to these metals has been associated with adverse health outcomes, including kidney disease, developmental effects, and certain cancers. Additional research is needed to confirm these findings across crops, production systems, and geographic regions.

In addition to benefits to health, reduced chemical use and nutrient runoff may generate economic benefits through avoided healthcare costs and environmental remediation expenditures. Pesticide exposure has been associated with acute poisonings and has been linked in some studies to elevated risks of certain cancers and neurodegenerative diseases, including Parkinson's disease. Nutrient runoff from agricultural systems contributes to drinking water contamination and environmental degradation.^{68,21} Nitrate removal from drinking water systems imposes substantial costs on water utilities and local governments, and elevated nitrate exposure has been associated with methemoglobinemia in infants and increased risks of certain cancers, including colorectal and thyroid cancer. Reducing nutrient runoff through cover crops, reduced tillage, and other soil health practices is associated with lower phosphorus and nitrogen loading into adjacent waterways.²¹ To the extent that regenerative agricultural practices reduce these environmental exposures, they may contribute to both improved public health outcomes and reduced costs for healthcare systems and public infrastructure.

Occupational and mental health benefits for farmers

Regenerative agricultural practices may also be associated with improvements in farmer well-being and select community health outcomes. Farming is an occupation associated with elevated stress, financial pressure, geographic isolation, and significant rates of depression and anxiety.³⁷

Emerging evidence suggests that regenerative agriculture may be associated with improved farmer well-being, although causal relationships have not been established. Regenerative agriculture adoption has been associated with higher farming self-efficacy and measurable improvements in farmer wellbeing, including higher occupational satisfaction.⁶⁹ A recent review found that regenerative agricultural practices were associated with increases in tensions during transition between conventional and regenerative agricultural practices but greater self-efficacy, job satisfaction, social connectedness, and resilience among producers long-term.⁷⁰ The regenerative agriculture transition involves distinct phases, and mental health vulnerabilities differ across these phases, with periods of high uncertainty requiring targeted support.⁷⁰

Proposed mechanisms include increased confidence in farm management, greater alignment between farming practices and personal values, and reduced dependence on purchased inputs. Supporting these findings, a study of Australian farmers found that management practices prioritizing landscape regeneration were associated with higher levels of subjective well-being. This analysis suggested that farming self-efficacy served as a significant mediating factor by strengthening farmers' perceived capacity to adapt to changing environmental and economic conditions.⁶⁹

Dairy farmers in Wisconsin who adopted management-intensive rotational grazing reported higher family quality of life satisfaction, fewer hours per week doing farm work, and greater intention to stay in

farming indefinitely compared to confinement operators in longitudinal surveys conducted from 1993 to 1999.⁷¹ Economic simulations of management-intensive grazing systems found that compared with confinement systems, grazing can convert work hours into higher profits through reductions in machine, production, and feed costs.⁷²

Overall, these findings suggest a potential positive relationship between regenerative agriculture and farmer well-being, although additional longitudinal research is needed to confirm associations, account for global and local variability, and characterize long-term impacts.

FUTURE HORIZONS: BRIDGING REGENERATIVE AGRICULTURE AND HEALTH

The President's Make America Healthy Again Commission was established in February 2025 through Executive Order, which required an assessment and strategy for responding to the childhood chronic disease crisis in the United States. The assessment identified poor diet and chemical exposures through food as potential drivers behind the rise in childhood chronic disease. As part of addressing these issues, the strategy report identifies "Food for Health," "Nutrition," and "Cumulative [Chemical] Exposure" actions. Several recent federal initiatives have identified nutrition, food quality, and environmental exposures as priorities for improving health outcomes and advancing prevention research:

- The **Food for Health** action is a commitment that HHS, the U.S. Department of Veterans Affairs (VA), and USDA will study the impact of programs that implement food and lifestyle interventions to improve health outcomes and decrease costs. The National Institutes of Health (NIH) Office of Nutrition will coordinate research initiatives to improve rigorous studies and maximize impact, including through randomized controlled trials, including through partnerships with the Food and Drug Administration (FDA) and USDA to conduct high-quality nutrition research and ingredient assessments, expanding research on dietary patterns that support metabolic health. NIH will take steps to fully utilize the newly created FDA and NIH Joint Nutrition Regulatory Science Program.^d USDA will prioritize precision nutrition research, which identifies how dietary exposures impact individuals, leading to more targeted nutrition recommendations. HHS will add questions to the National Survey of Children's Health that focus on nutrition.

The strategy also recognizes the importance of understanding environmental contributors to health. For Cumulative [Chemical] Exposure, NIH will partner with the U.S. Environmental Protection Agency and USDA to develop a research and evaluation framework to assess cumulative exposure to various chemicals, such as pesticides. These activities align with growing interest in understanding how agricultural production systems influence food quality, dietary exposures, and health outcomes.

^d <https://www.fda.gov/news-events/press-announcements/fda-and-nih-announce-innovative-joint-nutrition-regulatory-science-program>

- Similarly, HHS’ **One Health program**, which historically focused on zoonotic diseases, has expanded to address how soil health, agricultural practices, and ecosystem resilience directly impact human and animal well-being. This broader perspective reflects increasing recognition that connections among environmental conditions, agricultural systems, food production, and health may provide important opportunities for research and prevention.

These activities can be strengthened by participation from the broader research community. Given important evidence gaps remain, there are many opportunities for researchers and analysts to continue to evaluate relationships between regenerative agriculture and health; a few examples of such efforts can be found in Table 1. A central limitation to advancing gold standard science in this space, however, is a lack of longitudinal datasets linking farming practices to soil metrics, food quality, and health outcomes. Partnerships between the scientific and agricultural communities will be important for filling this gap. Such efforts may help strengthen the evidence base needed to evaluate potential relationships among regenerative agricultural practices, food systems, environmental exposures, and human health outcomes.

Table 1. Examples of Regenerative Agriculture Data Resources and Research Initiatives.

Data Sources and Research Initiatives	Primary Focus	References
Agricultural Health Study (AHS)	Prospective study of a regional cohort of pesticide applicators and human health outcomes	NIH. 2026. Agricultural Health Study
1,000 Farms Initiative	Regenerative agricultural practices, ecological outcomes, and farmer well-being	1000 Farms by Ecdysis. 2026. https://www.ecdysis.bio/1000-farms
Regenerative Agriculture and Human Wellbeing Study (Australia)	Farmer well-being and quality-of-life outcomes	University of Canberra. 2026. Search Engine for regenerative agricultural practice studies and Farmer wellbeing study.
USDA Conservation and Program Data	Conservation practices and program participation adoption and implementation	USDA Conservation Practice Data and Innovations. 2026. Program information .
USDA NRCS Regenerative Pilot Program	Whole-farm assessments, soil health testing, and regenerative practice implementation	USDA-NRCS. 2026. Regenerative pilot program .

CONCLUSION

Regenerative agriculture is a promising component of a broader strategy to improve American health. Practices that rebuild soil health can increase the nutritional quality of food, reduce exposure to harmful agricultural chemicals, strengthen national security by reducing reliance on imported pesticides, and support the well-being of farmers and rural communities. The economic case is also encouraging, with regenerative systems showing potential for improved long-term profitability.

Federal initiatives including the USDA Regenerative Pilot Program, the Make America Healthy Again Commission's food and nutrition priorities, and expanded NIH nutrition research, provide a strong foundation for advancing regenerative agriculture. Future study is needed to examine measurable links between regenerative agricultural practices and long-term human health outcomes.

As the nation shifts its focus from managing symptoms to addressing the root causes of chronic diseases, regenerative agriculture represents an important approach to improve health by strengthening the living systems on which health depends. The groundwork is already being laid, and the opportunity to build a food system that is not only productive but actively health-supporting is substantial.

APPENDIX.

Table 2. Brief Descriptions of Agricultural Practices Identified as Options in Regenerative Agriculture Systems

Agricultural Practice	Brief Description	References
Crop Rotation	Planting different crops in sequential seasons. This practice helps manage soil nutrients and pests and conserves biodiversity.	Crop Rotations. 2026. Rodale Institute. Stivers, L. and T. DuPont. 2025. Start Farming: Planning a Crop Rotation. PennState Extension. U.S. Department of Agriculture Agricultural Marketing Service. 2026. Crop Rotation Practice Standard.
Contour Farming or Orchards	Using farming practices that follow the edge of the natural slope of the land, which reduces water runoff and soil erosion.	Conservation Practice Overview Contour Farming (Code 330). 2017. U.S. Department of Agriculture. Sim, R. 2025. Contour Farming: A Smart Approach to Soil Conservation. Sound Agriculture.
Cover Crops	Crops planted between seasons to increase soil nutrient and moisture content and reduce weeds, pests, diseases and erosion.	Clark, A. 2015. Cover Crops for Sustainable Crop Rotations. Sustainable Agriculture Research and Education. USDA. 2026. Cover crops and crop rotation.
Mulching	Mulch is a protective layer of material on top of soil, such as grass, straw, stones, or wood chips. This suppresses weed growth, reduces soil erosion, conserves water retention, and maintains temperature.	Mulch. U.S. Department of Agriculture.
Nutrient Management	Supplying crops with the right nutrients efficiently. Management might include soil testing for micronutrients, optimizing rate, timing and application methods, and other measurements.	Glass, K. 2025. Nutrient Management in Agriculture. AquaSpy. USDA-NRCS. 2026. Nutrient Management.
Stripcropping	Growing crops in a systematic arrangement of strips across a field, with an aim to reduce wind and soil erosion and improve water quality.	U.S. Department of Agriculture. 2017. Conservation Practice Overview Stripcropping (Code 585). PDF.
Reduced or No-Till Residue and Tillage Management Systems	Reducing tilling to minimize soil disturbance to maintain soil structure and allows for increased water retention and an undisturbed soil microbiome.	Spears, S. 2018. What is No-Till Farming? Regeneration International.
Grazing Management	Management of pasture, livestock, and fencing systems with an aim to improve soil, pasture, and animal health. Systems like rotational grazing and prescribed grazing allow for intentional weed management,	U.S. Department of Agriculture. 2026. Grazing Management.

Agricultural Practice	Brief Description	References
	manure distribution, and reduced feeding of hay.	
Pest Management Conservation Systems	Practices that use integrated pest management with natural resource management, limiting injury to beneficial organisms and reducing pesticides.	U.S. Department of Agriculture. 2019. Conservation Practice Standard Pest Management Conservation System (Code 595) .
Forage Harvest Management	Practices to optimize forage harvest and removal for conservation.	Nelson, C.J.; Redfearn, D.D.; Cherney, J.H. 2012. Conservation Outcomes from Pastureland and Hayland Practices . USDA-NRCS. 2020. Forest Harvest Management . Code 511.
Forest Stand Improvement	Adjusting composition, structure, or density to sustain forest health.	U.S. Department of Agriculture. 2015. Conservation Practice Standard Forest Stand Improvement (Code 666) .

Table 3. List of Terms and Brief Descriptions

Term	Brief Description	References
Biodiversity	The variety of all life on Earth.	Smithsonian National Museum of Natural History. 2026. What Is Biodiversity?
Co-management	Co-management minimized the risk of fecal contamination and the resulting microbiological hazards associated with food production while simultaneously conserving soil, water, air, wildlife, and other natural resources.	University of California-Davis. 2012. Balancing food safety and sustainability. Opportunities for co-management . 157154.
Energy flow	The movement of energy from the sun to primary producers (plants), primary consumers (herbivores), secondary consumers (carnivores), and decomposers.	National Geographic Society. 2026. Energy Flow in an Ecosystem .
Food Is Medicine	Food and nutrition can help improve health and access to nutritious food is essential for well-being.	HHS-OASH. 2025. Food is Medicine. https://odphp.health.gov/foodismedicine/understanding-food-medicine
Mineral flow	The release and absorption of nutrients between rocks, plants, animals, and soil.	Singh, B.; Schulze, D.G. 2015. Soil Minerals and Plant Nutrition . Nature Education Knowledge.
One Health	A collaborative, multisectoral and transdisciplinary approach, working at several levels (e.g., locally, nationally), to achieve optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment.	CDC. 2025. About One Health. https://www.cdc.gov/one-health/about/index.html
Water flow	The movement of freshwater through precipitation, soil infiltration, runoff, evaporation, condensation, transpiration, and collection and drainage.	Water Knowledge For All. 2026. Water Flows . NOAA. 2026. The water cycle .

References

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