Bridging the Gap: A "Sustainable Food Seal" Needed to Improve Transparency between Farmers and Consumers about Sustainable Food Production

Paul E. Schickler (co-chair), Ag III, LLC Owner; DuPont Pioneer Former President
Francesca DeBiase (co-chair), McDonald's Former Executive Vice President and Chief Global Supply Chain Officer
Sally Rockey (co-chair), Rockey Consulting CEO; Foundation for Food and Agriculture Research Former Executive Director
Jennifer Goldston, AgTech PR Founder and CEO
Peggy Tsai Yih, Chicago Council Managing Director of Global Food and Agriculture
Natalie Burdsall, Chicago Council Communications Officer of Global Food and Agriculture

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Food labels are often the most important means of communicating product and nutritional information and safe handling instructions to consumers.[1] While frequently overloaded with content, labels still offer the most direct source of information for consumers prior to purchase. As more consumers link their food purchases to products that are more sustainable, a means to verify comprehensive sustainable practices is needed to offer greater transparency about how a food item has been grown, sourced, or produced.

Consumers are becoming more aware of the deleterious effects of climate change, and are consequently changing how they make purchase decisions.[2] The 2021 NielsenIQ Omnibus survey affirms that consumers rank climate change as the top issue they are concerned about. To help inform their purchasing decisions, consumers are demanding more information about how and where food is produced. Although "eco-labels" and "green labels" already exist (such as the US Department of Agriculture Organic Seal[3] or the Fairtrade mark[4]), the current variety of labeling systems with different certifications lacks clarity despite years of debate.[5]

Agriculture is amid an information technology revolution, with innovative practices being developed and adopted at an astonishing rate across the entire food system and with more data being generated and shared in recent years than ever before.[6, 7, a] At the same time, the

a 90 percent of the world's data was created in the past two years, with the rate doubling every 18 months.

convergence of broad climate change acceptance, the connection across many demographics for more sustainable food options, and confusion created due to multiple systems to verify sustainable farming practices means the data revolution must become a data-rich transformative force to more clearly communicate—thereby closing the information gap between farmers and consumers.

As farmers and ranchers adopt more sustainable practices, science-based verification standards expressed simply on food labels would help consumers make informed food purchase decisions. Alternatively, this "sustainable food seal" can also help consumers use their buying habits to support and fund sustainable practices across the supply chain, including on the farm.

This white paper explores current food labeling practices, identifies challenges to label standardization and voluntary adoption, and proposes potential actions and strategies to provide insight into the role a "sustainable food seal" can play in validating practices and empowering stakeholders to support a more sustainable food supply chain. With comprehensive and comparable metrics that involve all parts of the food value chain, it is possible to unite farmers and consumers around a common goal of enhancing sustainability through food.

The Foundation for Sustainable Food Systems

The global food system has performed remarkably well over the past century. Experiencing a population growth of nearly seven billion people within 120 years, global demand for food has increased exponentially, and the agri-food sector has kept pace with expanded commercial production and enhanced productivity.[8, 9] However, this trajectory is not sustainable. Agriculture and related land-use emissions currently contribute 17 percent of global greenhouse gases. With global food production estimated to increase by 15 percent by 2050, food systems emissions are correspondingly projected to increase by up to 80 percent due to rising demand from continued population growth and demand for protein.[9, 10, 11, 12] And while mainstream agriculture continues making extensive progress in reducing its environmental footprint and adopting more sustainable practices, further access and advances are needed to accelerate climate mitigation and adoption efforts.

The UN Food and Agriculture Organization (FAO) describes food systems as "encompass[ing] the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded. The food system is composed

of sub-systems (e.g., farming system, waste management system, input supply system, etc.) and interacts with other key systems (e.g., energy system, trade system, health system, etc.)." FAO describes a sustainable food system as "a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised. This means that: (1) It is profitable throughout (economic sustainability); (2) It has broad-based benefits for society (social sustainability); and (3) It has a positive or neutral impact on the natural environment (environmental sustainability)."[13]

With the goal of this white paper to offer solutions to bridging the gap between farmers' sustainable practices and consumers' purchase decisions, guidance is needed on a common definition of sustainable practices. Guidelines and standards worth further consideration include those set by the US Department of Agriculture's Climate-Smart Commodities project funding criteria, the Stewardship Index for Specialty Crops calculator, and the US Farmers and Ranchers in Action's Decade of Ag 2030 sector-wide movement to fight climate change with nature-based solutions. These guidelines were informed with deep appreciation for consumer demand, farm livelihoods, and climate change, and they offer a basis for metrics and standards to underpin "sustainable food seal" verification and communication.

Farmers and Ranchers Can Lead Efforts to Restore a Healthy Planet

Agriculture is extremely vulnerable to the effects of climate change, with invasive pests, weather variability, and shifting agroecosystem boundaries[b] each contributing to reduced crop yields and lower livestock productivity.[14] However, farmers and ranchers have a unique ability to use their position as the world's food suppliers to drive innovation. While it is well documented that meeting the demands of 9.8 billion people by 2050 requires a 70 percent increase in food availability,[10, 15] agtech innovation and investment is helping farmers and ranchers gain access to new tools that balance productivity, sustainability, and profitability on the farm. These gains are needed to ensure a resilient, affordable, and sustainable food supply for all.

Today, more farmers and ranchers are engaged in substantial climate adaptation and mitigation efforts, and they play a critical role in securing a more climate-secure future for generations to come. These practices include pathways to protecting biodiversity through climate-smart practices, enhancing supply chain resiliency, improving water quality, and increasing crop productivity while using less inputs and land,[16] among a plethora of other methods. Most importantly, however, are tools being used across agriculture to sequester carbon. Estimates provided by the US Environmental Protection Agency (EPA), the UN Intergovernmental Panel on Climate Change (IPCC), the National Academies of Science, Engineering and Medicine (NASEM), and others demonstrate that agriculture's current trajectory will reduce agricultural greenhouse gas emissions by 50 percent, and when applying additional innovative solutions and investments, the emissions fall even further, reaching a net negative of up to 147 percent.[12] In other words, farmers and ranchers who implement these innovative agricultural solutions and practices are leaders in efforts to restore the health of our soils, waterways, and air quality. However, changing practices may require a major initial investment by farmers and ranchers to implement at scale. Incentives, tax credits, and recognition should be provided for those who adopt new practices to help accelerate change needed to restore balance between the health of our food supply and our planet.

Farmers have shown a willingness to shift operations to meet consumer demand—saying "If you want it, we can grow it." As multi-generational businesses, farmers understand the overall health and longevity of their business is rooted quite literally in the health of the land and are willing to change when it makes business sense to do so. As global fertilizer prices increased to a record high in 2022 and biological technologies matured, farmers were more willing to try biofertilizers that maintained yield while improving soil health. As fertilizer prices normalize in 2023, broad interest in biologicals remains as a cost-effective, sustainable option. Additionally, as younger

b Agroecosystems refer to communities of plants and animals that support food production. Agroecosystem boundaries specifically consider the area in which these communities exist, and how climate change may shift their boundaries and decrease arable land.

generations take over the family farm, they are leaning into new technologies and practices that equally offer productivity and sustainability gains. Choosing a sustainable food product should not be a privilege; the US food supply should ensure affordability for all. New technologies can help every participant to ensure more sustainable and nutritious food is available at a cost that delivers value across the supply chain—from the farmer to the consumer.

Additionally, food and beverage companies are pursuing more credentials for farming and sourcing practices that they can share with consumers, starting with their suppliers.[17] In 2022, regenerative agriculture gained the spotlight, with many consumers learning about it with interest on how their food is grown. Food companies in turn are looking for ways to educate consumers about farming practices used to source ingredients in their products.

Consumers Increasingly Aware of Their Role to Reverse the Impact of Climate Change

Consumer behavior is shifting to reflect a growing awareness of how their lifestyle, purchases, and behaviors are affecting the health of our planet. Consumers rank climate change as the top issue they are concerned about, according to a 2021 NielsenIQ Omnibus survey.[18] The Hartman Group's latest report, *Sustainability 2021: Environment and Society in Focus*, found that nearly 44 percent of consumers are willing to drastically change their lifestyles to live more sustainably, which includes changing purchasing decisions. Even though sustainability has yet to be a consistent purchase consideration for most consumers, its impact is steadily increasing, with more than a quarter of consumers indicating they always or usually base their purchases on sustainability, an 11-point increase over the past 14 years and four-point increase from just 2019.[19] The NielsenIQ Product Insight illuminates similar trends in 2021, as consumers purchased products with "a clear commitment to a broader definition of a sustainable future."[20]

The momentum towards sustainable practices is growing along with the appetite for supporting sustainable products. Given clear consumer trends towards shopping for sustainable products, a "sustainable food seal" could provide consumers with more transparent and consistent information they need to purchase sustainable food products, thus giving them the agency to take personal, directed action towards contributing to a more sustainable food system. Through their purchases, consumers also encourage companies to change how they source food products and value farmers who meet sustainability standards.

US Government Commitment through Climate-Smart Commodities

The US government has also made a commitment in addressing climate-smart agriculture, which uses a transdisciplinary approach to integrate climate change information into natural resource management and aims to contribute to economic development, poverty reduction, and food security.[21] In 2022, the US Department of Agriculture announced more than $3.1 billion in project funding for Partnerships for Climate-Smart Commodities[22] that would support in implementing climate-smart commodity production and expand American climate-smart commodity markets. The 141 projects include academia to the private sector (notably including start-up companies) and represent a wide swath of stakeholders engaged in the mission. This huge financial commitment by the US government in investing in climate-smart solutions is only effective if research results are implemented and more broadly conveyed to the public. Furthermore, as these solutions are more broadly adopted, farmers need to have the ability to differentiate how their products were grown with climate-smart approaches to help them recoup costs in making the change to existing practices. Climate-smart labels for food[23] were debated as part of the USDA funding initiative and even touted by Agriculture Secretary Tom Vilsack at COP26, but concerns related to validation, verification, and certification means that we are still merely beginning to scratch the surface of this issue. Ultimately, there must be ways to connect the benefits to both farmers and consumers via a verification and certification process that clearly conveys that information to consumers.

Lessons from Other Sustainability Labels

Simple to Understand Standards and Metrics

A food label should be simple, clear, and easy to understand for consumers, with no more than a handful of areas to measure. To prevent widespread confusion and ultimately create an easy-to-understand sustainable food seal, agreed upon standards and metrics must exist before entering the marketplace. Labels would be meaningless in the absence of agreed upon measurable metrics, and thus require major investments in science and research. This would involve academic researchers to validate measures and metrics, and industry partners for supporting and implementing test trials. Ideally, unified standards and metrics could be agreed upon on a national or even global scale, but commodity-specific labels offer a good starting point that could simultaneously account for local and regional needs.[19] Current models of environmental impact food labels in Europe and Asia vary based on data considerations, bonuses and penalties, enforcement policies, and front-of-label packaging, among other factors, creating a hodgepodge of information that could easily confuse consumers and counteract the intended goal of improving consumer knowledge on sustainable food products (see Box 1 for Examples of Other Environmental Impact Food Labels).

Box 1: Examples of Other Environmental Impact Food Labels

Several other countries have developed environmental impact food labels that build on existing “green” and “eco” labels[24] that aim to promote sustainable purchasing habits. While the push for a mandatory environmental food label is primarily limited to Europe and Asia, several countries within these regions have committed to developing methods for its execution that offer valuable insight into how future mandates can function. For the time being, actions towards mandating sustainability labeling for food remain largely voluntary; however, the progress towards the development of these labels has great potential to contribute to creating sustainable and healthy food systems, meeting the objectives of the UN Sustainable Development Goals. Movement toward accepting a single environmental impact food label has been demonstrated through investment in scoring systems, implementing compressive voluntary labels, and incorporating expanded environmental standards into existing eco-labels. Table 1 and Figure 1 provide a brief overview of front-of-pack labeling efforts by France, Denmark, India, the United Kingdom, and the European Union and the primary criteria used for those labels.

Table 1: Status of Front-of-Pack Labels Being Adopted Globally

Implementation Date	Labeling System	Method	Primary Criteria
France			
Early 2023	Eco-Score	Front-of-pack label; rates food products on an A (low environmental impact) to E (high environmental impact) grading scale	Biodiversity
			Packaging
			Transportation
			Environmental policy of producer country
Early 2023	Planet Score	Front-of-pack label; rates food products on an A (low environmental impact) to E (high environmental impact) grading scale	Biodiversity
			Carbon impact
			Pesticide use
Denmark			
Proposal end of 2022	Unnamed	Undetermined	Carbon impact
India			
Implemented 1991	Ecomark	Front-of-pack logo for compliant products	Biodegradable
			Recyclable
			Pollution
United Kingdom			
Expected 2022	Unnamed	Front-of-pack label; rates food products on an A+ (low enviornmental impact) to G (high environmental impact) grading scale	Biodiversity
			Carbon impact
			Water usage
			Pollution
Expected 2022	Enviroscore	Front-of-pack label	Water usage
			Pollution
			Land use
			Biodiversity
			Human health effects
			Resource use
European Union			
Implemented 1992 for other products, consideration for food products pending	Ecolabel	Front-of-pack logo for compliant products	Tracking environmental impact from material extraction to distribution and disposal
			Recyclable

Table 1 sources[25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35]

Figure 1: Primary Criteria for Various Environmental Impact Labels

Water Usage
Water is used for irrigation, pesticide and fertilizer application, frost control, and crop cooling. Water-intensive crops reduce clean water available for human consumption.

Pollution
The most common sources of agricultural pollution are pesticides, fertilizer, and natural animal waste. Chemicals often seep into the soil and contaminate water.

Recyclable
Using recycled products for packaging and recycling agricultural waste can help reduce waste produced during a product's life cycle.

Carbon Impact
Carbon pollution from deforestation, livestock exhalation, product packaging, and more gets trapped in the atmosphere and contributes to planet warming.

Biodiversity
Biodiversity is essential for supporting all life on Earth, 80 percent of which is stewarded by Indigenous communities around the globe.

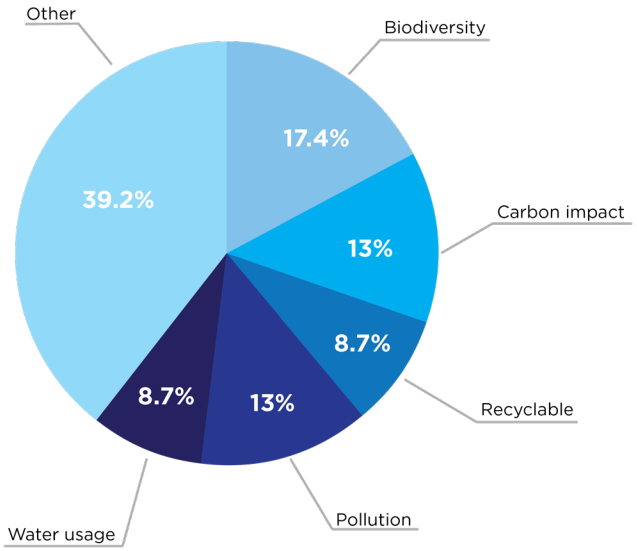

Figure 1: The primary criteria used for environmental impact food labeling consists of water usage, pollution, recyclable, carbon impact, and biodiversity. This is reflective of the front-of-pack labeling systems in France, Denmark, India, the United Kingdom, and the European Union, as noted in Table 1.

Currently, there is insufficient global market penetration data to accurately assess the value of environmental impact food labeling;[36] however, continued progress towards mandated labeling schemes in Europe and Asia demonstrates growing interest. For environmental impact food labeling to be successful, it will need to embrace a unified approach that is easily accessible and understandable for consumers around the globe. This requires a baseline understanding of such impacts and how they will be measured before impact-labeled products enter the marketplace, ideally with consistent and simplified metrics across all labels, coupled with a culture of trust and social enforcement measures.

Rather than independently developing metrics that vary for each product, leaders could use industry-wide metrics that are measured and analyzed the same way, allowing consumers to directly compare labels of different products. Metrics would need to be limited in number but expansive in scope, including factors such as nutrient management, emissions, biodiversity, and water use. For example, the Stewardship Index for Specialty Crops (SISC) is a multi-stakeholder initiative dedicated to developing tools for measuring sustainable performance across specialty crop (all fruit, nut, and vegetable) supply chains. SISC offers a suite of outcomes-focused metrics enabling operators to benchmark, compare, and communicate their own performance.

Sustainability impact communication would benefit from the use of simplified, consistent metrics and symbols that are easily digestible for consumers. For example, the Eco-Score and Planet Score A through E labeling systems provide consumers with a comprehensive overview of a product's environmental impact (see Figure 2 for an example of Eco-Score's labeling symbology and criteria). The use of a commonly understood metric accompanied with corresponding colors allows consumers to make quick, informed decisions about the food they are purchasing without additional research or analysis. Space is limited on labels, and there can only be so much additional information provided before it becomes overcrowded. For consumers who wish to access more information about grading systems and specific metrics, digital codes (such as a QR code) can link directly to expanded product information. This prevents consumers from being overwhelmed with information, while still providing them the opportunity to access relevant data and criteria.

Figure 2: Eco-Score Labeling System Overview[23]

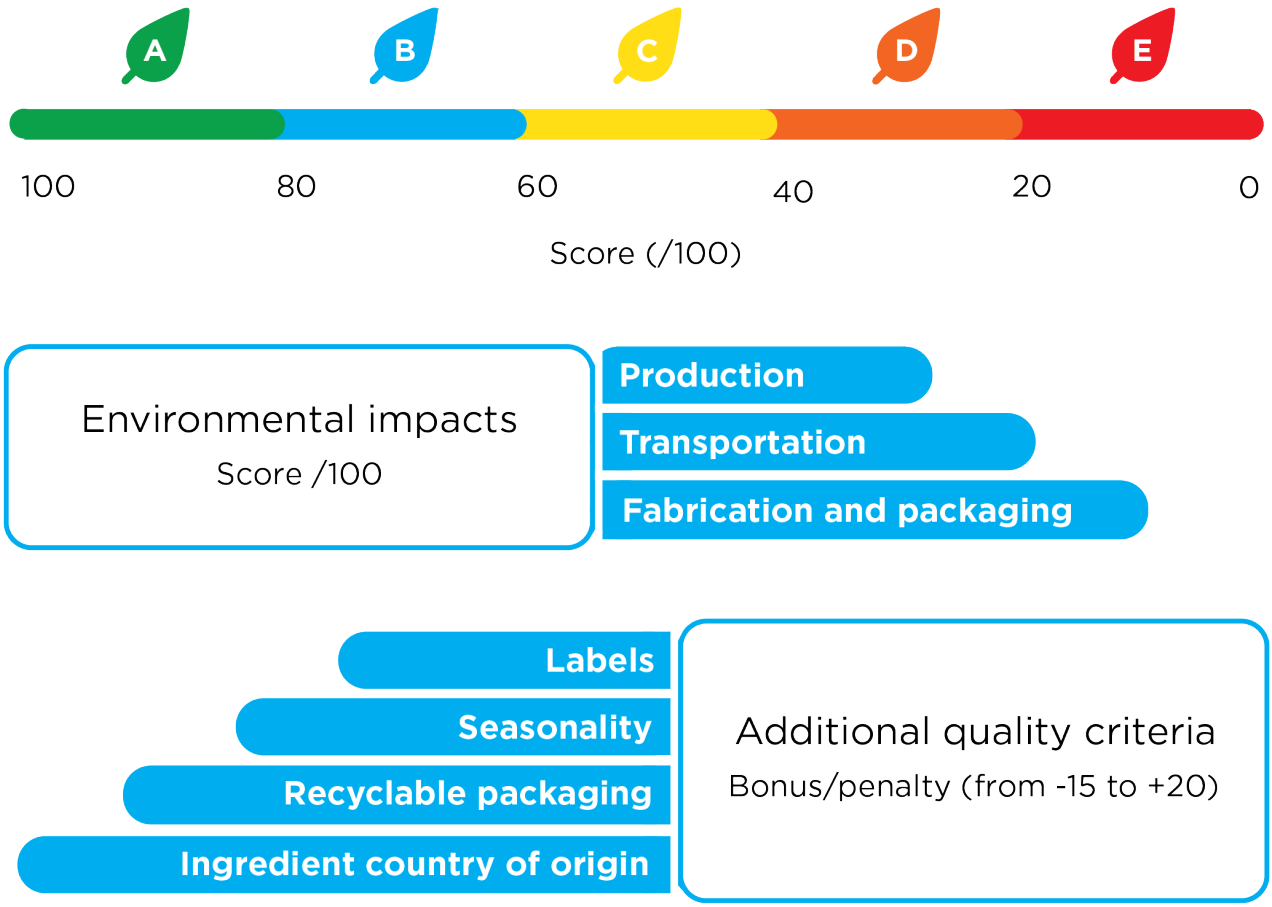

Figure 2: As an example, the Eco-Score environmental impact food labeling system uses the Product Environmental Footprint method, which is based on the Life Cycle Assessment (LCA) and considers a product's total environmental impact from farm to fork. In addition to calculations based on the LCA, Eco-Score uses a bonus/penalty approach (from the Latin term bonus/malus) that considers factors the LCA does not adequately address. This can downgrade or upgrade a product's score out of 100 from a negative 15 points to 20 points.[37]

Building Trust

Consumers need to be able to trust the information provided on labels and product information. Consumer surveys indicate widespread trust for farmers, creating an opportunity to infuse this trust while telling the sustainability story of the food or product. According to a 2022 Gallop poll, when asked about their overall view of various business sectors in the United States, people ranked farming and agriculture as the second most trusted industry, with 57 percent of respondents having a "total positive" view.[38] Including farmers in a coalition of leaders in developing a sustainable food seal will naturally bank on this trust consumers have for farmers, instilling trust in the system itself, and rightfully centering farmers in conversations on sustainable food seal verification processes and implementation.

Social Enforcement Mechanisms

Unified enforcement metrics are appealing in their ability to uphold compliance with a sustainable food verification system, but enforcement mechanisms can take a less formalized approach, using social perception to inspire behavior change. Take the USDA "organic" label, for example. When the Pew Research Center surveyed US adults about organic products in 2016, they found that 76 percent of people who purchased organic foods do so to get healthier foods,[39] despite comprehensive evidence showing that there is no nutritional difference

between organic and non-organic foods.[40] A 2019 study by the National Institutes of Health revealed similar findings, when the majority of surveyed consumers reported believing organic foods are healthier and more nutritious.[41] The lack of consumer understanding of the organic seal but willingness to purchase organic products illuminates a widespread association of organic products with "good" and "healthy" products, creating an underlying form of social enforcement; consumers identify what products are "good" and "bad" based on their associated label. This type of label association should be taken advantage of in developing a sustainable food seal to create widespread social trust for the system, even though there may be skeptics who may be concerned about greenwashing.

A similar phenomenon can be observed with the forest industry. In the early 1990s, the forest industry was under fire for clear cutting forests in the Pacific Northwest after discovering the loss of habitat for spotted owls could lead to their extinction. Consumers near and wide rallied around the spotted owl, demanding action be taken against the forest industry, which ultimately led to the development of the Sustainable Forestry Initiative (SFI).[42] Designed to protect wildlife, plants, soil, and water quality in North America's valuable forests, the SFI created substantial protections for the spotted owl and other species, becoming one of the world's largest sustainable forestry programs. Through developing a strong positive public perception of the spotted owl, thus rendering the forest industry the enemy, this movement inspired consumers to take action and led to the development of impactful public policy. This case study provides a valuable lesson of consumer-driven demand for sustainable industry practices. While the process for developing a sustainable food seal will be more complex for the food industry, as the forest industry focused only on one commodity while the food industry has thousands, the overall message remains the same: by developing strong positive associations with products labeled as more sustainable, it is possible to change consumer behavior and enforce standards of sustainability.

Criteria for a Sustainable Food Seal

The potential benefit from a sustainable food seal is clear, but there are significant challenges for implementation. The current food system was developed under a series of objectives—the need to increase productivity, optimize efficiency, and protect national security—and these objectives are still engrained in the system today. These goals, while necessary, can be misaligned with certain consumer segments who place greater importance on other values. Successfully implementing a sustainable food system requires an acknowledgement that these objectives can still work together—fueled by the data and technology revolution that is happening across the food system to bring new levels of transparency, flexibility, and information flow.

Consistent Labeling Required to Avoid Consumer Confusion

Existing "green" and "eco" labels are often private certification schemes that mainly focus on one aspect of sustainability. These labels lack consistency and frequently add to confusion as consumers' attempt to make the right purchasing decision for themselves. To overcome this confusion, a sustainable food seal should act cross-functionally, maintaining consistent measurement metrics and scoring systems through a regulatory body, whether it be government or self-regulating commodity groups. A regulatory body can enforce consistency across the data, process, and language used to communicate compliance, which allows consumers to directly compare one product to another while maintaining a clear understanding of how actors who opt-in contribute to the environmental sustainability of the product. However, existing labeling systems—such as Fair Trade or Organic labels—do not need to be removed, since this would require a greater undertaking that could potentially undo progress towards sustainability, and are in fact two examples of practices that would be included within a sustainable food framework. Instead, the regulatory group would help standardize one specific sustainable food system that summarizes, rather than replaces, other labels. This will help minimize confusion between different product grading systems and give consumers the information they demand.

Consumers Trust Farmers Yet Lack Trust in Food System

A 2023 NielsenIQ survey asked consumers to rank which top three players should be most responsible for progress on sustainability, and research results showed consumers hold brands

and local governments most responsible (at 46 percent and 39 percent, respectively), while consumers expect some responsibility for farmers to engage in sustainable practices (see Figure 3). Despite their trust in farmers, consumers maintain a paradoxical distrust of the food system, illuminating a disconnect between farm and fork. A 2018 study by the Center for Food Integrity (CFI) found a trust deficit between consumers and food companies, with only 33 percent of survey respondents saying they "strongly agree" that they are confident in the safety of the food they eat, down from 47 percent in 2017.[43] When provided the statement "I trust today's food system," only 25 percent of respondents said they strongly agree, and in a later question only 42 percent of people said they believe the food system is headed in the right direction. A 2022 survey of 1,022 consumers by University of Minnesota's College of Food, Agriculture, and Natural Resource Sciences affirmed CFI's survey results, reporting that only 24 percent of adults have a "high degree of trust" in the information they receive about the food they buy.[44] This number decreases seven percent when asking Generation Z consumers specifically, indicating that distrust in the food system is growing among younger generations. And with only 27 percent of survey respondents reporting a "very favorable" impression of agriculture and food production in the US,[30] it becomes clear that consumer distrust in the food system is on the rise, despite high favorability for farmers. Coupled with widespread greenwashing, consumers are given a multitude of reasons not to trust the food system, presenting a challenge for a sustainable food seal.

Globalized food supply chains and increasingly complex food systems inflate the distance between farmers and consumers and introduce more participants into the system, causing consumers to primarily rely on downstream food operators, such as retailers, rather than the farmers themselves.[45] The small number of people employed on farms—only 1.4 percent of total US employment[46]—similarly contributes to the distance between farmers and consumers, reducing trust in the food system.

Figure 3: Consumers Hold Brands and Government Most Responsible for Sustainable Progress

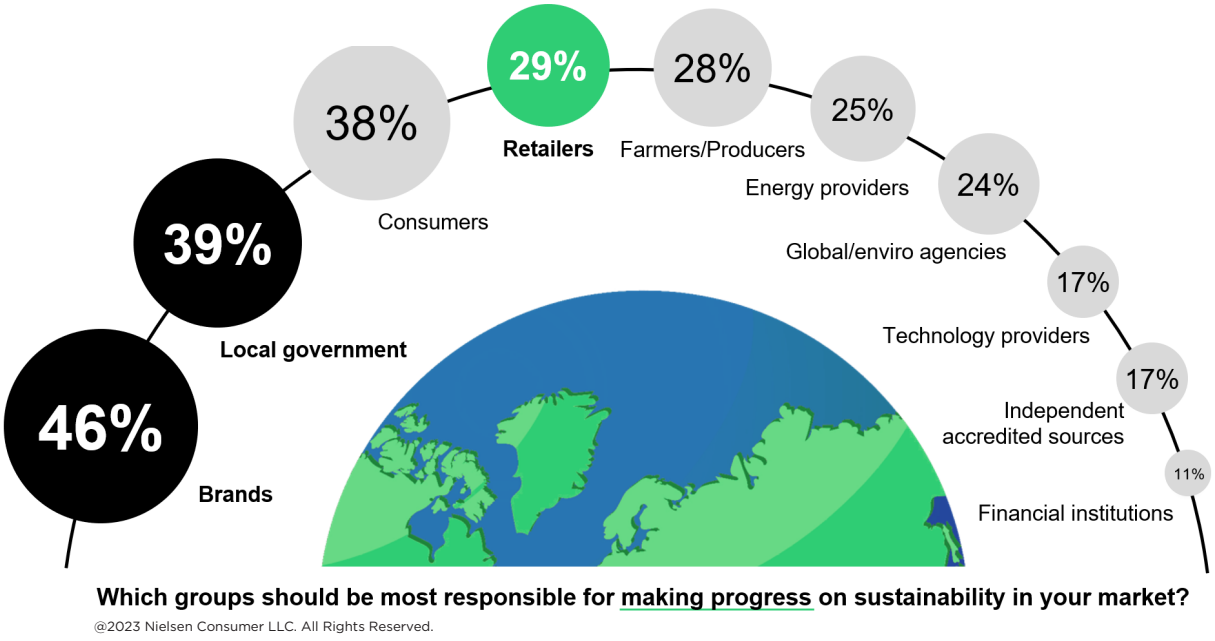

Figure 3: Results of a 2023 NielsenIQ survey ranking the top three entities that should be responsible for sustainability. The questions were: Which of these groups do you believe should be the most responsible for making progress on sustainability in your country? Second most responsible? Third most responsible? Results indicate the net percentages for a ranking of one, two, and three. In contrast, respondents indicated that the number one rank for responsible parties was brands (manufacturers) at 17 percent, local government at 17 percent, and "me" (consumers) at 12 percent. Reprinted with permission from Sherry Frey, NielsenIQ.

To protect product assurance and counteract distrust in the food system, supply chain management platforms have advanced technology that can track food from the source through product manufacturing. These technologies help maintain transparency throughout the food value chain as we have never been able to do. In 2021, the Stewardship Index for Specialty Crops was created using to track fruits, vegetables, and nuts from the source through the food supply. The calculator enables food companies to communicate ESG practices and farmers to receive credit for the sustainability practices used on their farms. This technology is being expanded broadly to agriculture, including row crops and animal agriculture. The potential is to leverage this type of technology as the underpinning of a sustainable food verification system that is standardized for the mainstream.

Overcoming Barriers for Farmer and Corporate Involvement

Farmers often express cynicism and distrust about conservation efforts due to a lack of clear communication from government operators,[47] and the absence of legal and regulatory frameworks around the collection, sharing, and use of agricultural data.[48] Coupled with a lack of transparency and clarity around data ownership, portability, privacy, and liability, commercial relationships governing farming contribute to farmers' distrust and their lack of engagement in the widespread sharing of farm data that will be vital for sustainable food seals.

Agribusinesses and food corporations similarly require incentives for adopting a sustainable food seal. Focused on their bottom line, corporations will not make radical changes to product packaging without positive financial benefits; the potential environmental and social benefits alone are not enough to justify additional costs to participate. Instead, corporate involvement requires market-based incentives that provide continuous monetary and near-monetary inducements.[49] With market incentives, corporations can incorporate a sustainable food seal into their production and consumption decisions, lowering social costs[35] and improving incentives for participation across the food supply chain.

Government actors may play a positive role in establishing trust among farmers and corporations, and build incentives for participation in a sustainable food seal by prioritizing open dialogue, education, and awareness, and instituting protections for farmers that provide them with control over how their data is used and distributed. However, the polarity between data confidentiality and data transparency can be difficult to manage. Farmers want to be protected from any liability (perceived or real) connected to their crops or animals, while consumers

want to access to all data in order to have confidence in the system. To manage these competing desires, government actors can institute protections including legal and regulatory frameworks that protect farm data confidentiality exclusively and extensively, along with measures to ensure compliance and accountability. Measures can include non-compliance fines and data processing suspension. To incentivize corporations, on the other hand, government actors can use market-based approaches. Examples include marketable permit systems; emission taxes, fees, and charges; subsidies for pollution control; tax-subsidy combinations; and hybrid approaches.[35] Through instituting these measures, government actors can help corporations make the connection between market destabilization and financial loss, ultimately making sustainability a profitable option.

Next Steps for Further Exploration

A sustainable food seal can be an opportunity to move us in the direction towards a more sustainable food system, but only if progress continues beyond this white paper. At the end of the Roundtable, participants offered proposals about what could be done.

One such proposal identified a collaborative group of cooperative business models (co-ops) and venture capital groups[a] as primary actors who have the flexibility to develop, test, and innovate. A pilot group for testing innovation is critical, since large incumbent players are more risk adverse and are less open to test out new ideas from the ground up. A group of co-ops and venture capital groups could lead the charge towards a sustainable food seal system through their ability to more nimbly integrate technology ecosystems with farmers. These organizations can also spearhead the selection of a small number of label indicators to maintain simplicity and consumer comprehension, and help establish standards for a sustainable food seal. With support from USDA, climate-smart agriculture grants could be used to develop and implement a pilot labeling system.

Industry leaders in science and technology will need to be involved to validate claims on labels. These groups will play an important role in standards setting for the adoption of labels. Similarly, it will be critical to gain the support of key influencers both within and outside of food and agriculture, including non-profit organizations and land-grant institutions as well as well-established corporations who can help affirm the legitimacy of a sustainable food seal and drive its widespread adoption. These organizations can serve to effectively disseminate information on a sustainable food seal, assist in building trust among consumers, and ultimately drive widespread adoption.

Stakeholders in academia, farmers, companies, and retailers each have a role in advancing sustainable actions in the food system that can drive change towards a sustainable future. The following action items are based on the expertise and feedback of the Roundtable participants, and highlight how various actors within the food value chain can continue to inspire sustainable solutions in food and agriculture.

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a Collaboration between co-ops and venture capital groups may create an effective and efficient system for instituting a sustainable food seal. Presenting differing but complimentary characteristics, co-ops and venture capital groups lay the foundation for the successful implementation of a labeling system and effectively approach challenges that face it.

Like co-ops in other sectors, farms that adopt the co-op model pool their resources with other farmers in certain areas of agricultural activity. Therefore, members of these co-ops are farmers rather than outside investors. This means that farmers own the co-op, help make decisions, and each producer gets a share when the larger cooperative business is profitable. Farmers no longer have to fear a lack of legal and regulatory frameworks in the food system, because they become responsible for managing both supplies and services, and marketing and selling their products. This creates a closer connection between farmers and consumers, providing access to goods and services that are otherwise unavailable to them, and compressing the supply chain to maximize impact. Through utilizing a marketing co-op, specifically, farmers become responsible for the transportation, packaging, pricing, distribution, sales, and promotion of farm products, allowing them to bypass lengthy policy processes required to institute a sustainable food seal. Co-ops led by farmers will also be able to determine the opportunity for generating value from a sustainable food seal, making them key to the implementation process. Co-ops include groups like Land O'Lakes and Global Farmer Network

Venture capital groups provide comparable value to developing a sustainable food seal through their flexibility. As organizations designed to focus on innovative thinking, venture capital groups have room to explore where co-ops and other corporations do not. Through investing in start-ups, venture capital groups can experiment with sustainable food seals, providing proof of concept more nimbly and without bureaucratic burdens often created through stakeholder groups.

1. **Academia**: Researchers and scientists can offer a starting point for developing a sustainable food seal by providing a study of the current landscape. Further research and analysis on existing labeling schemes can prevent actors from duplicating existing work, encouraging them to instead build upon it. By socializing this topic with experts, such as agricultural economists, academia can similarly generate further discussions on sustainable food seals through creating the opportunity to improve existing systems. Summarizing information on labeling systems will allow researchers to make information more accessible to the public, turning complex information and scientific jargon into meaningful and readable labels.
2. **Farmers**: With the most to gain and lose, farmers will need to be at the forefront of movements to implement a sustainable food seal. In using existing agricultural technology, they can enhance the sustainability of their products, building momentum towards a food value chain that not only values but prioritizes sustainability. In doing so, they can help build ecosystems around a sustainable food seal, thus driving change throughout the food system.
3. **Companies**: From private and public companies to nonprofit organizations, a bevy of actors are connecting people across the food value chain through data and technology that can also help accelerate the development of a sustainable food seal. These companies can virtually shrink the global food supply chain landscape to accelerate actions at each point in the supply chain to adopt practices that are the underlying metrics of these labels. Companies' ability to help farmers and ranchers with data collection and preparation for labeling system requirements will be a critical step to further assist the development of a labeling system, while elevating the voices of farmers who are central to its creation.
4. **Retailers**: Retailers connect consumers with food and products through how they market and label them. In developing a coordinated marketing message that focuses on existing labeling systems, retailers can build the customer for the product, rather than building the product in the hopes that the customer will materialize; retailers can help develop an ecosystem where a sustainable food seal thrives. By placing diversity at the forefront of this process, retailers can also create a real culture of inclusivity that inspires consumers to get involved in the system, all while elevating farmers, the unsung heroes of the food supply chain.

Conclusion

A sustainable food seal can be one of many valuable tools to communicate efforts and help inspire action to promote a more sustainable food system, and thus can provide widespread ramifications for the food value chain. The impetus behind a sustainable food seal is clear: the system is ripe for a food information revolution. Younger generations are moving towards sustainable options at higher rates, with Gen Z touted as the sustainability generation.[50] As the original stewards of the land, farmers around the world want to do their part to leave Earth in good shape for the next generation. A sustainable food seal could be a catalyst for change driven through transparency.

There is global momentum to change how we understand and access information about our food and its associated growing practices, with the end goal of promoting a system that is sustainable for many generations to come. Stakeholders from across the food system can make strides through simple steps that may be imperfect but can collectively contribute to greater action; it is more important to debate these ideas in the public discourse, test these ideas by initiating trials, and to correct missteps and learn from them than it is to have a perfectly envisioned system that comes too late. A sustainable food seal offers an opportunity to unify the entire food system from farmers to food companies to consumers armed with clear information in order to make decisions and take appropriate steps to protect our food and our planet. While this white paper merely skims the surface of these issues, our intent is to lay the foundation for initiating future conversations between farmers and consumers on how we can bridge the understanding gap in ensuring a more sustainable and resilient future.

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Contributors: Brita Jelen
Layout and graphics: Natalie Burdsall

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