Nutrient Density Alliance

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ENGAGING CONSUMERS ON REGENERATIVE AGRICULTURE

How Brands Can Integrate Nutrient Density for Top-line Growth

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Contents

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This publication has been released in the name of the Nutrient Density Alliance. It is the result of collaborative efforts by representatives from member companies and external experts. It does not reflect all viewpoints of each company or partner, nor does their engagement in the process necessarily constitute an endorsement of every assertion within the document.

Nutrient Density Alliance

02. An Introduction to the Nutrient Density Alliance

The Nutrient Density Alliance, formed in 2022, is a pre-competitive effort sponsored by the Soil & Climate Alliance Network to connect regenerative agriculture (RA) practices to improved outcomes for soil, climate and human health.

This white paper works to address key questions from across the spectrum of stakeholders in RA as it relates to nutrition. It provides practical guidance to help food companies capture new opportunities presented by their RA commitments and programs. As consumer interest grows around the connections between farming techniques and food nutrition, brands have a chance to better engage shoppers by quantifying and communicating the measurable health benefits enabled through regenerative methods.

The fundamental need for this effort is driven by the fact that the RA movement has now grown to include more than 79 publicly-listed agri-food companies with a combined annual revenue of $3 Trillion, equivalent to a third of the global agri-food sector.[1] Rather than being focused on only one corner of the food system, the RA movement is increasingly adopted across multiple systems of agriculture, driving the broadest possible transformation of existing systems. This in turn will support the work of slowing climate change[2] while bolstering communities, food access, and human health.[3]

A key element of any food system transformation involves educating and meeting consumers where they are at on a wide variety of topics relevant to their own health. While some brands adopted RA commitments over the past five years, many have yet to fully apply this value proposition when marketing products or conveying sustainability efforts to customers. Despite strong evidence that today's consumers want to understand how their food choices impact personal wellness,[4,5] transparent messaging around these links remains limited in the RA sector.

Since the United Nations Food and Agriculture Organization (UN FAO) 2015 International Year of Soils there has been a confluence of widely-available, peer reviewed information about the fact that nutrient deficient soils will produce nutrient deficient plants, ultimately causing people to suffer from nutrient deficiencies.[6] This work has only accelerated over the last decade based on notable research within the United States (e.g., aggregated research from The Rodale Institute, Food Animal Concerns Trust [FACT] and many more here), and from other researchers across the globe. Individual researchers and institutions have advanced not only the knowledge of soil science related to carbon sequestration, ***but the notable uptick in nutrition outcomes related to the adoption of the very same principles***.

For the purpose of this white paper, Regenerative Agriculture is defined as a program with 3rd party validation around soil-centric and agroecological principles, with acknowledgment that Indigenous Practices are being resurfaced in commodity agriculture via RA. This idea is explored further within the paper, as well as the practices which are foundational elements of most mainstream RA definitions.
See more on page 14.

As it stands today, the nutrient profile of numerous crops related to atmospheric carbon dioxide is already being impacted and will continue to be impacted in the future.[7] RA offers an avenue for working to stabilize/de-risk that impact while demonstrably adding in nutritional outcomes which have been stripped in previous years by intensive agricultural practices.[8] Significant thought leadership has already been demonstrated around the absolute link between soils and nutrition.[9]

The health and wellness sector tied to "healthy eating, nutrition and weight loss" stands at $1 Trillion[10] as of 2023, which means the consumer is a critical stakeholder group to create balance within the unfolding RA movement: their support is required for sustaining it in the long term as a system of positive transformation. This enables a more expansive opportunity for systems transformation via the facets of markets, supply, and demand.

Companies with Regenerative Agriculture commitments must do this work anyway, why not explore what is possible in evidence-based outcomes related to improved nutritional value in a way that drives top-line growth (i.e. their revenues and gross sales)?

If businesses and policy stakeholders view the RA movement as being 'altruistic' or 'about stakeholder reporting' or 'about managing capital' then the sector will have missed several paradigm shifts which are equally possible within this moment, and which may be more difficult to instill once the RA system has calcified into specific lanes of thought (spanning from conventional to regenerative organic).

This white paper contains helpful resources, key questions that still exist, example steps for a project-management approach, and answers to frequently asked questions from a broad variety of industry stakeholders.

This document is specifically created for those functions within food companies that dictate how on-pack messages are proven/validated (Quality/Regulatory, likely in conjunction with Legal) and how they are messaged (Marketing) to consumers and all company stakeholders. It is intended to help examine internal company processes and decision-making as department leaders work to establish the connection between RA and nutrition in the minds of consumers.

More broadly, the full regenerative agriculture paradigm shift should also encompass:

- Creating an environment in agriculture that future generations would find welcoming, as well as addressing looming (significant) farmer retirements.[11]
- Addressing what the broader markets are currently seeking as solutions to climate-driven supply disruptions.[12]
- Whenever possible, centering the voices of Indigenous communities as approaches are resurfaced for commodity agriculture which these leaders have been actively practicing for millennia.[13]
- Working to resolve ongoing under-funding of farm operations and fair and living wages for farmers[14] and value-added partners that honor segregation and provenance.
- Nutrition science around chronic illness[15] and fertility issues[16] within several developed markets or from the lens of healthcare insurers[17] and the growing food as medicine movement.[18]
- And there is much more still unfolding.

The fact that the Nutrient Density Alliance is led by non-profit organizations and pre-competitive by design enables this work to be intentionally structured for the broadest stakeholder groups within the RA movement. The intention in surfacing nutrition differences and potential advantages from RA is to meet the food needs of both current and future generations while unlocking meaningful opportunity that can actively drive change, growth, innovation and revenue for the sector. Along with key leaders from the Soil & Climate Alliance, leadership includes the Non-GMO Project in forming the Design Team that defines the objectives of the Nutrient Density Alliance. Our member companies, both large and small, have joined in co-creating solutions by which this nutrition-focused future can be woven into the existing regenerative movement.

Companies and RA leaders are invited to explore the latest science, the business case, and the consumer case for advancing nutrition within RA. Now is the time for allyship, community, shared momentum, and expansive bridge building to pull forward multiple parts of the existing agricultural system into what is entirely possible, within grasp, and already backed by global scientific bodies.

We seek to offer actionable information for food companies to seize this opportunity by endeavoring to support the industry in growing consumer demand for RA and related health attributes.

Call to Action: Realizing the Full Potential of Regenerative Agriculture

The RA movement holds incredible promise - delivering stability amidst climate change, restoring healthy natural systems, and enabling more nutritious foods.

Yet the full potential of RA cannot be reached through supply web adjustments alone. True transformation requires meeting consumers where they are and generating demand for the measurable human health benefits made possible by regenerative techniques.

For food brands who have begun the regenerative journey or are just getting started, this represents a pivotal moment to expand strategic efforts to the consumer side of the equation. By quantifying and highlighting tangible nutrition gains, companies can stabilize their long-term resource investment engage consumers in this mission, and ultimately accelerate the impact of programs already underway.

This begins with a mindset shift - recognizing nutrition as a key component of the regenerative opportunity instead of solely a supply web initiative for stakeholder management. Marketing, innovation and product development teams have critical roles to play alongside sourcing and sustainability leaders.

The recommendations in this white paper, and ongoing support from collaborations like the Nutrient Density Alliance, offer a roadmap for unifying RA across key functions within your organization. The latest consumer research, existing scientific proof, and detailed planning steps provide a launch pad for your brand.

Now is the time for early movers to take full advantage of the market opportunity. Please reach out so we can support your industry efforts in leveraging nutrient density to realize the full promise of regenerative ingredients for both human health and planetary health.

The long-term business case is clear - consumers, farmers and companies all stand to benefit from this more holistic approach to systems transformation. We hope you will join us.

Sincerely,

Tina Owens
Managing Director, Nutrient Density Alliance

Nutrient Density Alliance

03. How to Use This Paper

This white paper is designed to support food companies of all sizes in accelerating consumer engagement around the nutritional benefits of regenerative agriculture (RA) programs.

It offers practical guidance for enabling science-backed messaging by leveraging existing processes for supply web testing, validation, and compliance procedures. Recommendations are tailored based on company resources:

- For companies with in-house dietitians, science teams and legal/compliance expertise, this serves as a roadmap for connecting your RA efforts to nutritional testing, verification, and responsible consumer messaging.
- Smaller teams can utilize the detailed references, relevant standards overview, third party resources and planning steps provided to pursue similar opportunities using external resources.

Core focus areas in the paper include:

- Importance of supply web segregation for nutrition-based messaging
- Leveraging current Certificate of Analysis processes
- Pursuing messaging substantiated by ongoing test data
- Seeking third-party validation/certification where required
- Understanding the latest regulatory guidance around labeling and advertising rules

Segregation of ingredient volume will be required for any potential on-pack messaging related to nutritional outcomes. The focus of this report is on the side panel/nutrition facts panel for highly governed processes and calculations. Both front-of and back-of-pack claims related to regenerative nutrition outcomes require additional scrutiny from resources with expertise in regulatory governance before a company should pursue them as messages to consumers.

Disclosures

- There is currently a lack of standardization around what constitutes a meaningfully relevant nutritional outcome specifically related to positive outcomes from regenerative ingredients. It is acknowledged that this gap exists, and as with the rest of the RA movement, standardized metrics and potential regulatory guidance will need to be developed. In service of that need, enabling companies to test what already exists within their RA programs is prudent for both current and future understanding of the full scope of the movement. Several agronomic services (four, by NDA's count) in the RA space have already conveyed their intentions to test around nutrient density, demonstrating their interest in quantifying the positive outcomes being monitored firsthand. In-market outcomes must first be measured to create future guidance on standardized metrics for the industry; this is how a food movement gets started.

- The Nutrient Density Alliance's sister organization is the Soil & Climate Initiative – a farm-to-shelf regenerative agriculture program with third-party verification by SCS Global Services, a leading third-party auditing body. Furthermore, founding members of the Nutrient Density Alliance include The Non-GMO Project, which also has an interest in engaging consumers around the outcomes offered within RA systems.

Disclaimers

- This white paper DOES NOT CONTAIN GUIDANCE ON ANIMAL PROTEINS. The Nutrient Density Alliance will work to create an addendum to this publication that is specific to animal proteins like eggs, dairy, meat, and cheese as there may be additional considerations to include. Please note this and apply accordingly for existing ingredient portfolios. In working with these ingredients, there could still be considerable information within this publication that can be useful in informing longer-term strategic work.

- This white paper is not in any way a substitute for U.S. Department of Agriculture (USDA), Food and Drug Administration (FDA), Federal Grain Inspection Service (FGIS), Food Safety Modernization Act (FSMA), Global Food Safety Initiative (GFSI), or other regulatory guidance that companies are required to follow when creating Nutrition Labeling and Education Act (NLEA) compliance and on-pack messaging.

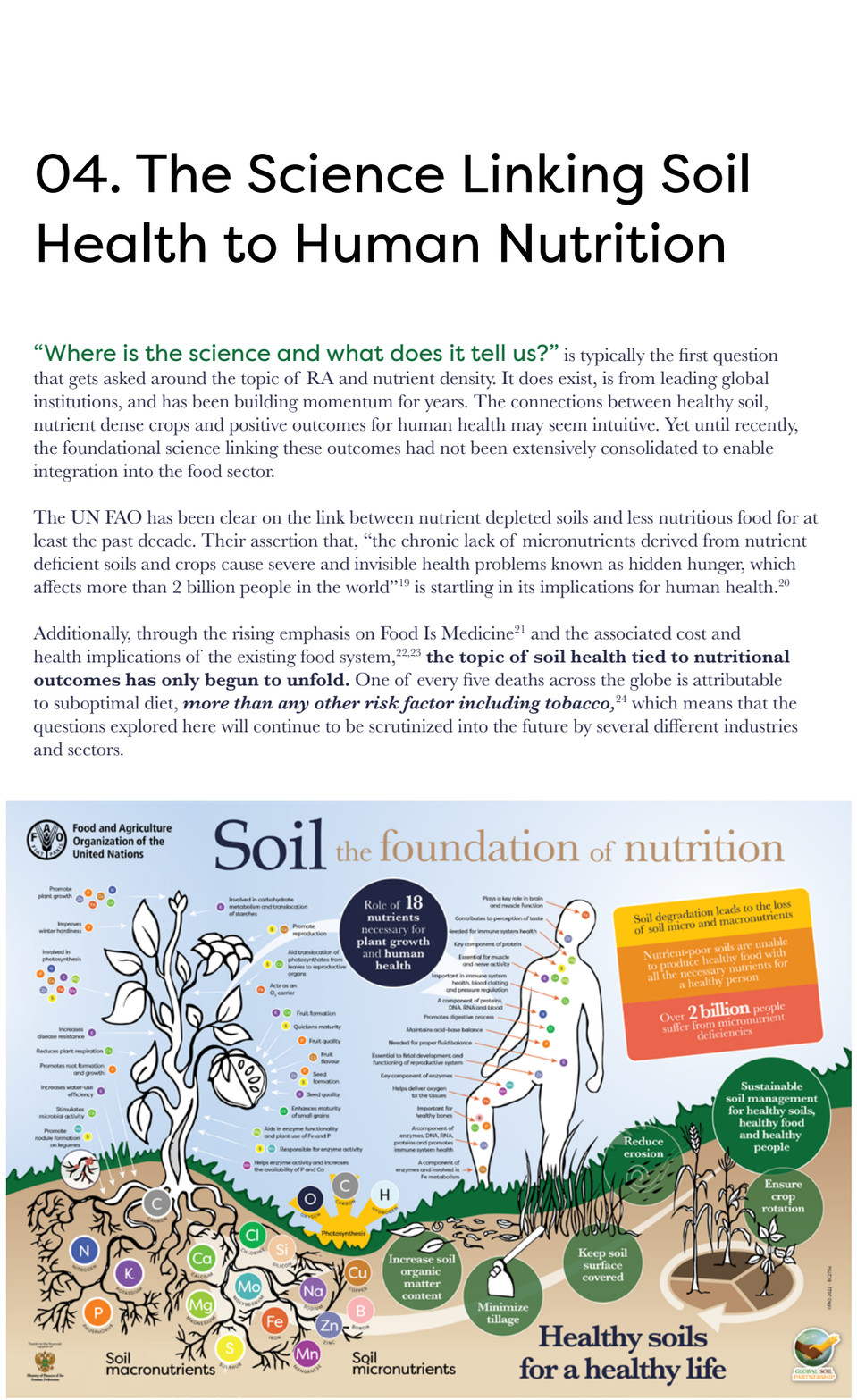
Please let the Nutrient Density Alliance know of any regulatory roadblocks that may be necessary for the industry to undertake in advocating for rulemaking or guidance from regulators to further enable transparency with consumers about the scientifically verifiable outcomes in nutrient density and related to consumer-facing messaging. The animal protein sector is one notable example that will require this additional step before clear guidance can be offered.

04. The Science Linking Soil Health to Human Nutrition

"Where is the science and what does it tell us?" is typically the first question that gets asked around the topic of RA and nutrient density. It does exist, is from leading global institutions, and has been building momentum for years. The connections between healthy soil, nutrient dense crops and positive outcomes for human health may seem intuitive. Yet until recently, the foundational science linking these outcomes had not been extensively consolidated to enable integration into the food sector.

The UN FAO has been clear on the link between nutrient depleted soils and less nutritious food for at least the past decade. Their assertion that, "the chronic lack of micronutrients derived from nutrient deficient soils and crops cause severe and invisible health problems known as hidden hunger, which affects more than 2 billion people in the world"[19] is startling in its implications for human health.[20]

Additionally, through the rising emphasis on Food Is Medicine[21] and the associated cost and health implications of the existing food system,[22,23] **the topic of soil health tied to nutritional outcomes has only begun to unfold.** One of every five deaths across the globe is attributable to suboptimal diet, ***more than any other risk factor including tobacco,***[24] which means that the questions explored here will continue to be scrutinized into the future by several different industries and sectors.



Graphic credit: UN FAO

Peer-reviewed research clearly demonstrates that regenerative farming methods lead to significant nutritional gains compared to depleted soils under conventional agriculture.

Important literature reviews and scientific studies:

- Global Symposium on Soils for Nutrition: State of the Art
- Technical Guidelines on Soils for Nutrition
- Fact Sheets from Year of the Soils and Infographics
- EU Agricultural Policy and Health
- World Health Organization Guidance
- Database of the Coalition of Health Professionals for Regenerative Agriculture
- Regenerative Agriculture and Human Health Nexus Literature Review
- Food Animal Concerns Trust (animal based, not in scope for this white paper)

The Nutrient Density Alliance aggregates updated consumer data, on-farm profitability, scientific breakthroughs, and more on it's Resource Hub.

The rising scientific consensus presents an opportunity for greater industry adoption. Translating these proven links between regenerative techniques and measurable nutrition gains into consumer messaging allows brands to meet increasing consumer demand for tangibly healthier and more sustainable products.

While further research is always beneficial, extensive existing evidence supports regenerative efforts today and warrants industry uptake versus waiting for additional studies. Early-movers have a chance to lead the way in translating science into credible consumer messaging.

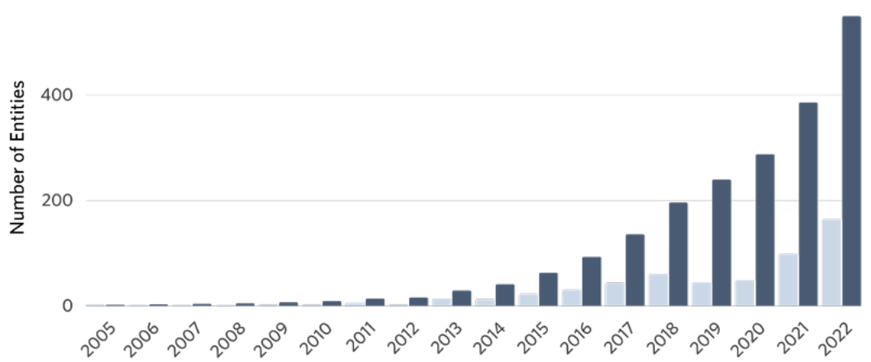
By verifying outcomes already occurring within their own regenerative supply webs, rather than making general statements, food brands can enable shoppers to make informed choices based on health and sustainability impacts.

05. The Regenerative Agriculture Movement is Accelerating Rapidly

According to HowGood, the number of companies adopting a variety of RA practices has grown by nearly 130%, from at least 239 in 2019 to at least 549 in 2022.[25] According to FAIRR, the movement also now includes more than 79 publicly-listed agri-food companies with a combined annual revenue of $3 Trillion, equivalent to a third of the global agri-food sector[26] and spans businesses, farms, non-profits, verification providers, retailers and startups working toward a larger aim of climate risk mitigation.

Most of the food company efforts have been behind the scenes within the industry, and some company RA commitments are now more than five years old. It is fully possible to engage the top-line growth and market development activities that are inherent opportunities that drive further investment, innovation and growth in RA, while ultimately supporting scope 3 emissions reduction efforts of these same companies.

Number and Cumulative Total on Entities Using "Regenerative Agriculture" By Year



Graph credit: HowGood

06. Regenerative Agriculture General Definition

We know. There is a lot of discussion about the definition of RA across the industry, starting with the basic principles that all RA definitions share (cover crops, crop rotation, no/low-till and animal or manure integration). A small list of definitions which have outlined these principles as a baseline can be found spanning academia, NGOs, research institutes and CPGs. See some examples here: Chico State, NRDC, Rodale Institute, Unilever. There is also significant momentum around notable existing certification standards like USDA Organic and the Regenerative Organic Alliance (which requires organic as a baseline), and which may be focused beyond soil to include social impacts.

For this publication, Regenerative Agriculture is defined broadly as a program with 3rd party validation around soil-centric and agroecological principles, with acknowledgment that Indigenous Practices are being resurfaced in commodity agriculture via Regenerative Agriculture.

Third-party verification should be used to confirm field-level metric outcomes of soil organic matter or provide an on-pack certification. If the company is claiming to build soil organic matter in order to tie it to a specific nutritional quantification there should be both agronomic oversight and food specification laboratory processes involved (covered in more detail below).

Large scale, enduring shifts in agricultural practices are universally recognized as essential if we are to meet global climate targets before the end of this decade. For this reason, it matters that the consumer becomes a driving force of the movement by generating predictable demand for farmer volume, and who must be brought in as a balance via demand and awareness to accelerate the potential of the full scope of this movement.

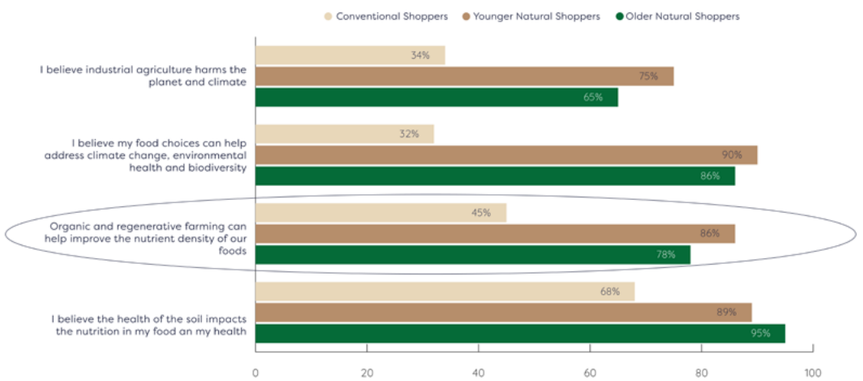
07. The Business Case for Consumer Awareness of Regenerative Agriculture and Nutrient Density

A large portion of internal influencing is enabled by having the appropriate consumer data to back up any brand innovation, positioning, and messaging.

Here are resources to create an internal business case for consumer demand around RA as it relates to purchase intention, understanding of the topic, future generational interest, and historical context:

Natural vs. Conventional Shoppers on Food, Health and Climate Change

Table 5. How much do you agree/disagree with the following statements about climate change and farming practices? Selected "strongly" or "somewhat" agreed.



Source: Non-GMO Project, 2024

- As pictured above, The Natural Shopper in 2024 and their expectations around nutrient density and health.
- Organic consumers lead the market in industry trends that become mainstream. This data from 2020 demonstrates the first signals of awareness of soil health tied to purchase intention. Hartman, 2020.
- Regenerative Organic Certified products enjoy a 35% price premium over organic products. See late 2023 data from SPINS.
- Farming for the Future 2023: ADM's look at RA for consumers.
- Gen Z Consumers Are Purchasing for Health & Wellness, Better Production (meaning addressing climate change and higher quality food outcomes). Hartman, October, 2023.
- Check out our Nutrient Density Alliance website for up-to-date consumer testing information as it is published across the industry, as well as further information like on-farm profitability reports from across the RA industry.

08. Brands Can Do More to Engage Consumers on Regenerative Agriculture

Many companies with defined RA objectives remain inwardly focused on strategies defined by procurement or sustainability teams without utilizing the broader company marketing influence to communicate the benefits to consumers. The potential remains to unlock innovative top-line growth and stronger demand to stabilize the investments made in this sector and offer balance to the investments that companies are making in RA with staffing, resources, and on-farm conversion.

Removing Barriers

Consumers are already focusing on nutrition and health with their purchase intentions. The supply and demand need is distinctly sharp as it relates to measurable outcomes and farmer adoption and uptake of RA practices based on CPG commitments. The mindset of the industry can and should shift to center on the strong consumer desire to manage their health through measurable outcomes in the nutritional shifts of foods through RA practices.

09. Four Barriers that Are Limiting Action on Nutrient Density Messaging

Barrier #1

Confusion about how higher nutritional outcomes are quantified

There is a belief that the nutritional benefits attributable to soil health are difficult to measure, or that 'human health trials' are required before utilizing standard measures that are already widely used and mandated as a result of the Nutrition Labeling and Education Act (NLEA).

Solution

The same systems that already exist for standard measurement can and should be used: specifications, Certificate of Analysis, and ongoing laboratory verification that target windows of measurement are achieved with each lot and shipment.

Barrier #2

Believing there is a lack of scientific evidence

Some consider RA to be a values-based movement, when in fact it is an evidence-based movement with clear and measurable outcomes in soil, planetary, and human health impacts using the latest established scientific methods. Relegating RA to a values-based movement drives the desire to talk to consumers from a space of food beliefs rather than personal and planetary health backed by science.

Solution

There is still a need to translate the science for consumers, but there is enough evidence that individual companies can and should explore the outcomes from their own RA supply as it relates to nutrient density, and the meaningful presence of additional compounds already associated with health outcomes. See pages 11 and 12 for scientific evidence.

Barrier #3

Believing that additional studies are needed before taking action

While more research is always warranted, many are not aware of the breadth of research which already exists and that can support efforts to create internal testing plans on regenerative ingredients. There has been a clear impetus to act since the 2015 International Year of Soils introduced significant peer reviewed research demonstrating the known links between soil, nutritional outcomes, and human health.

Solution

What is needed now is industry uptake and translation of measurable outcomes to activate consumers and catalyze top-line growth. In turn, this can lead to standards of industry adoption that are universally recognized outcomes of RA, and which still need to be built from a multi-stakeholder approach.

Barrier #4

The worry about marketing complicated soil science to engage consumers

The emphasis on soil and associated climate sciences has already caused many marketers to shy away from engaging consumers on these topics as their expertise lies elsewhere, and quality/regulatory/legal professionals will be less likely to support such efforts for fear of on-pack messaging that gets scrutinized in the marketplace by regulators.

Solution

Using the existing segregation and ingredient specification model can demonstrate to internal stakeholders where the measurements are proving a specific outcome within a third-party verified RA program in a way that translates to consumer value. For examples of what makes up a food specification, see page 27.

Addressing these key barriers through persistent collaboration with first movers in the space of RA will in turn create a larger, safer marketplace for farmers to feel confident in converting their operations to include regenerative practices, while also increasing the potential that farmers may receive rewards – such as payments for nutrition premiums that allow the brands to message to consumers about nutritional outcomes.

Click here for examples of studies around soil health influencing Health, Quality, and Nutrition (Soil Health Institute, Rodale Institute's The Power of the Plate and Nutrient Density reports).

Framing around the topics of health, quality and nutrition creates a much clearer opportunity for business leaders to support engaging consumers through their years of experience in core messaging tied to brand identity. It also allows any existing brand consumer research to be used in ways that support meeting their purchase intention for current product lines via messaging that marketers are comfortable and knowledgeable in discussing.

Discussing Regenerative Agriculture with consumers does not require marketers to adopt an entirely new approach or to translate complicated soil science.

Regenerative Agriculture increases the ability to connect on matters of Health, Quality, and Nutrition, which are core tenets of how brands already engage with consumers.

10. Cross-Functional Guidance for Success

Within any medium- to large-sized food company there are several departments which must be aligned and directly engaged operationally to enable innovation. The exact same departmental process can be used in testing for, segregating, producing and measuring RA product outcomes. Cross-functional departments typically involved in decision-making an innovation development for consumer engagement related to nutrition include:

The focus for this white paper is on the **Marketing, Quality/Nutrition and Regulatory/Legal** functional spaces is intentional as these are the gatekeeping stakeholders of social media posts, company website refreshes, and on-pack content of any nature – these three departments must be engaged and aligned to create any messaging for consumers.

Ahead of determining whether to segregate RA grown ingredients for product use, a holistic understanding of the difference between segregation and mass balance is warranted. Segregation must be part of on-pack messaging, and multiple channels and options for creating value from segregated ingredients are included in the graphic below.

Strategies to Achieve Over Multiple Crop Years

Short Term

Volume that can be segregated creates momentum for:

- Niche Brands
- Smaller/Individual SKUs
- Line Extensions
- Innovation Launches
- In & outs / Retailer-specific launches
- Setting a mass balance strategy

Medium Term

- Segregated volume and claims are extended to a product line or brand leadership strategy
- Consumers begin to rely on brand claims as a point of differentiation
- Mass balance efforts reach tipping points that enable production lanes to convert on specific channels of volume
- Farmers can rely on annual contracts for ongoing sourcing

Long Term

- A portfolio-wide integration is possible when mass balance targets are achieved
- Farmers see follow through from sourcing to on-pack and retail integration
- Consumers have integrated brand loyalty into their purchase decisions

11. The Role of Marketing in Engaging Consumers on Regenerative Agriculture

Marketers sit in the driver seat for messaging around and engaging consumers in ways that lead to purchase intent, trial, repeat, and overall brand identity. Marketers are typically initializing or heavily engaged in any innovation launches, renovation relaunches, or brand re-setting that occurs within a given product line.

The marketer's likely role is to decide whether a 3rd party validated RA program covers enough volume of individual or collective hero ingredients to establish a point of differentiation within a category or versus competitors. As this type of validation requires partnership within a company, the recommendation is to seek consensus on the type of project undertaken in conjunction with peers in other departments, beginning with Quality/Regulatory as a key enabler.

Due to the unfolding volume of regeneratively grown ingredients, it is likely necessary for larger companies to focus first on smaller-volume products within a product portfolio including line extensions, individual SKU launches, or smaller brands that already exist in specialty markets.

If Marketing and Quality/Regulatory agree that an ingredient fully procured using existing standards of segregation can lead to improved nutrition outcomes, then it is possible to have a fully viable project for alignment and review with other departments and decision makers.

12. The Role of Quality and Legal Teams in Enabling Consumer Engagement on Regenerative Agriculture

While Marketers sit in the driver seat for messaging to engage consumers related to overall brand identity, internal **Quality and Regulatory/Legal** department partners provide much of the relevant content, critical review, or enablement of key messages made on product, in social media, or on the website. And Quality/Regulatory or Nutrition (or an outside contracted service) are typically fully responsible for any Nutrition Labeling and Education Act (NLEA) calculations to meet USDA or FDA on-pack requirements.

In reviewing the general processes and principles around NLEA Nutrition Facts Panel generation with industry stakeholders it has been affirmed that the existing industry standard process of segregation (i.e. alike with organic, allergen, or Non-GMO Project Verified materials) is required to support any specific on-pack messages that brands intend to use in engaging consumers about nutrient density tied to third-party validated regenerative ingredients.

An example of internal process steps for ongoing segregation is included below:

1. A regeneratively-grown ingredient is identified at product and crop/field level in quantities that meet company demand for a specific supply need.
2. Determine the path to segregated supply to meet downstream and upstream minimum order quantities (MOQs) in ingredient processing, storage, packaging, and final production.
3. Perform standardized nutrition tests (Primary Data) to determine nutritional parameters that are differentiated from standard USDA specifications (Secondary Data) for that ingredient.
4. Create a specification that includes the updated parameters based on representative sampling of primary data.
5. Use the updated specification to calculate the side panel outcomes under standard NLEA processes.
6. Use the Certificate of Analysis process to confirm ongoing adherence to quality parameters for each lot are within 80% compliance as required by USDA.
7. After consulting regulatory experts, call out on pack or direct consumers to your website to learn more about why your RA practices have enhanced nutritional outcomes.

13. Recommended Quality & Regulatory Questions and Planning Steps

Review what is already in place for standard supply activities in distinguishing one variety of wheat from another; the difference between a roasted almond versus one that is pasteurized using steam sterilization; or the difference between a standard soy component and a Non-GMO Project Verified soy component. Each of these examples follows standard industry processes for segregating and delineating the unique nature of these materials. This approach can also be applied to regeneratively grown ingredients where differentiation and a desire for segregation exists.

Industry Adoption and Standardization Over Time

Short Term	Medium Term	Long Term
• Nutrition Facts Panel direct testing through existing processes of specifications and Certificates of Analysis • Data established across multiple categories with third party RA practice validation	• Aggregated information is established across multiple brands and outcomes • In-market claims pressure test consumer, retailer and regulator interest • Additional thought leaders (dietitians, regulators, legal) provide refined metrics	• The industry aligns to best practices based on stakeholder alignment • Rule making at the USDA/FDA level is undertaken as it relates to meaningful differences across ingredient and nutrient types

14. Example Innovation Project Checklist

An example Project Checklist to engage cross-department decision makers in a specific ingredient or product launch is included on page 26. For large companies, the standard processes can be used. For small companies, these examples may help in understanding what steps should be taken on segregated volume.

Implementing Nutrient Density Outcomes Project Checklist		Procurement	Ingredient Supplier	Quality	Operations	R&D	Food Tech.	Marketing/Sales
1. Confirm Availability of Minimum Required Volumes	Determine if there is enough volume of the identified ingredient in the regenerative agriculture program to meet demand for one SKU launch, product renovation, or other opportunity for a recipe update.	☑	☑					
2. Test Nutritional Impact	Design a representative sampling plan to lab test the relevant ingredient using your standard lab and testing protocols (additional resources on next page) to determine if the regeneratively-grown ingredient has the desired nutritional result.		☑	☑				
3 Confirm Significance of Nutritional Impact	If the lab tests prove positive outcomes that are statistically relevant, confirm the difference in nutrition to create positive outcomes of comparison. We strongly suggest comparing any outcomes versus USDA Nutrient Profile System FoodData Central.		☑				☑	
4. Verify Downstream Impacts	Determine whether the affected nutritional attributes impart any meaningful effect on product handling, storage, processing and/or shelf life.				☑	☑	☑	
5. Verify Customer Acceptance	Consult with customer marketing or your key retailer customers to ensure you are meeting their guidelines for on-pack regenerative claims							☑
6. Confirm Supplier Can Segregate Ingredient	Confirm the ingredient can be segregated throughout the supply web utilizing a separate ingredient specification number, storage, and processing to ensure the nutritional difference within the SKU.	☑	☑					
7. Confirm Operations Can Segregate Ingredient	Confirm internal production facility(ies) can segregate the regenerative ingredient(s) from other ingredients.				☑			
8. Obtain Product Margin Approval	Ensure the margin of the segregated products meets with your project target and pricing needs.							☑
9. Make Go/No-Go Decision	Decide if the organization wants to proceed with the new SKU or not.	☑	☑	☑	☑	☑	☑	☑
10. Update Specification, COA, NLEA Panel	If the ingredient can be segregated, update the specification for regenerative ingredient(s) specific to the SKU. Utilize existing guidance on acceptable margins of error for the ingredient specification, Certificate of Analysis, and NLEA verification process.		☑	☑				
11. Define Marketing Objectives	Decide whether to use this launch as a way to kick-start conversations or further relationships with key retailer partners. Develop a strategy that helps engage the rest of your internal stakeholders as supporters of your project.							☑
12. Craft Marketing Messaging	Identify key messages and modes of outreach. Develop an action plan for how to engage consumers on the meaningful difference around Taste, Healthy, Quality, and Nutrition as fits with your existing brand voice.							☑
13. Perform Consumer Testing	Consider whether consumer-specific testing should be done on key messages, brand repositioning, etc. as part of your normal process.							☑

15. Critical Resources to Support Companies' Learning Journey

Non-Exhaustive

FDA Guidance for:

- Front of Pack Claims
- Health Claims
- Nutrient Content Claims
- Nutrient Content Claims for "good source," "high," "more," and "high potency"
- Guide for Developing and Using Data Bases for Nutrition Labeling
- NLEA Requirements

Representative Sampling Protocol Guidance

- USDA Grain Inspection Handbook, Sampling Protocols
- FDA Food Sampling/Preparation of Sample Homogenate
- FDA Investigations Operations Manual 2023: Sampling

UDSA Nutrient Database Materials

- FoodData Central
- Related Resources
- Dietary Supplement Ingredient Database
- USDA Table of Nutrient Retention Factors

General Materials

- Which foods fall under USDA vs. FDA oversight for labeling? Read more from Eurofins.
- FTC Green Guides on Truth In Advertising relates to federal oversight of any environmentally friendly claims.
- USDA Website on Food Specifications

If the company intends to message on a product about containing "more" of a nutritional attribute, be sure to consult the regulatory guidance located here. For all other messaging, best practice is to ensure compliance to the appropriate and specific regulatory guidance that matches the unique company or product situation.

As standard practice, consult with a compliance expert in USDA and FDA regulations about any intended claims about RA ingredient nutrition outcomes. See page 30 for a list of laboratories that provide services in nutrition and regulatory compliance.

16. Third-Party Regenerative Certifications

Regenerative Certifications are an important component of 3rd party verification for any RA messaging and field practice validation, but do not yet include nutrition testing outcomes. While there are several certifications within the RA space, focusing on which is most appropriate for the company/brand portfolio type (animal, organic, multi-crop) and consumer target is critically important.

See comparative lists of RA Certifications at:
Kiss the Ground
Climate Collaborative

If assistance is needed in determining which certifying body (if any) is the best fit for a product portfolio, please contact the Nutrient Density Alliance at info@NutrientDensityAlliance.org.

Some retailers require 3rd party validation for any on-pack regenerative claims and will typically have a list of acceptable certifications. Talk with key retailers about certifications required for any Regenerative Agriculture claims.

Animal+ Focused	Ag System Agnostic	Foundationally Organic
Verified Land to Market	Soil & Climate Health Initiative Verified	USDA Organic
Certified Regenerative by AGW	Certified Regenified	Regenerative Organic Certified
	Foodchain ID Regenerative Certified	Demeter Certified Biodynamic

17. Laboratory Guidance and Accreditation

The Nutrient Density Alliance has compiled a small, but growing, list of laboratory principles. Ideally, an ISO/IEC 17025 accredited laboratory should be the facility baseline used to provide any nutrition testing specific to RA outcomes. It is likely that the existing laboratory a company uses has a 3rd party ISO accreditation but double-checking this step can ensure more standardized results which can hold up in further and future comparisons made across the industry.

Why ISO/IEC 17025 Accreditation? See more at ISO Standards.

- Requires the traceability of all supplies or inventory items from purchase to usage.
- Labs must demonstrate that appropriate tests were performed, testing was conducted on properly maintained and calibrated equipment by qualified personnel, and with appropriate quality control checks.
- Requires all food testing laboratories to have a documented sampling plan for the preparation of test portions prior to analysis.

Allows for better 'apples to apples' comparisons when looking at the nutritional outcome data from a comprehensive systems view.

- Facilitates cooperation between laboratories and other stakeholders by generating wider acceptance of results between countries. Test reports and certificates can be accepted from one country to another without the need for further testing, which, in turn, improves international trade.

Examples of ISO/IEC 17025:2017 Compliance Requirements include:

- Maintaining a Chain of Custody
- Tracking Laboratory Supplies
- Managing Training & Competency
- Calibrating & Maintaining Equipment
- Evaluating Measurement Uncertainty
- Validating Test Materials & Results
- Maintaining Data Integrity
- Documenting a Sampling Plan
- Controlling Documents
- Documenting Non-Conforming Work

Laboratory Considerations

The list below is non-exhaustive and is based on publicly available information provided by each laboratory, including their ISO/IEC 17025 Accreditation. Chosen laboratories are those which are already heavily relied upon within the CPG industry for specification, Certificate of Analysis, and side-panel authentication of on-pack messaging/claims and nutritional quantification.

It is strongly recommended that any specific messaging around nutritional outcomes are reviewed by experts from a laboratory with NLEA and regulatory experience.

ISO/IEC 17025 Accreditation is recommended as a baseline quality measure for any nutrient density testing to allow for 'apples to apples' comparison on testing methodologies across supply web steps like ingredient suppliers, production facilities, and Nutrition Facts Panel calculations.

If the company's existing laboratory provider offers nutrition testing and is ISO accredited, talk with them about performing nutrition tests in support of the potential to segregate supply and add on-pack messaging related to nutrient density and RA.

Potential Laboratories (in alphabetical order):

- Beaconpoint Labs - Nutrition Advantage Analysis
- Columbia Laboratories – Nutrition testing here
- EMSL Laboratories – Food Testing here
- Eurofins Laboratories – Nutrition Analysis Testing here
- Health Research Institute (HRI) Laboratories
- IEH Laboratories & Consulting Group
- Medallion Laboratories – NLEA Nutritional label here

This list is not exhaustive. Let us know if an additional ISO/IEC 17025 Accredited laboratory should be listed here. The Nutrient Density Alliance will regularly provide updates to this list at our website.

Nutrient Density Alliance

18. FAQs

How can a company determine whether an ingredient has a positive nutrition outcome from its Regenerative Agriculture program?

It is recommended to pull random samples from a segregated regenerative supply and conduct supplemental nutritional testing that matches the specification and certificate of analysis requirements for that ingredient in conventional systems. If it is determined that there is a measurable difference from the standard specification, then the next step is to decide whether representative testing throughout the segregated supply would drive a meaningful and relevant impact for Nutrition Facts Panel calculations. Check the Representative Sampling Protocol Guidance on page 24, and use the checklist on page 26 to help determine further steps.

Why is segregation of Regenerative Ingredients recommended to enable messaging around better nutrition outcomes on a product?

Messaging on pack comes with regulatory guardrails, especially when statements are made about the nutritional content of a food. As this area includes oversight from the FDA, USDA, and FTC it is important to ensure that any messaging is based on specific outcomes for which the company has measured. Not generalities. Sharing peer reviewed research on a company website, or that a company is pursuing further research on nutrient density is different from making statements about the actual nutritional content of its products. Segregation of materials is what opens the door to companies messaging on specific outcomes, or integrating (through standard processes) outcomes on the Nutrition Facts Panel.

What tests should be conducted?

In short: what can be measured for a Nutrition Facts Panel, the same as today, on segregated regenerative ingredients. ***The recommendation is to focus on what is most meaningful for the company consumer target and their purchase intentions with the brand and where the consumer has already been taught to view a benefit (or place a purchase value) on that nutritional outcome.*** Enlist help from an ISO/IEC 17025 accredited laboratory as a testing partner to help determine how these outcomes can impact a Nutrition Facts Panel or messaging potential. A list of ISO accredited laboratories has been included within this report for convenience.

What type of laboratory should be used?

The recommendation is to use an ISO/IEC 17025 Accredited laboratory so that the processes are uniformly applied, and the lab understands USDA and FDA requirements for on-pack labelling, specification confirmation, and regulatory requirements for messaging and claims. See more details on page 31.

What about crop variability?

Wherever possible a multi-year review of nutritional variability within regenerative supply should be undertaken, ***as ingredient variability already exists within the current food system*** and is constantly being managed with existing ingredients, so standard processes should be applied. Discussing volume guarantees or required nutritional ranges with the supplier of third-party validated regenerative ingredients is key. If critical specification targets cannot be met year-to-year the brand will risk having costly reprints of their packaging or risk being out of compliance with regulations.

What is third party validated Regenerative Agriculture?

Ideally, an outside party should be providing the field level measurements for soil health outcomes as the most basic role of any RA program, as well as segregation of the ingredient volume from those fields to enable product messaging and calculations. This service can be provided by agronomy consultants, by measurement, reporting and verification (MRV) consultants, or by certifying agencies. See page 29 for a list of RA certifiers to help with company decision making.

A company's initial tests have positive nutrition outcomes. What should these outcomes be compared against, nutritionally speaking?

Two suggested modes of action: (1) compare regenerative outcomes to existing or past non-regenerative nutrition for the same product, and (2) compare nutritional outcomes to the USDA standard nutrition database outcomes. Work with a laboratory or regulatory consultant to determine any appropriate messaging related to meaningful nutrition comparisons.

How to Reach Us:

Reach out to info@NutrientDensityAlliance.org for more information.

View our website at NutrientDensityAlliance.org for updated consumer research, economic data on regenerative transitions, and the latest industry and scientific studies.

19. Term or Acronym Definition

CPG
Consumer Packaged Goods companies

FDA
Food and Drug Administration of the United States

FSMA
The Food Safety Modernization Act

FTC
Federal Trade Commission of the United States

GFSI
Global Food Safety Initiative

Hero Ingredient
An ingredient that is pivotal to the identity of the product, its nutrition, drives meaningful purchase intention from consumers, etc.

ISO/IEC
17025 International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), 17025: Enables standardized testing and calibration for laboratories.

MRV
Measurement, Reporting, and Verification, typically used in relation to compliance for greenhouse gas (GHG) emissions measurement and reporting.

NDA
Nutrient Density Alliance

NGO
Non-Governmental Organizations

NLEA
Nutrition Labeling and Education Act of the United States

RA
Regenerative Agriculture

SKU
Stock Keeping Units – the barcode and identification number on CPG packages that allows it to be traced through distribution systems.

Top-line growth
A company's revenues and gross sales (the balance to bottom line costs within a business).

UN FAO
United Nations Food and Agriculture Organization

USDA
United States Department of Agriculture

20. Endnotes

An Introduction to the Nutrient Density Alliance and the Opportunity of Regenerative Agriculture

1 https://www.fairr.org/resources/reports/regenerative-agriculture-four-labours
2 https://www.isric.org/utilise/global-issues/climate-change
3 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5800787/#:~:text=Soil%20is%20an%20important%20source,cause%20negative%20effects%20on%20health
4 https://pubmed.ncbi.nlm.nih.gov/37014671/
5 https://www.hartman-group.com/newsletters/680349105/7-key-needs-driving-gen-zs-food-choices?utmsource=ActiveCampaign&utm_medium=email&utm_content=7+needs+driving+Gen+Z+s+food+choices&utm_campaign=7+key+needs+driving+Gen+Z+s+food+choices%E2%80%AF
6 https://www.fao.org/3/cc0900en/cc0900en.pdf
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8 https://www.frontiersin.org/articles/10.3389/fsufs.2021.699147/full
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10 https://globalwellnessinstitute.org/press-room/statistics-and-facts/#:~:text=The%20global%20wellness%20economy%20was,than%20its%20size%20in%202019
11 https://missouriindependent.com/2022/07/15/as-aging-farmers-retire-lawmakers-explore-how-to-boost-beginning-producers/
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The Science Linking Soil Health to Human Nutrition

19 https://www.un.org/en/un-chronicle/soils-where-food-begins#:~:text=The%20chronic%20lack%20of%20micronutrients,for%20fertilizers%20in%20plant%20production
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23 https://www3.weforum.org/docs/WEF_Achieving_Societal_Resilience_The_Nutrition_Opportunity_2022.pdf
24 https://www.bmj.com/content/369/bmj.m2482

The Regenerative Agriculture Movement is Accelerating Rapidly

25 https://howgood.com/regenerative-industry-landscape/
26 https://www.fairr.org/resources/reports/regenerative-agriculture-four-labours


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