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WHAT AN EQUITABLE FOOD INDUSTRY LOOKS LIKE & HOW ALTERNATIVE PROTEIN CAN GET US THERE

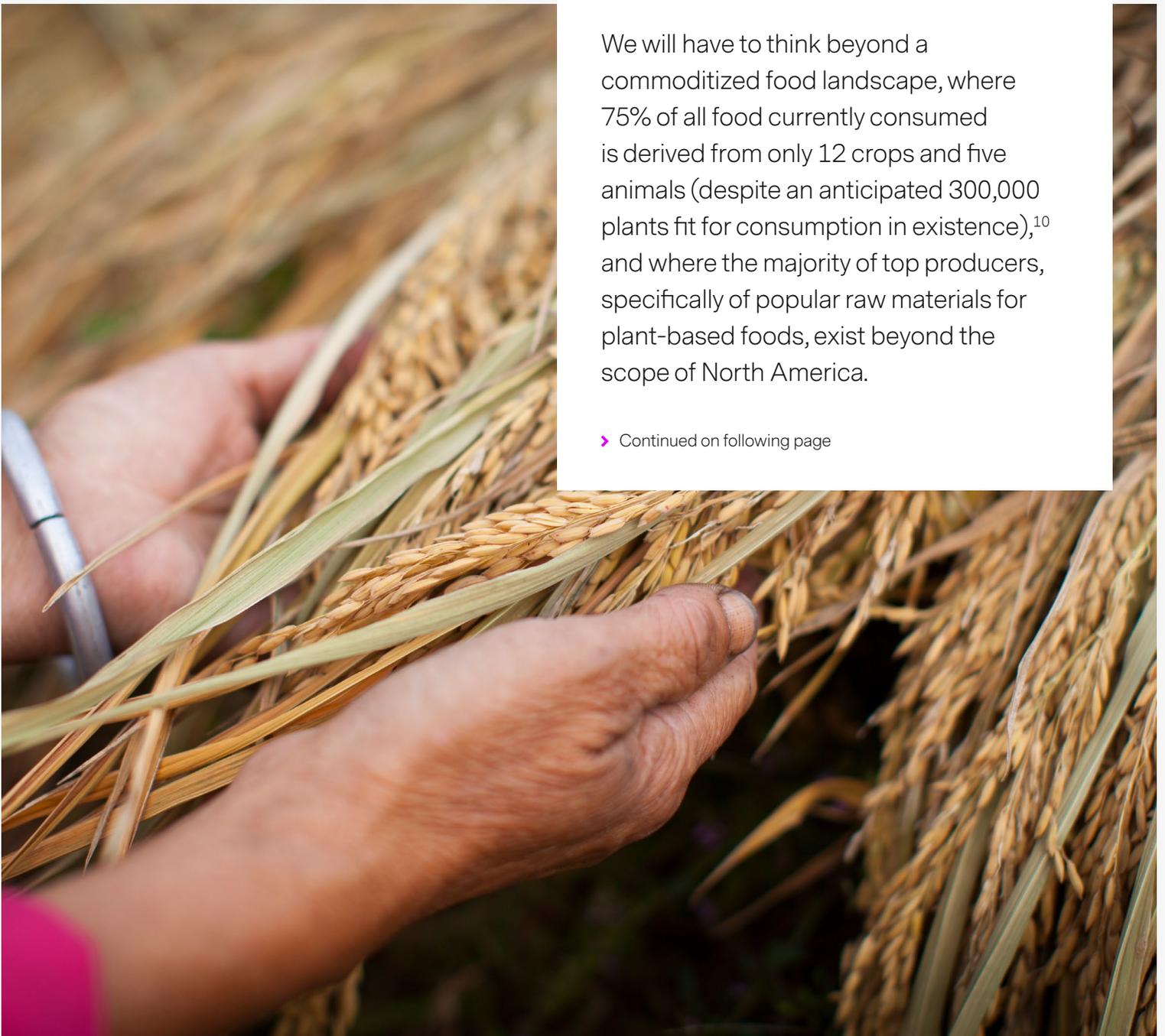
MJ Kinney, Plant-Based Protein Expert, XPRIZE

EXECUTIVE SUMMARY

The transition from legacy to alternative protein presents a series of obstacles that will require an entire industry to think beyond the comforts afforded thus far in our careers.

We will have to think beyond a commoditized food landscape, where 75% of all food currently consumed is derived from only 12 crops and five animals (despite an anticipated 300,000 plants fit for consumption in existence),¹⁰ and where the majority of top producers, specifically of popular raw materials for plant-based foods, exist beyond the scope of North America.

▶ Continued on following page



We have to question what we claim to know as we tap into a category consumers never knew they wanted just less than 7 years ago (that today accounts for \$878 million – and growing – in annual sales).¹⁸ Further, we have to prioritize the facts we've long ignored, such as the known fact women are not only the nutritional gatekeepers of a household, but account for the majority of food purchases (93 percent of all food purchases in US households, specifically). Despite this staggering and often-repeated knowledge, women and people of color are underrepresented in the food industry's corporate pipeline across all subsectors (manufacturers, distributors, and operators).⁷

From a scientific, economic, and social perspective, diversity is in high order during what is a dramatic and wide-reaching change in the way something works and is organized (also known as a revolution). This white paper will touch upon how a global conversation on COVID-19, social justice, and equality, has prioritized

a conscionable supply chain, and how decisions that bring us closer to direct insights with consumers requires we don't stop at a quota when it comes to diversity. Importantly, despite these challenges ahead, perhaps now more than ever, we have been given the best chance to create an equitable system of doing business in food.



THE PRESENT DAY

The transition from legacy to alternative protein has a series of obstacles requiring food scientists to think beyond the comforts afforded us thus far in our careers – that of a commoditized food landscape: complete with standardized specifications, standards of identity, ingredients with desired characteristics at their inherent level, and a line-up of suppliers offering the same thing but at a different level of accommodation (typically one in favor of earning your business).

The non-commodity, alternative protein landscape is a near 180-degree difference. The raw materials of the trendiest plant proteins may be traded on public markets (and in that way a commodity), but the finished ingredient varies widely by supplier – each having a specification differing from their competitor. Desired characteristics (largely referred to as “functionality”) vary not only by the foundational raw material, but the myriad of ways it can be processed. The line-up of suppliers are few and they don’t offer the same thing – at best (for reliability purposes), they provide the same few ingredients sourced from a small pool of manufacturers (just now branded under their company name). Accommodation is now in their favor.

While products at the CPG level can be innovative, it has always required innovation of the ingredient at the B2B level to get there. Over time, that innovation becomes so pinnacle to the success of the customer, it is commonly demanded, produced, and purchased to the beat of a commodity. All of this makes sense. In the lead time of scientists figuring out which parts are responsible for

their desired end-results (the inherent characteristics of the raw material used, the processes utilized to yield a finished ingredient, and the genetic material responsible and revisable to yield reliable, optimal crops), manufacturers guess at the functionality sought by food scientists, the ever-growing demands by consumers that shape a marketing narrative (and thereby, the buying decisions of a Product Manager), and the parameters that make it feasible by operations to adopt.

In other words, B2B manufacturers are also start-ups. They take big risks, find a first customer and build to a small list of key customers, and in the process, their ingredient’s demand may surge beyond what they’re capable of producing. And so, by the time many food scientists are tasked with the work to build an “innovative” product, it has already become a trend. At that point, the only people with reliable access are the ones who got there before it was popular, at least (generally-speaking) until an influx of investment supports that manufacturer’s growth.

THE TRANSITION

Though transitioning from a commodity food landscape comes with so long a list of challenges that it seems unfair, the potential of an equitable food industry has never been brighter than now. The reason: What I've described above is defined as a revolution. We are in the midst of a dramatic and wide-reaching change in the way something works and is organized. Further, people's ideas about it (food, specifically alternative proteins) have also changed.

Though consumers may resonate with a plant-based meat product's attributes – such as taste, freshness, and familiarity, there are perceived long-term, societal benefits that accompany some consumer purchases. These benefits are likely to appeal to Gen Z and

Millennials more than any demographic group, and include altruistic motivations such as improved health and nutrition, environmental sustainability, and animal welfare as purchasing drivers.¹⁹



FOR ANY PERSON PURCHASING ANY PRODUCT, IT HAS ALWAYS BEEN A CASTED VOTE IN FAVOR OF WHAT THAT PURCHASE REPRESENTS.



Only in recent years has the power of that vote been conscious to consumers – who may prioritize organic because they don't support GMO or conventional practices, search for a source of origin that brings economic value to their region, or look for a Vegan certification to ensure they won't support the environmental destruction and mistreatment of animals that accompanies their mass manufacture.

The layers of expected parameters (demanded by consumers) as standard may mean more paperwork in the short-term, but from here on out, it will ask of those involved to know their work better – understanding how their role interconnects with others, and its influence on the overall big picture.

It will question how much we think we know to be true, versus what has been taught to us and accepted without proper curiosity. The revolution of alternative proteins is asking its industry stakeholders to stand up to a series of challenges that may redefine nutrition, finally acknowledge the direct impacts of the foods we create on human and environmental health, and uphold integrity to a level that doesn't rely on regulatory loopholes, but meets the consumer's safely-assumed expectation. This dramatic and wide-reaching change is essentially giving us the opportunity to reinvent the system of doing business.

THE OPPORTUNITIES

- COVID-19 Yields a Conscionable Supply Chain
- Support Social Justice, Support Equality
- Diversity as a Culture, Not a Quota
- Democratized Costs

COVID-19 YIELDS A CONSCIONABLE SUPPLY CHAIN

A small island city-state 128 kilometers from the equator, Singapore hosts a tropical climate with uniformly high temperatures and humidity year-round. There is no distinct wet or dry season. Combined with its limited quantity of arable land, it is not an advantageous location to grow plant crops. And so, it has come to be that an alarming 90 percent of the food consumed in Singapore is imported.^{9,13}



Image provided by Robert Vaughn | nuwestusa.com

OPTIMAL SUPPLY CHAINS HAVE ALWAYS BEEN KNOWN TO POSITION THE SOURCE OF THE RAW MATERIALS, ITS PROCESSING FACILITIES, OR THE MARKET DESTINATION AS CLOSE AS POSSIBLE TO THE PLACE OF ORIGIN.



The logical distribution costs would generally make any other scenario prohibitive.²⁰ However, that is only when not accounting for the bottlenecks of a growing industry – that just a few years ago, was niche to inexistent.

About 1.8 M tons of peas were exported from Canada to China in 2018 and 2019, roughly 57% of Canada's total pea exports (roughly 8% was exported to the United States).⁹ How does this happen? (1) A high demand for pea starch by China, and (2) a high demand for pea protein by North America is combined with (3) limited processing infrastructure across regions, which thereby creates a mind-boggling system where roughly 23,000 miles (between Vancouver and Hong Kong ports)¹² of transport is somehow economically feasible.

Though it is hard to acknowledge the silver linings while still in crisis, COVID-19 has fortunately emphasized the importance of local food production, resulting in proactive government measures to de-risk regional reliance on imports for at least food security purposes.

Such measures will require creativity that positions a region's inherent abilities with an existing market demand, or one not yet provided. With 75 percent of all food currently consumed being derived from only 12 crops and five animals, the diversity of our food's raw materials will pave a way to that needed level of creativity (there are over 300,000 plants fit for consumption).¹⁰ When combined with regional self-sufficiency, it can encourage something we all want for ourselves: the ability to lean into what it is we do best.

For cities like Singapore, self-sufficiency may not be reliant on traditional plant crops grown from the earth, but on innovative fungi- and bacteria-derived ingredients yielded from fermentation. For countries like the US, self-sufficiency may prioritize an operational and processing landscape competitive with China, thereby allocating China's pea and pulse protein supply to alternative protein food products demanded by their region's consumers. The hope is that the restrictions on imports and exports between regions will prioritize and support locally-sourced food over short-term costs, enact greater self-sufficiency, and in the long-term, reduce costs and reap huge rewards for domestic producers.²⁰

SUPPORT SOCIAL JUSTICE, SUPPORT EQUALITY

Wikipedia will tell you Michael Parenti is an American political scientist and cultural critic. I stumbled across him thanks to algorithms that be on Youtube. I see him as a human with an informed perspective, clear understanding, and ability to communicate effectively.

His words: “Most countries are rich; only the people are poor,” acknowledge the billions to be made (that have been made) from natural resources which have historically been taken – be it indigenous crops, materials, or people. What was once in the horrific capacity of slavery, is today a blind eye toward cheap labor. Regardless of this reality, notions (still largely in effect today) refer to some countries as underdeveloped (or worse, third world), though they are in actuality, the inevitable conclusion of systemic exploitation.²¹

Region-dependent crops make sense, and for those regions reliant on imports for their food security, the practicality of greater self-sufficiency is being increasingly prioritized. However, there will always be demand for products that are not native to the place we reside, especially when that product is a keystone

to the product’s identity. For the case of plant-based meat, jackfruit’s naturally chewy, fibrous, meat-like consistency makes it highly desirable in mimicking shredded pork (among other meats). Coconut oil is a highly saturated fat, comparable to the essential taste and texture derived from the saturated fat of animals. Cashews are the staple of dairy alternatives due to their white color, desirable taste, and mouthfeel – like jackfruit, they also serve a clean label and whole food narrative for alternative milk, cheese, yogurt, and any other application derived traditionally from cows. These staples to the alternative protein category are readily sourced from humid, tropical and near-tropical climates in regions such as India, Bangladesh, Vietnam, the Philippines, Indonesia, Mexico, Brazil, and both East and West Africa.

THESE COUNTRIES ARE NOT UNDERDEVELOPED, THEY ARE OVEREXPLOITED.²¹

Michael Parenti

A PORTION OF THE PROCEEDS SHOULD BE GOING BACK TO THAT COMMUNITY IN A NATURE THAT EITHER SEEKS TO UPLIFT OR PRESERVE IT, OR BOTH.¹⁵

Amanda Seales



All of these regions are a top producer for at least one of the three mentioned keystone crops, however, none of them have a reputation for economic nor social leadership; many would be called “underdeveloped.” In the process of food brands creating innovative, alternative protein products, they will inevitably come across an invalidated supply chain for their ingredients. Parties with the greatest leverage will race to provide a solution and at the lowest cost possible, often at an extent that is willing to compromise on a farmer’s free-will at the cost of a contract, guaranteed business, and the whims of their say-so. It is my hope that in the state of a revolution that will change how we eat, treat animals, and conduct business, a history of unrestrained capitalism can be met with the gains we have made in social justice, and that these advancements will be upheld to protect against wielded leverage.

In the same vein as social justice via supply chain, I would be remiss to not mention the role of cultural appropriation and cultural reference. As explained in her book, *Small Doses: Potent Truths for Everyday Use*, Amanda Seales explains: “Cultural appropriation is the borrowing of aspects of a culture by those who are not of said culture, who have no connectivity to said culture, and who pay no respect to said culture, for the purpose of vanity or commercial gain.” She shares the historical fact it is “committed most often by white people who have forcefully taken or simply eradicated indigenous cultures in pursuit of dominance.”¹⁵

An ethical solution toward an inevitable demand for the ingredients native to regions other than our own, begins with cultural reference (though it certainly won’t absolve one from acts of cultural appropriation). “Cultural reference is when sufficient homage, acknowledgment, and in some cases, payment, are given for the use of aspects of a culture outside of one’s own.” It requires one to specifically reference the source, have researched insight into its meaning or use, and if profit is to be made from “aspects of a culture not your own, a portion of the proceeds should be going back to that community in a nature that either seeks to uplift or preserve it, or both.”¹⁵ While Seales uses the fashion industry as an example for indigenously-derived prints and textiles, the food industry is a long-standing offender – be it flavor profiles, spices, or full-on recipes of traditional cuisine other than our own... sources of origin that give credit to the manufacturing facility or brand, but not the provider of the raw materials... or procuring a raw material so irresponsibly, that it results in deforestation, polluted waterways, or a myriad of environmental harms that undeniably hurt the people of that region (more than it ever will the distant and privileged consumer).



DIVERSITY AS A CULTURE, NOT A QUOTA

As said by author Liz Plank in her book *For the Love of Men*, “Work has historically been a central characteristic of the female and male experience.” To her point: “Women have always worked. But the difference is that now women actually get paid for it.”¹¹

While this is true for some parts of the world, it is not true for all regions – and consequentially, has become a contributor to at least the global hunger crisis.

According to FAO estimates, women produce more than 50 percent of the food grown worldwide. However, the FAO goes on to acknowledge “there is still insufficient gender disaggregated data to give exact figures on women’s contributions to agricultural production everywhere in the world.” Since the contributions of data begins with surveys and consensus which count only paid labor, it is believed that women’s contributions are underestimated. Despite the importance of women’s roles in food security – being active in both the cash and

subsistence agricultural sectors, combined with much of their work in producing food for the household and community consumption – this additional work is not accounted for statistically-speaking.²

Women need to be paid in order for their contributions to be accounted for. Being paid is not the same as being paid fairly, nor is it the case that if we could have both these obvious solutions met that women would be afforded the same opportunities. Further exhausting the issue is the unequal ability to access productive resources such as land title, credit, information, training, fertilizer and farm equipment – which are at a disadvantage to women farmers in the rural economy.¹⁴





According to a 2018 Root Capital report, if women had equal access to these productive resources, it is expected they could increase their farming yields by 20 to 30 percent. Based on this estimate, this would raise total agricultural output in developing (arguably, systemically exploited) countries by 2.5 to four percent, and reduce the number of hungry people in the world by 12 to 17 percent.¹⁴ These issues are just the beginning of the supply chain that delivers the food we consume. What about everything in-between the farmed raw materials and the grocery store shelves?

Fortunately, efforts to support equality are becoming more prevalent and vocalized in recent times. It has asked us to show up in terms of our energy and time, through protest and volunteering, listening, self-education, difficult conversations, the spreading of awareness, and donating money.⁵ Of the hopes is that those who have benefited from white privilege can acknowledge it and make the necessary adjustments to not take space away from those who don't. A history of avoiding this introspective conversation with our self has resulted in the lack of acknowledging the insidious and uncomfortable reality of the advantages we never earned on merit alone, but were simply ours for the taking because of [insert gender, race, and any other social construct that benefits from the realm of the heterosexual white male]. Without this acknowledgment, the long-sought solution for true diversity remains lacking; at best, we often get "inclusion."¹⁶

Women may make up almost half the entry-level workforce in the food industry, but they are underrepresented across the board above this level. It is not an example of diversity when less than a fourth of the food industry C-suite are women, and far fewer being women of color.⁷ This is an example of diversity as performance, or what Seales may call "inclusion," where a company's decision-makers can feel good about welcoming someone other than another white male to the conversation.

The irony is defeating considering the long-standing contradiction between the leaders of the food industry and those who actually make the purchasing decisions. As it pertains to the alternative protein space, there are now thousands of companies benefiting from the plant-based protein trend. Plant-based meat alternatives alone increased by 19.2% last year and account for \$878 million in annual sales.¹⁸ We know the innovation and growth in this sector has largely been a response to consumers who identify with a flexitarian lifestyle (where a vegetarian diet is the foundation, and traditional meat and poultry are occasionally consumed). And though women are about twice as more likely to be flexitarian than men, as well as twice as likely to have reduced their meat consumption (regardless of the diet they adhere to),¹⁸ they are significantly underrepresented in food industry leadership roles.⁷ If the foundation of any business relies upon the rule of knowing one's customer, the foundation of the food industry (and the future of plant-based) requires knowing women.



Further, a rising number of households (33%) have at least one member voluntarily following a vegan, vegetarian, pescatarian or flexitarian diet – a trend which is higher for Gen Z and Millennial households. Among Gen Z, 13% eat a flexitarian diet (currently, individuals between the ages of 8 to 23).¹⁸ Acknowledging that the majority of emotional labor is still the responsibility of women in the household,⁴ the increase in alternative protein demand by Gen Z requires the same, familiar gatekeeper that accounts for 93 percent of all food purchases in US households: WOMEN.⁷ Women not only buy for themselves, they also buy for members of their household.

Elaborating further on the contradiction between leaders of the food industry and those who make the purchasing decisions, nonwhite individuals report having reduced meat in their diets at a higher rate than white individuals. When asked if they had been eating more meat, less meat, or about the same amount (in the past year), 31% of nonwhite adults replied “less,” compared with 19% of white adults.⁶ With plant-based shoppers spending +61% more than the average shopper,¹ it is a failure on behalf of companies leading this area to not do more in diversifying their predominant white male ranks with women and people of color... it is also, quite simply, unjust.

MANY PEOPLE ARE SO ACCUSTOMED TO THE RIGID ROLES OF REPRESENTATION THAT THEY'VE SEEN FOR SO LONG THAT SIMPLY MEETING THE TERMS OF INCLUSION OF ANY 'OTHERS' FEELS LIKE AN ARDUOUS STRETCH OF COMFORT THAT LOOKS LIKE DIVERSITY.¹⁶

Amanda Seales

DEMOCRATIZED COSTS

The economics of animal agriculture create problems that affect everyone. In the past nearly three decades (a period spanning 1980 - 2008), inflation adjusted prices of ground beef and cheddar cheese fell by 53 and 27 percent, respectively.

During about the same span of time, fruits and vegetables rose 46 and 41 percent, respectively. The artificially low prices (that allow a single dollar to buy three times the ground beef compared to vegetables it once did), hurt rather than help consumers. In fact, the costs of animal food production affect even non-consumers alike, despite their choice to abide by a flexitarian, vegetarian, or vegan lifestyle.¹⁷

Externalized costs are those expenses related to producing or consuming a good but are not reflected in that good's price. Instead, the cost is passed on to third parties. True, some percentage of cost reductions

in animal food production is the result of economies of scale that accompany consolidation and increased output volumes. Vastly more efficient animal agriculture practices favoring (1) high-density, hyper-confinement methods over traditional wide-open spaces, (2) automated processes over more intensive and time-consuming manual labor, as well as (3) strategic breeding to yield larger animals that reach their desired weight sooner, have aided in the short-term affordability by consumers. However, these efficiencies do not account for the entirety of the price reduction that allows a consumer to purchase a double cheeseburger at nearly the same cost today as it did in 1991.¹⁷



THE RACE TO THE TOP MAKES MORE SENSE; IT IS FOCUSED ON DESIGN AND RESPECT AND DIGNITY AND GUTS AND INNOVATION AND SUSTAINABILITY AND YES, GENEROSITY WHEN IT MIGHT BE EASIER TO BE SELFISH.³

Seth Godin



What is an immediate cost savings to many consumers, is simply a deferred cost everyone will pay in other ways. Although these costs can be quantifiable in terms of dollars to remedy destructive animal agriculture practices, they exist more immediately as a burden on our health though the impacts on our waterways, the effects of antibiotic-resistance, the prevalence of disease, and an altered quality of life for communities local to sites that raise animals. While an indisputably controversial calculation (that ranges from the low-end by free market advocates, to the high-end by market regulators), animal foods have been valued to generate \$1.70 in external costs per \$1 in retail sales. This would yield a true cost of \$13 for a \$5 carton of organic eggs, and \$27 for a \$10 steak.¹⁷ How then, would plant-based meat products begin to compete on price?

Stakeholders of plant-based (and the alternative protein ingredients to come) also rely on economies of scale to reach lower prices – but efficiencies that translate to greater output volumes will only get the industry so far. In the interim, many plant-based meat products are affordable only to those willing to pay a premium – not the many who survive by stretching the value of a dollar. The principle of removing animals (essentially, the “middle man”) from the equation seems a promising strategy toward price parity between legacy animal products and those derived from alternative proteins. After all, the plants no longer are grown to feed the animals that then feed us. Instead, the plants are grown to then feed us.

However, the noble goal of democratized pricing is positioned to be an unfair race – as are all races with an ever-moving finish line. It’s not enough to create a great-tasting product derived from non-animal components, or one that delivers approximately the same nutritional value. Nor is it enough if you come below the true cost of any animal product in existence today – you likely will not get below the artificially low true cost that a history of special interest politics has made possible.

The current system in place is a race to the bottom. Arguments will continue to be made by big corporations for the lowest possible tax rate, loosened environmental regulations, and the elimination of employee protections (among a long list of other measures that reflect little to any accountability). But as stated by the brilliant Seth Godin: “The race to the top makes more sense; it is focused on design and respect and dignity and guts and innovation and sustainability and yes, generosity when it might be easier to be selfish. It’s also risky, filled with difficult technical and emotional hurdles, and requires patience and effort and insight. The race to the top is the long-term path with the desirable outcome.”³ In that way, equity may not be achieved as immediately as price parity between legacy and alternative proteins, but, in a global population of increasing wealth, equity (as a standard for the producers), may be the premium consumers are willing to pay that makes all the difference.

CONCLUSION

The transition to a food system that offers alternative meat requires everyone to think beyond the norms we have known. Innovation disrupts what has been established, and beyond just the scope of new ideas, methods, and products. The revolution we are in the midst of has given every one of us the opportunity to course-correct and set the tone for how food business ought to be done. It will demand we think hard, creatively, and strategically on things that often will be absent of a roadmap.

For instance, if the future of a more equitable food system includes procuring a raw material responsibly (forgoing deforestation, polluted waterways, or a myriad of environmental harms that undeniably hurt the people of that region), how will you communicate this to the consumer in a way that matters? Further, will it justify the increased price point result of the expense of doing work outside the fray of business-as-usual? How does one quantify and validate the new criteria consumers value (to preventatively solve issues)? Or, is response only warranted when there's disaster (headlines of deforestation, wildfires, and contaminated water)?

As an industry, we must think beyond the obstacles and beyond our comforts, prioritize long-ignored facts, and do our part in creating an equitable food system. For procurement, it may be the due diligence to know the quality of life or business arrangements for the people who farm, harvest, and process their core raw materials.

For food scientists, it comes with the territory of questioning what is possible, and trying ingredients and processes that don't fit conveniently with the way your systems currently work.

For marketing, it may be the integrity to carry through on the expectations a brand delivers in its words, claims, and imagery – if how that brand ought to make you feel is radically different from the truth of its supply chain and development, this is the time to change that. For C-level executives who prioritize the existence of these company-wide efforts (such as new product development), it's time to look hard at your state of diversity and question if it's out of merit or performance. Further, is it your intention to change or maintain the long-standing contradiction between the leaders of the food industry and those who actually make the purchasing decisions?

Will women leaders ever see equal representation within your company?

Lastly, for the consumer, please don't lose sight of what you want from the products you buy, **because every purchase is a vote casted in favor of its way of doing business – starting all the way from the beginning.**

MJ KINNEY

Plant-Based Protein Expert, XPRIZE

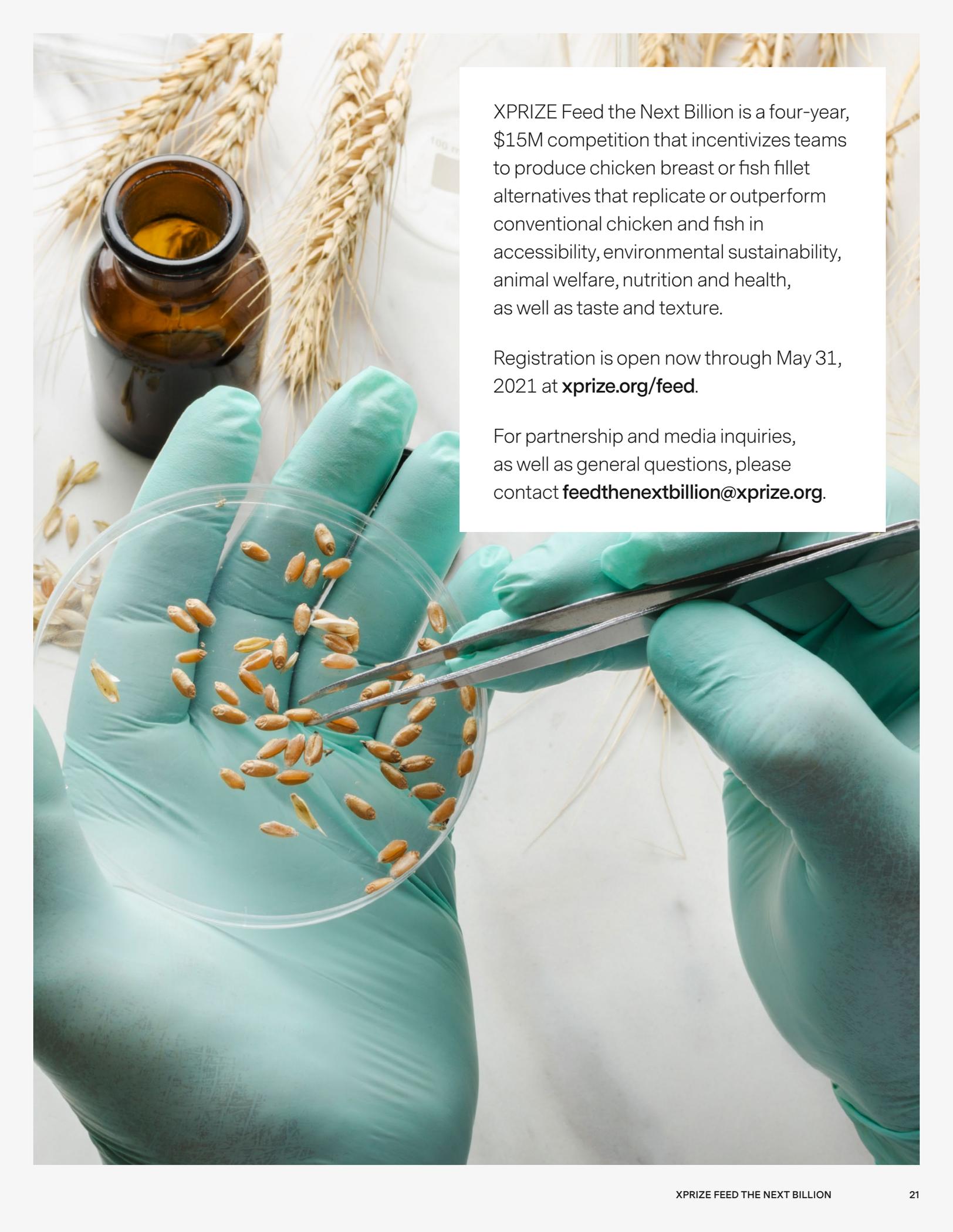


MJ Kinney is a food scientist and the Founder of FareScience, a consulting company that specializes in next generation food product development.

Her specialization in alternative proteins has spanned B2B, B2C, and non-profit sectors, throughout which she has built collective experience in R&D, technical sales, and project management.

A big picture thinker, MJ has interfaced with various subject-matter experts to create new narratives in food innovation, while strategizing and executing a concept through its commercialization and sale.

MJ's product development experience spans the natural and organic foods segment, where she has formulated according to a wide variety of standards including clean label, vegan, USDA Certified Organic, Non-GMO, allergen-free, gluten-free, and reduced sugar. She is a go-to expert for the application of plant proteins in alternative meat, egg, and dairy products.



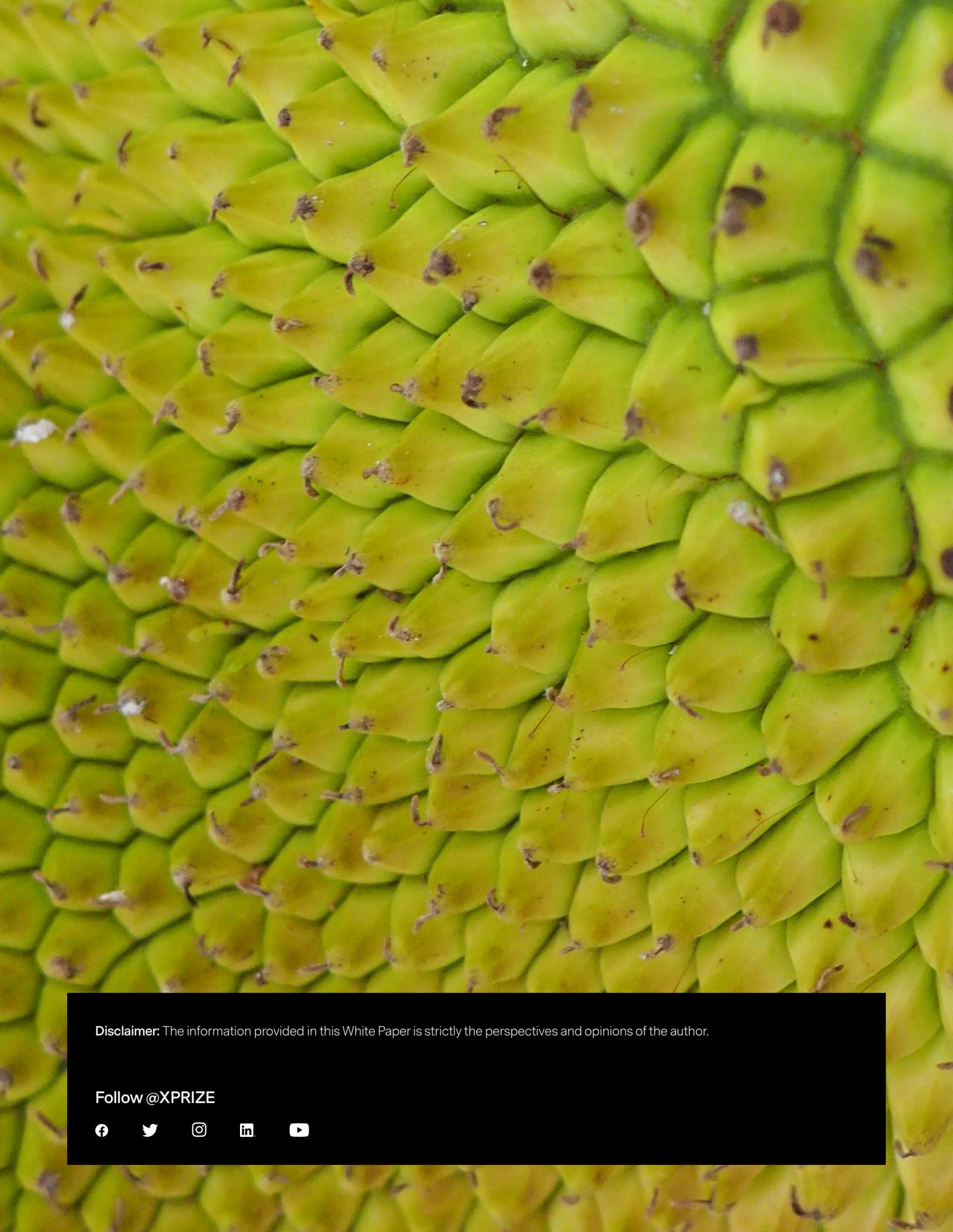
XPRIZE Feed the Next Billion is a four-year, \$15M competition that incentivizes teams to produce chicken breast or fish fillet alternatives that replicate or outperform conventional chicken and fish in accessibility, environmental sustainability, animal welfare, nutrition and health, as well as taste and texture.

Registration is open now through May 31, 2021 at xprize.org/feed.

For partnership and media inquiries, as well as general questions, please contact feedthenextbillion@xprize.org.

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