

The logo features the letters 'S2G' in a large, white, sans-serif font. The letter 'G' is stylized with a small sprout growing from its top right, consisting of a short stem and three leaves.

S2G

VENTURES

SEED 2 GROWTH

# Table of Contents

- **Consumer Is Driving Change – Why, What and How**
  - Capital Markets Context – Ag and Food VC
  - System Investing Approach – Why, What, How
  - Appendix

## Industry Dynamics: The Why?

*Food and agriculture system issues have persisted over the last 50 years. These problems have risen to the forefront of public attention as “mainstream” societal issues. Why does the public now care about addressing these challenges?*



**Changing demographics** (millennials, rising middle-class, aging population) are re-shaping **consumer preferences** ...



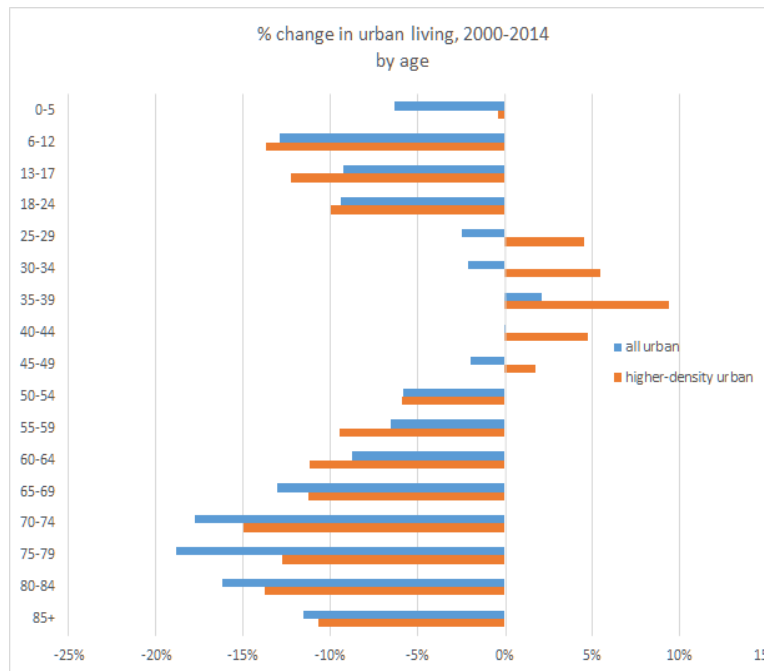
...while **information transparency** is empowering consumers to make more informed purchasing and lifestyle choices...



...and negative consequences from system issues like **rising healthcare spending** have become an unavoidable matter of **public policy debate**.

# Millennials are the most ethnically diverse, urban, and educated (but in debt) generation. As educated conscious consumers, they are driving many of the changes in consumer preference today.

- **Largest generation** in U.S. history (~80m people)
- More likely to **live in urban areas**, particularly in 6-90 largest cities in the US (perhaps driven by wages and costing of living considerations)



- 42% identify with an ethnicity other than non-Hispanic white
- 61% millennials have attended college vs. 46% of baby boomers
- More in the debt (student loans): **~\$1.3 trillion of borrowings to fund education**

## Millennials On Track to be the Most Educated Generation to Date

% completing at least a bachelor's degree at ages 18-33, by gender

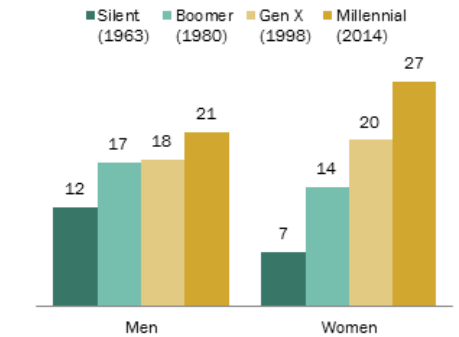
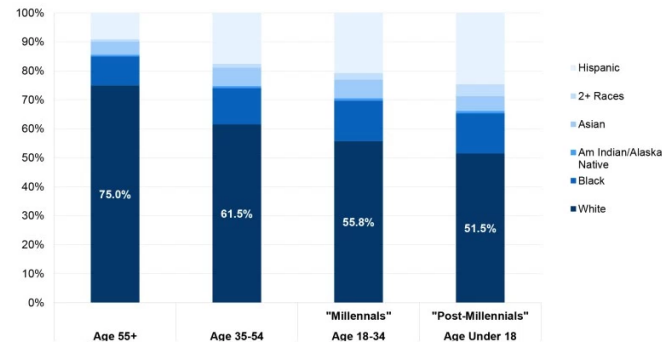


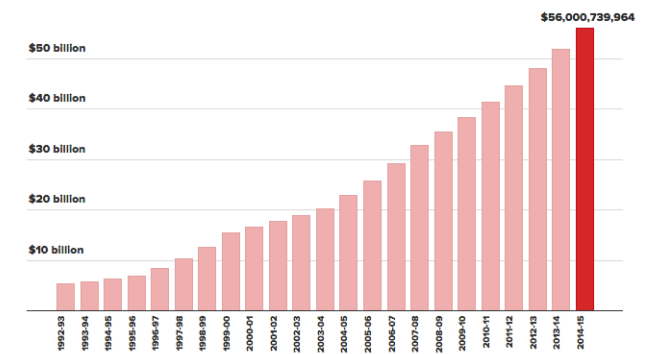
Figure 1: US Race-Ethnic Profiles for Age Groups, 2015



Source: William H Frey analysis of Census Bureau Estimates released June 23, 2016

## The class of 2015 is graduating with \$56 billion in student loan debt

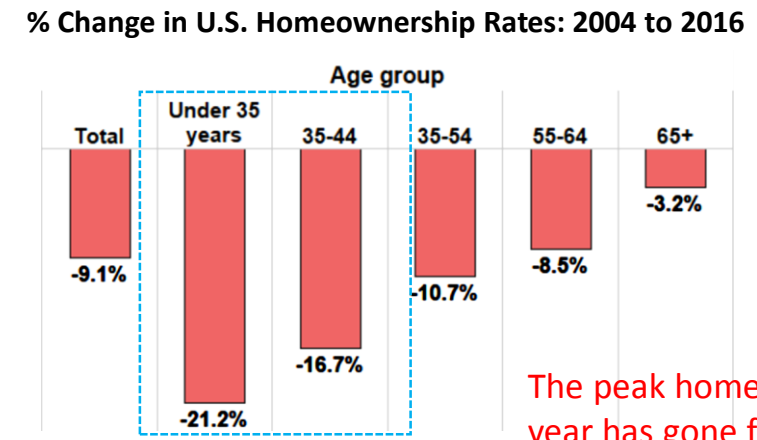
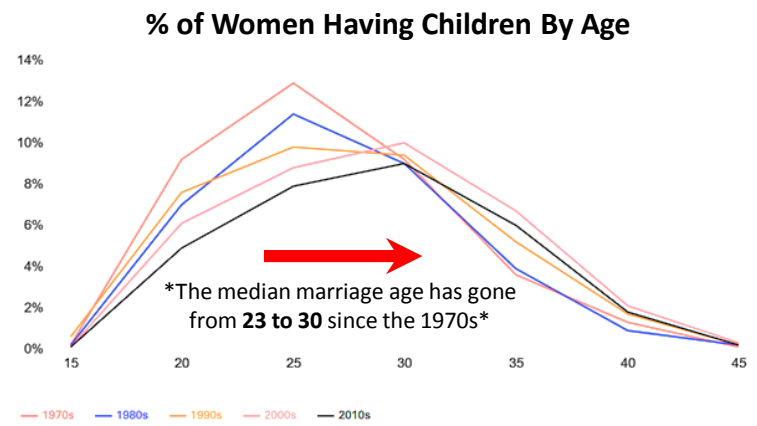
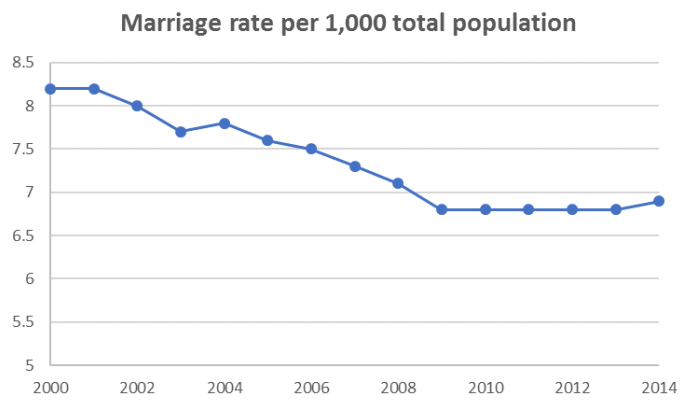
Total student debt by graduating class



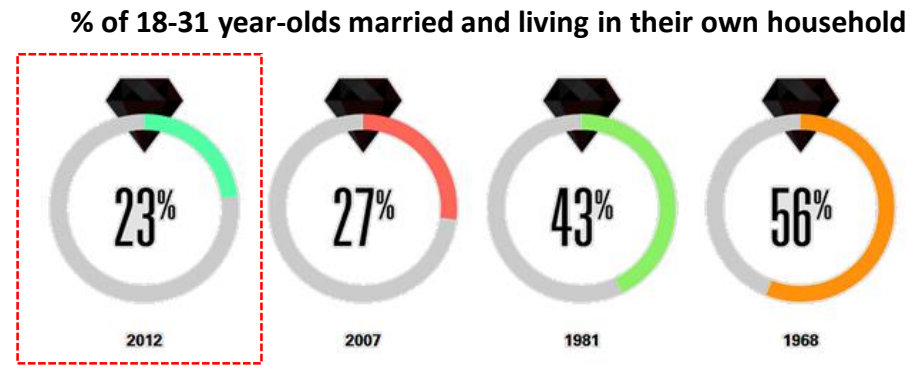
Source: Mark Kantrowitz, Edvisors.com



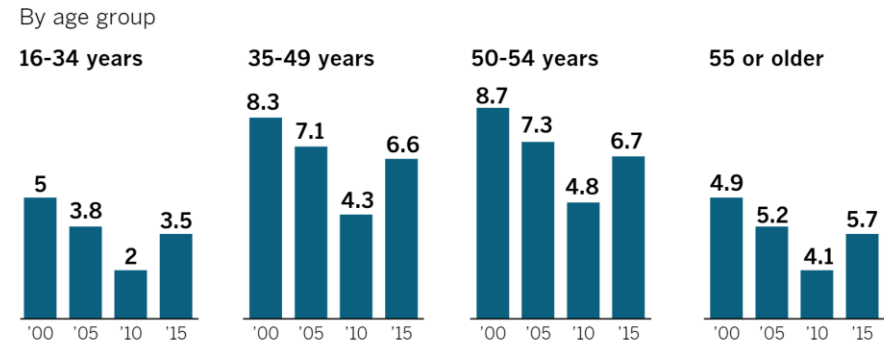
**Millennial lifestyles from ownership to marriage are driving new consumption dynamics and disruption across many industries (auto, real estate, etc.). The implications for food and agriculture are just as enormous.**



The percentage of young people married and living on their own has dropped by more than 50% since the 1960s



**Vehicles purchased per 100 people per year**



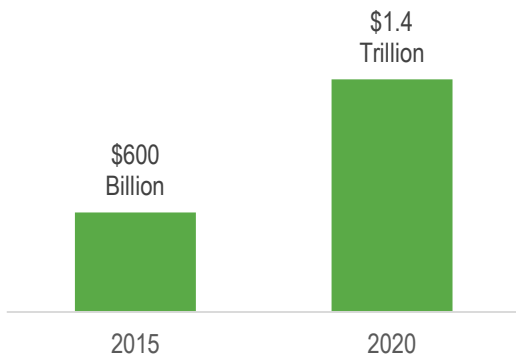
The peak home-buying year has gone from 25 to 45 years-old since the 1970s

Sources: Goldman Sachs, U.S. Census, U.S. Federal Reserve.

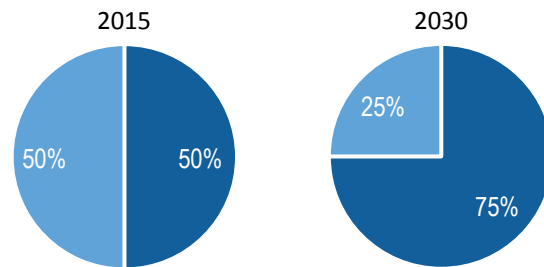
***Millennials have become the most powerful group of consumers. Advertisers will continue to direct marketing resources to specifically target this generation, which cares as much about the product as the “story” behind it.***

- Millennials are a highly influential population that **effects the buying decisions of other demographic cohorts** and **change the market share of channels**
- Millennial customers **crave a true, authentic, personalized experience**
- More than 50% of millennials make an effort to **buy products from companies that support the causes** they care about

**Millennials Will Have Massing Spending Power**

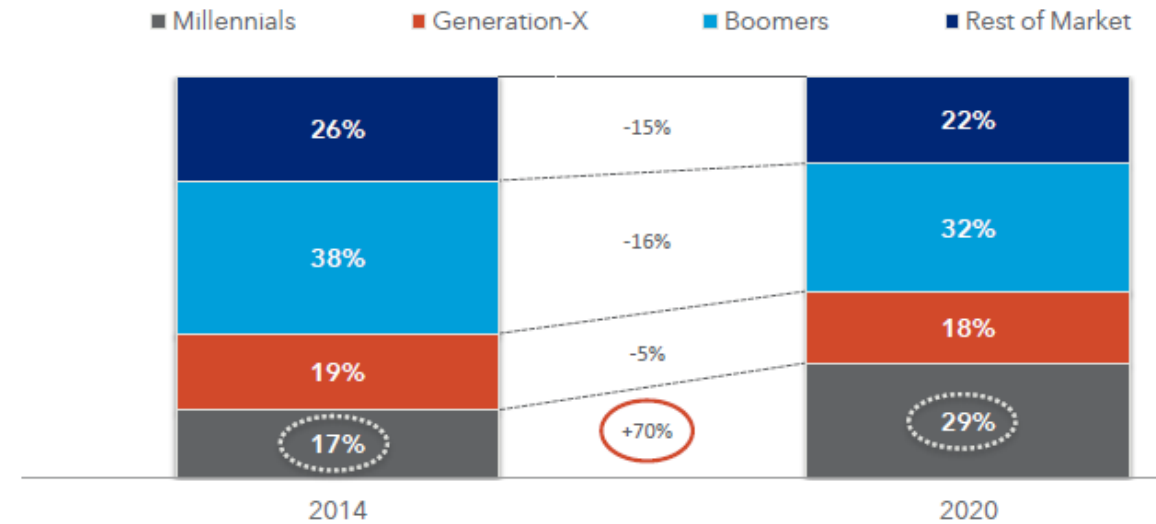


**Millennials Will Soon Dominate the Workforce**



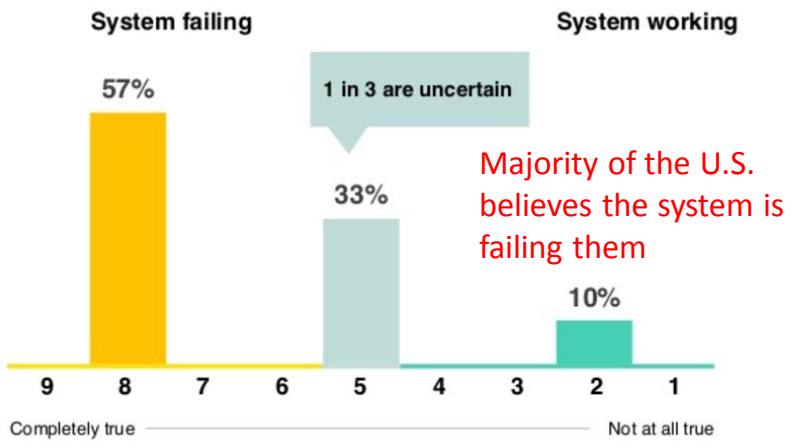
Source: KPCB 2017 Internet Trends, Accenture, US Bureau of Labor Statistics

**PERCENT OF CPG DOLLAR VOLUME BY CONSUMER SEGMENT 2014 & 2020P**

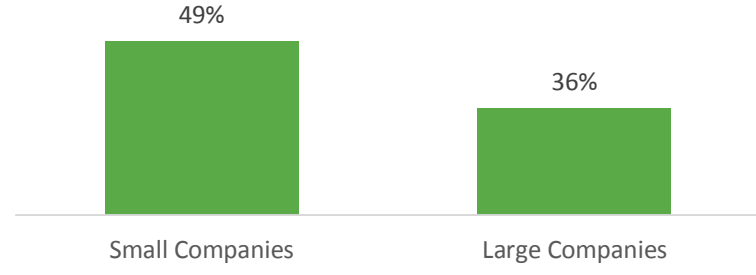


Source: IRI EconoLink™ Survey, 2013.

**Societal trust of major institutions has eroded, which has fed into negative perceptions of major brands and big business. Authenticity is now harder to achieve for companies with scale and power, but brand building has become easier for the smaller player.**



**“Half of consumers say they trust small companies to do the right thing (49%), while big businesses (36%) are much less likely to be trusted”**

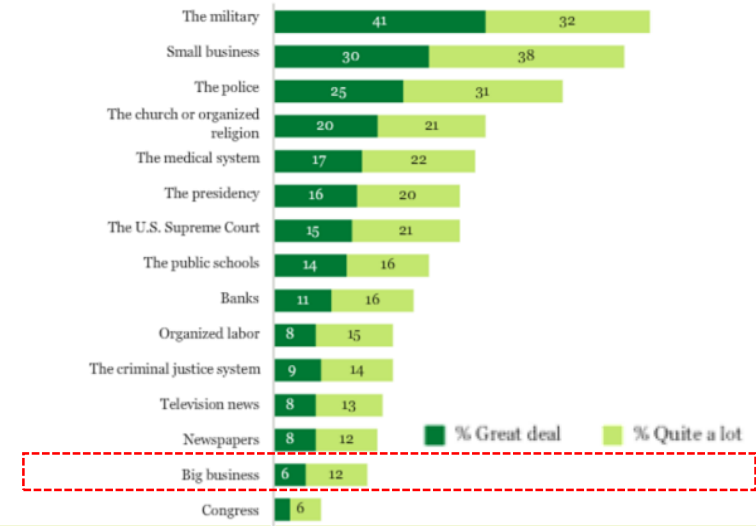


**Most Trusted Source for Accurate Product Information According to US Internet Users, by Generation, May 2016**

% of respondents in each group

	Millennials (18-35)	Gen X (35-54)	Baby boomers (55+)	Total
Online reviewers	40%	32%	24%	31%
Friends/family/colleagues	24%	25%	21%	23%
The brand itself	19%	17%	23%	20%
Retailers/retail associates	11%	11%	14%	12%
News articles	2%	2%	3%	3%
Other	1%	2%	3%	2%
None of these	3%	11%	12%	10%

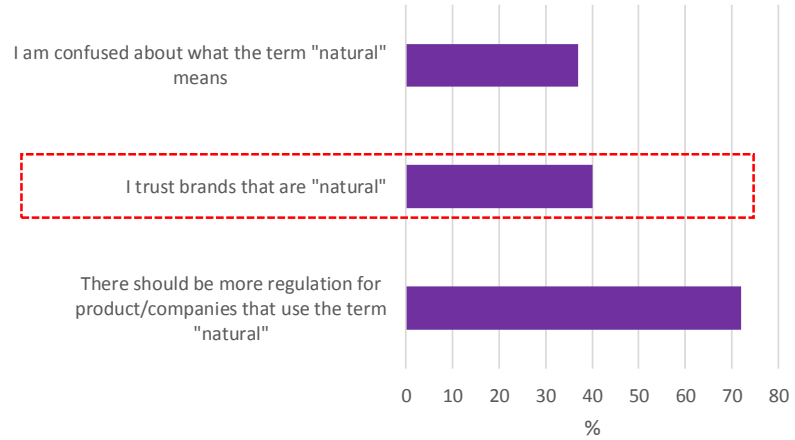
**“How much confidence do you have in each one of the below?”**



**Average % of Americans who have a ‘great deal’ or ‘quite a lot’ of confidence across 14 key institutions: 32%**



**Attitudes toward the word “natural”**



Sources: Gallup, Mintel, Edelman Trust Barometer, eMarketer.

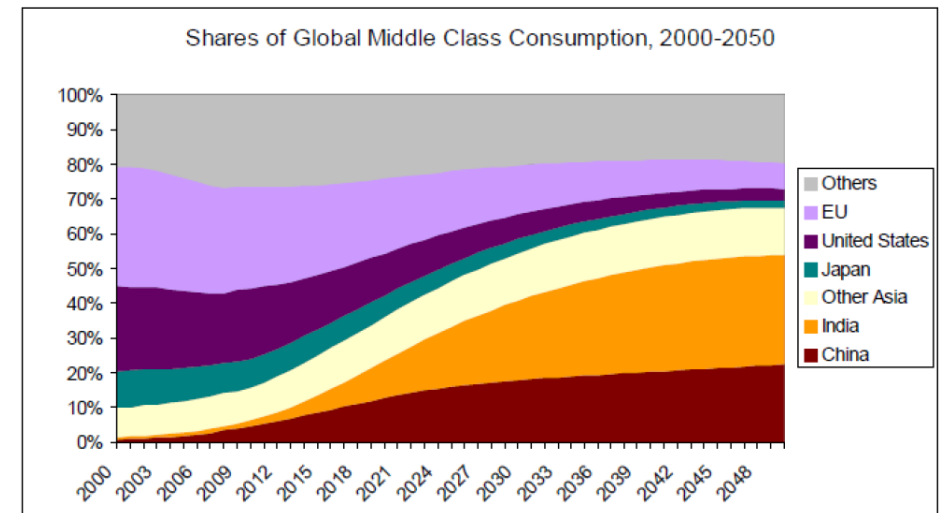
## The rise of the middle-class in Asia will have long lasting implications for the global food and ag system as trade imbalances shift and supply chains adapt to meet the growing demand

- At a global level, we are witnessing the most rapid expansion of the middle class the world has ever seen
- At the end of 2016, there were ~3.2 billion people in the global middle class. On average, **160 million will join the middle class annually** for the next 5 years **for a total growth of 25%**
- Middle class market in the US, Eurozone and Japan is projected to grow at only 0.5% per year, **compared to annual growth of 6% or more for China and India**
- In only 3 years around 2020, the middle class will become a majority of the global population for the first time ever



Size of the Middle Class, 2009 - 2030  
(millions of people and global share)

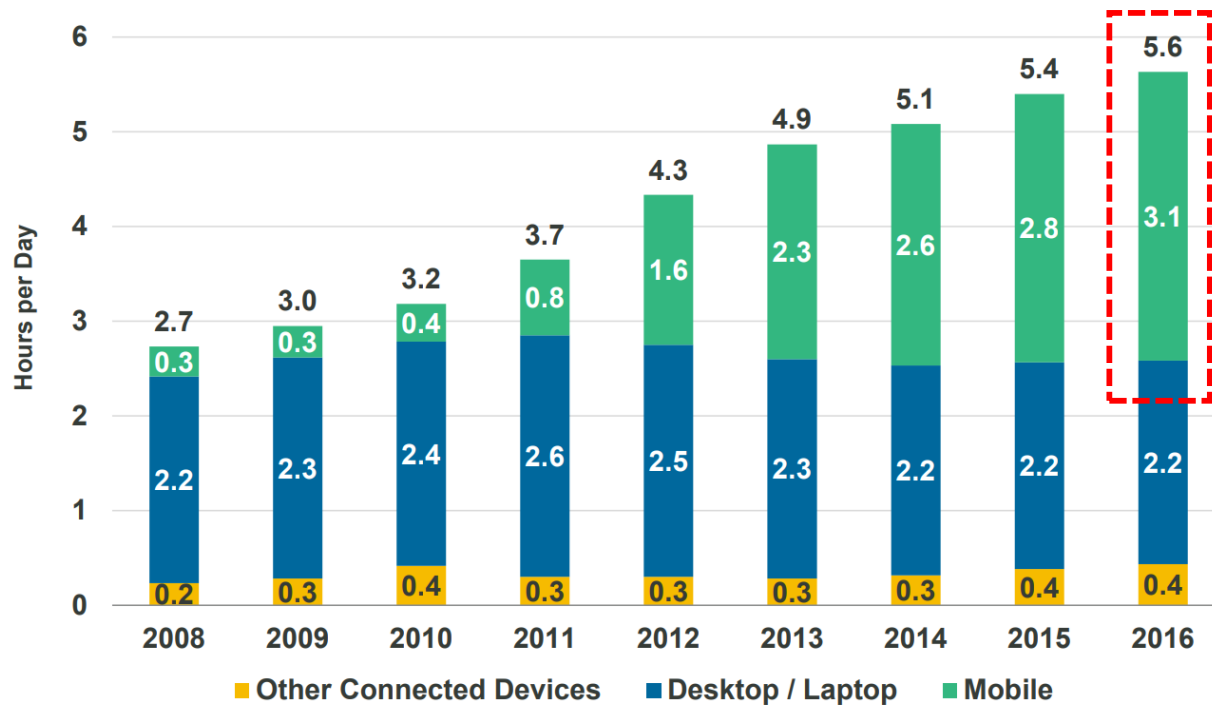
	2009		2020		2030	
North America	338	18%	333	10%	322	7%
Europe	664	36%	703	22%	680	14%
Central and South America	181	10%	251	8%	313	6%
Asia Pacific	525	28%	1,740	54%	3,228	66%
Sub-Saharan Africa	32	2%	57	2%	107	2%
Middle East and North Africa	105	6%	165	5%	234	5%
World	1,845	100%	3,249	100%	4,884	100%





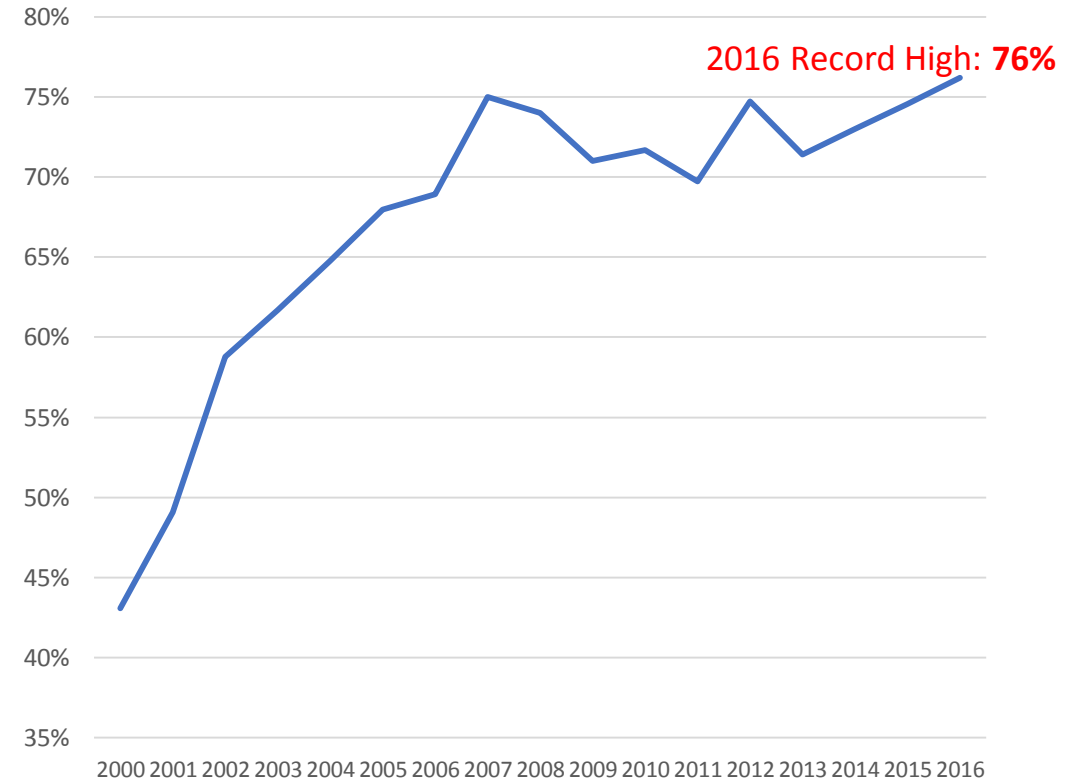
*The Digital Age has fundamentally altered how consumers spend their time and receive media exposure. This has led to an environment ripe for disruption given information transparency from product ingredients to corporate behavior.*

**Time Spent per Adult User per Day with Digital Media, USA, 2008 – 2016**



Time spent with digital media has continued to increase, with the majority of connected time now spent on mobile devices.

**U.S. Internet Penetration, 2000-2016**

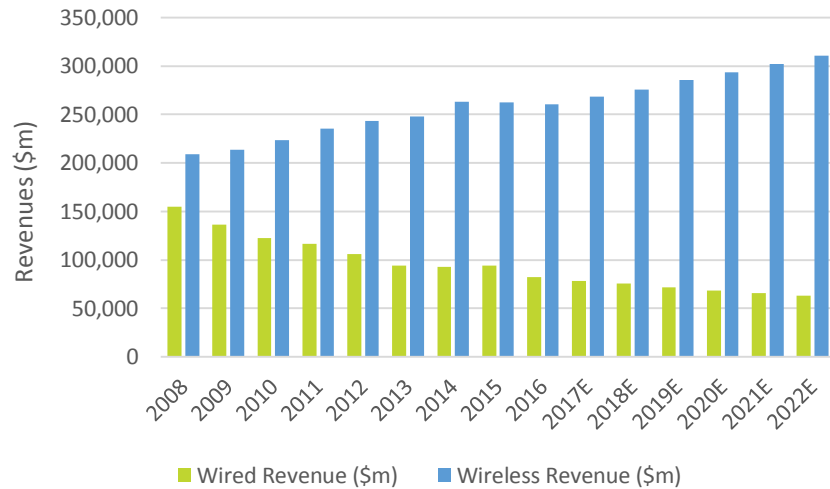


Sources: eMarketer, Zenith Advertising Expenditure Forecasts, Statista, The New York Times.

# Mobile has changed how people communicate, receive information, and go about their routines. It has enabled channel disruption, supply chain disruption, and shift in market share.

## From making calls...

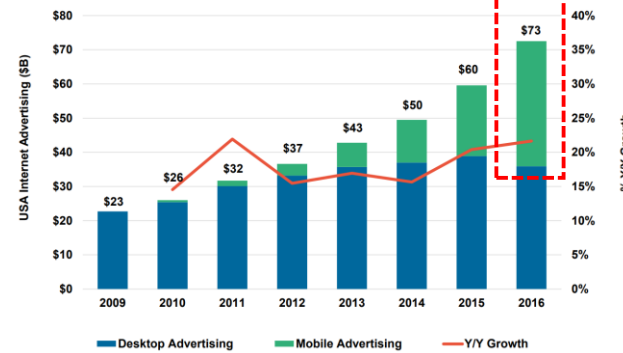
U.S. Wired vs. Wireless Telecom Revenues



About a quarter of all U.S. home phone subscriptions disappeared between 2010-15 despite an increase of 7 million households during the same period (Mintel).

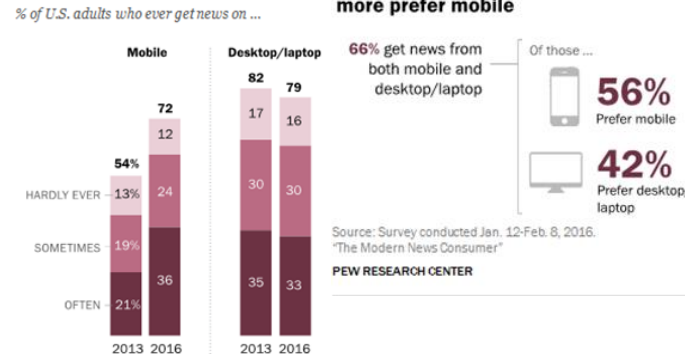
## ...to shopping and getting news...

USA Internet Advertising (\$B), 2009 – 2016



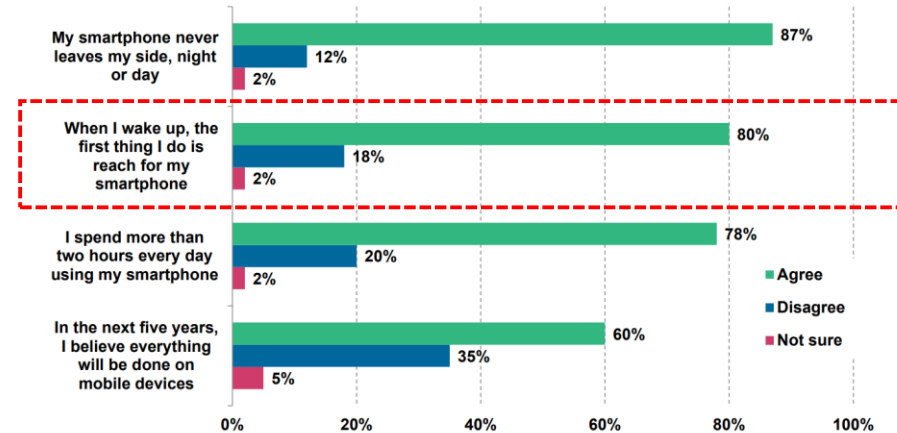
Rapid growth since 2013 in portion using mobile to get news; desktop/laptop usage holds steady

Among people who get news on both, more prefer mobile

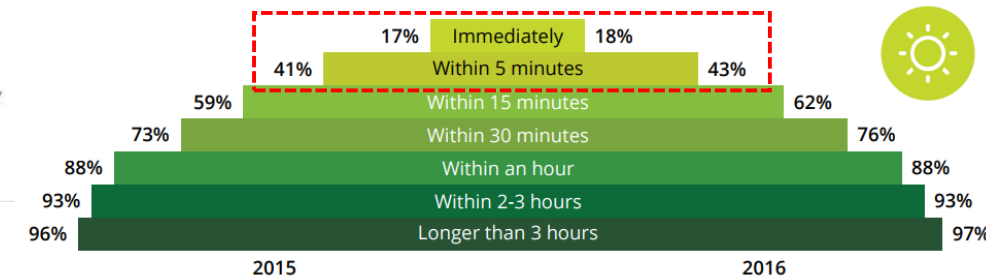


## ...to waking up in the morning!

Millennial Smartphone Behavior, USA, 2014



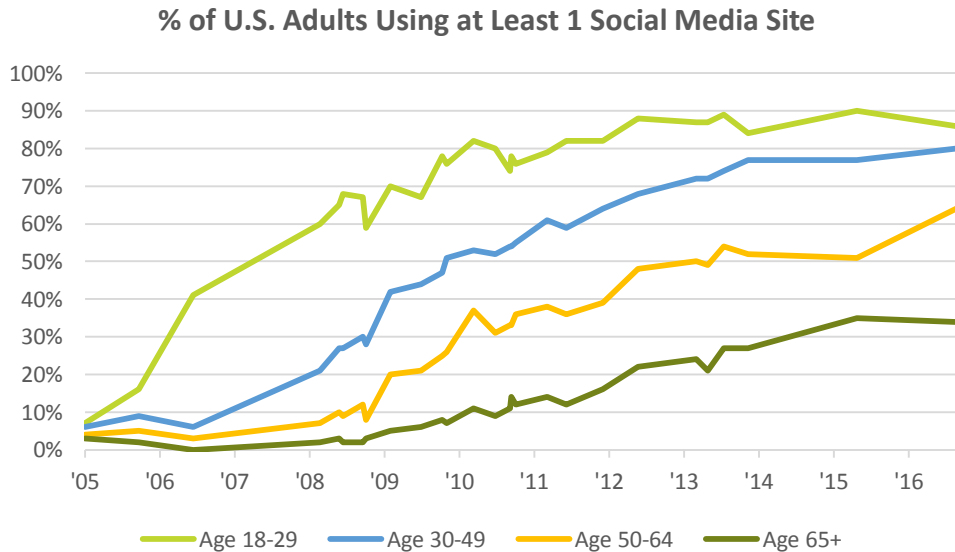
## Typically how long is the interval between waking up and looking at your phone for the first time?



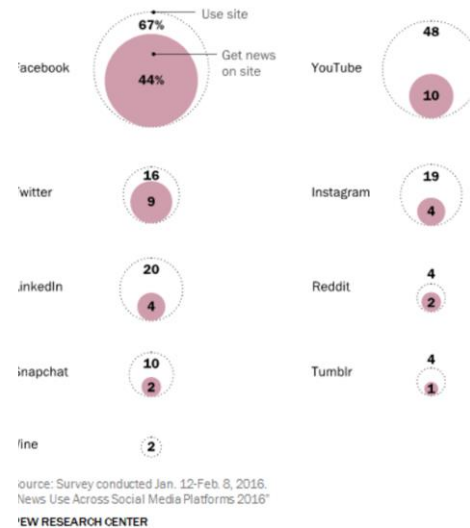
Sources: IAB / PWC Internet Advertising Report (2016), Informa, World Cellular Information Service (WCIS), IbisWorld, Mintel, Zogby Analytics, Deloitte '16 Global Mobile Consumer Survey.

**As social media has become universal, it has also become a major news source and shaper of public opinion. In other words, people get their news from other people -- the downside is the prevalence of unreliable “fake” news.**

- Millennials are **three times more likely to use social media** on a mobile device than Baby Boomers — 33% versus 11%
- As of January 2016, US internet users spend ~1.7 hours on social media every day
- 76% of Facebook users check the site daily
- Pew Research: **50% of consumers aged 18-49 often get their news online**

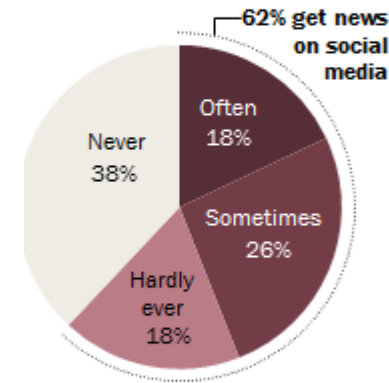


**Social media news use: Facebook leads the pack**  
% of U.S. adults who ...



**About 6-in-10 Americans get news from social media**

% of U.S. adults who get news on a social networking site ...



Source: Survey conducted Jan. 12-Feb. 8, 2016, News Use Across Social Media Platforms 2016

© EW RESEARCH CENTER

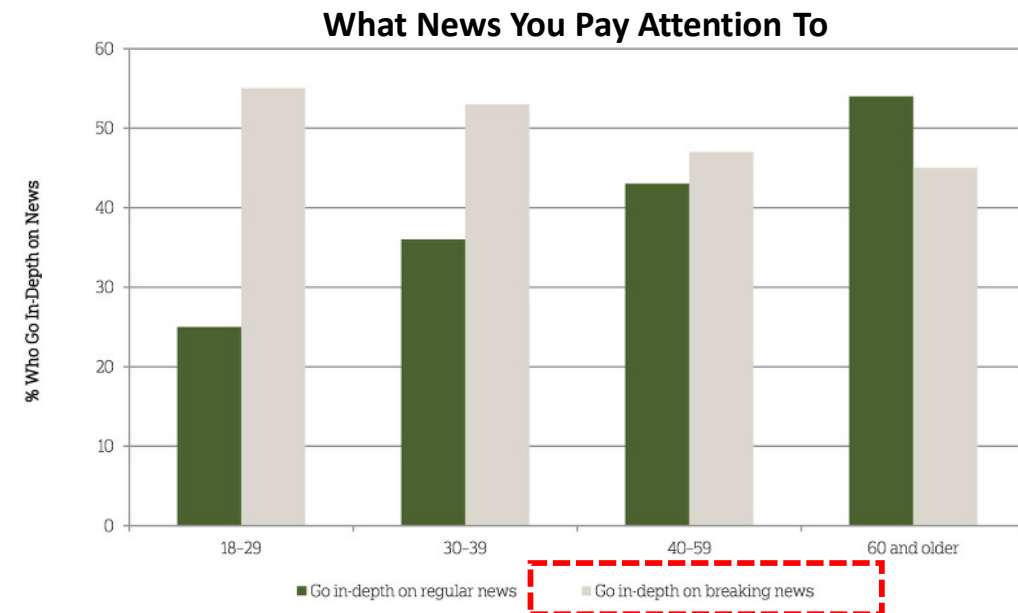
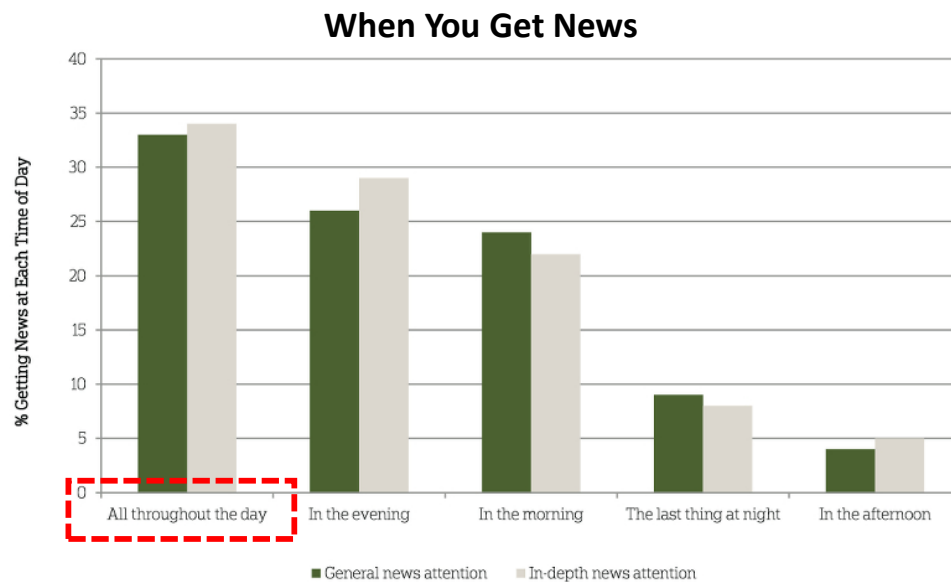


*“The first changes you’ll see will be in News Feed... As we roll this out, you’ll see less public content like posts from businesses, brands, and media. And the public content you see more will be held to the same standard -- it should encourage meaningful interactions between people.”*

- Mark Zuckerberg on 1/11/18 describing policy changes in response to criticism around Facebook facilitating the proliferation of misinformation, allowing foreign interference in national elections, and exploiting human psychology for profit

## *Twitter has turned the 24-hour news cycle into a 2-hour news cycle, but the quality of journalism has suffered as news outlets race to “break” the news without the proper investigative research*

- Vast news resources available in recent decades have increased competition for audience and advertiser attention, prompting media providers to deliver the latest news in the most compelling manner in order to remain ahead of competitors
- Adults age **18-29** are equally as likely to get news from TV as from their cell phones
- Cornell Study: **Traditional news outlets lead and the blogs follow, typically by 2.5 hours**, according to a new computer analysis of news articles and commentary on the Web during the last three months of the 2008 presidential campaign. The study found that **3.5% of story lines originated in the blogs and later made their way to traditional media**



***Paris Accords: even when the Administration declared withdrawal from the agreement, numerous food and Ag companies stepped in to declare support. A growing faction of the private sector will drive environmental progress forward when policy fails.***

- On June 1, 2016, **President Trump announced on that the US would withdraw from the Paris climate accord**, weakening efforts to combat global warming and embracing isolationist voices in his White House who argued that the agreement was a pernicious threat to the economy and American sovereignty. In the last year, the administration also promised to **repeal a key policy to reduce greenhouse gas emissions and scrap the word climate change from government websites.**
- Instead, compliance of the Paris Accords and leadership in climate change will be driven by Food and Ag companies:
  - Cargill Chairman and CEO David MacLennan: “Exiting international accords like the Paris Agreement will negatively impact trade, economic vitality, the state of our environment, and relationships amongst the world community. And it positions the U.S. as an outlier on this important issue... remain fully committed to address climate change in supply chains around the world.”
  - Ben & Jerry’s, the Vermont ice cream company, took the opportunity to list 6 (sarcastic) reasons that pulling out of the Paris Climate Agreement was the right move, including “Clean Energy, Schmenenergy” and “Crises Keep Life Exciting.”
  - Andy Pharoah, Vice President of Corporate Affairs at Mars Incorporated, agreed that “climate change is a real threat to the world” and that “the science is clear.” Despite Trump’s decision to withdraw the U.S. from the agreement, Pharoah added that “many other businesses are sticking by it, and governments throughout the world are sticking by it.”
- Numerous other business leaders including Elon Musk, Tim Cook, Robert Iger and Jeff Immelt also voiced support of the agreement



## Industry Dynamics: The What?

*Society is finally paying attention to systemic issues, but what about the system is actually changing? What is an enduring trend vs. fad among consumers?*



The fundamental shift in demographics has caused a shift in **consumer preferences** that can be measured in enduring trends that are here to stay beyond fads...



...leading to **shifts in market share** and **channel disruption**...



...followed by **supply chain disruption**.

*Consumer changes are impacting the “Billion Dollar Brand,” as large CPGs suffer while up-start brands steal share. For smaller brands, the food industry is much more welcoming than it was a few years ago.*

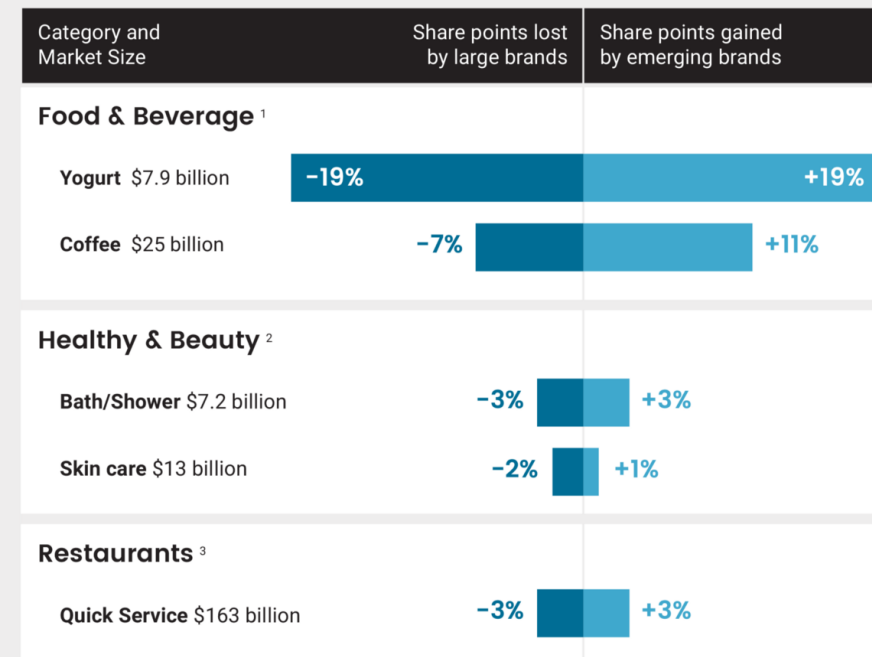
Lower barriers to entry are causing the “death” of the Billion Dollar Brand:

- 1 Cheaper, electronic marketing avenues
- 2 Lower distribution costs
- 3 Startup-friendly retailers willing to lower slotting fees
- 4 Growing demand for authentic products that can define a retailer’s value proposition
- 5 Increased access to capital

## Seismic Shift in Market Share

Growing market shift to emerging brands

CircleUp



**\$18 billion**  
lost in market share by 25 top food & beverage companies since 2009

**\$4 billion**  
lost last year by major packaged food companies <sup>5</sup>

**90%**  
of Top 100 CPG Brands lost market share and 62 had declining sales, 52 weeks ended June 2015 <sup>6</sup>

Source: <sup>1,2</sup> Euromonitor International (Sept 2014); <sup>3</sup> QSR Magazine, Wells Fargo Securities; <sup>4</sup> 2013 Yogurt Market via Statista Yogurt Dossier; <sup>5</sup> Specialty Coffee Association of America (Dec 2014); <sup>6</sup> Fortune Magazine (May 2015)

*The retail environment has become start-up friendly, often reducing slotting fees for natural products. To make up the revenue, those retailers have hammered the large CPGs for even more trade spend.*

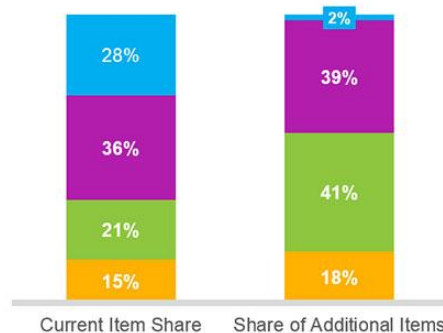
- Smaller companies are putting a great emphasis on health and wellness to meet consumer demand for transparency, while also selling products at premium price points. As a result, retailers are making room for them on shelves
- In the last five years, small- and medium-sized manufacturers have increased their distribution across regions, meaning more shelf space at stores. For **approximately 900 food and beverage items that have been added to the shelves since 2013, 88% came from small- and medium-sized companies.**

### SMALLER MANUFACTURERS ARE BENEFITTING FROM A WIDER ARRAY OF PRODUCTS ON THE SHELF

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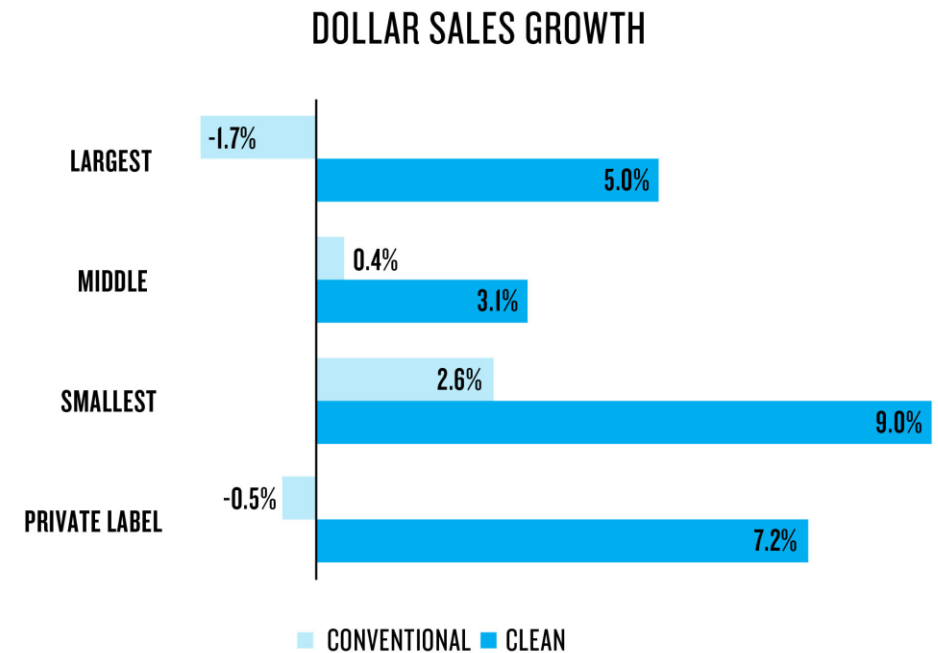
AVERAGE # OF ITEMS SOLD PER POINT OF DISTRIBUTION

	2013 52 W/E 5/4/2013	2017 52 W/E 4/29/2017
Largest	2,550	2,570
Middle	2,960	3,300
Smallest	1,550	1,890
Private Label	1,230	1,390



### SMALLEST COMPANIES ARE CAPTURING MORE CLEAN PRODUCT GROWTH

n





**Zero-Based Budgeting (ZBB) reigns supreme across big CPG firms as they try to emulate the Kraft Heinz model and boost profitability, which means cuts R&D. To find innovation, they have instead turned to acquisitions which have not successfully stemmed the tide of market share loss.**

*“Campbell Soup Outlines Aggressive Cost Cuts, Reorganization”*

**Campbell's** - Announced 2/18/15

*“Mondelez Details Cost-Reduction Progress and Strategies to Accelerate Growth”*

**Mondelez International** - Announced 9/10/15

*“Nestle names \$2.5B in savings through cost-cutting efforts”*

**Nestlé** - Announced 5/26/16

*“Unilever Seeks To Appease Investors By Cutting Costs, Scooping Up \$5 Billion In Stock”*

**Unilever** - 4/6/17 (Post Kraft Bid)

*“P&G Reiterates Significant Transformation is Delivering Shareholder Value”*

**P&G** - Announced 9/22/17

## Big CPGs Ready for M&A

Slow Growth, Ancient Products, Money in the Bank

Low R&D (% of R&D revenue spend)	Slow Growth (YoY 2014–2015)*	Ancient Products (Unchanged formulas, heavily marketed)	Cash to Spend (2015 balance sheets)
 <b>1.9%</b>	0.1% Prepared dishes and cooking aids 1.7% Milk products/ice cream 5.4% Powdered/liquid beverages	Nesquik: Created in 1948 	<b>\$4.9 billion</b>
 <b>1.6%</b>	2.0% Frito Lay North America -1.0% Quaker Foods North America 2.0% North America Beverages	Pepsi Cola: Created in 1898 	<b>\$9.1 billion</b>
 <b>1.9%</b>	4.1% Personal care 1.5% Food 5.9% Home care	Suave Shampoo: Created in 1937 	<b>\$2.5 billion</b>

R&D spending based on CircleUp analysis of CapIQ data  
 Pepsi cash ending 12/31/15; from PepsiCo's 2015 Annual Report  
 Nestle cash in CHF, ending 12/31/15, which is \$4.9 billion on 12/31/15; from Nestle's 2015 Financial Statement  
 Unilever cash in Euro, ending 12/31/2015, which is \$2.5 billion on 12/15/2015; from Unilever's 2015 Financial Statement

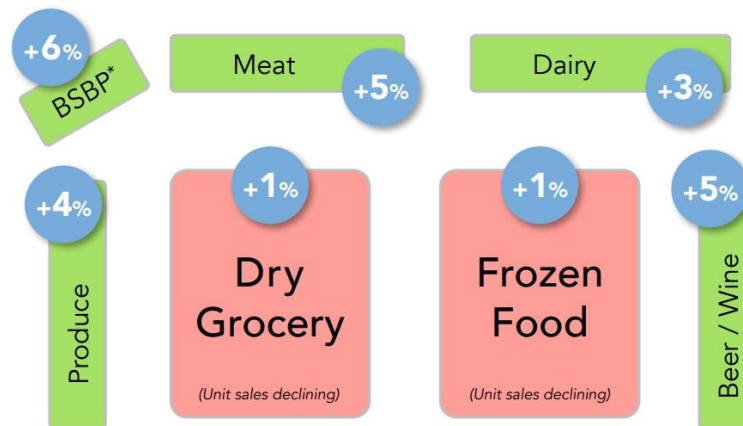
\*Note for Pepsi data: Latin America, Europe Sub-Saharan Africa, and Asia, Middle East & North Africa all exhibited a YoY '14-'15 net revenue net revenue decline ranging from -3.5% to -26.0%.

**“Fresh” dominates retail sales growth, as those sections have increasingly become a key area for a grocer to establish their identity, while the center of the store suffers. With hot bars and food stations, retail is turning to foodservice as a growth area.**

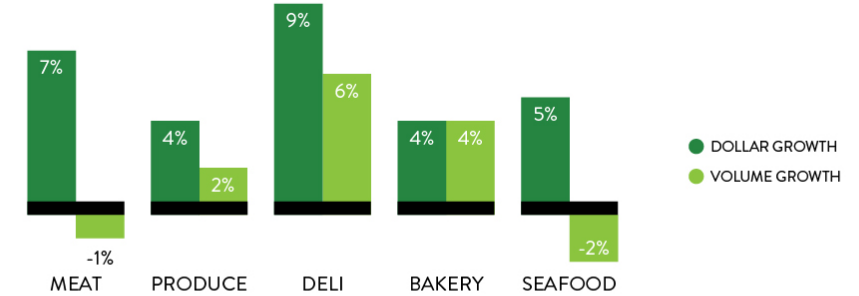
- Sales growth on the perimeter over the last four years was 3.8% — **2.7 times greater than increases posted for the whole store.** Most forward-looking supermarkets are rethinking the allocation of space — shrinking the staid center and expanding the sexy perimeter.
- Some food manufacturing M&A is based on this trend. **Campbell Soup acquisition of Bolthouse Farms: “It gives us a great platform for the growth that’s going on at the perimeter,”** said Anthony Sanzio, a Campbell spokesman
- Nielsen data suggest companies that offer more fresh food are growing faster than those who don't. **Fresher stores experienced a 4% growth in sales last year, compared with 1 percent for other stores.**

- Certain categories within the center store still have strong trends:

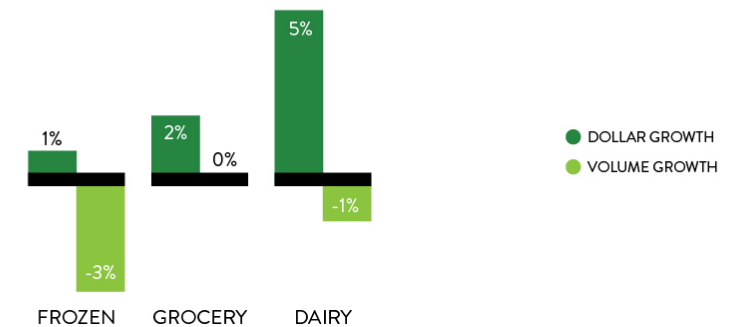
- Salty Snacks
- New age beverages
- Candy
- Coffee



FRESH DEPARTMENT GROWTH



CENTER STORE DEPARTMENT GROWTH

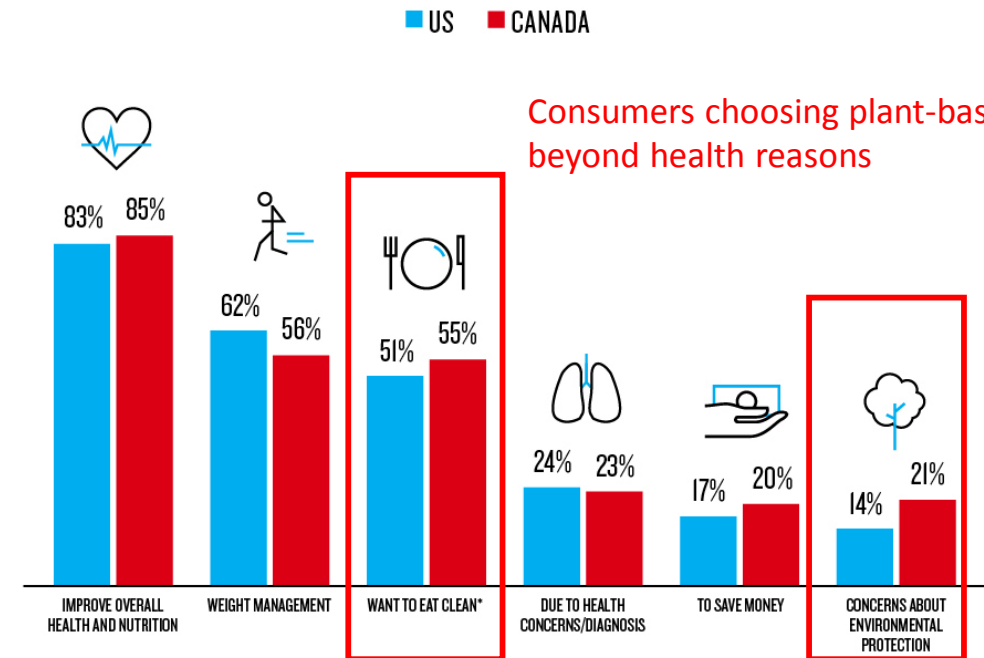


**Consumers are becoming aware of the resource intensity required for protein production. While health reasons will continue to primarily drive the category, sustainability is also driving adoption.**

- According to a Nielsen study released in August, **23% of North American consumers want to see more plant-based protein options in stores**
- In North America, **consumers are actively trying to incorporate more plant-based foods into their diets** (39% of Americans and 43% of Canadians).
- This suggests that **plant-based options appeal to significantly more people than just those who follow vegetarian diets** (6% of North Americans) and those who follow vegan diets (3% in the U.S. and 2% in Canada, respectively)
- Beyond the associated health benefits, North American **consumers believe that plant-based foods improve overall health and help with weight management**
- In addition to these factors and eating clean, many also turn to plant-based diets to address health issues and to **promote environmental sustainability.**

**NUTRITION AND WEIGHT CONTROL ARE THE TOP REASONS TO INCLUDE MORE PLANTS**

Top reasons from those wanting to incorporate more plant-based foods



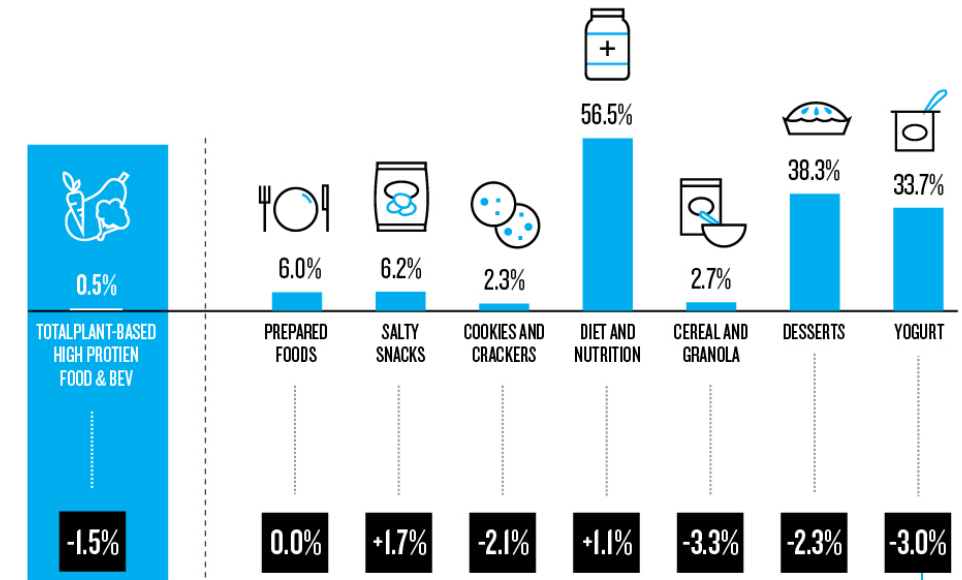
**Plant-based foods have become the premier growth category in food while attracting significant venture capital, where gluten-free was in 2014.**

- In the U.S. in the year ended July 8, 2017, dollar sales of plant-based food and beverages increased 14.7%
- In particular, sales of meat alternatives are growing within prepared foods.
- Alternatively, sales of prepared foods containing jackfruit, which only represent just over \$220,000 in annual sales, grew 377% in the last year, indicating that consumers are willing to try a wide variety of protein options



**HIGH PROTEIN PLANT-BASED FOODS ARE SEEING STRONG GROWTH IN SELECT AISLES**

Plant-based high protein Food & Bev: High growth categories



TOTAL STORE GROWTH BY CATEGORY

## 2013 marked a fundamental shift in trade as China became a net importer of US grains, highlighting the growing demand of protein by the rising middle-class in Asia. The US food system cannot be viewed in isolation.

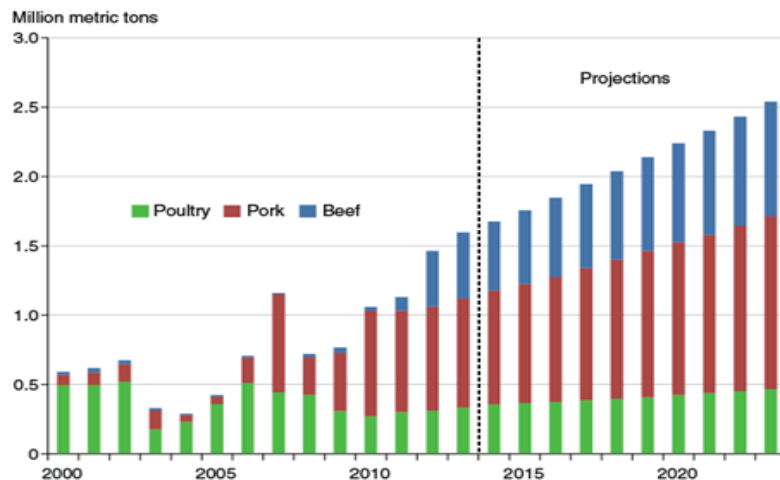
### Growth of feed consumption in China:

- China was a net exporter of grains until 2007
- **Now signs of a surge in China's demand for imported grains, much of it from the US.** During 2013, imports of cereal grains rose to 18 mmt and China became a major importer of sorghum from the US and Australia for the first time

### China's meat consumption is expected to rise

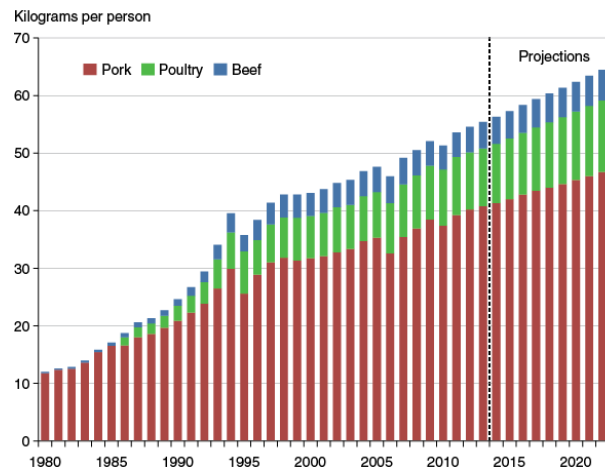
- **Per capita pork consumption is projected to rise 6.6 kg by 2023/24, 3x the increase in poultry (2.7 kg) and 7x increase in beef (0.85 kg)**
- Poultry is projected to account for an increasing share of China's meat consumption, with per capita consumption rising 2.4% annually during the next 10 years
- Production is unlikely to be able to match that demand, threatening food and nutritional security

China's global meat imports projected to continue upward trend



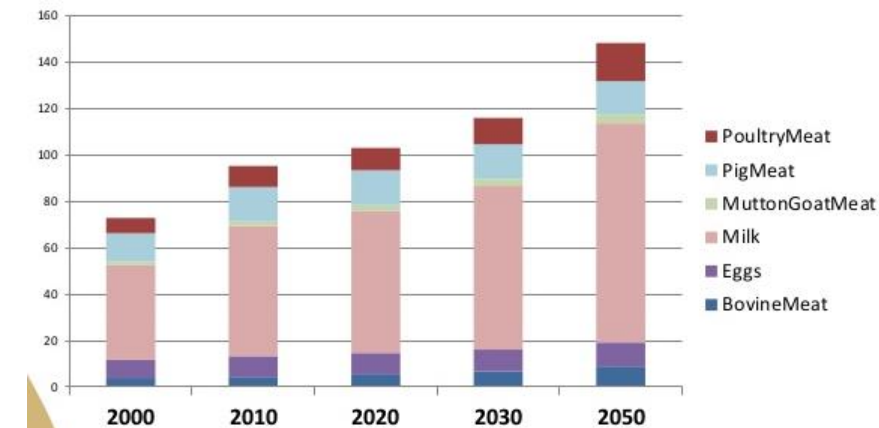
Source: USDA Production, Supply and Distribution database and projections.

Continued growth projected in China's per capita meat consumption



Source: USDA Production, Supply and Distribution database and projections.

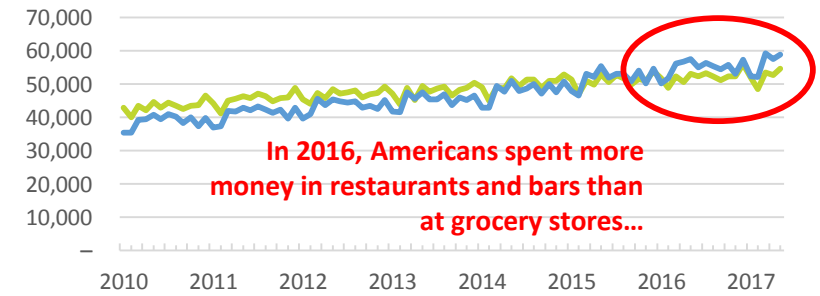
Kg Per Capita Consumption in Asia



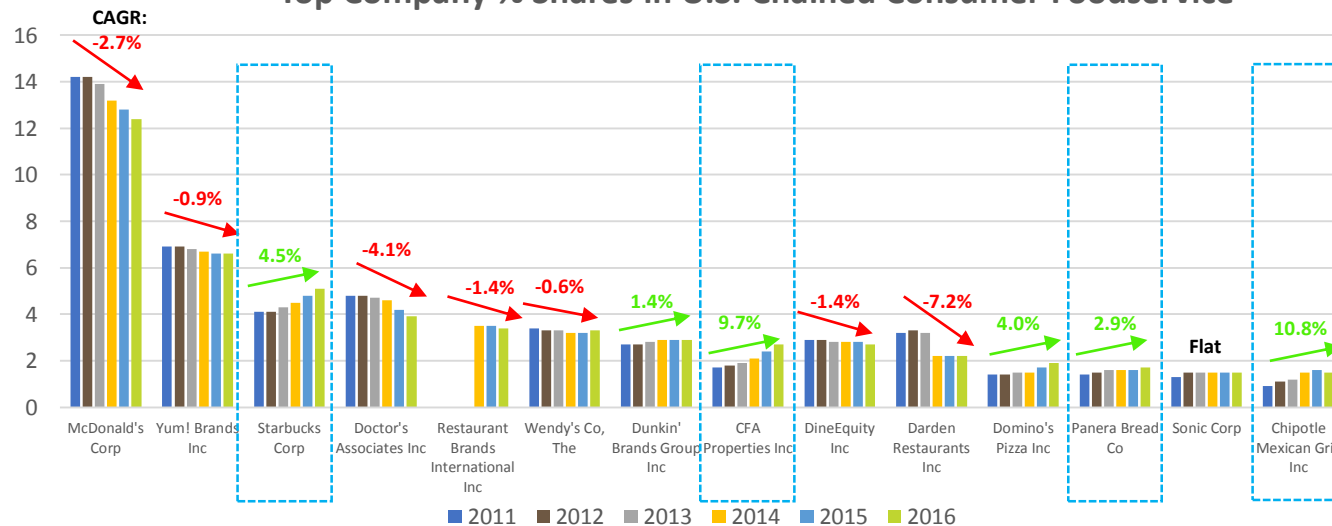
**Consumers have generally favored “eating-at-home” since the recession for cost reasons, but 2016 marked the first time in nearly a decade where spending has shifted to “out-of-home” eating. It has been driven by Millennials looking for fast-casual solutions.**

- **Millennials place a premium on “experiences,”** especially those that translate into social media moments, and food is no different
  - Since 2005, sales at “food services and drinking places” have grown twice as fast as all other retail spending
- Fast food chains like McDonald’s and Subway saw their sales stagnate or decline in 2016
  - Consumers chose instead to dine at “fast casual” locations that offer premium ingredients, a high quality service, and rapid convenience

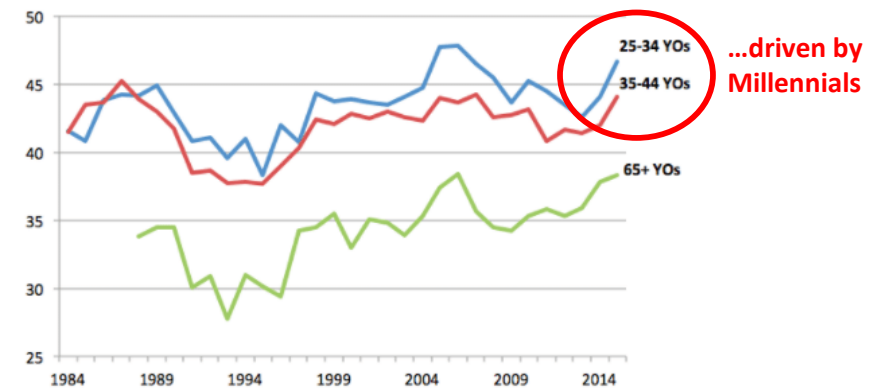
**U.S. Monthly Retail and Food Services Sales**



**Top Company % Shares in U.S. Chained Consumer Foodservice**



**% of Food Spending Away by Age Group**

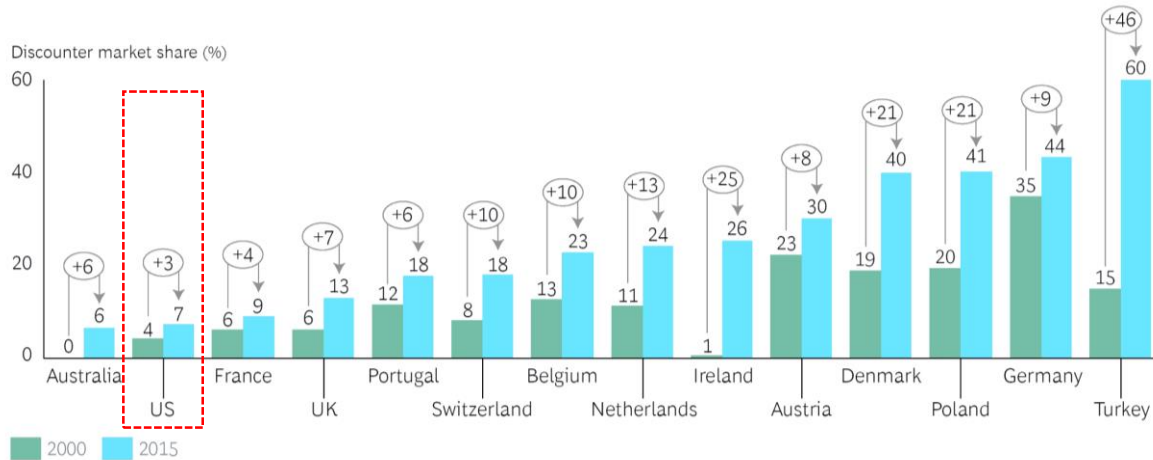


Sources: The Atlantic, US Census.

**The recession drove increased adoption of private label (PL) when consumers discovered the lack of quality difference between the more expensive branded options. Quality has improved further as conventional retailers emulate Trader Joe's and seek to establish their identity with PL offerings.**

- **Discounters** specialize in premium private label brands, low pricing, and a narrower selection of offerings
- Aldi is the leading player in the U.S., with 60% market share
  - The European giant has >1,650 stores in the U.S. and plans to reach 2,500 by 2022
- Save-A-Lot (Supervalu) is the second largest player in discounters, growing its value sales by 5% in 2016 to reach \$4.8bn
- Lidl is planning to open 100 stores within a year

- Despite recently growing in line with inflation, **private label** store brands are already threatening large retail brands
- Store brands increasingly offer **all-natural, organic, and artificial ingredient-free products at bargain prices**
- **Millennials, Hispanics, and households with children are all very likely to buy store brands** for a high percentage (75-100%) of their grocery items
- U.S. PL industry remains highly fragmented—only 18% of market—but could have extensive power when it consolidates



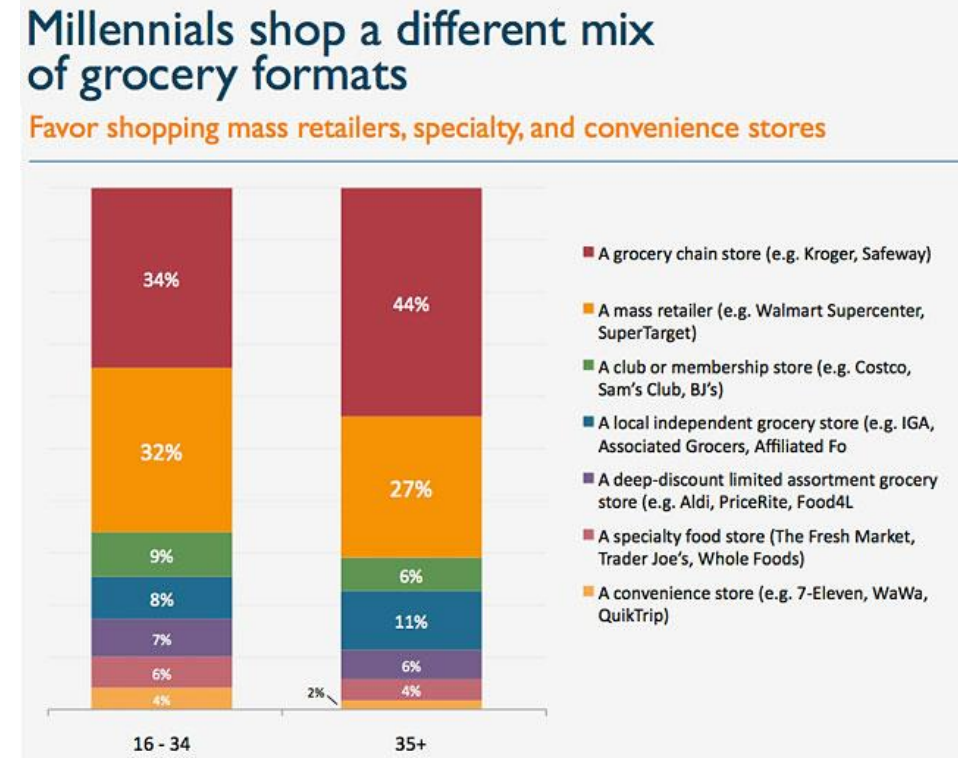
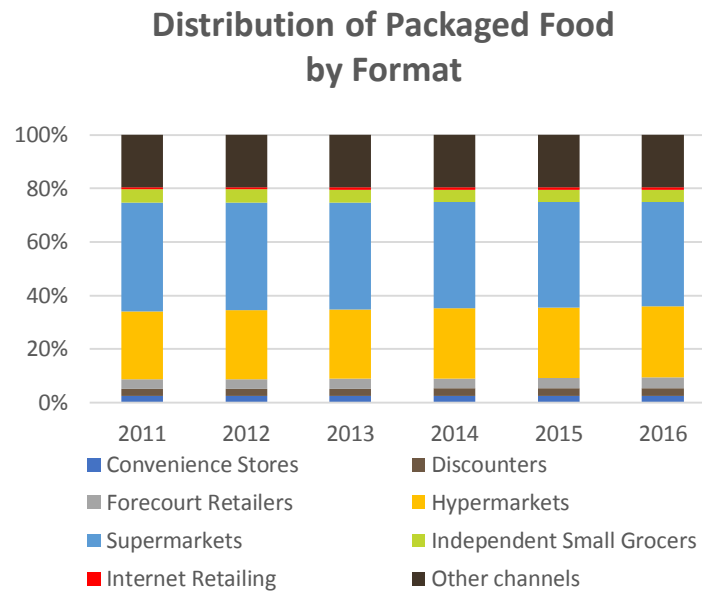
Sources: Mintel, Euromonitor, Food Manufacturing, Boston Consulting Group, Bain Insights.

How much do you agree with each of the following statements about store-brand food products? (Mintel Survey, U.S. consumers)



**Consumers are increasingly purchasing food outside of traditional grocery outlets, which has been driven by convenience stores re-inventing themselves with fresh offerings and technology adoption (although the growth of online has been slower than forecasted from ~3 years ago)**

- Convenience stores now commonly offer an extensive grocery section, as do hypermarkets
- Health and beauty specialists are increasing their offerings, often providing a refrigerated case of chilled lunch kits from local restaurants or a selection of snack bars and nuts at the checkout counter
- Internet retailing is also increasing its distribution share—growing at 11% / year
- “Snackification” of society: consumers are increasingly shedding the traditional custom of eating three meals a day in place of eating smaller portions more frequently, or snacking
  - Combined sales of biscuits, snack bars, savory snacks, confectionery, ice cream, bakery snacks (cakes and pastries) and yogurt increased by a CAGR of 3% between 2011 and 2016
  - Nearly double the 2% CAGR of the remaining packaged food market





*Secular trends have led to several changes on global supply chains. Digital reigns supreme as being able to get real-time updates of the supply chain is now table stakes along with total transparency.*

## Trend

Internet and mobile transform communication, information reception, daily routines

Ecommerce growth continues to accelerate

Social media shapes public opinion / spread of news

Millennials are key consumer base driving new consumption habits and lifestyles

Low societal trust, especially for big business

*transparency.*



## Impact

Traditional barriers to entry have **collapsed**  
Creation of **digital shelf-space**

The channel has become **digital**

Content has become more **fragmented**

Novel content is **valued**

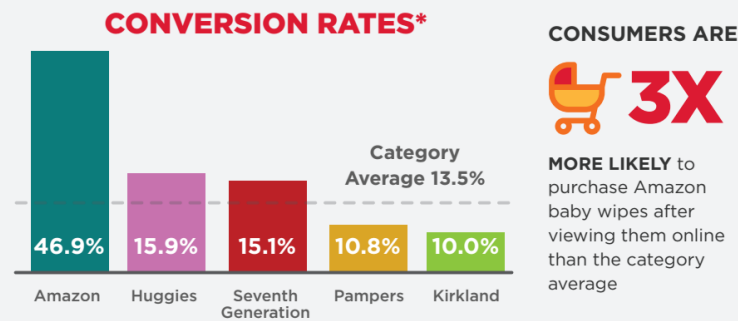
Greater emphasis on **transparent** supply chain

# Amazon Case Study: Amazon has rolled out upwards of 20 private-label brands in categories spanning from clothing to baby to bedding, for \$2.5bn in revenue in 2016...proving the power of ecommerce, store brands, and mass customization

## Amazon Elements: Baby Wipes

Amazon is #3 player in market with 16% share after just two years

80% of baby wipes sold online go through Amazon; Elements only available to Prime members



\* Conversion Rate is calculated as Units Sold divided by Product Views across all online retailers

## Amazon Basics: Batteries

Category leader in batteries: 31% share as of 2016

94% of all batteries sold online sell through Amazon's marketplace, allowing Amazon to market its own products to shoppers easily

Amazon Basics YOY growth for batteries sales is 93%

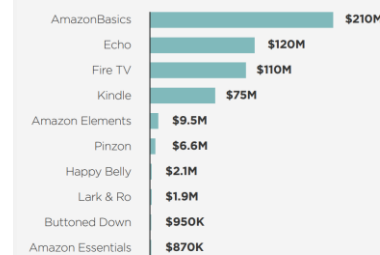
Amazon Basics brand launched in 2009; now offering close to 1,500 products

## Perishables Brands

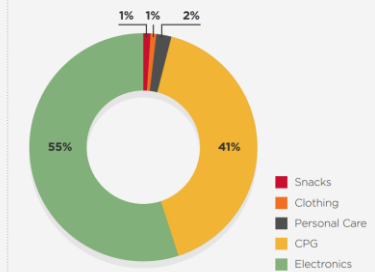
Amazon began selling baby food (Mama Bear), whole-bean and ground coffee (Happy Belly), and snacks (Wickedly) last year

Acquisition of Whole Foods will provide brick and mortar channel for Amazon Fresh

Sales of Amazon Private-Label Brands | H1 2017



Share of Amazon Private-Label Sales by Category | H1 2017



*To remain competitive, manufacturers are consolidating and implementing cost-cutting programs while also relying on M&A as a source of innovation and growth.*

### Consolidation in Branded CPG Companies

Acquirer	Target	Date	Deal Size
Campbell Soup	Bolthouse Farms	2012	\$1.6 bn
General Mills	Annie's	2014	\$0.8 bn
Heinz	Kraft	2015	\$62.2 bn
Hormel Foods	Applegate Farms	2015	\$0.8 bn
Danone	WhiteWave Foods	2016	\$10.4 bn
JAB	Keurig Green Mountain	2016	\$13.9 bn
Kellogg's	RxBar	2017	\$0.6 bn
Campbell's	Snyder's Lance	2017	\$4.9 bn

- Major branded food/bev companies adopting **Zero-Based Budgeting**:
  - Kraft Heinz, BRF (Brazil), General Mills, Unilever, Kellogg, Mondelez International, the Campbell Soup Co., ConAgra Foods, and Diageo
- Largest food and beverage companies have lost roughly \$20 billion in retail sales since 2011
- Many CPG companies, seeking to respond to disruptive changing consumer behavior, have been on an M&A binge
  - Seeking to diversify their business or acquire startup know-how to help them expand in growth areas such as ecommerce
  - Responding to millennial-led consumer preference for healthier, natural and more environmentally conscious food and consumer products

Sources: Euromonitor, Capital IQ.

## Industry Dynamics: The How?

*Underlying demographic changes and information dissemination explain why system issues are finally being addressed. Consumer preferences and market disruption explain what system issues are being addressed. But how are industry dynamics actually being driven? What enables the change?*



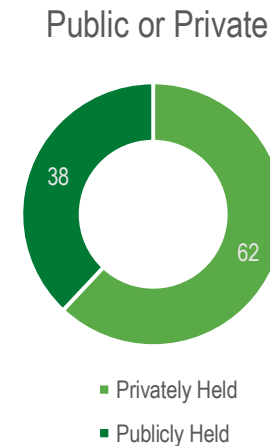
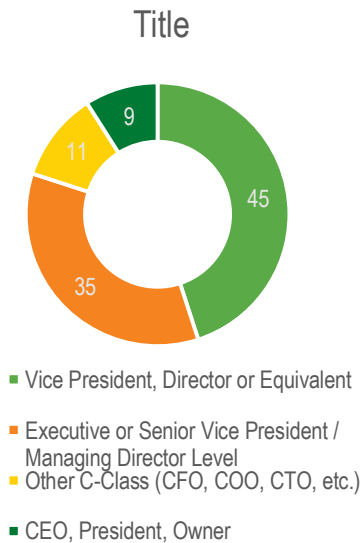
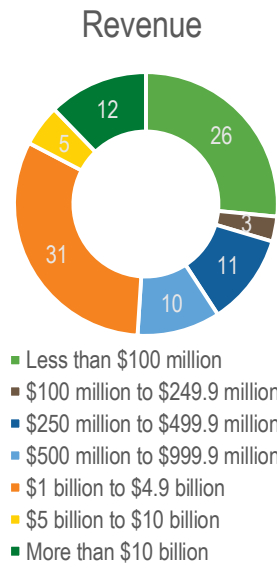
The Consumer is changing but **supply chains have not scaled...**



**...innovation** is helping to **transform the supply chain and consumer experience.**

# Secular trends from the Consumer are starting to impact supply chain procurement - “Feed the Changing Consumer” – “Customers” are Starting to Invest in this Arena

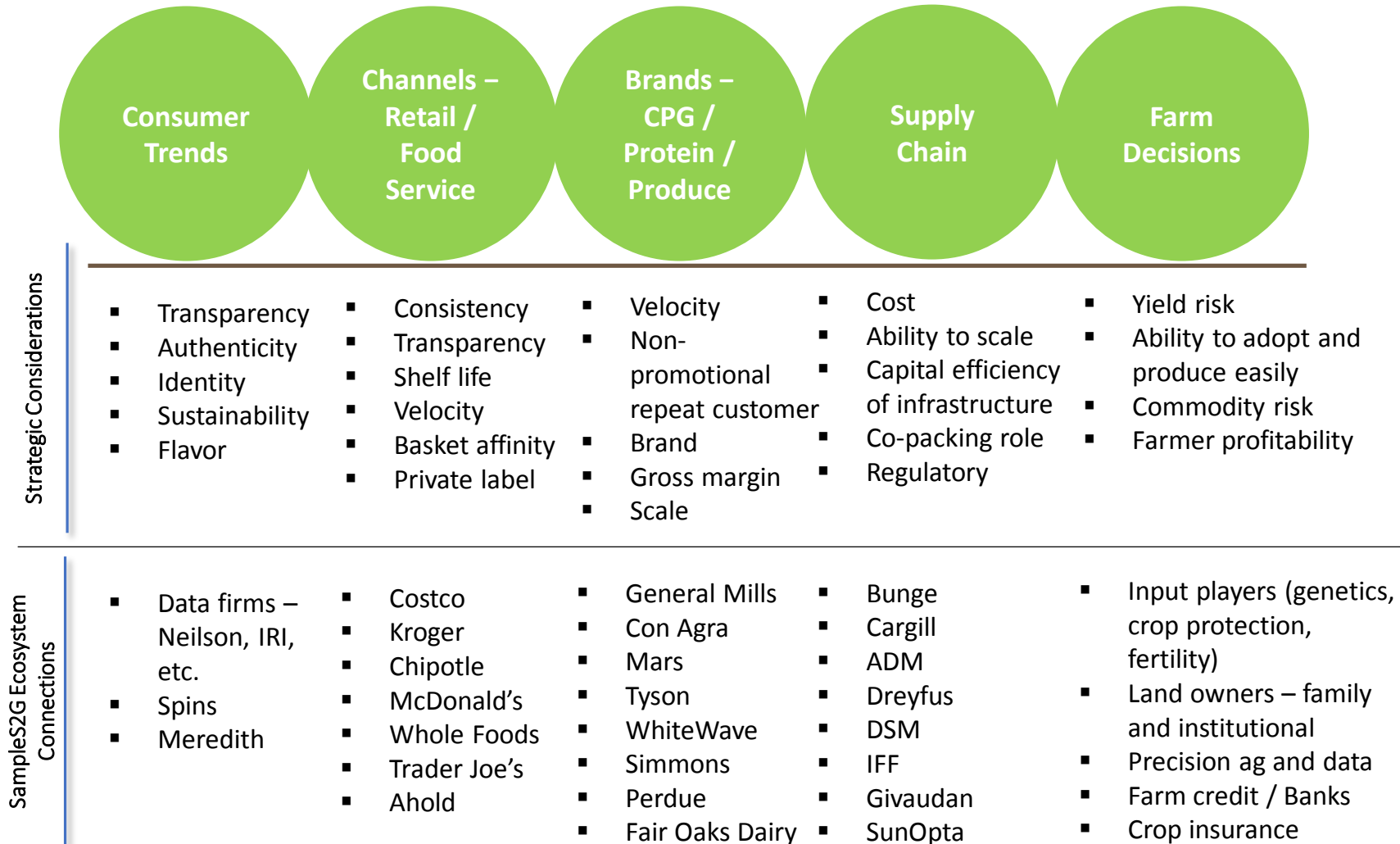
KPMG’s Food, Drink and Consumer Goods Survey Reflects the Viewpoints of 100 Senior US FDCG Execs



A new product is only as good as the supply chain that supports it. Not only do FDCG companies need to deliver enticing products that meet customer demand, but they also need to distribute them efficiently to reduce operating costs and create the shopping experience today’s empowered consumers expect. As such, many FDCG organizations are focused on optimizing their supply chain—including product launch planning, product processing, and product delivery—to be able to execute product launch strategies flawlessly. Indeed, as speed-to-market pressures increase in the FDCG industry, the back end of the supply chain is becoming as critical to a new product introduction as R&D and engineering processes, and is therefore calling for increased investment. FDCG companies,

- In a survey of 100 senior US food and consumer executives, nearly 50% of respondents stated that their supply chain needed to be more effective and enable their “right product, right time and right place” strategy
- Example -- McDonald’s : With nearly 15,000 stores in the US, decided to change its chicken sourcing via Tyson’s. The poultry sector will need to change its production and this change may have an impact at the farm gate level

## However, from consumer trends to actual farm decisions, not a straightforward path today

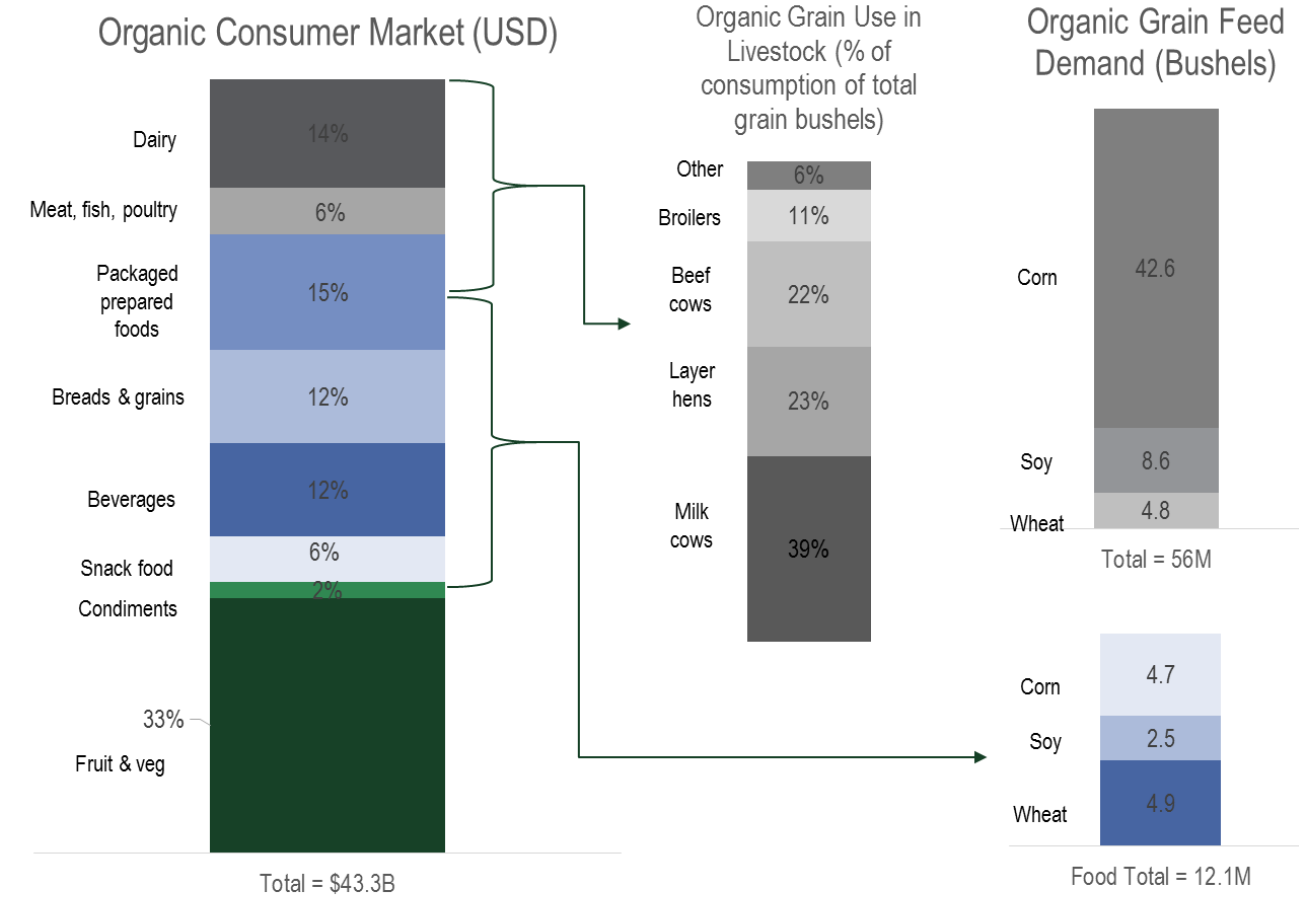


## Production agriculture and consumer trends – 1.0 is organic...

While production ag starting to pay attention to consumer trends..

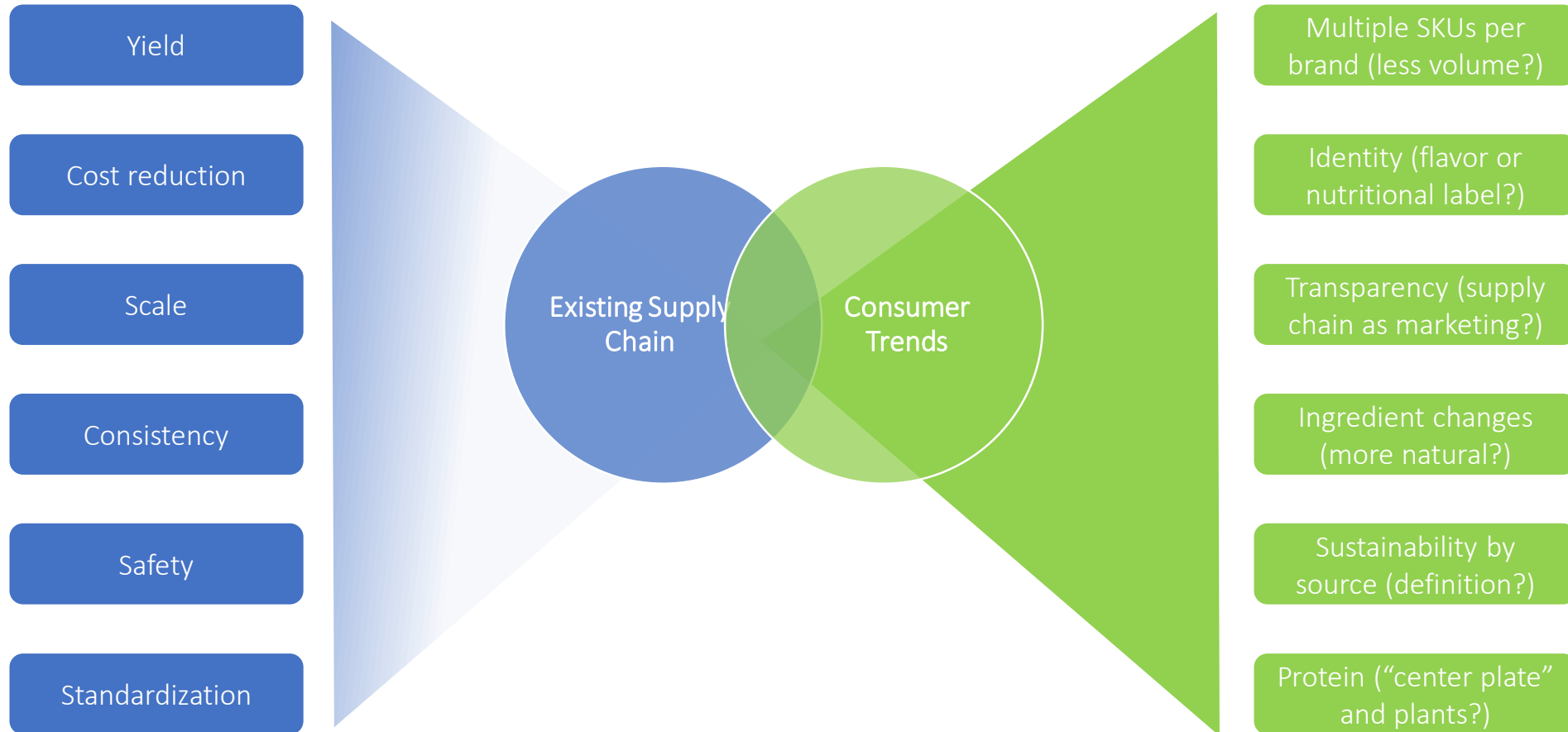


...it is often viewed an organic story



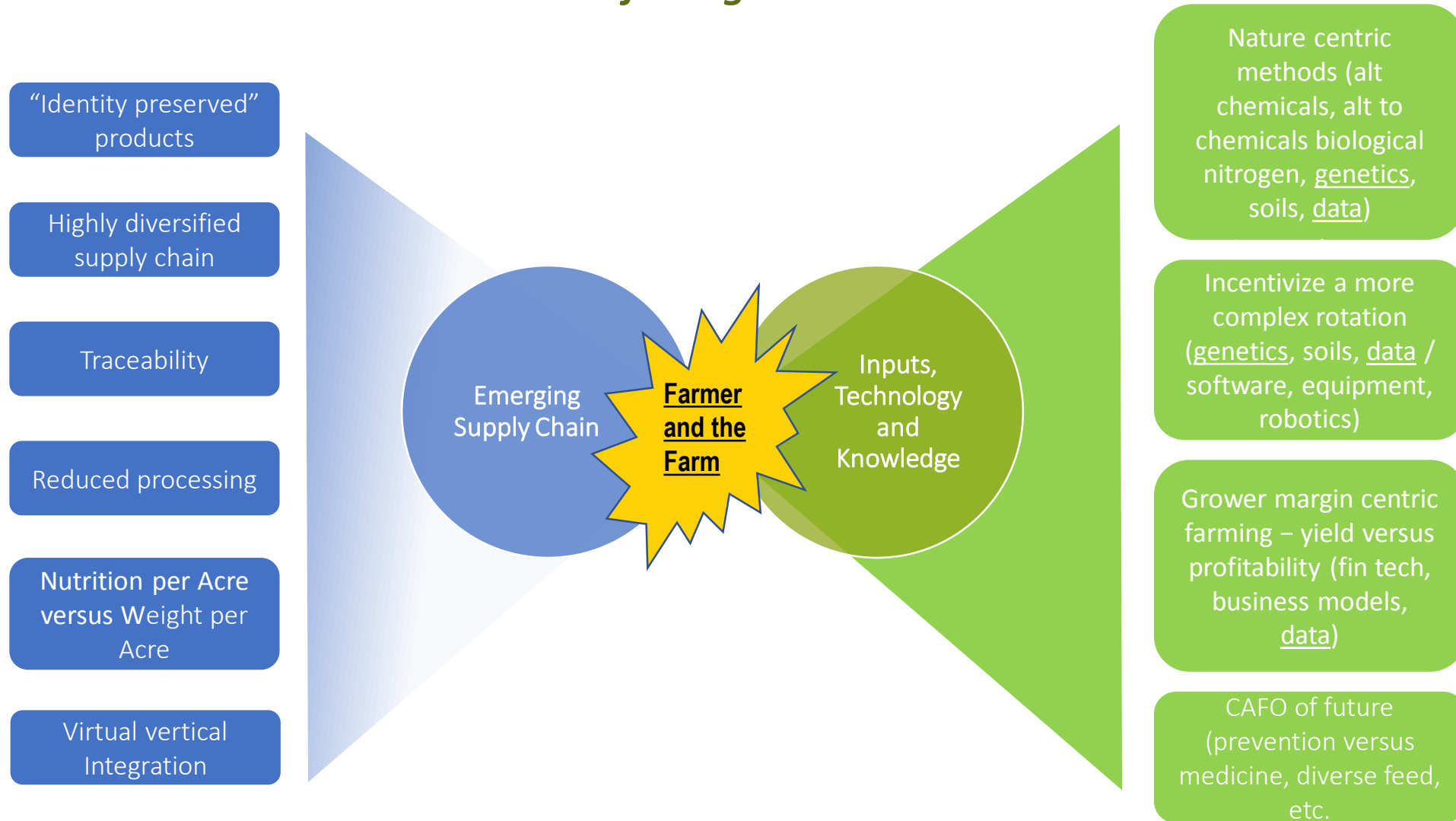
Source: OTA, Mercaris

*...however, these niche consumer trends go beyond organic or non-GMO*

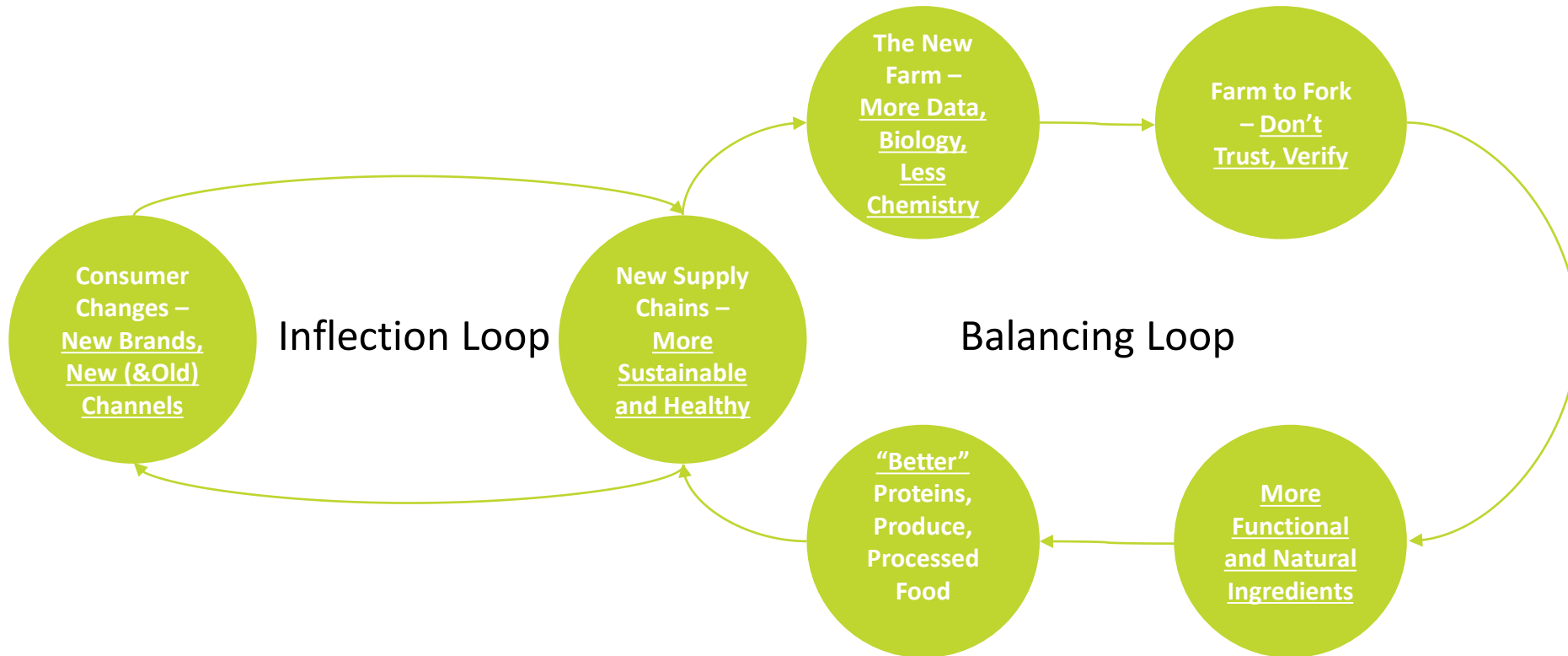




*To scale some of these niche trends, new toolkits will likely need to be deployed in the supply chain or farm gate*

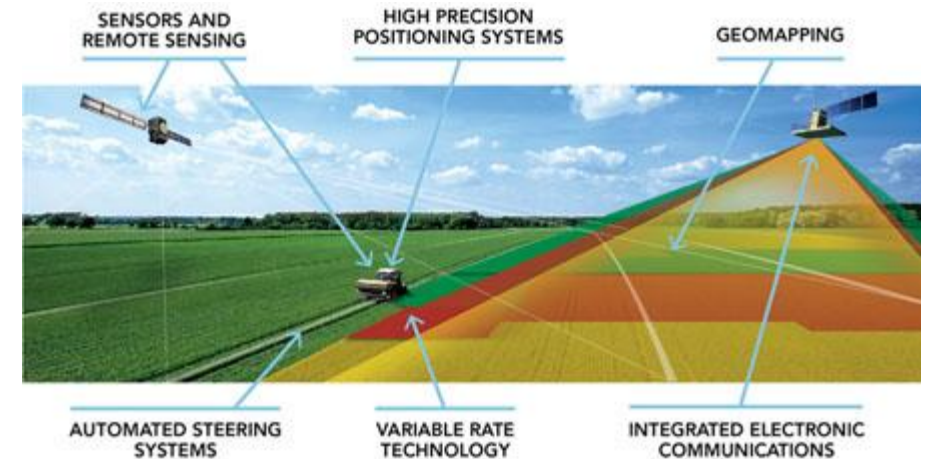


***These supply chains will emerge – catalyzed by a new consumer but scaled via new innovations and business models***



## The Farm: Data Poor to Data Rich with Precision Ag

- **High precision positioning systems** (like GPS) are the key technology to achieve accuracy when driving in the field, providing navigation and positioning capability anywhere on earth, anytime under any all conditions. The systems record the position of the field using geographic coordinates (latitude and longitude) and locate and navigate agricultural vehicles within a field with 2cm accuracy.
- **Automated steering systems:** enable to take over specific driving tasks like auto-steering, overhead turning, following field edges and overlapping of rows. These technologies reduce human error and are the key to effective site management:
  - **Intelligent guidance systems** provide different steering patterns (guidance patterns) depending on the shape of the field and can be used in combination with above systems.
- **Geomapping:** used to produce maps including soil type, nutrients levels etc in layers and assign that information to the particular field location. (see picture on the left)
- **Sensors and remote sensing:** collect data from a distance to evaluating soil and crop health (moisture, nutrients, compaction, crop diseases). Data sensors can be mounted on moving machines.
- **Integrated electronic communications** between components in a system for example, between tractor and farm office, tractor and dealer or spray can and sprayer.
- **Variable rate technology (VRT):** ability to adapt parameters on a machine to apply, for instance, seed or fertilizer according to the exact variations in plant growth, or soil nutrients and type.



## The Farm: From Chemistry to Biology with Bio-Pesticides

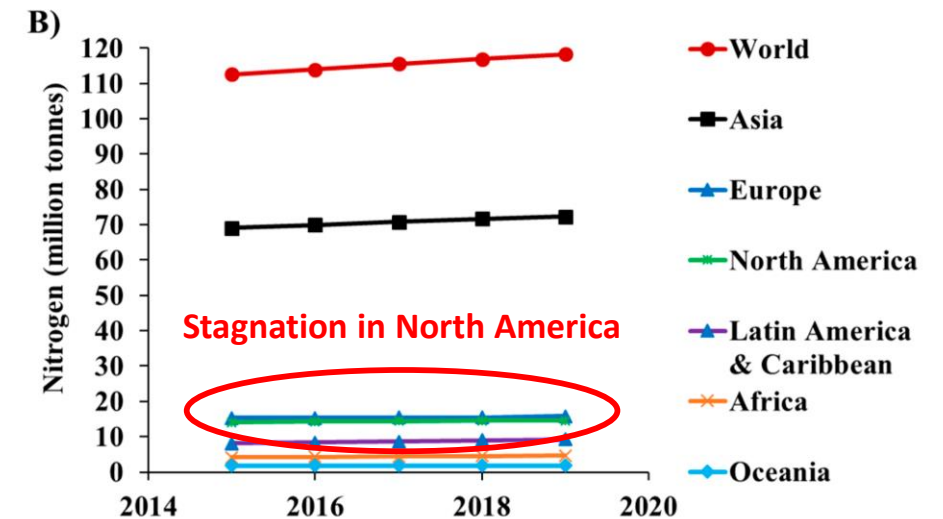
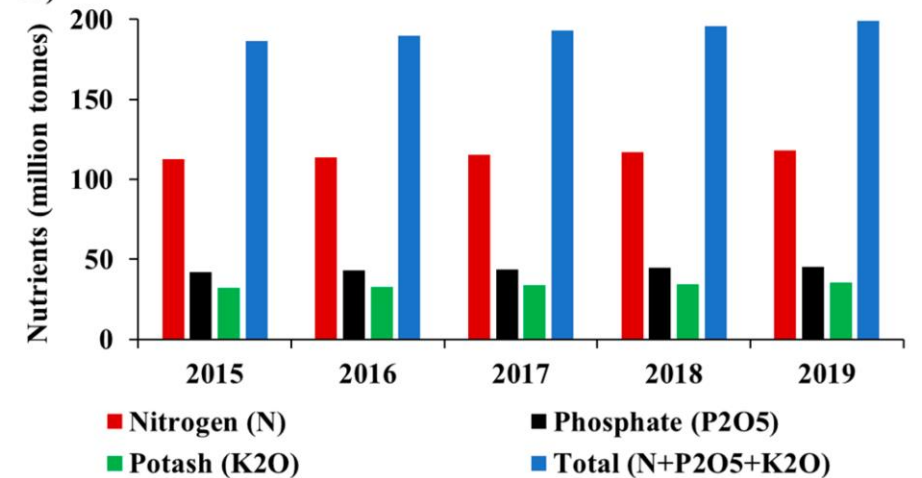
- Over **97% of pesticides globally are chemical**. However, **bio-pesticide** products represent a strong growth area in the global pesticide market, **growing at approximately 16% annually** compared to 7% growth of the total pesticide market
- **Chemical fertilizer use in the US is expected to stagnate over the next 3 years** due to consumer, grower and regulatory concerns regarding current pest management practices, pest resistance and food and worker safety.
- Major chemicals such as glyphosate (herbicide), atrazine (herbicide), chlorpyrifos (insecticide), and many others are constantly under review and face the risk of being phased out or outright banned if more environment-friendly alternatives are available

**TABLE 2 BIOPESTICIDES MARKET SIZE, BY TYPE, 2012-2019 (\$MILLION)**

Type	2012	2013	2014	2019	CAGR% (2014-2019)
Bioinsecticide	710.22	823.86	955.68	2,029.04	16.3
Biofungicide	684.54	794.06	921.11	1,956.07	16.3
Bioherbicide	15.83	18.37	21.31	44.89	16.1
Bionematicide	46.29	53.70	62.29	124.34	14.8
Others	91.88	106.58	123.63	215.54	11.8
<b>Total</b>	<b>1,548.76</b>	<b>1,796.56</b>	<b>2,084.01</b>	<b>4,369.88</b>	<b>16.0</b>

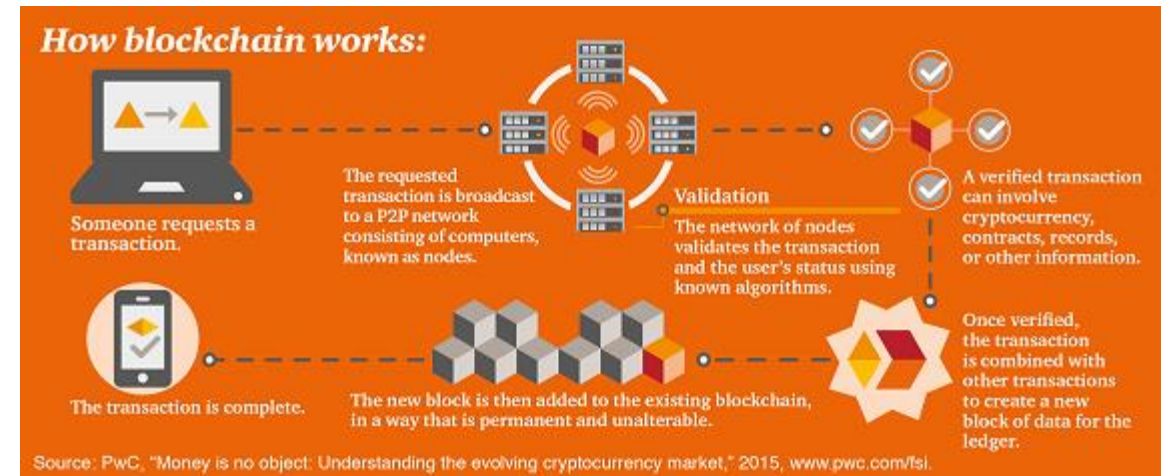
Source: Expert Interviews, Government Authorities, Related Associations/Institutes, Related Research Publications, Government Publications, and MarketsandMarkets Analysis

**A) Chemical Pesticide Usage by Type and Geography**



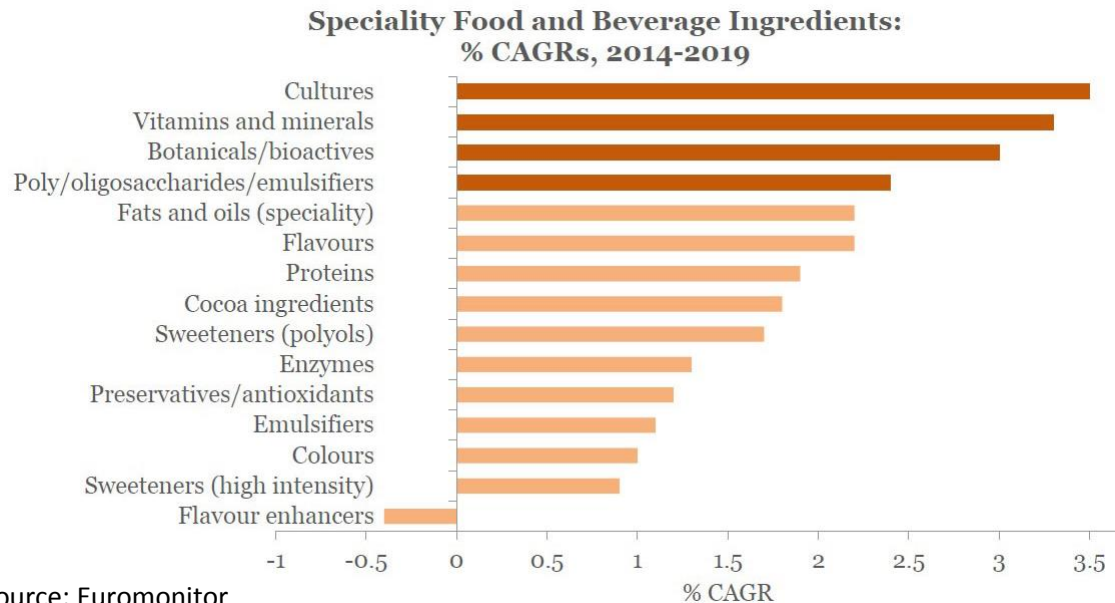
## New Supply Chains: Don't Trust, Verify

- **Blockchain technology** is a way of storing and sharing information across a network of users in an open virtual space. Blockchain technology allows for users to look at all transactions simultaneously and in real-time. Additionally, since transactions are not stored in any single location, it is almost impossible to hack the information.
- In food, for example, **a retailer would know with whom his supplier has had dealings.**
- For consumers, blockchain technology can make a difference. By reading a simple QR code with a smartphone, data such as an animal's date of birth, use of antibiotics, vaccinations, and location where the livestock was harvested can easily be conveyed to the consumer.
- Food safety implications:
  - Blockchain makes a supply chain more transparent at an all-new level. It also **empowers the entire chain to be more responsive to any food safety disasters.** Massive organizations such as Nestlé and Unilever are considering blockchain technologies for that reason.
  - Walmart, which sells 20% of all food in the U.S., has just completed two blockchain pilot projects. Prior to using blockchain, **Walmart conducted a traceback test on mangoes in one of its stores. It took six days, 18 hours, and 26 minutes** to trace mangoes back to its original farm. **By using blockchain, Walmart can provide all the information the consumer wants in 2.2 seconds**



## New Labels : Ingredients, from Chemicals to Natural and Functional

- As consumers demand for natural and healthy products grows, natural and healthy ingredients are outperforming chemical and artificial counterparts:
  - 39% of U.S. consumers say they would switch to others that provide clearer, more accurate product information
  - 73% of consumers say they feel positively about brands that share the “why behind the buy” information about their products
  - 68% say they’re willing to pay more for foods and beverages that don’t contain ingredients that they perceive are bad for them
  - 53% of consumers say the exclusion of undesirable ingredients is more important than the inclusion of beneficial ingredients



Source: Euromonitor

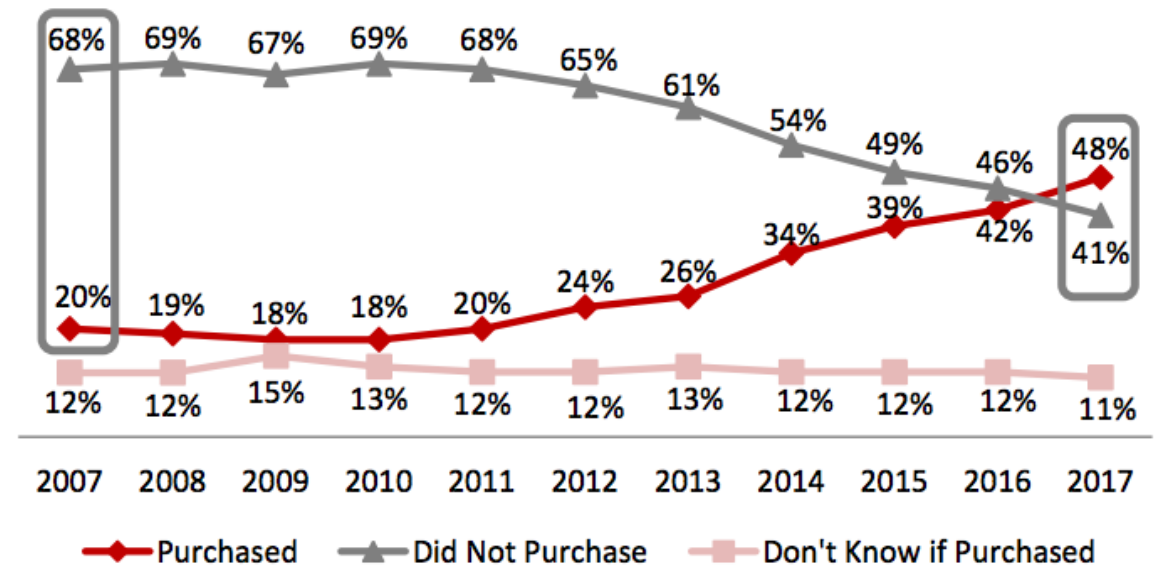
### Examples of innovation in natural ingredients:

- Glanbia Nutritionals’ **OptiSol 3000** is a **flaxseed-based egg substitute** for use in a number of other bakery applications
- Ingredion developed **Q-Naturale**. Primarily for use in natural beverages, Q-Naturale is extracted from South American Quillaja saponaria trees
- Hemp seed protein** is appearing in more products and offering a broader array of amino acids than other plant proteins
- Sacha inchi** is often referred to as the Inca nut or Inca peanut. Label Insight data indicate that 62 U.S. food and beverage products include sacha inchi
- Newly emerging, tiny **aquatic plants**—including Mankhai from Hinoman and Lentein from Parabel—are sustainable whole protein sources that can grow rapidly in all weather conditions
- Fermented steviol glycosides**, which are sourced from yeast and not stevia plants, is entering the sweetener market
- Another natural preservative, **celery powder**, is becoming more widely used after its successful use in meat products
- Comax Flavors recently introduced a line of **meatless flavor additives** for use in standard meatless products, as well as broths, sauces, marinades and dressings
- Ashwagandha** promotes physical and mental health, restores the body, and increase longevity used in sports drinks

## Old School Protein: Feedlot of the 21<sup>st</sup> Century, More Natural and Less Antibiotics For Animals

- For the first time in 2017, the **percentage of U.S. shoppers who have purchased "natural" or "organic" meat and poultry exceeded those who did not** according to a recent report by the Food Marketing Institute (FMI) and the North American Meat Institute (NAMI)
- U.S. meat departments in multi-store outlets sold \$43 billion worth of fresh beef, chicken and pork in 2016. Of that, **7.4% was comprised of sales of organic and natural meat**, or nearly \$3.6 billion.
- Grass-fed beef is enjoying a 25-30% annual growth rate, while sales of grass-fed yogurt and kefir have in the last year increased by over 38% according to SPINS
- U.S. **sales of fresh organic beef, chicken and pork** in 2016 were \$731 million, **up 23% in value and volume**, while **sales of "natural" fresh beef, chicken and pork** were \$2.9 billion, **up 11.5% in dollar value** and 14.6% in volume
- The **number one reason for buying natural and organic continues to be "free from" substances** shoppers want to avoid, predominantly mention antibiotics and hormones. That was followed by "perceived better treatment of the animals the meat came from."
- This is very much **driven by millennials**, who have an above-average likelihood of citing animal welfare and environmental concerns as reasons for buying natural and organic

Organic/natural purchases in the past 3 months

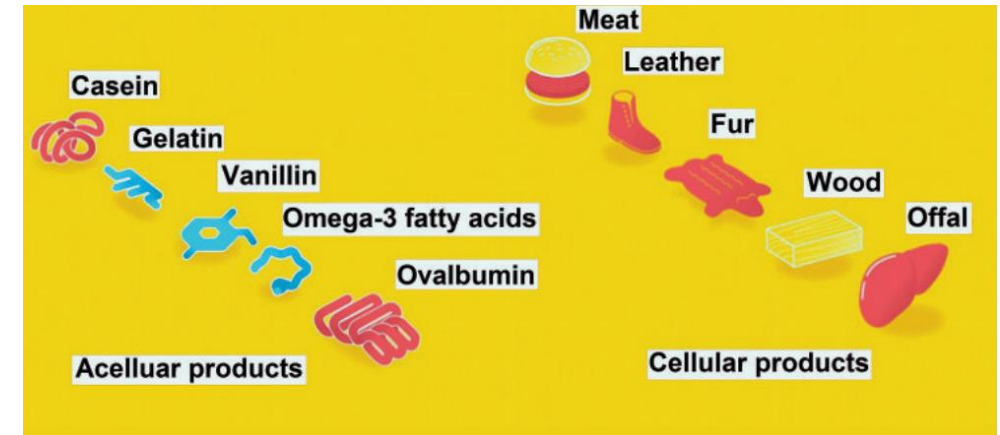


Fresh meat	Dollar size	Dollar growth	Volume growth
Conventional	\$31.9B	-4.0%	+1.9%
Natural	\$2.0B	+4.4%	+8.8%
Organic	\$474.7M	+13.1%	+9.6%
Antibiotic-free	\$926.5M	+10.8%	+14.2%
Vegetarian fed	\$819.7M	+13.4%	+11.5%
Grass-fed	\$288.2M	+15.9%	+20.3%
Free-range/vegetarian-fed	\$40.3M	+86.5%	+63.4%

Source: Food Marketing Institute (FMI) and the North American Meat Institute (NAMI)

## 21<sup>st</sup> Century Protein – Plant Based, Cellular and Who Knows

- **Cellular agriculture** is the production of agricultural products from cell cultures. It enables production of animal protein without the need to raise and manage livestock. There are two kinds of agricultural products:
  - **Acellular products** are made of organic molecules like proteins and fats and contain no cellular or living material
  - **Cellular products** are made of living or once-living cells. Cells from a particular species and tissue type are assembled on a scaffold (to grow on) with serum (food for the cells to feed on) in an environment that promotes growth
- Cellular agriculture has a number of challenges to overcome: developing a legal framework, foodtech startups' ability to produce on a large scale, project funding, consumer trust and media exposure
- **Fermentation** is one of the oldest scientific processes to be harnessed for food production, giving us alcohol, yogurt, kimchi, kombucha, and some pickled foods. Some forms of fermentation fall under the cellular agriculture umbrella as well
  - E.g. **cultured coffee**, in which the coffee beans undergo a secondary fermentation process “to precisely remove undesirable coffee flavor molecules while enriching interesting ones,” unlocking new flavors and improving digestibility. The resulting cup, the company says, is unlike anything else: extremely low in bitterness with shining fruity, floral, and chocolatey notes
- **Centuries-old techniques and microbial lineages are re-examined to coax out new flavors and foods in previously undiscovered ways**





## Produce Meets Material Science: Fresher Avocados, Less Food Waste

- Losses due to food waste are estimated to amount to more than **\$165 billion annually in the US alone**, and estimates suggest that as much as **\$38 billion of those losses come from post-harvest produce**
- Food waste is greatest in produce, with as much as **45-50% of fruit and vegetable production going to waste**. While a significant portion of losses is estimated to occur during the production phase, the **majority occurs after harvest**, including during storage, processing and packaging, distribution and retail, and at the consumer.
- Estimates of the addressable market for shelf life extension products are **~\$313 million in the US and ~\$3 billion globally**. These figures are derived from an analysis suggesting the market currently spends ~3.0% of the total production value of produce in the US and ~1.7% of the total global production value of produce on shelf life extension



### Old Technology: Thermal Preservation, Chemical Sanitizers

- Cold chain: postharvest deterioration can be controlled by reducing the storage temperature and respiration rate. Among the cold chain's primary functions is to slow ethylene activity in produce. Ethylene activity causes wilting, erosion of flavor and aesthetics, and ultimately leads to spoilage.
- Controlled atmosphere and modified atmosphere packaging: modification of the gas atmosphere surrounding the product which would improve stability and extend the shelf life of fresh produce
- Chemical sanitizers do not provide an efficient microbial reduction, besides being perceived negatively by the consumers, dangerous for human health, and harmful to the environment
- Irradiation (ionizing radiation) - treatment of food with x-rays or gamma radiation to kill bacteria and mold



### New Innovation: Packaging and High Pressure

- Innovative packaging systems: **Hazel developed an ethylene inhibition technology** to improve the efficiency of ethylene inhibitor delivery. **Apeel's products take plant materials** and extract all liquids from them to produce tiny pellets to **control the rate of water and gases that go in and out of produce**, thus slowing down the rate of decay
- High pressure processing (HPP): involves subjecting food to extremely high pressure, which kills most micro-organisms, by damaging cell components such as cell membranes
- Pulsed Electric Fields (PEF): When an electrical impulse is applied, the osmotic balance of the micro-organisms present is disturbed. If processing conditions are chosen correctly, micro-organisms are inactivated
- Others: Ultrasonication, Hydrostatic High Pressure, Micro Filtration, Cold Plasma

## Produce Meets Indoor Ag: Who Needs The Sun For Efficient Photosynthesis

- Controlled Environment Agriculture can be defined as a method of cultivating plants in an enclosed environment, using technology to ensure optimal growing conditions. The CEA cultivation process can be done in **virtually any form of contained area**. Moreover, by using this method food may be **produced at any time of the year**.
  - Hydroponics is an engineered way of cultivating plants that uses a soil-less growth medium and an optimized nutrient solution in order to deliver the calculated resources that a crop requires. Because of this, **plants are theoretically able to uptake the maximum amount of nutrients that they can**, in the most efficient way that they can, to achieve their best possible health and fastest growth
  - Photosynthesis takes light and co2 and converts to fuel (biomass) and the “waste” is oxygen. The process uses sunlight, co2, water, nutrients (breaks the water, creates a carbon molecule long chain (sugar, carb, et al)) and its waste product is oxygen.
- Controlled agriculture production is limited in the United States to date (less than 5% is non-land based). However, **as concerns build surrounding conventional field agriculture**, including its impact on topsoil degradation, water usage, and distance from urban centers, **CEA is increasingly being looked toward as a viable alternative for modern food production**.

### New Technologies



- Automated gutter moving greenhouses** produce vastly **more product per acre than land based agriculture – 20x-50x times more**. Growing systems recycle both water and fertilizers with a zero impact footprint to adjacent ecosystems
- Finishing rooms** plants are then taken into a fully enclosed and temperature controlled grow chamber where they are placed on flood and ebb benches under a calibrated and timed LED lighting array
- Nitrogen Cycle** in its greenhouse system in a dramatically accelerated way (hours and days as opposed to weeks and months) producing liquid nitrate for fast complete plant uptake of nitrogen through the closed loop irrigation system



- Photosynthesis acceleration** by deconstructing photosynthesis by isolating the light (wavelength) and changing the geometry of how you get the light into the organism (2D v 3D)
- The result is cheaper photosynthesis that is carbon neutral or negative and a process that emits excess oxygen into the climate. The **uptake of photosynthesis in a plant grows from 8-15% to 80-90%**

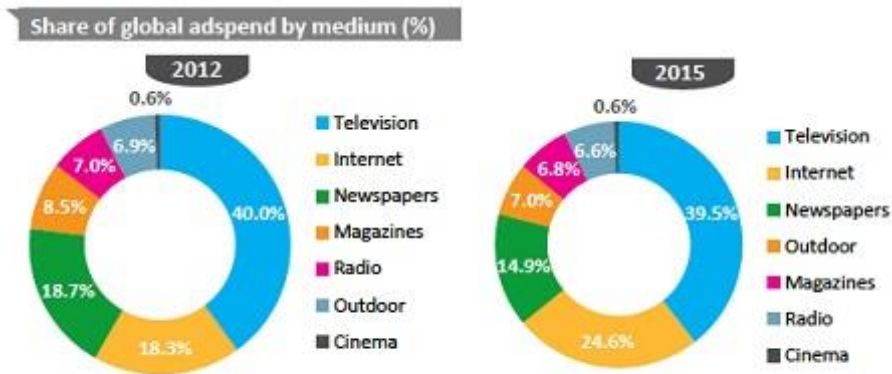
## The Digital Channels: Scope for Mass Customization

- **Mass customization** combines the personalization and flexibility of custom-made business manufacturing and takes it to another level of mass production, which offers a lower unit cost.
  - It creates new opportunities for companies to distinguish their products from others and command a price premium.
- Satisfies desire within our hyper industrialized food system to have something that feels like it meets personal taste profile
- **Ordering food digitally** also makes it easier for people to customize what they eat—you can build your own pizza on many pizza company websites, and add toppings or sides or write special notes to the restaurant on GrubHub or Seamless
- Rise of **fast-casual restaurants**, like Panera, Chipotle, and Sweetgreen, which allow you to **create your own combo**, burrito, and salad, respectively. Places like these walk you through the customization process without subjecting you to lengthy fine-print menus.



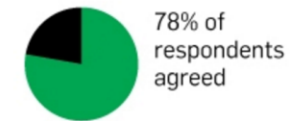
## The Brand: More Digital, More Data Driven

- The democratization of digital channels as mediums of brand building is significant. The barriers to entry are significantly down (or non-existent)
  - Instagram** allows you to start a promotion using recently snapped pictures for as low as **\$5 to reach an estimated 10,000 people**
- Studies show that between 70-80% of people research a company online BEFORE visiting the small business or making a purchase with them
- Almost **90% of marketers say their social marketing efforts have increased exposure for their business**, and 75% say they've increased traffic
- 32% of small businesses invest in social media marketing only**, 25% of small businesses invest in online marketing, 17% are investing in search engine optimization (SEO)



Source: ZenithOptimedia

### Marketing Is Expected to Undergo Radical Changes Over the Next 5 Years



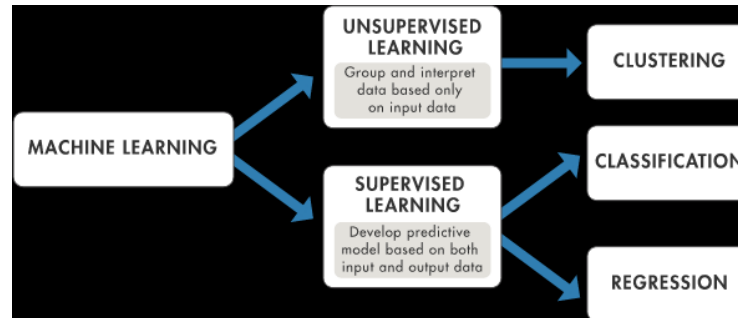
#### What will those changes include?

- Digital will account for more than 75% of marketing budgets **37%**
- Mobile specifically will account for more than 50% of marketing budgets **35%**
- Earned media will be more important than paid and owned media **27%**
- Marketing campaigns will begin unfolding in real time **32%**
- Analytics skills will become a core competence in marketing **42%**

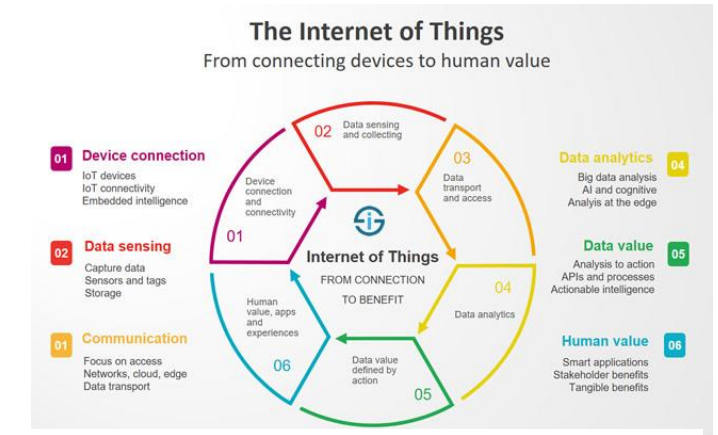
# Finally, Other Secular Trends Like IoT, Machine Learning and Gene Editing Impacting Food and Ag

- **Internet of things (IoT)** is network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and network connectivity which enables these objects to connect and exchange data
- IoT is an essential driver for customer-facing innovation, data-driven optimization and automation, digital transformation and entirely new applications, business models and revenue streams across all sectors

- **Machine learning** is a field of computer science that gives computers the ability to learn without being explicitly programmed
  - Machine learning algorithms use computational methods to “learn” information directly from data without relying on a predetermined equation as a model. The algorithms adaptively improve their performance as the number of samples available for learning increases.



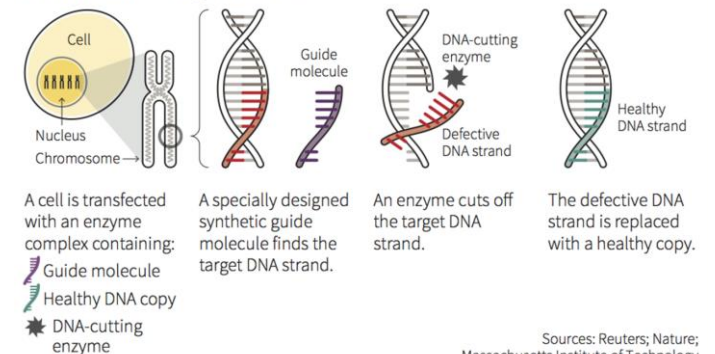
- **Gene editing:** CRISPR is a technique that allows scientists to make precision edits to any DNA, whether bacterial or human. Scientists are now able to take the CRISPR system's ability to cut, copy, and replace pieces of DNA and use it to their own ends, applying it to virtually any DNA
- The potential for this technology is huge: **if scientists have the accuracy to replace just a few faulty genes, it might be possible to cure genetic disorders**



## DNA editing

A DNA editing technique, called CRISPR/Cas9, works like a biological version of a word-processing programme's “find and replace” function.

### HOW THE TECHNIQUE WORKS



Sources: Reuters; Nature; Massachusetts Institute of Technology

W. Foo, 24/04/2015

# Table of Contents

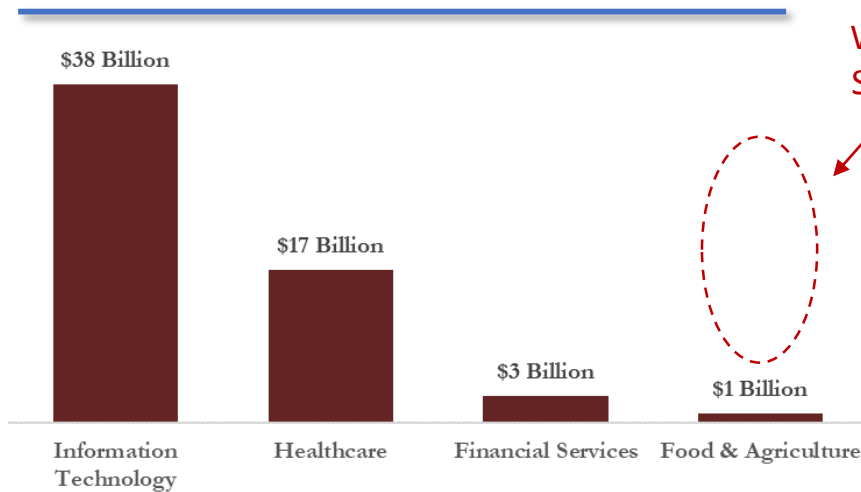
- Consumer Is Driving Change – Why, What and How
- **Capital Markets Context – Ag and Food VC**
- System Investing Approach – Why, What, How
- Appendix

# Food and Agriculture Remain Underinvested Sectors Relative to GDP

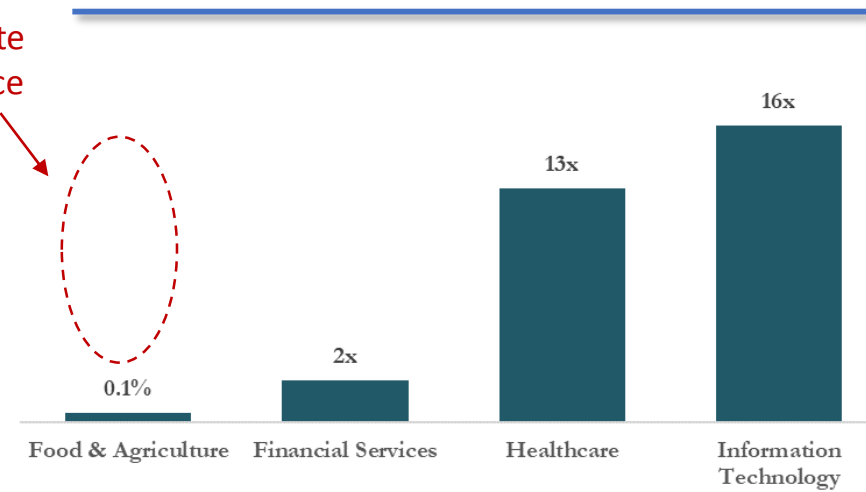
*Early stage risk has significant catch up in order to reach levels seen in adjacent venture backed sectors*

- Estimates peg US Food and Agriculture at contributing 6.5% of GDP (~\$1.2 trillion)
- Despite increased interest in inflection across the food and ag supply chain, early stage risk capital in the sector materially lags that of other typical “venture backed” sectors
- Latest data shows an order of magnitude increase would be needed to bring food and ag venture investment to levels seen in healthcare and information technology sectors

Risk Capital Invested by Sector (2016)



Risk Capital Invested as a Share of GDP (2016)



# Food and Agriculture is an Immature Asset Class with Very Little Risk Capital and a Different Intensity of Portfolio Construction

	Food and Agriculture Venture Capital	Traditional Venture Capital
Oldest Fund	\$75 million (2006)            \$32 million (2006)	Founded in 1911            Founded in 1965
Total Invested Capital in 2016	<ul style="list-style-type: none"> <li>\$1.1 billion</li> </ul>	<ul style="list-style-type: none"> <li>\$69.1 billion across ~7,750 companies</li> </ul>
Total Dedicated Funds		<p><i>Approximately 2,200 traditional venture capital funds</i></p>
Market Adoption and Financial Returns	<ul style="list-style-type: none"> <li>Market traction in ag tech can take five to seven years, meaning VC-funded ag tech companies are under pressure to sell out early or get shut down by the VC that control its boards</li> </ul>	<ul style="list-style-type: none"> <li>Built on 10-year funds that must exit via an initial public offering or acquisition within that 10-year life to deliver a financial return</li> </ul>
Relative Market Sizing Metrics	<ul style="list-style-type: none"> <li>Big food and agriculture's total market capitalization as a percentage of the S&amp;P 500 represents approximately 6.75%; however, food and agriculture remains comparatively undercapitalized with \$1.1 billion in 2016</li> </ul>	<ul style="list-style-type: none"> <li>The S&amp;P 500 Technology index as a percentage of the S&amp;P 500 represents approximately 24.0%, technology represents a significant amount of venture capital investments</li> </ul>



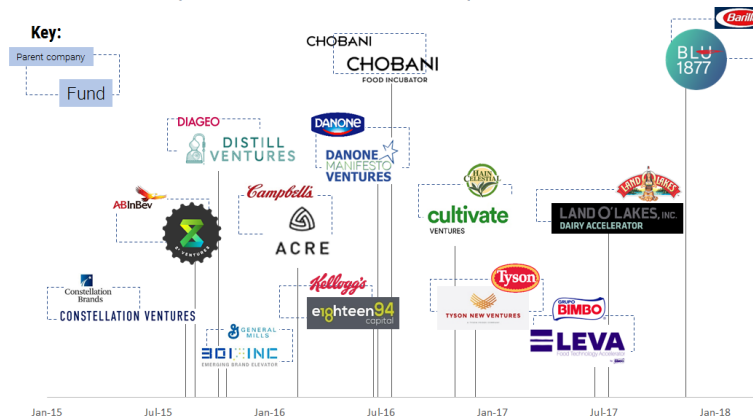
# However, Investor Participation in Food and Ag is Rising, Especially Among Corporates

*However, few institutional investors are mission oriented, focusing on sustainability and impact*

- Domino effect of leading global food and agriculture companies establishing venture funds, accelerators, or incubators
- As of H1 2017, AgFunder reported that there were 24 corporate agrifood VC funds – managed internally or launched with the company as the sole LP (investor) and other investment initiatives
  - Many are doubling down by quietly investing in venture capital funds to gain additional market insight and deal flow access
- There is an evident trend of new and unique investors, but still few institutional investors with domain expertise and mission focus

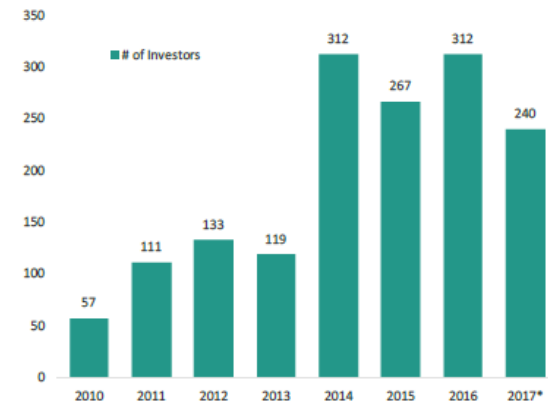
## Major food companies' investment vehicles

A timeline of recently launched venture funds/incubators by date of initial announcement



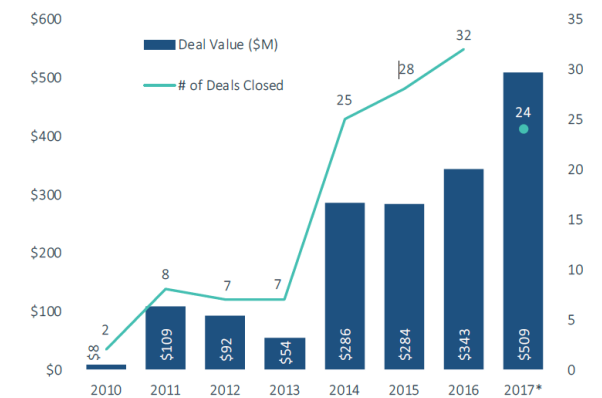
Source: Pitchbook and CB Insights

## Unique investors (#) in agtech



Source: PitchBook  
\*As of 8/25/2017

## Agtech VC activity with corporate venture participation

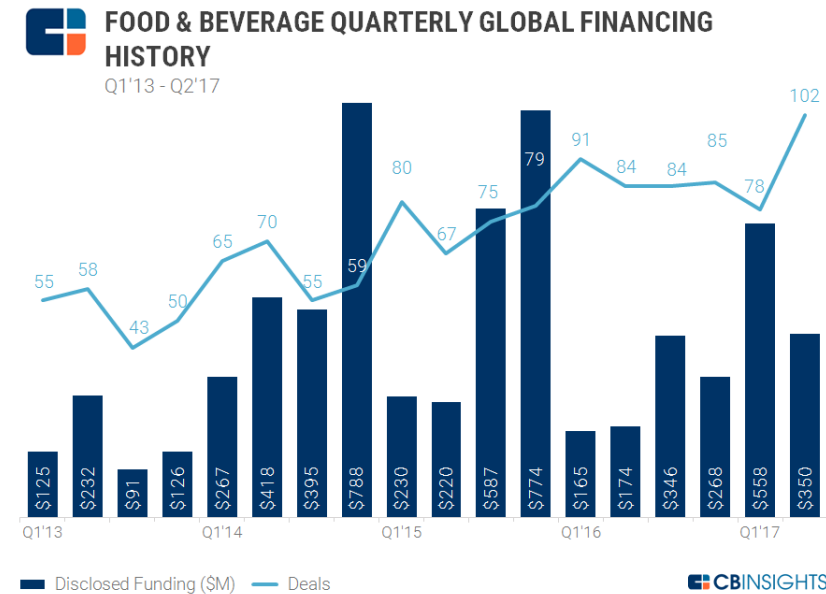
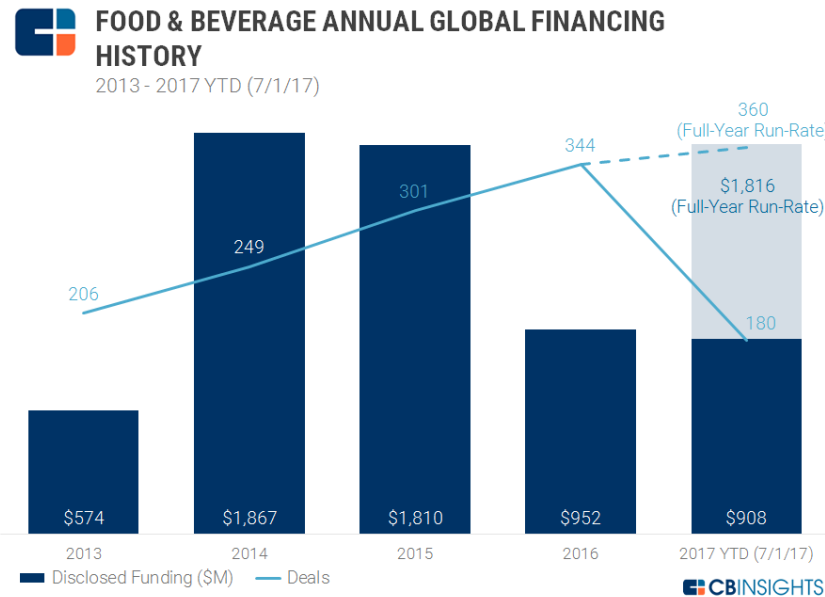


Source: PitchBook  
\*As of 8/25/2017

# Interest is Climbing in Both Sectors – Food

*Investments in private food and beverage companies hit an all-time high in Q2'17*

- According to CB Insights, “attracted by big exits, corporate activity, and new brands, the number of investors backing food & beverage startups has tripled in four years”
- Food and beverage companies attracted \$908M in disclosed equity funding across 180 deals in H1'17
- Q2'17 food and beverage deals jumped to a new high of 102, worth \$350M in aggregate disclosed equity funding

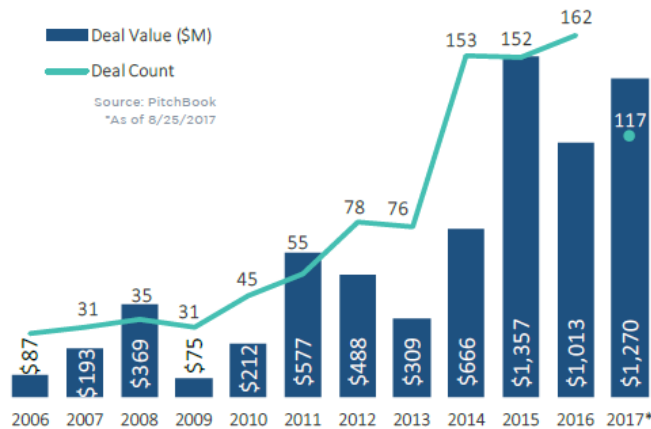


# Interest is Climbing in Both Sectors – Agriculture

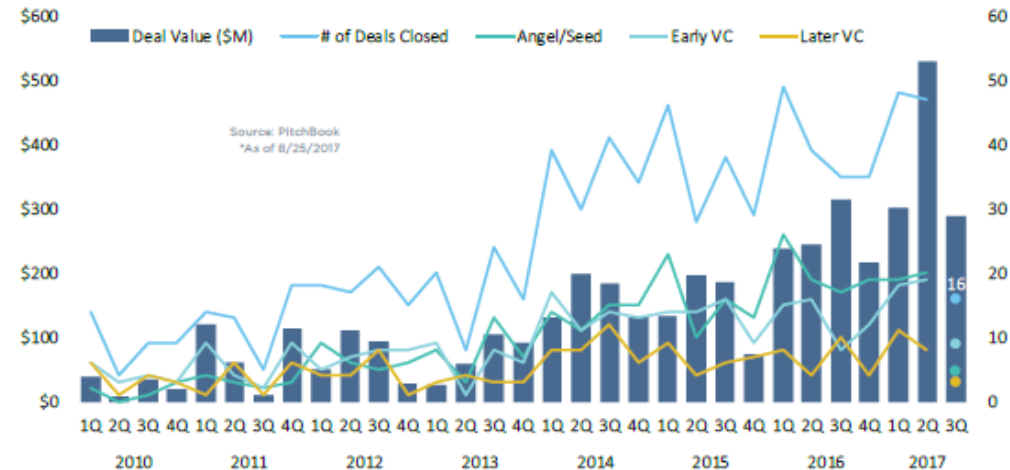
*Significantly growing interest in financing agtech from venture capital and private equity in the US*

- Monsanto’s acquisition of Climate Corp in 2013 is viewed by the industry as ground zero and the pace of investment has climbed since this point
- 2015 was a peak point setting a record of almost \$1.4 billion invested in agtech and 2017 is on track to surpass this record (data as of August 2017)
- US VCs committed a record \$530 million to agtech startups, representing 47% of global capital invested in agtech as of August 2017

Significantly growing interest in financing agtech  
Private investment (PE & VC) in agtech



Venture financing powering the industry  
Venture activity in agtech



Source: Finistere Ventures and Pitchbook

# Table of Contents

- Consumer Is Driving Change – Why, What and How
- Capital Markets Context – Ag and Food VC
- **System Investing Approach – Why, What, How**
- Appendix

# S2G Is Focused on Changing the US Food System via a System Investing Approach



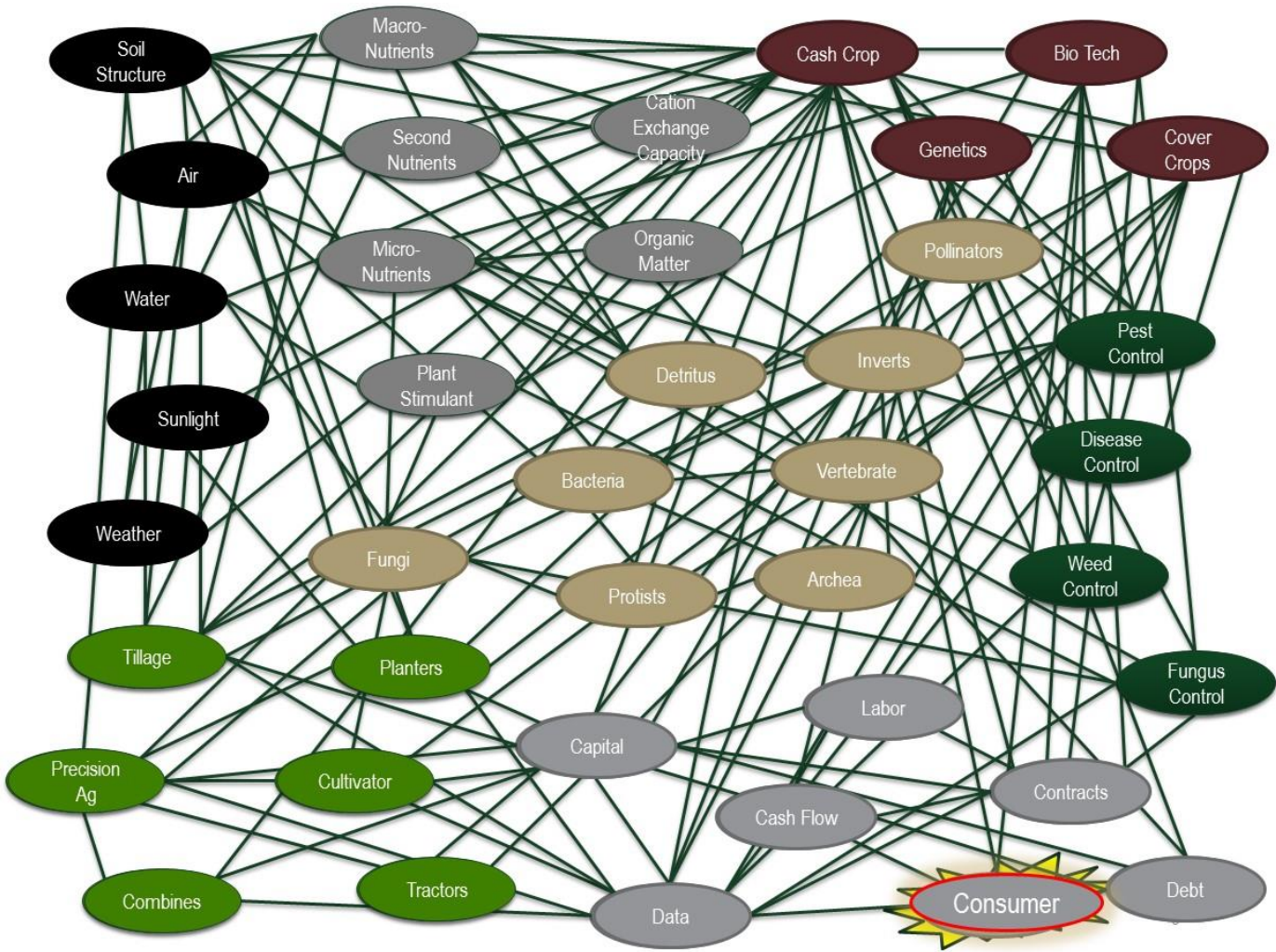
## S2G Is Focused on Changing the US Food System via a System Investing Approach (cont.)



## Investing the “physical world” is difficult, especially in “commodity like” sectors...

	<b>Physical</b>	<b>Digital</b>
Target sectors or theme	Calories, electrons, H2O and energy density (fuel)	Software, consumer internet
Industry Characteristics	<ul style="list-style-type: none"> <li>• Commodity markets – anchored around lowest cost</li> <li>• Tend to be more capital intensive</li> <li>• More seasonality and exogenous risks (weather, demand cycle, et al)</li> <li>• The channel is “physical” – relational and often regulated</li> <li>• Proving trust critical – will you be around? vicious cycle?</li> <li>• Switching costs are high – fixed asset deployed! churn low</li> <li>• Tend to be oligopolies or consolidated (regulated or not)</li> </ul>	<ul style="list-style-type: none"> <li>• End markets are varied – commodity or not</li> <li>• Capital intensity varies</li> <li>• Channels more digital</li> <li>• Less seasonality</li> <li>• Sometimes trust matters but a great killer app can go viral by 2 people in a garage</li> <li>• Can be oligopolies but tend to unregulated (higher cashflow, higher margin and more buying power)</li> </ul>
Investment Characteristics	<ul style="list-style-type: none"> <li>• Scarcity of risk capital</li> <li>• Limited bench of talent for start ups (many 1<sup>st</sup> time)</li> <li>• Margin profiles lower and hence make valuation more sensitive</li> <li>• Pool of exit limited</li> </ul>	<ul style="list-style-type: none"> <li>• Most VC investing focused on these sectors</li> <li>• Experienced talent available</li> <li>• Higher margins and potential for quicker viral effect can mitigate overpaying</li> <li>• Pool of exit varied</li> </ul>

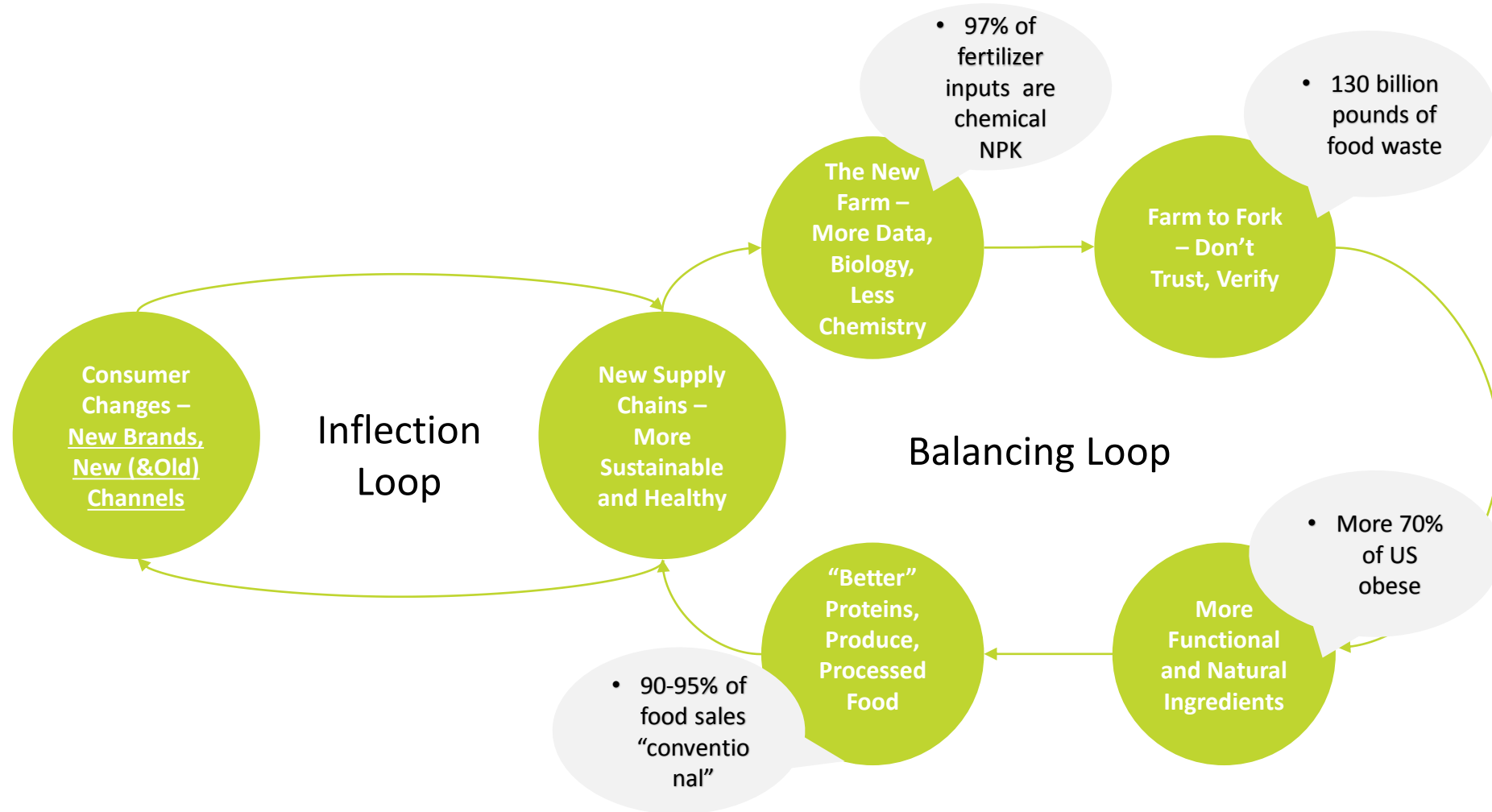
**As noted, many of the same issues exist in food and ag, although the consumer can propel change faster!**



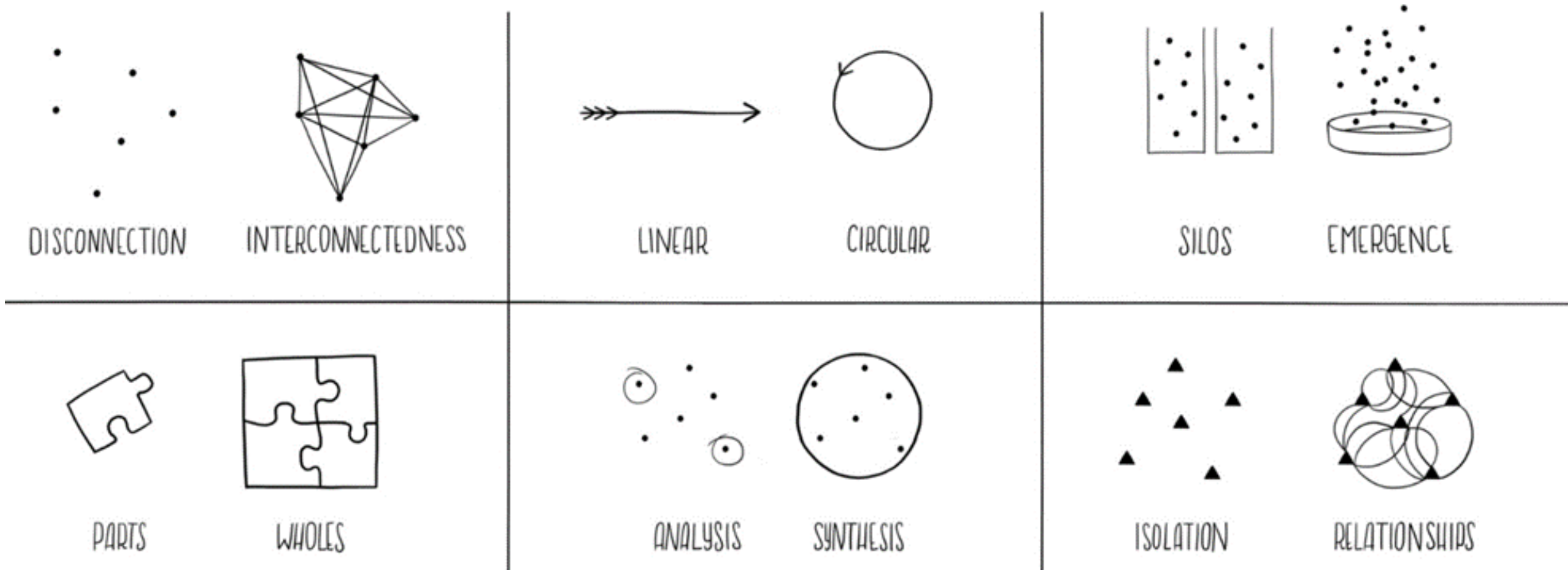
- Fragmentation in the Channel and value chain:
  - Farmers, Retailers, Consultants, Wholesalers, Incumbent input players and ag tech start ups
  - Inventory cycles, cost to acquire, cost to serve and non-digitalization of last mile complicate efforts (relationship driven versus data/transaction driven?)
- Principal – Agency issues across the value chain:
  - Owned v Leased Land – behavioral differences driven by duration of leases?
  - Crop Selection versus Merchandising/Logistics infrastructure – impact on farm gate pricing for crop output
  - Role of risk – ROI expectations vary, lenders and crop insurance incentives vary
  - Demographics - Risk appetite, change-over costs and uncertain financial returns cloud adoption cycle timing
- Cycle of change has an inertia to status quo?
  - Number of grow seasons needed to generate trust versus product innovation cycle versus customer adoption timing versus burn rate – recipe for limited cases of non-linearity?



## S2G's System Investing Approach : the Consumer can drive change, still hard though

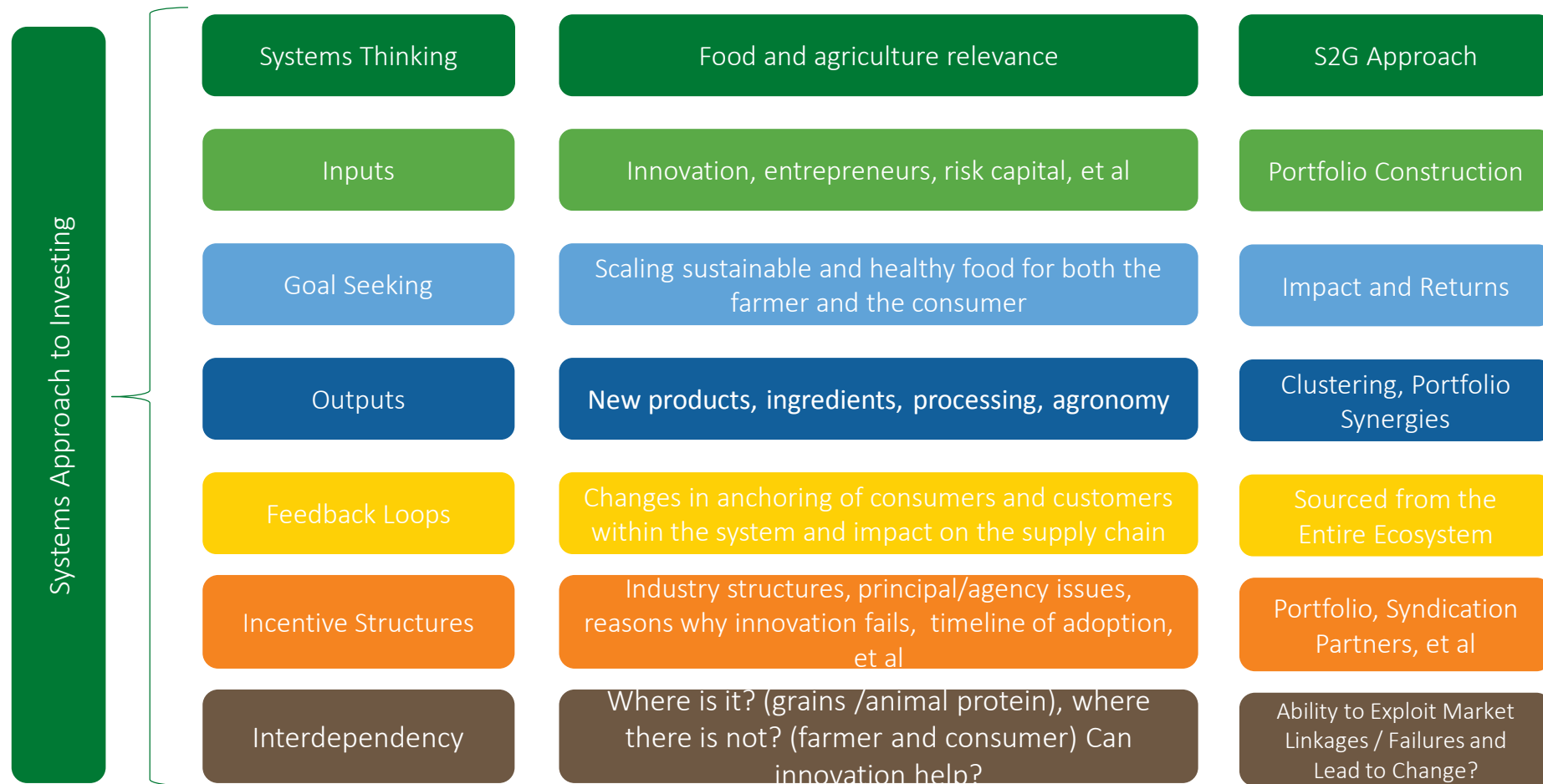


***S2G's "System Investing" Approach Have Been Borrowed From Systems Thinking Frameworks and Being Applied to Food and Ag VC Investing***



## S2G's System Investing Approach : how have we implemented it to date?

Examining the linkages and interactions between the elements that compose the entire system and invest where risk capital, innovation and entrepreneurs can influence changes



# S2G's System Investing Approach : Case Study of Encouraging Portfolio Synergy

One portfolio company's issue can be a purchase order for another

	sweetgreen	Shenandoah Growers	Shenandoah Valley Organic	Mercaris	MBA	Crop Pro Insurance	Terramera
	<b>Healthy fast-casual chain</b>	<b>Indoor organic herb grower</b>	<b>Organic chicken processor</b>	<b>Data and procurement of identity ag</b>	<b>Soil health, fertility and organic</b>	<b>Crop insurance (private)</b>	<b>Crop protection</b>
<b>Highlights</b>	<ul style="list-style-type: none"> <li>Rapidly growing fast casual salad chain</li> <li>Provides healthy, local and sustainable food at accessible prices</li> <li>Sophisticated approach to lifestyle branding</li> <li>~80 stores nationwide</li> </ul>	<ul style="list-style-type: none"> <li>Innovative herb company</li> <li>Proprietary and proven technology that allows for production of organic produce in a controlled environment</li> <li>Provides organic herbs at value prices</li> <li>Brand leader nationally</li> </ul>	<ul style="list-style-type: none"> <li>Branded and private label organic chicken processor</li> <li>Focus on chicken that is healthier for the consumer – antibiotic free and organic</li> <li>Unique “farmer owned” model offers an outsized opportunity for farmer profitability</li> </ul>	<ul style="list-style-type: none"> <li>Online trading platform for organic, non-GMO grains</li> <li>Market information for organic and non-GMO agriculture is currently sparse / out of date or unavailable</li> <li>Offers real time price discovery for participants in the supply chain</li> </ul>	<ul style="list-style-type: none"> <li>Pioneering biological farming business</li> <li>Uses a consultative, systems-based sales strategy to diagnose and treat farmland soil to enhance productivity by adopting and using its proprietary blend(s) of bio fertilizer products</li> </ul>	<ul style="list-style-type: none"> <li>16<sup>th</sup> licensed crop insurance provider in the US</li> <li>Focus on creating, unique and individualized insurance products that will help accelerate organic growth and better meet farmer needs</li> </ul>	<ul style="list-style-type: none"> <li>Offers high-performance organic bio-pesticides for agricultural applications</li> <li>Reduces grower losses from pests and diseases</li> <li>Increase crop yields more effectively than conventional chemical pesticides</li> </ul>
<b>Challenges</b>	<b>Need to scale up their supply chain</b>	<b>Certified organic sources of crop protection needed</b>	<b>Organic animal feed – need for higher volume and at affordable cost</b>	<b>Access to Farmers that will convert to organic in a “net short” climate</b>	<b>Growing their farmer base, especially via long term off-stake on for organic grains</b>	<b>Growing their farmer base, especially via offering <u>private</u> insurance products for ag tech adoption</b>	<b>Growing their farmer base, especially via long term off-stake on for specialty crops</b>

# S2G's System Investing Approach : Case Study on Clustering & Exploiting Interdependency

Produce has more interdependency than Corn/Soy – Fewer steps from the consumer and the farmer!



Produce is 4% of land and 25% of farm gate revenues

- Farmers have less seasonality (often plant multiples a year)
- Often have higher gross margin (can perhaps afford more innovation)
- Less principal agency issues (packer have more power to push change)
- Very sensitive to what retailers and food service demand (more than an Iowa corn farmer)

S2G Portfolio Clustered Around Produce



Strategic Bus Dev Partnerships

- Western Growers Association (WGA) is a 90+ year-old trade association representing family farmers account **50% of US Produce**
- S2G has a strategic alliance – S2G funds innovation, WGA has “trusted” and “direct” channel access (last mile) – entering the 2<sup>nd</sup> phase of collaboration

# S2G's System Investing Approach : Case Study on Exploiting Market Feedback Loops



## The Mission

- Produce meat that is better for human health, environmental health and animal health
- Sources the highest quality proteins without use of animal protein



### Feedback Loops from BYMT that helped Myco

- 2014, we learned from BYMT (and others) that soy was out of favor for consumers and retailers as plant protein
- 2015, Beyond Meat began sourcing Canadian yellow pea, predominantly from France. Supply was limited at scale and yellow pea presented issues with regard to formulation (S2G facilitated an introduction to BYMT team)
- 2016, Myco began to discover the potential for fungi based protein that was superior to soy and yellow
- 2017, BYMT interactions helped Myco approach the **positioning of their protein source from a nutritional, taste, formulation and even helped determine pricing**



### S2G's Connection (s) Creates Value for Myco but also for BYMT hopefully

- Myco's mushroom based protein isolate with superior nutrition to other meat alternatives. It is also easily produced at scale and could be valuable for BYMT's supply chain or for new product ideas. Also, Myco's investor group can help BYMT – Ajinomoto, Kellogg, Bunge, Conti Grain all have networks useful to BYMT
- BYMT could potentially gain a scalable and cost effective protein source early in commercial launch to get ahead of competition and provide differentiation in protein levels and label
- BYMT and Myco would not be collaborating without S2G having identified the system issue and potential for "Alpha"
- S2G can do the same for other ingredient, especially given brand and channel access (private label also):



## The Mission

- Uses myceliated agriculture (mushrooms) to produce novel and impactful solutions enabling healthier eating without compromise



# S2G's System Investing Approach : Case Study on Force Multipliers That Can Hopefully Help Multiple Companies in the Portfolio



21<sup>st</sup> Ag Tech Innovation – new genetics, biologics, fertility, IoT, et al

Frictions to getting on the Farm

Average age of the farmer is ~58

For many, farm incomes down 50% due to commodity price

One planting a year for most farmers – “one shot on goal”

Why improve land I don't own – 40% farmed on non rented acres for average one year lease

My lender wont give me a loan for working capital if I use this

A lot snake oil parading as innovation – no trust in start ups

Frictions are real and adoption cycles in ag tech can take up to 5-7 years – why most start ups are reliant on Big Ag for channel access



Crop Pro - market innovator via crop insurance with farmer financial protection for the new wave of ag technologies with proven Agronomic prescriptions producing higher yields and better results.

- Hi-Fidelity Genetics HFG
- Midwestern BIOVAG
- NewLeaf SYMBIOTICS
- Terramera
- ARABLE
- greenlight
- BENSON-HILL BIOSYSTEMS
- MERCARIS

## *S2G's System Investing Approach : Case Study on Thought Leadership - Helping General Mills, MBA and other Portfolio Firms*

### Background

- Beginning in 2015, S2G, Midwestern BioAg and others within S2G's network explored the opportunity to **directly operate and manage agricultural land on a long term basis**. During that exploration, a potential long term offtake agreement with General Mills (GM) emerged, resulting in the **acquisition of Gunsmoke Ranch by TPG** in August, 2017
- 31,000 farmable acres near Pierre, South Dakota - **transition from conventional to organic**
  - Long term offtake agreement with General Mills (Annie's) for wheat
- Long term contract with Midwestern BioAg and TPG for land management / MBA fertility program
- Expecting post transition profits of ~15% - 25% of land value
- GM is seeking increased access to organic grain
  - Offtake assurance supports corporate commitments and brand drivers related to organic and regenerative agricultural practices
  - Allow verification of regenerative practices that can be used as a brand/marketing tool
  - **Provide for farmer focused story – increased traceability/transparency** and brand building
- The agreements with MBA and TPG for the Gunsmoke Ranch operations provide proof of concept within GM, but are insufficient to meet larger grain purchasing needs
  - **Conversion of Cheerio's to organic would require estimated 2 million acres growing organic oats**
  - **GM has indicated an interest for 100,000 acres under long term offtake agreements by 2020**

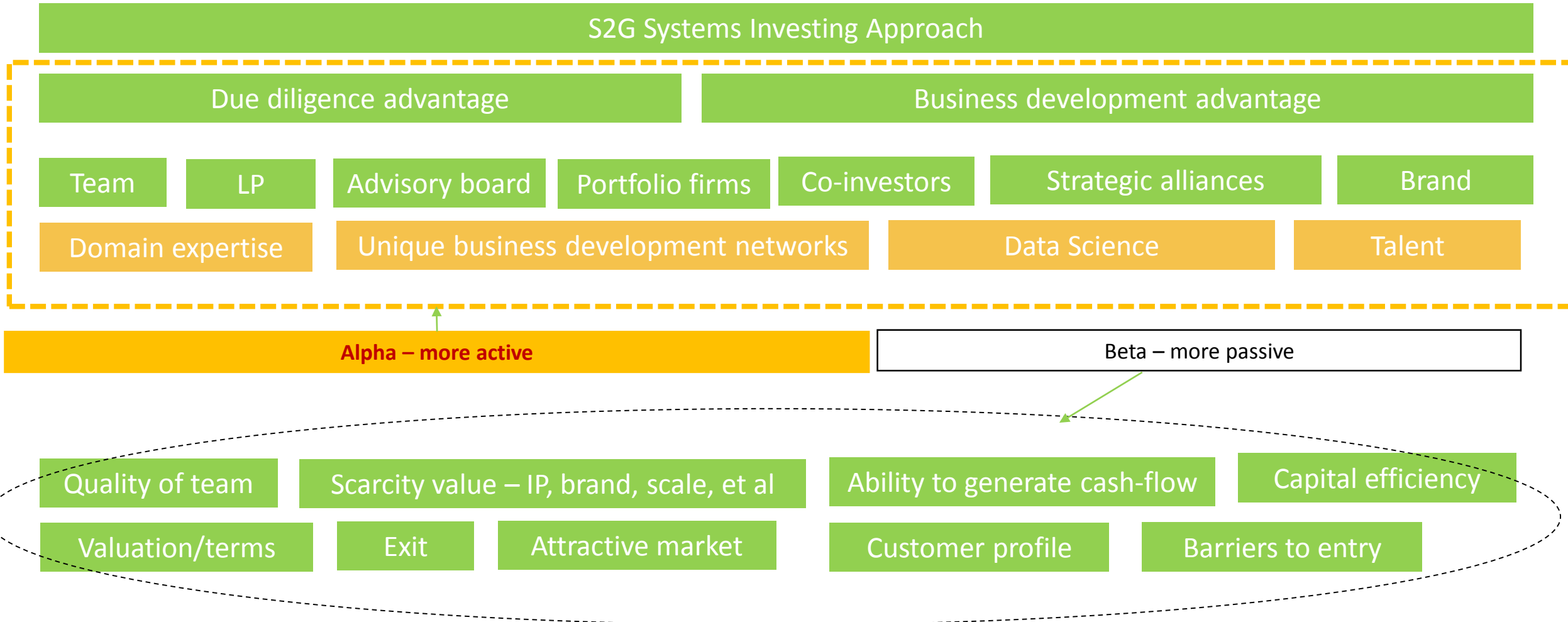


### General Mills Offtake

- 10-year contract post-transition (2020-2029 cropping years)
- 350,000 bushels of food grade hard red spring wheat (10,000 acres at 35 bushels/acre)
- GM must purchase all production up to 350,000 bushels; first option on any additional amounts
- Gunsmoke has no requirement to deliver a minimum volume



# Ultimately, System Investing is about an Active Approach to Building Due Diligence and Business Development Uniqueness for the Fund



***We still have a long way to go and the proof will ultimately in the Cash on Cash Returns and the portfolio impact on the Food System – Early Signals are Positive But Long Way To Go***

**Strong Results to Date**

Gross XIRR of ~22%

**Robust and High Quality Deal Flow**

Sourced 2,000+ deals across the food and ag sectors

**Extensive Co-investor Network**

Collaborative deal flow with ~110 funds and investors worldwide



**Investment, Advisory and Operational Team**

[150]+ years of experience in investing, food, agriculture and entrepreneurship

**~\$[500] Million Catalyzed**

Investments into 35 portfolio companies

# Table of Contents

- Consumer Is Driving Change – Why, What and How
- Capital Markets Context – Ag and Food VC
- System Investing Approach – Why, What, How
- **Appendix**