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United States Department of Agriculture

USDA's
93rd
Annual

Agricultural Outlook Forum

A New Horizon: The Future of Agriculture

February 23-24, 2017 • Crystal Gateway Marriott Hotel, Arlington, Virginia

Presentation from the USDA Agricultural Outlook Forum 2017

United States Department of Agriculture
93rd Annual Agricultural Outlook Forum
“A New Horizon: The Future of Agriculture”

February 23-24, 2017
Arlington, Virginia



The Future of Agriculture

Rajiv Singh

CEO, Rabobank North America Wholesale Banking

USDA Agricultural Outlook Forum

Washington, DC

February 23rd, 2017



Rabobank

Introduction to Rabobank Group



The world's leading Food and Agriculture ("F&A") bank

Size

- Among the world's largest banks
- 13.5% Tier 1 Ratio
- Nearly EUR 670bn in assets
- Over 1,300 offices in 40 countries
- 52,000 employees

Commitment

Dedicated focus on F&A

Cooperative structure encourages long-term relationships

Over 115 years financing agriculture

Expertise

- Bankers with local knowledge
- Specialists from "gate to plate"
- F&A Research and Advisory Group
- More than 80 F&A research analysts worldwide

Global presence

Rabobank Group

operates in 40 countries around the world with Rabobank and its subsidiaries

Argentina | Australia | Austria | Belgium | Brazil | Canada | Cayman Islands | Chile | China | Curacao | Czech Republic | Denmark | Finland | France | Germany | Hungary | India | Indonesia | Ireland | Italy | Japan | Luxembourg | Malaysia | Mauritius | Mexico | New Zealand | Norway | Poland | Portugal | Romania | Russia | Singapore | South Korea | Spain | Sweden | Switzerland | The Netherlands | Turkey | United Kingdom | United States

40

countries

Rabobank

Wholesale Rural & Retail

has offices in 661 locations in 30 countries

Argentina | Australia | Belgium | Brazil | Canada | Cayman Islands | Chile | China | Curacao | France | Germany | India | Indonesia | Ireland | Italy | Japan | Luxembourg | Malaysia | Mauritius | Mexico | New Zealand | Poland | Russia | Singapore | Spain | St. Maarten | The Netherlands | Turkey | United Kingdom | United States

30

countries

Rabobank Foundation

supports projects in 25 countries

Bolivia | Brasil | Cambodia | Colombia | Ecuador | Ethiopia | Ghana | India | Indonesia | Ivory Coast | Kenya | Laos | Mali | Mexico | Mozambique | Nicaragua | Peru | Philippines | Rwanda | Senegal | Sri Lanka | Tanzania | The Netherlands | Uganda | Vietnam

25

countries

Rabo Development

holds non-controlling interests in 8 partner banks and provides advice and support for various projects

Brazil | Cameroon | China | Ethiopia | Ghana | India | Ivory Coast | Kenya | Mozambique | Paraguay | Peru | Philippines | Rwanda | South Africa | Tanzania | Uganda | Vietnam | Zambia | United Kingdom | United States

18

countries

1

Setting the scene

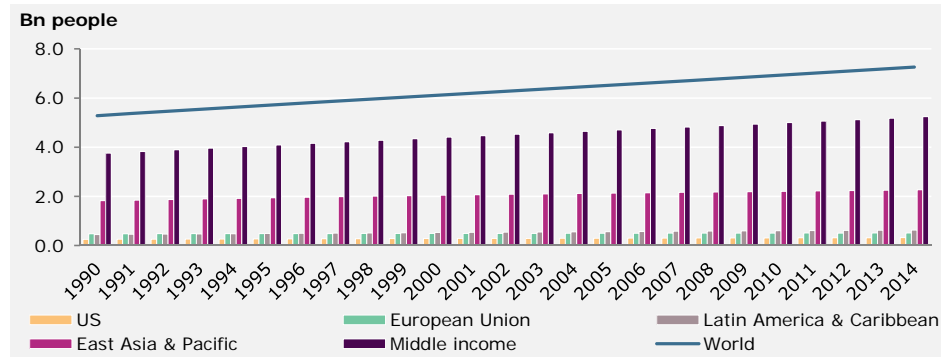


Rabobank

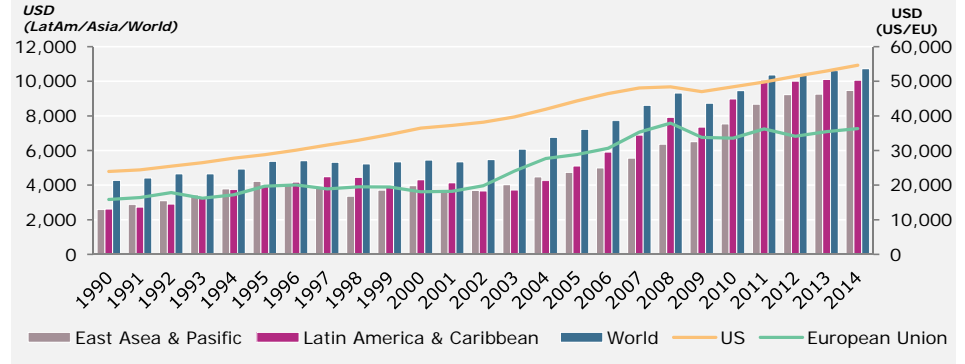


Agricultural production is driven by five key variables

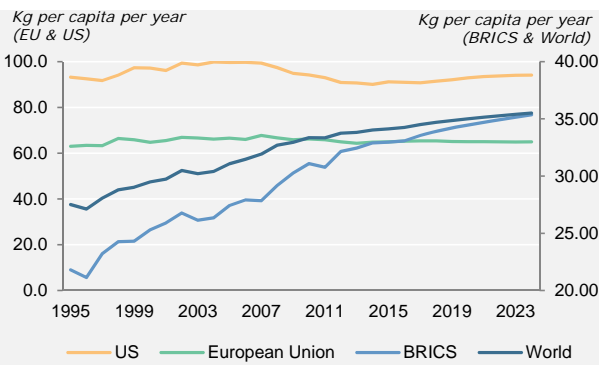
Growing global population



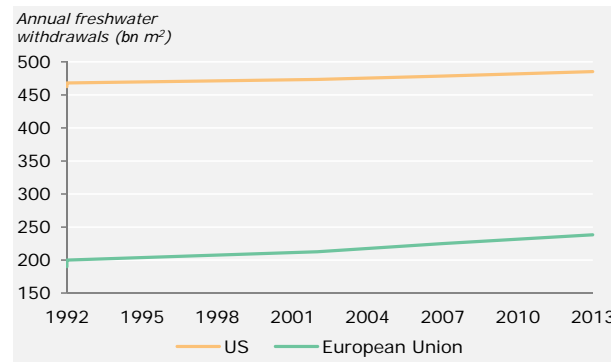
Increasing global wealth and urbanization



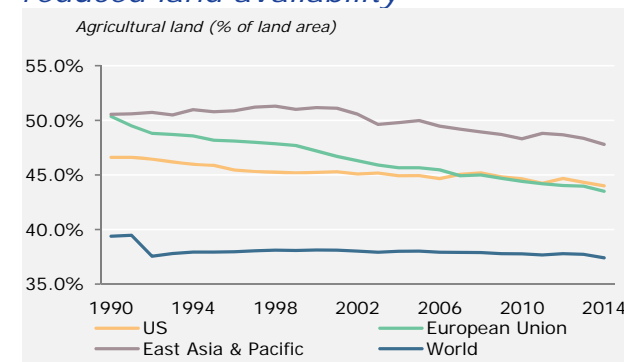
Increasing animal protein consumption¹



Climate volatility and water scarcity

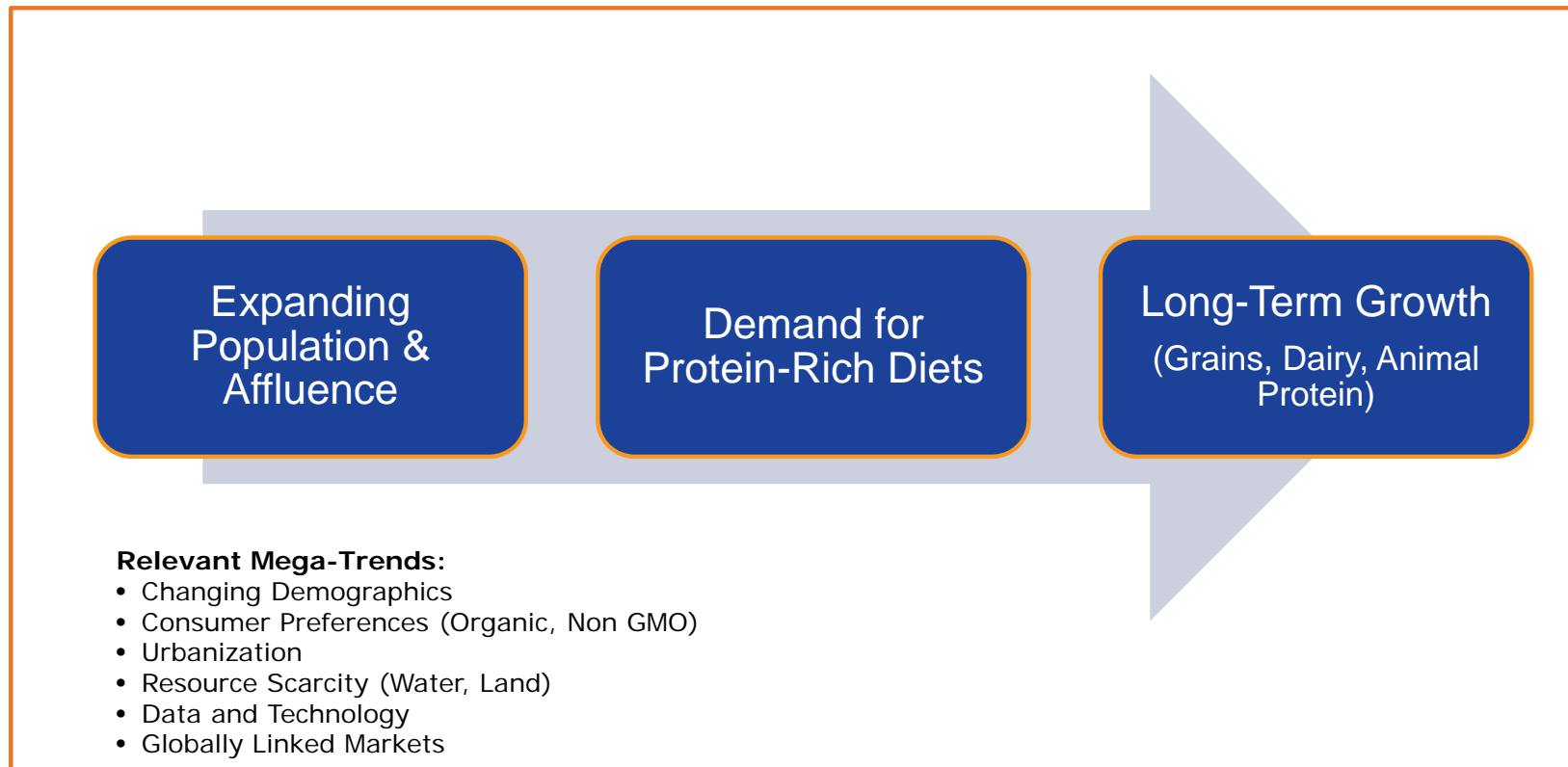


Need for yield improvement given reduced land availability



Sources: World bank, OECD, Note 1: cumulative consumption of beef, pig, poultry and sheep

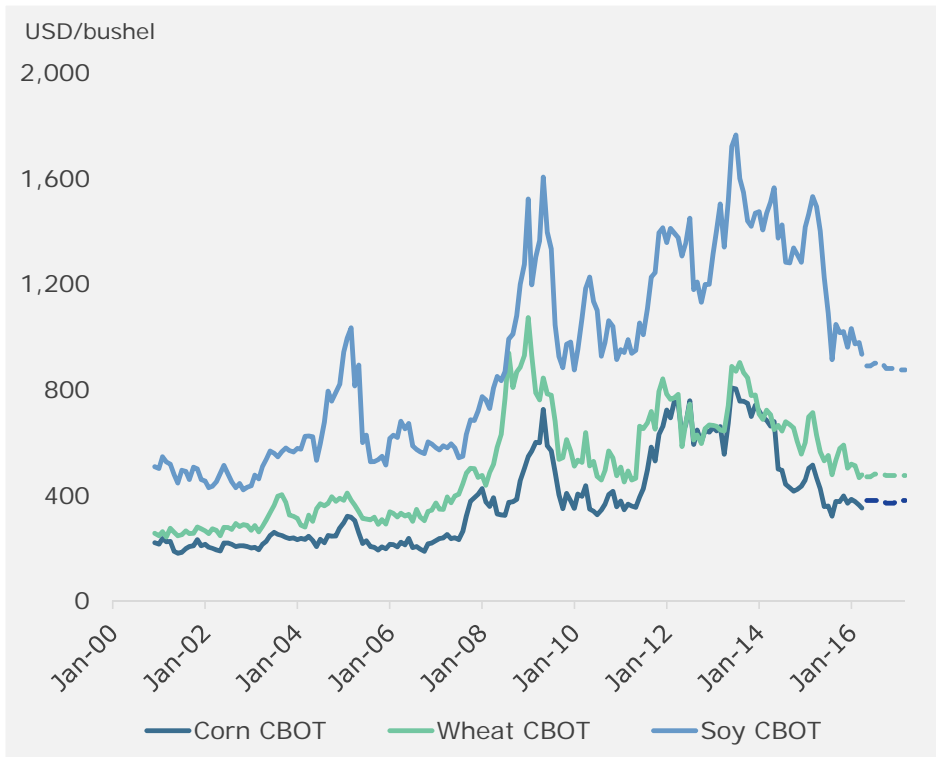
Several of these underpin the industry's long-term growth story



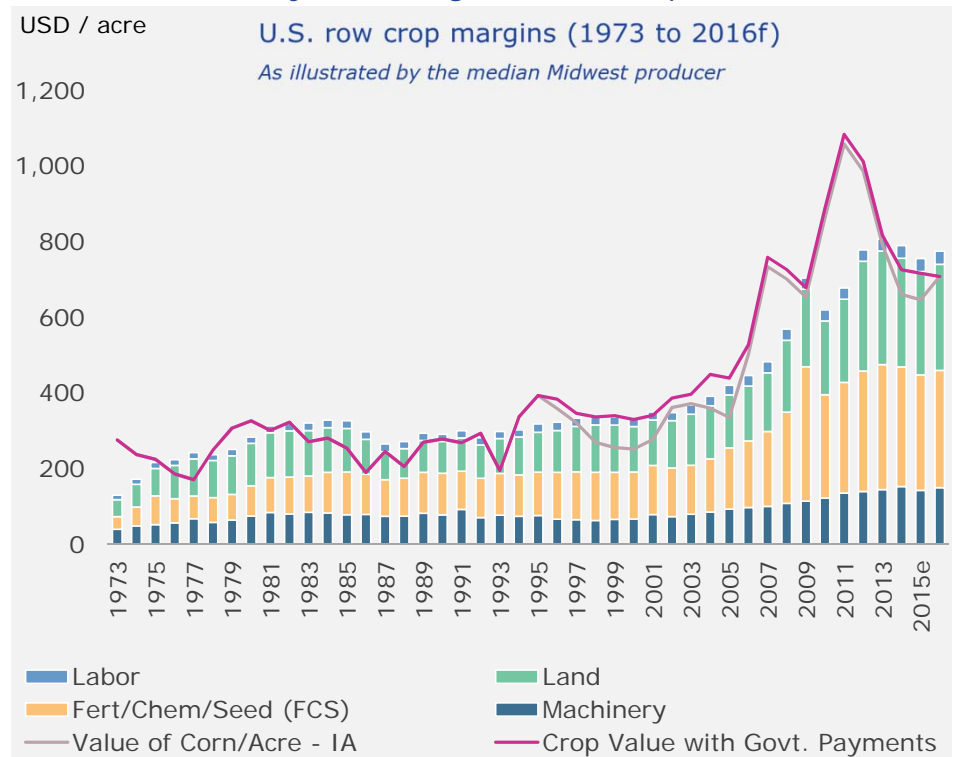
Farmer profits have been under pressure since the peak in commodity prices during 2013



The fall in grain prices since 2013

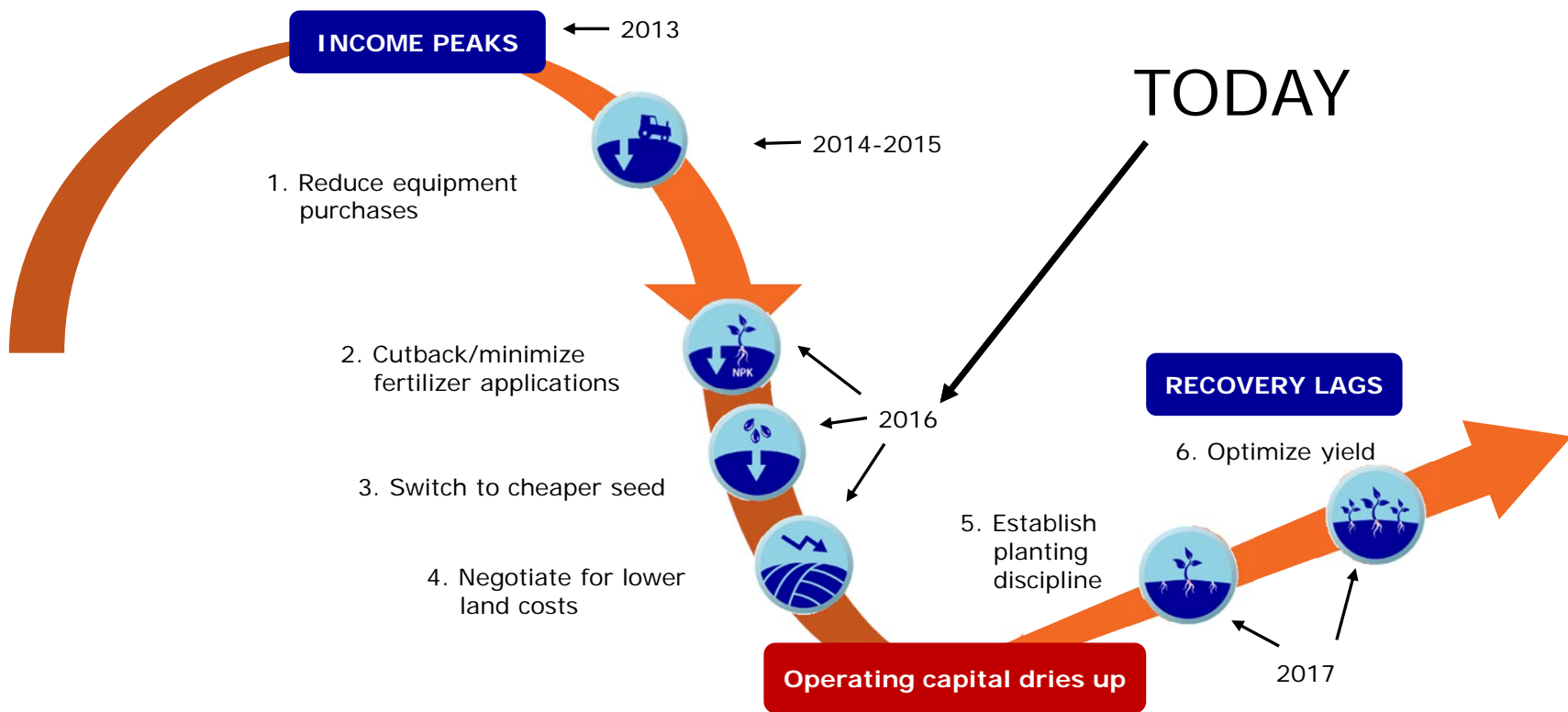


Has led to a third year of negative row crop farm income

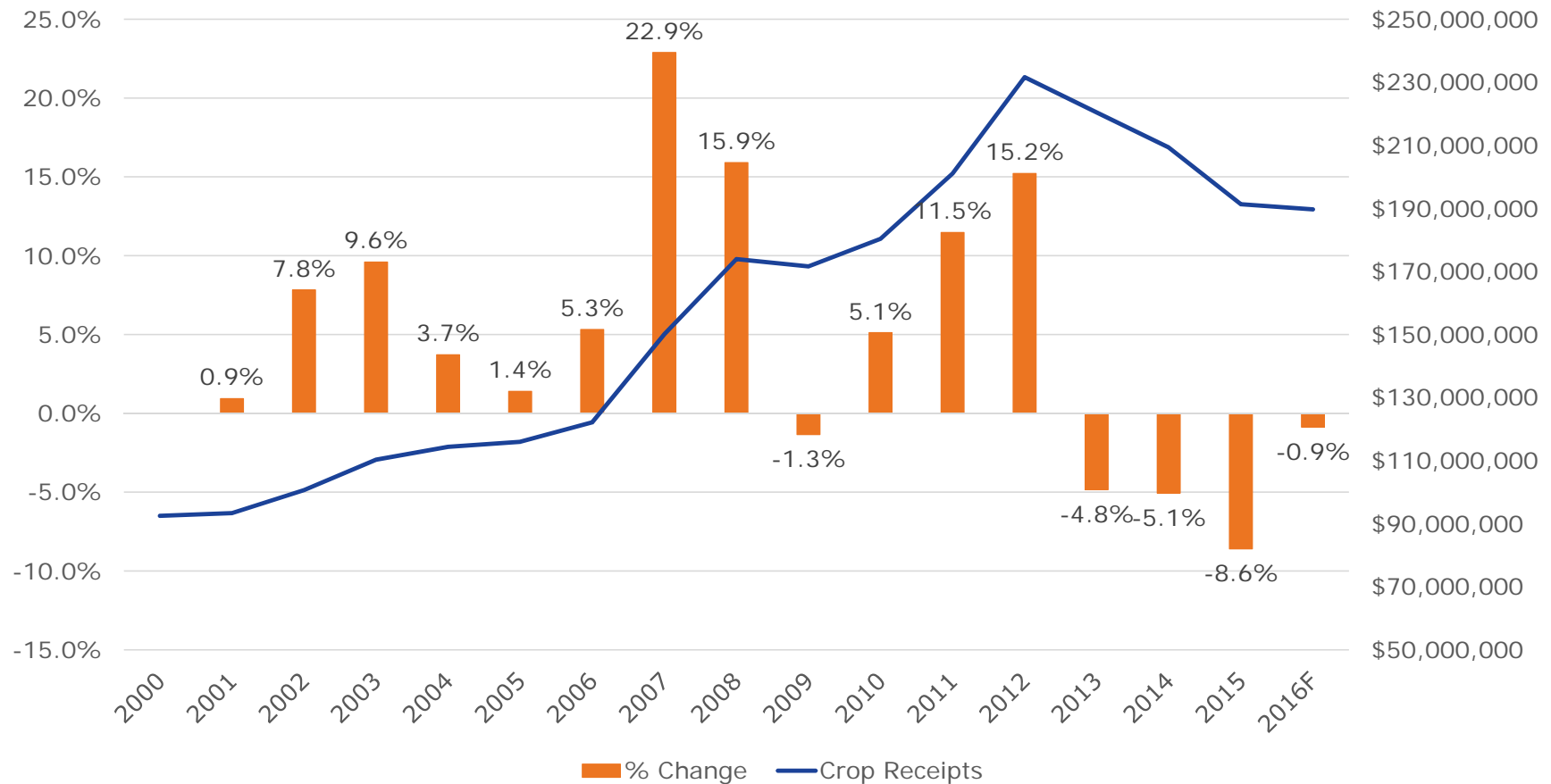


Source: Bloomberg, LP, Iowa State University, University of Illinois, Purdue, Rabobank, 2016

Causing a major reduction in farm inputs spending; we see returns stabilizing in 2017 / 2018



Although crop receipts have continued to decline in 2016, the situation seems to be stabilizing

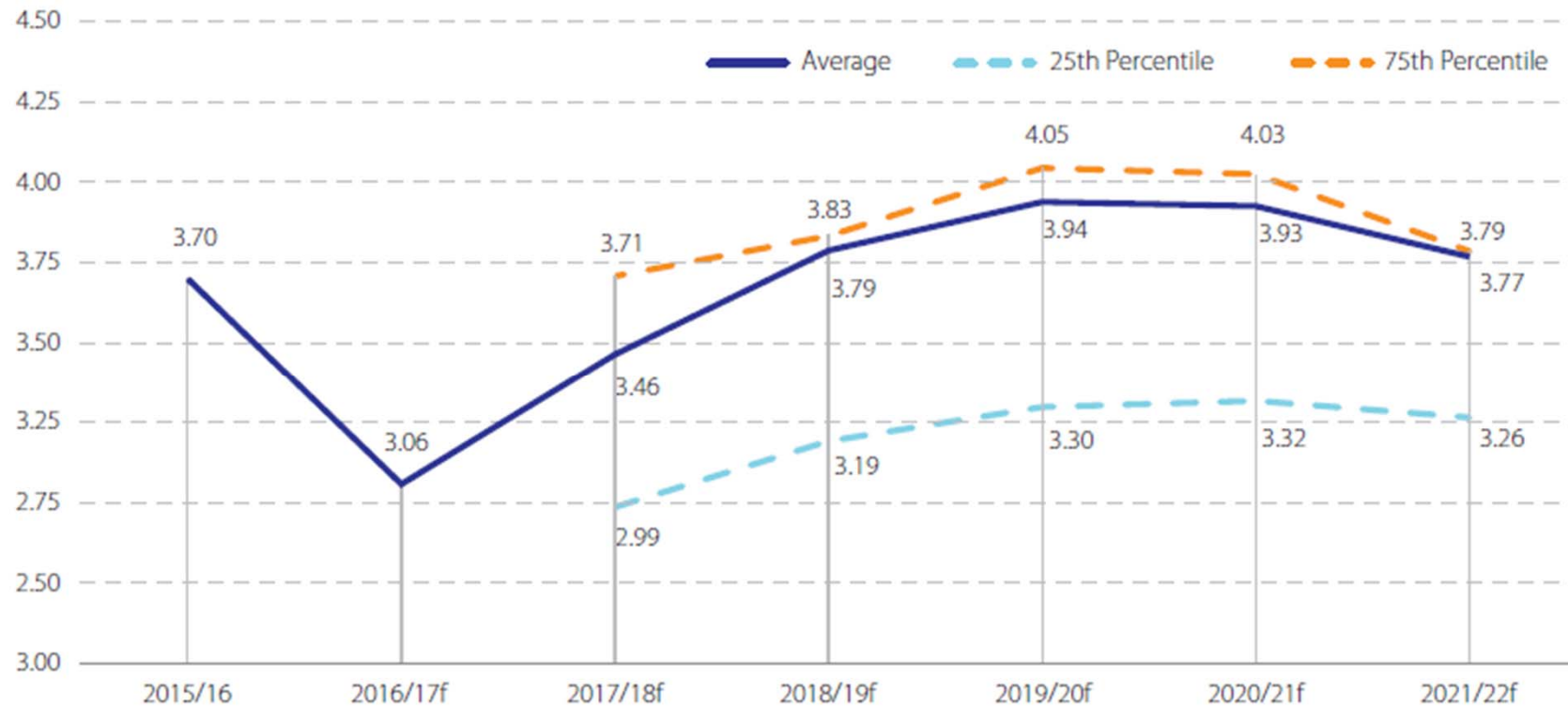


Source: USDA, Rabobank

The issue however is that we forecast a period of low (although stable) grain prices over the next five years



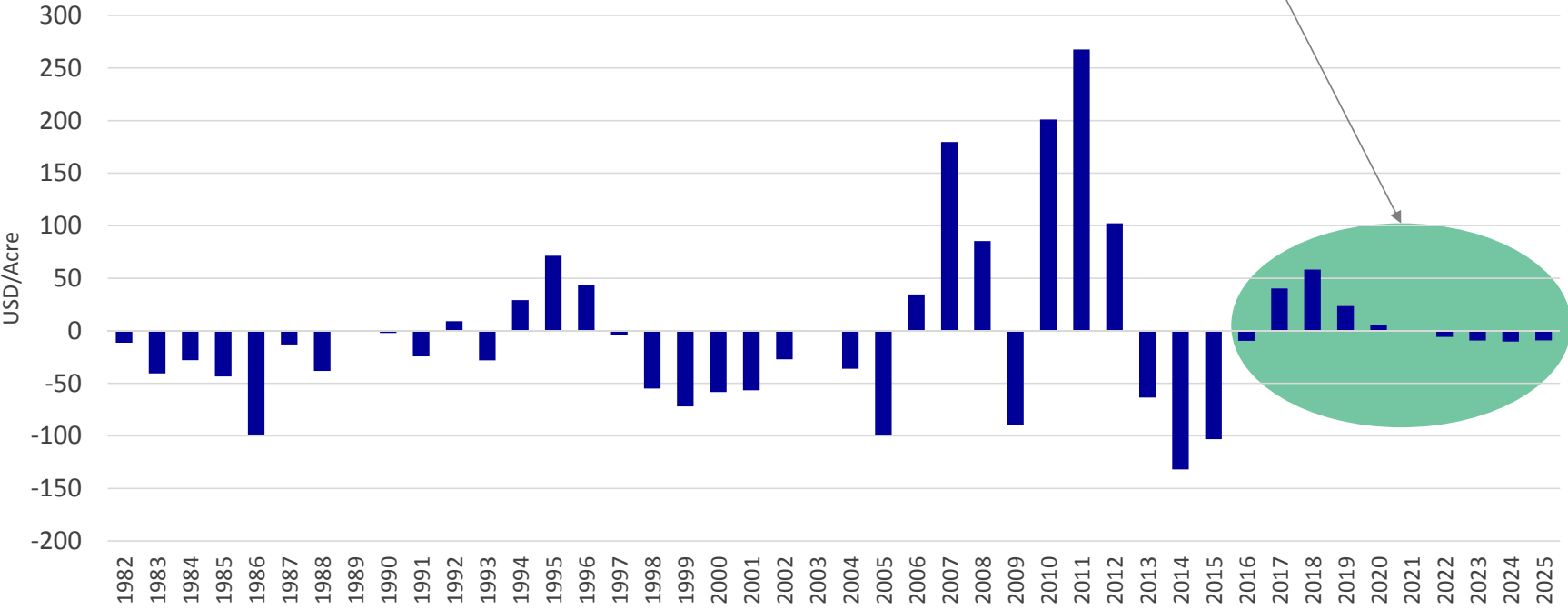
Actual and Projected Corn Price (USD/bu), 2015-2021f



Note: Years are crop years. 2016/17 is projected based on USDA data, All other years are forecasts.

Source: Rabobank Food & Agribusiness Proprietary GEM Analysis 2016

Which means that crop farming will NOT see a cycle upturn but rather an extended period of low returns



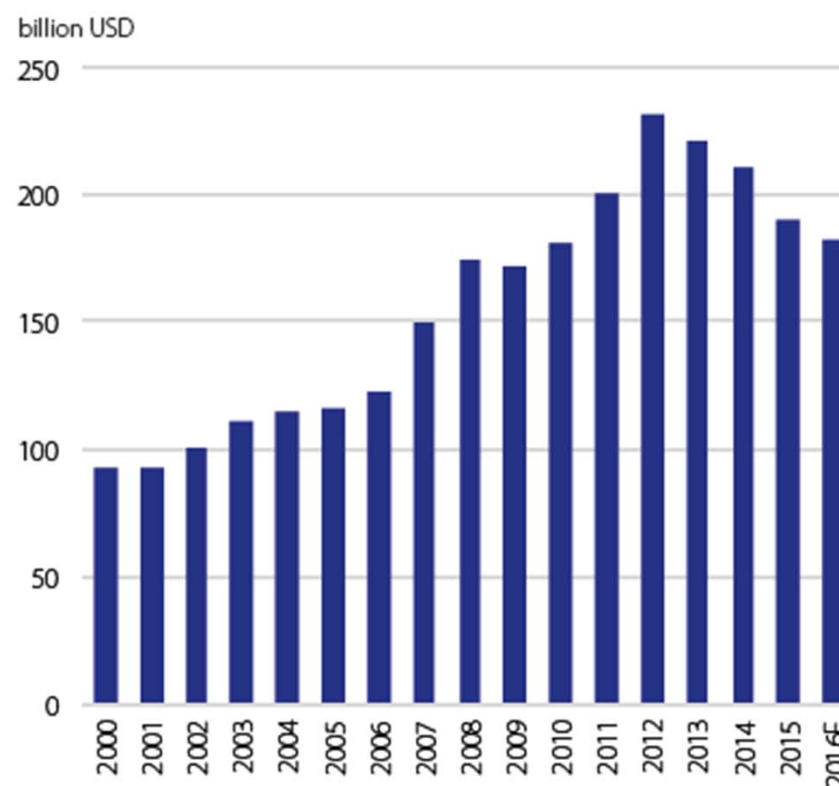
Modest expectations from the next cycle...

Thompson Equal Weighted Commodity Index (CCI)

Period	Magnitude	Duration of Rally
2001-2011	278%	114 months
1971-1974	147%	28 months
1977-1980	83%	39 months
1986-1988	39%	23 months
1992-1996	33%	44 months

Source: Commodity Research Bureau Yearbook, 2016

US Crop Cash Receipts (2000 to 2016f)



Source: USDA/ERS Farm Income and Wealth Statistics

The situation has punished the results of the major input providers, a key factor driving the mega-Mergers



Recent Deals

Combination	Value	Announced
Bayer/Monsanto	\$66 billion	2016
Agrium / Potash Corp	\$36 billion	2016
ChemChina / Syngenta	\$43 billion	2016
Dow / DuPont	\$130 billion*	2015

Source: company reports, *Dow DuPont reflects non-Ag businesses also





Key Deal Drivers

- Structurally low farmer demand and excess supply
- The need for technological innovation to deliver value in a sustainable way
- The need/desire to transform from stand alone product sellers into integrated service providers

Themes / Transaction Rationale

- Access to new markets, technologies and expertise (ChemChina/Syngenta)
- Food security and reduced reliance on imports (ChemChina/Syngenta)
- Value creation through scale and market share (Dow AgroScience / DuPont Pioneer)
- Market dominance in key product categories (Bayer/Monsanto)
- Operational efficiencies through vertical and horizontal integration (Agrium/PotashCorp)
- Positioning for secular changes in F&A (all deals)
 - ✓ *Organic and non-GMO are a \$50 billion market in the USA*
 - ✓ *Its growth will further threaten demand for crop protection chemicals and other inputs*

Consolidation has different implications across the value chain; distributors likely to be the most at risk

1 Growers	<i>Farmers could actually benefit from industry consolidation in the form of new products and service</i>	
2 Fertilizer Manufacturers	<i>Little expected incremental impact from the announced CPC/seed mergers, although Agrium/PotashCorp could drive smaller nutrient players to merge</i>	
3 G&O	<i>Little expected incremental impact from the announced CPC/seed mergers near-term although structural changes in farm inputs could undoubtedly impact the ABCDs in the long-run</i>	
4 Distributors	<i>Greater concentration of supplier power; thus retailers, wholesales and cooperatives will experience even greater margin pressure as input manufacturers renegotiate selling commissions and concessions</i>	

2

*A Lot Else is Changing...
Behind the Scenes*



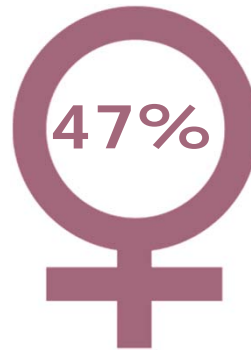
Rabobank

The composition of the population is changing...

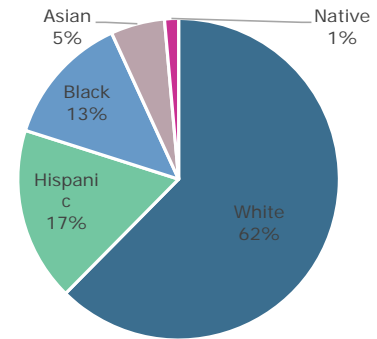


70%
of households have no children under 18

Share of women in US labor force

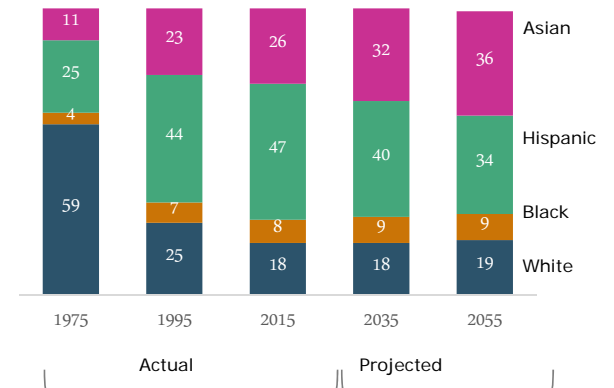


Increasingly multicultural

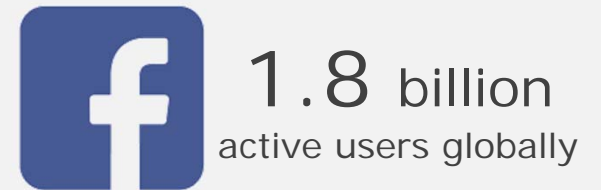
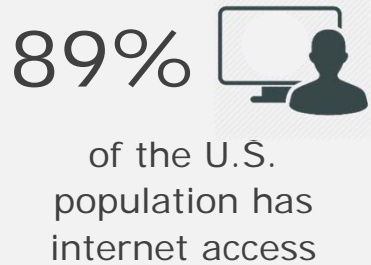


25%
Millennials have become the largest generation

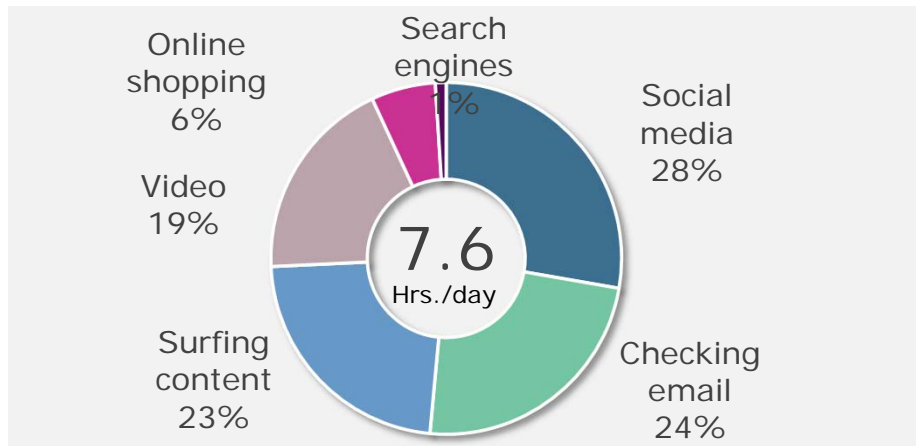
Asians projected to become the largest immigrant group
% of total immigrants



And technology is transforming our lives

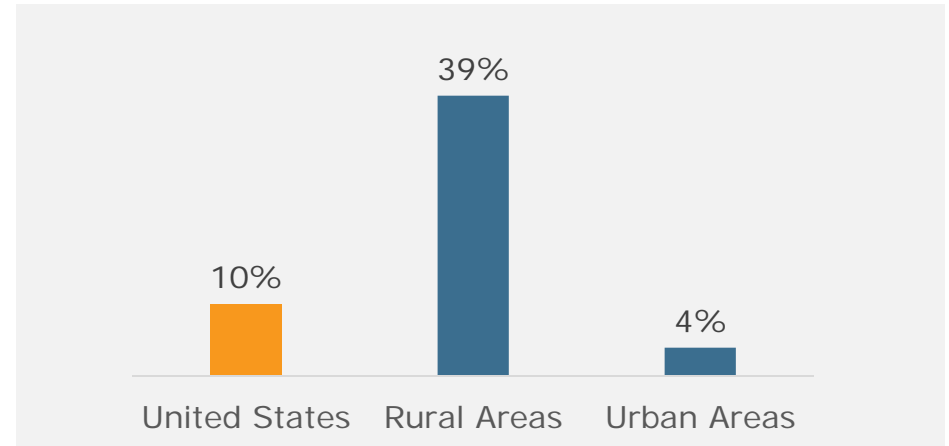


How people spend their time online



Source: Multiview

Population without access to fixed broadband



Source: FCC, 2016 Broadband Progress Report

Consumer preferences are changing as a result

Health and wellness

- Definition of healthy has changed
 - means fresh, natural, organic, high protein, non-GMO, and many other free-froms
- Strong preference towards minimally processed and clean labels

Transparency

- Today's consumers demand information regarding what is in their food, how it is made, where does it come from and what its environmental footprint is

Hybrid Consumer

- Emphasis on quality ingredients leads to increased demand for premium products across all categories
- Dichotomy: there is also strong demand for 'value' products. The middle ground is shrinking

Convenience

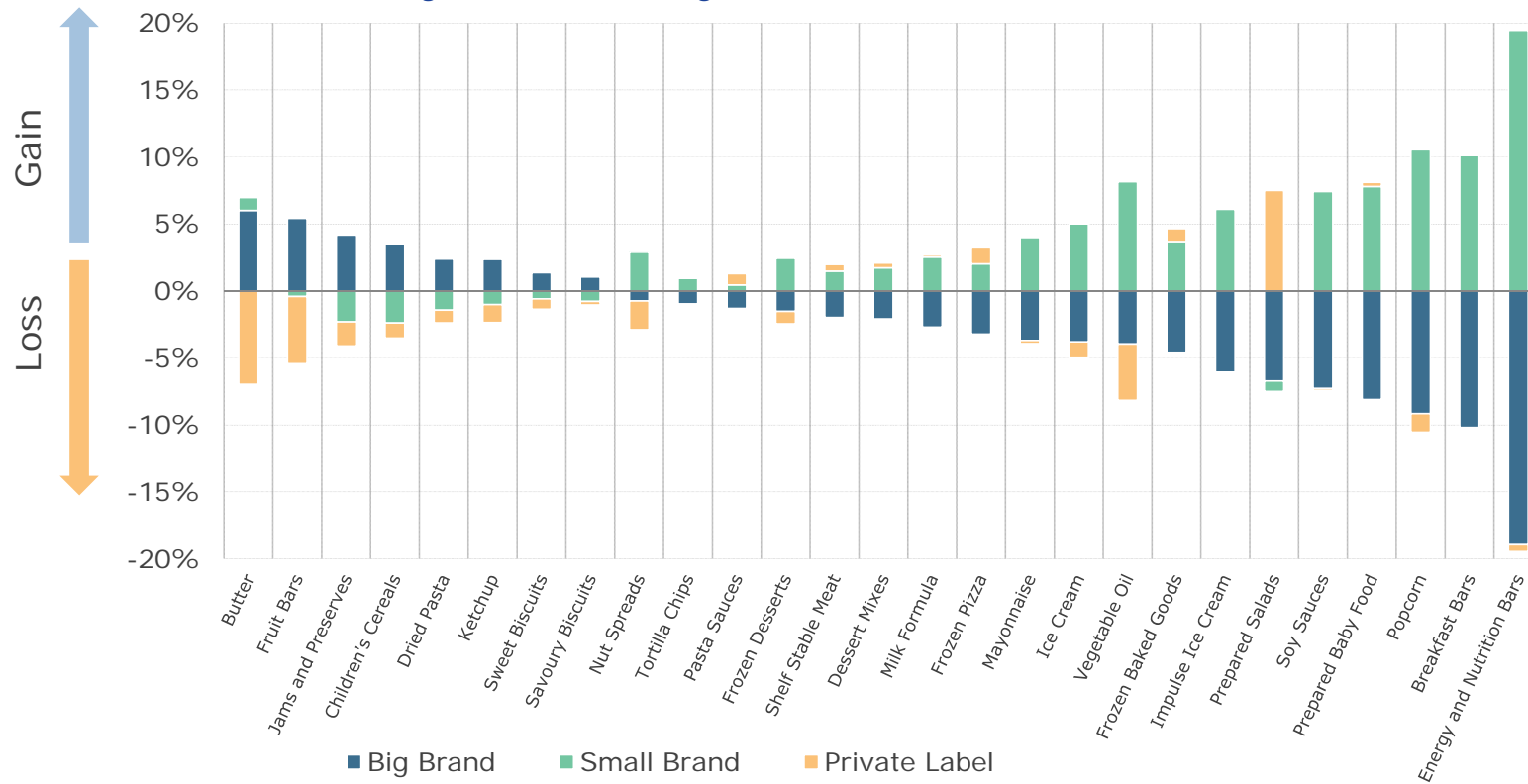
- Shorter prep times, single serve packaging, on the go alternatives, delivery
- Rise of snacking: no longer three sit down meals a day but snacking throughout

Novelty and customization

- Millennials in particular are looking for new and innovative experiences
- Success of ethnic and bold flavors
- Do-it-yourself options, personalized marketing campaigns

Consumers are moving away from 'big brands'

Big brands are losing share to smaller, more innovative brands

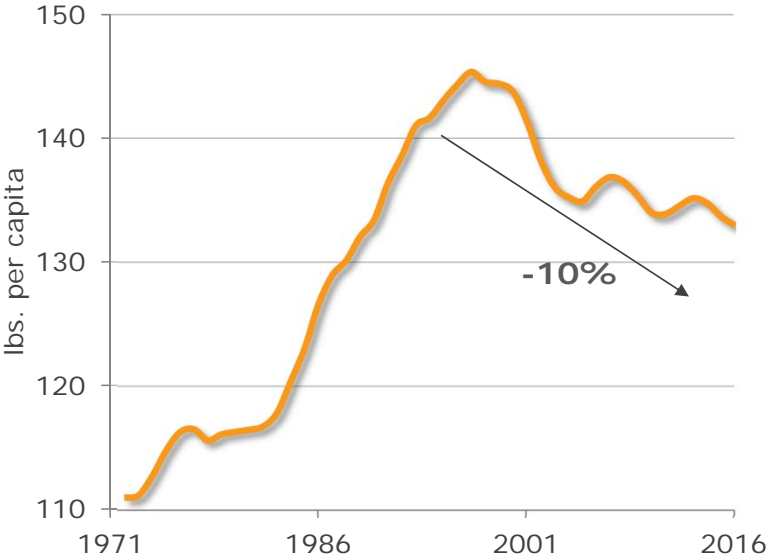


Source: Rabobank, Euromonitor 2016. Big Brand >3% market share.

And driving new trends (or fads): Gluten Free

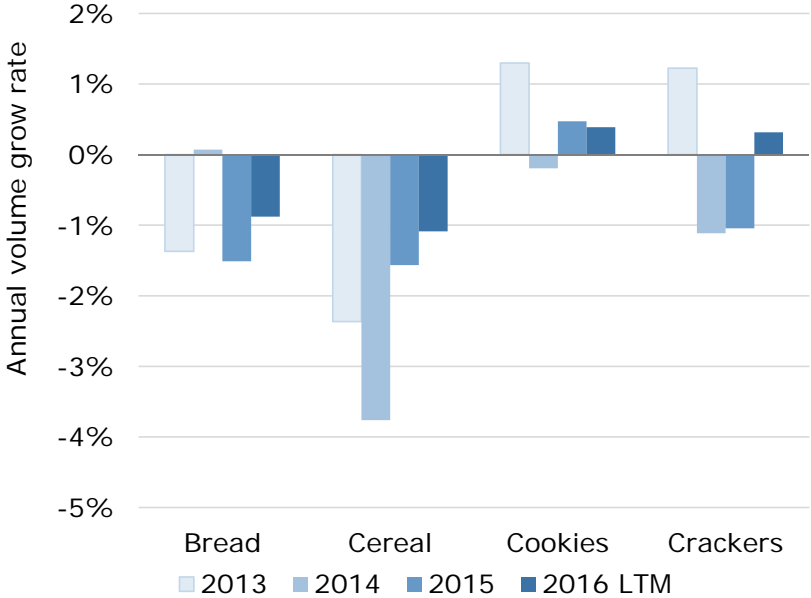
- While only 1% of the population has Celiac disease, 30% say they are trying to reduce their gluten intake
- Major grain-based categories are struggling

Wheat Consumption in the U.S. (lbs/capita)



Source: USDA

Sales volume of major grain based categories



Source: IRI

And driving new trends (or fads): Natural and organic

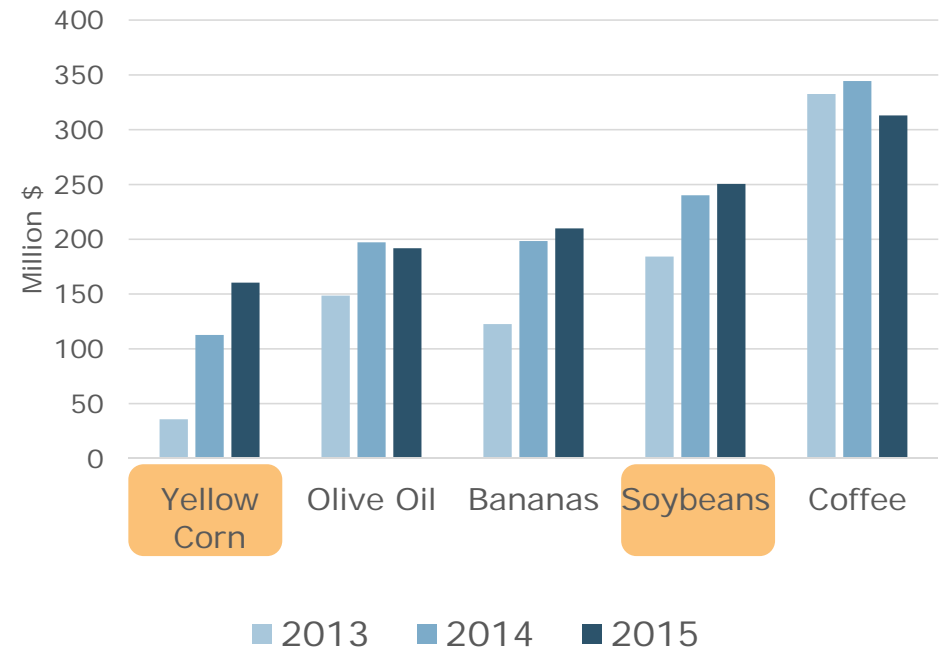
- Organic sales have been growing at an average annual rate of 10% for the past five years
- But many raw materials are being imported

US Trade in Organic Products



Source: USDA

Top 5 Organic Imports

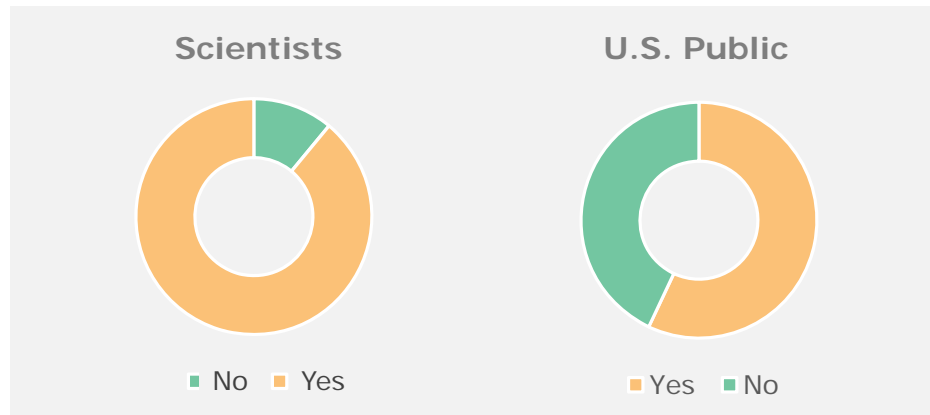


Source: USDA

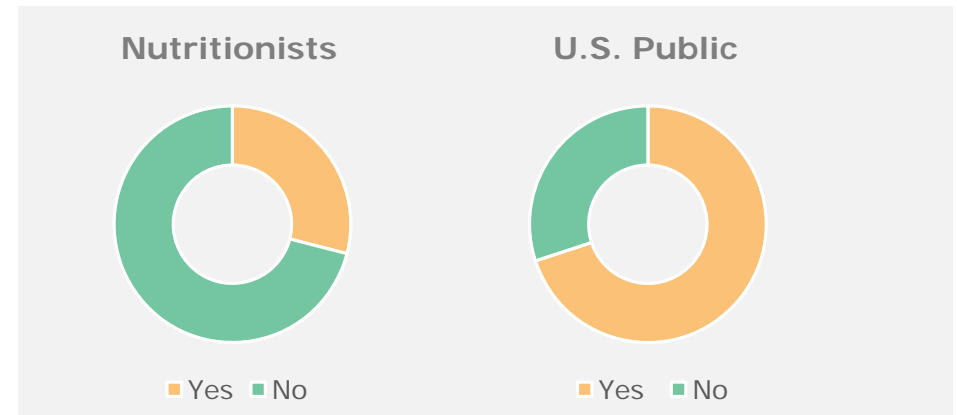
'The experts' are no longer the main source of information

- There is more information available on the internet than ever before
- Millennials trust a wide range of sources for information about which foods they should eat:
 - personal healthcare professionals (68%)
 - friends or family members (41%)
 - health, food and nutrition bloggers (33%)
 - U.S. government agencies (28%)

Are genetically modified foods healthy?



Are granola bars healthy?



3

How can ag respond

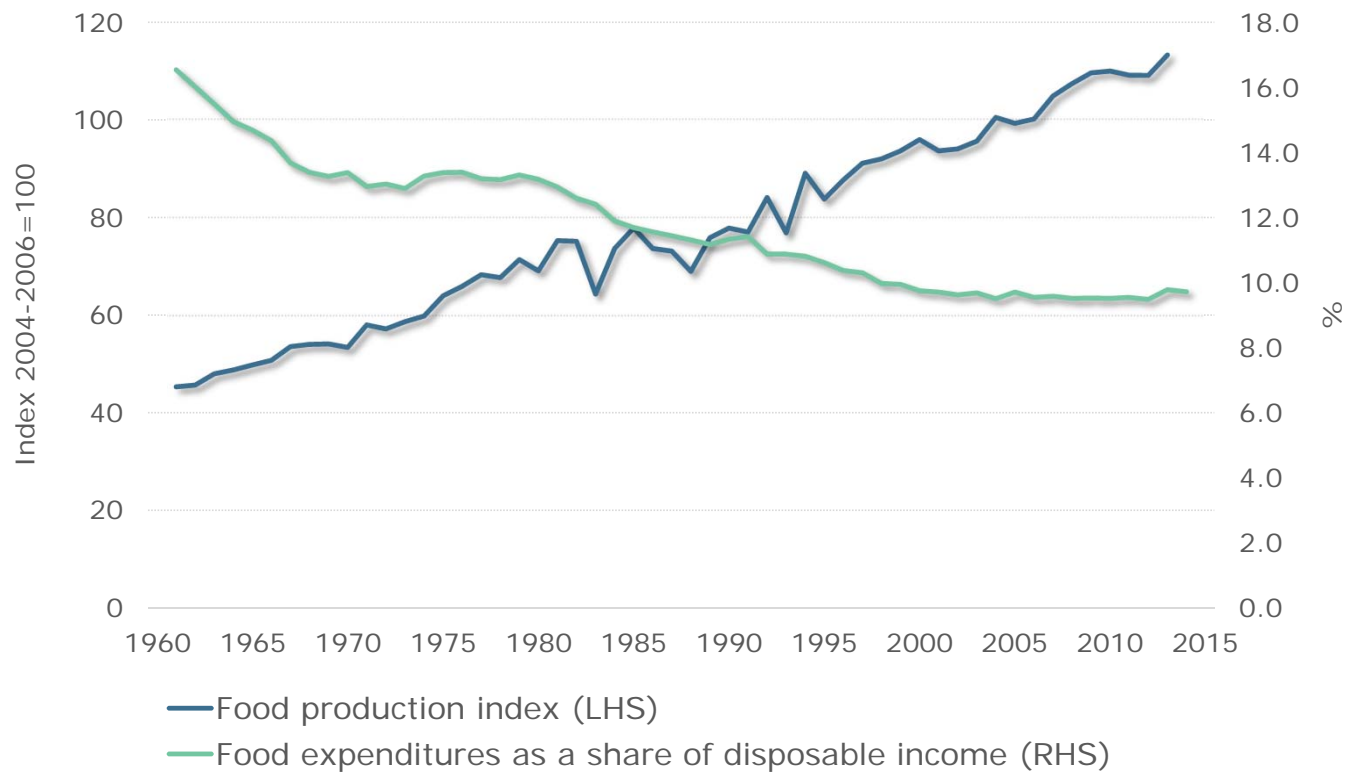


Rabobank

Ag sector has been extremely efficient in providing plentiful and accessible farm products to big food processors

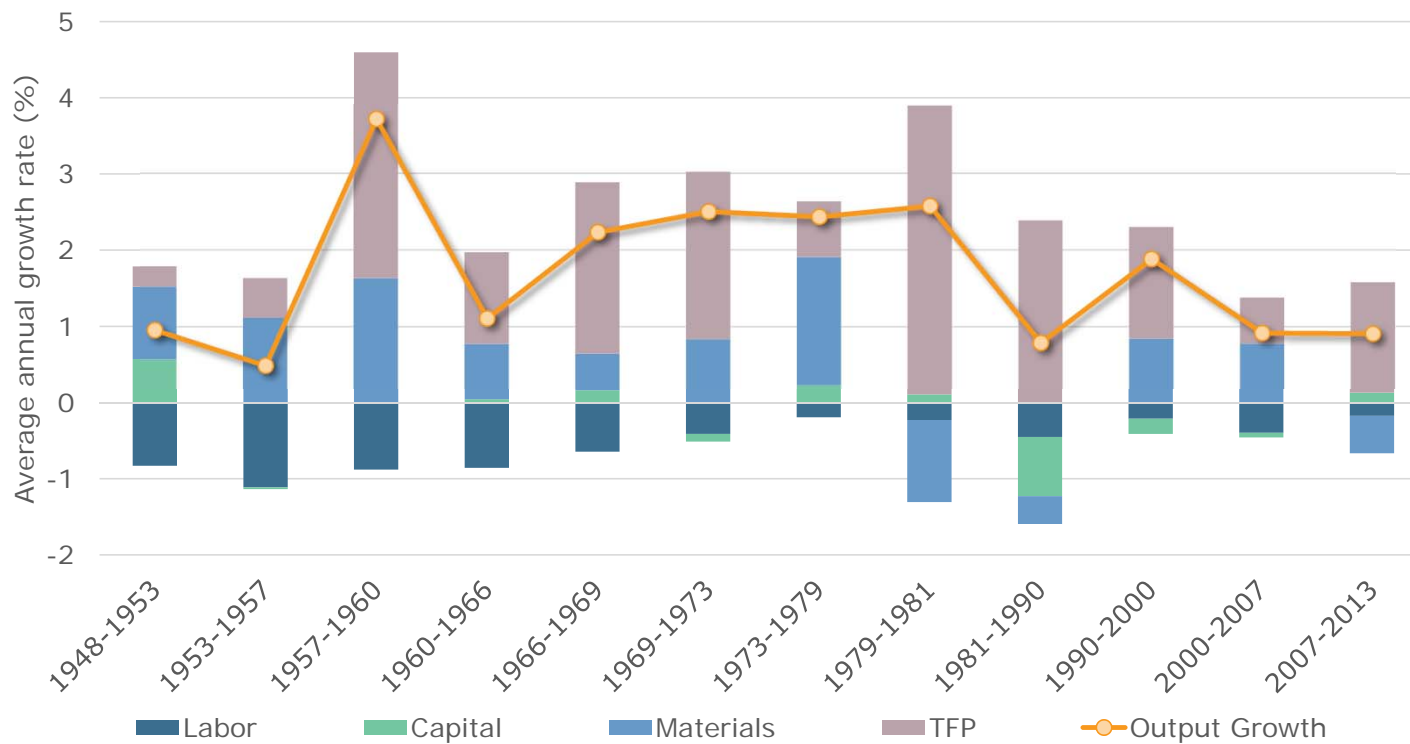


Increase in Food Production, and Food Spending as a share of Disposable Income



Source: World Bank, World Development Indicators

Most of the increase has been due to TFP growth



Source: USDA

But, what worked in the past may not now. Need to innovate...



Source: Rabobank analysis

1. Looking beyond the mainstream products

The Long Tail theory:

- Our culture and economy is increasingly shifting away from a focus on a relatively small number of "hits" (mainstream products and markets) at the head of the demand curve and toward a huge number of niches in the tail
- Products that have a low sales volume can collectively make up a market share that rivals or exceeds the head



The internet and online retailing lower:

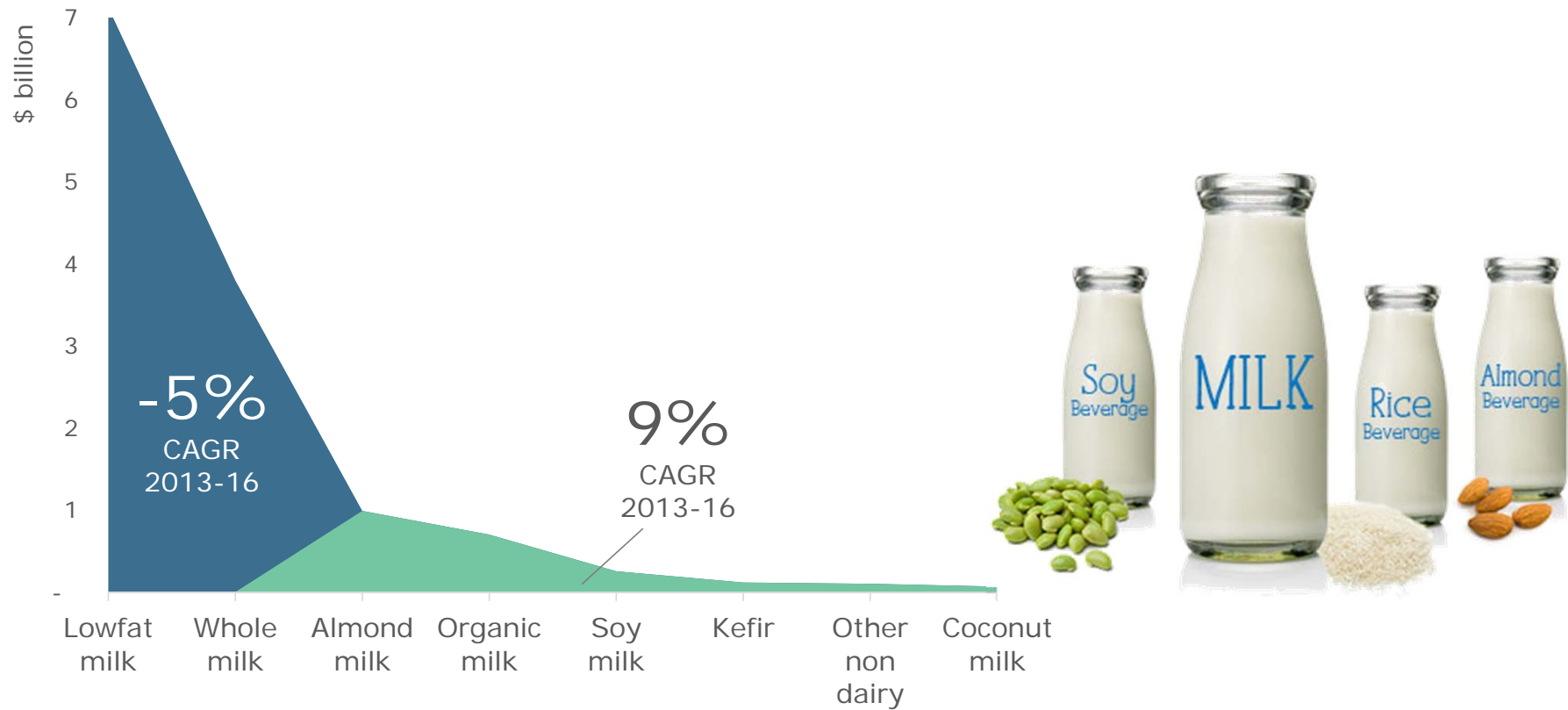
- Search costs
- Marketing costs
- Inventory costs



Less need to lump products and consumers into a few big categories

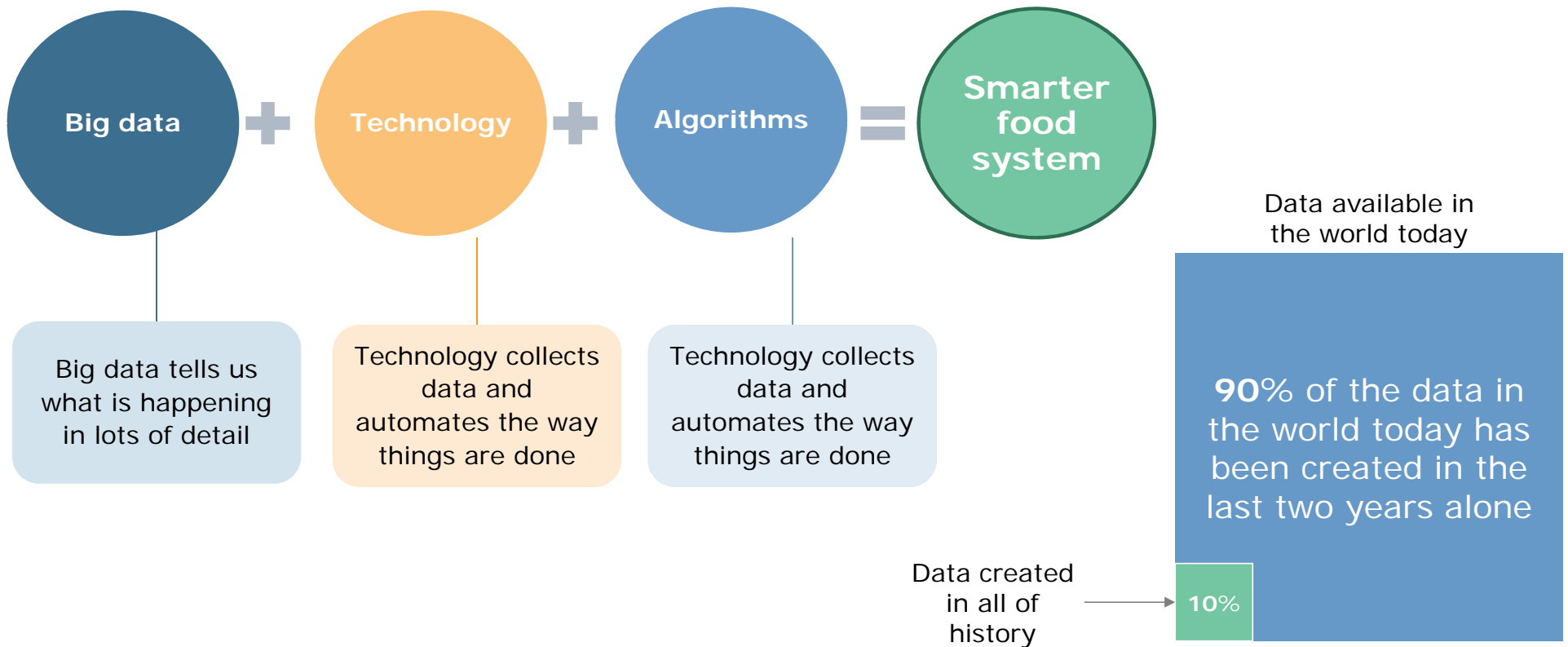
Long tail example in milk

Milk and milk-alternative sales, 2016



Source: Rabobank, IRI

2. Use of Technology



Ag Tech investments across the supply chain



Ag Biotechnology

On-farm inputs for crop & animal ag including genetics, microbiome, breeding



Farm IoT

Ag data capturing devices, decision support software, big data analytics



Robotics

On-farm machinery, automation, drone manufacturers, grow equipment



Novel Farming System

Indoor farms, insect, algae & microbe production



Other

Equipment sharing software, cultured leather, etc.



Supply Chain Technologies

Food safety & traceability tech, logistics & transport, food processing



Bioenergy & Biomaterials

Non-food extraction & processing, feedstock technology



Innovative Food

Alternative proteins, novel ingredients & supplements



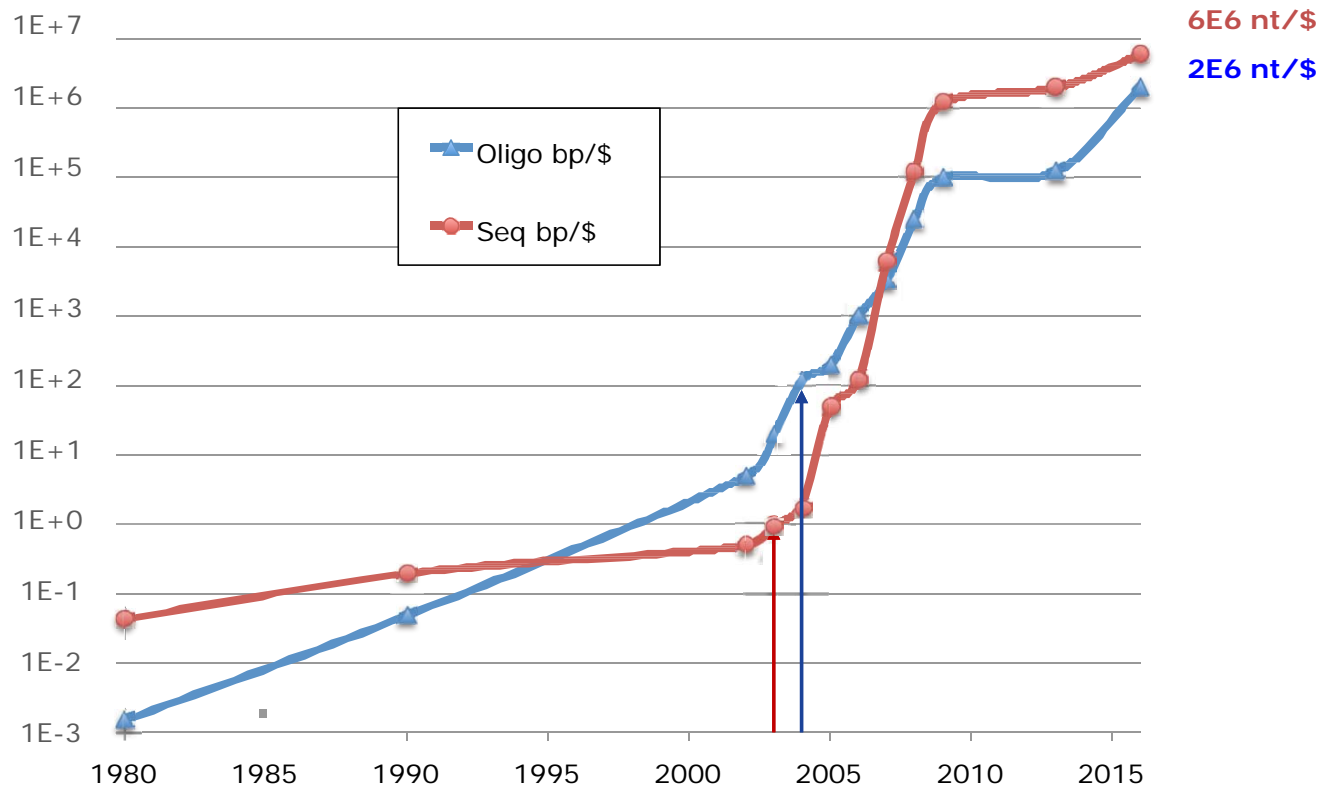
Food Ecommerce

Online Farm-2-Consumer, meal kits, specialist consumer food delivery

Exponentially Improving Gene Read/Write/Edit Capabilities

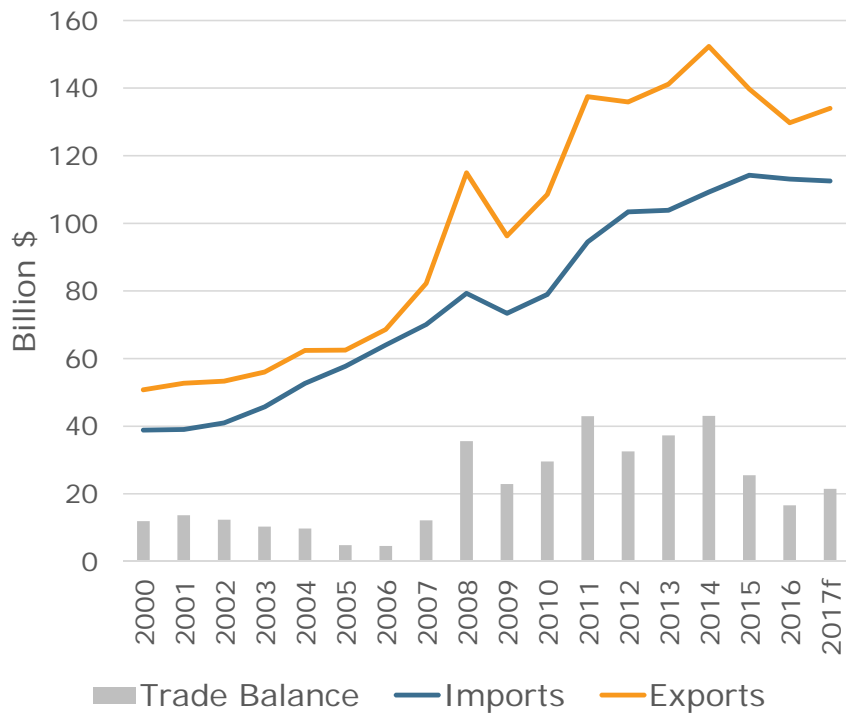


Boeke, Church, et al. 2016 Science. The Genome Project-Write.



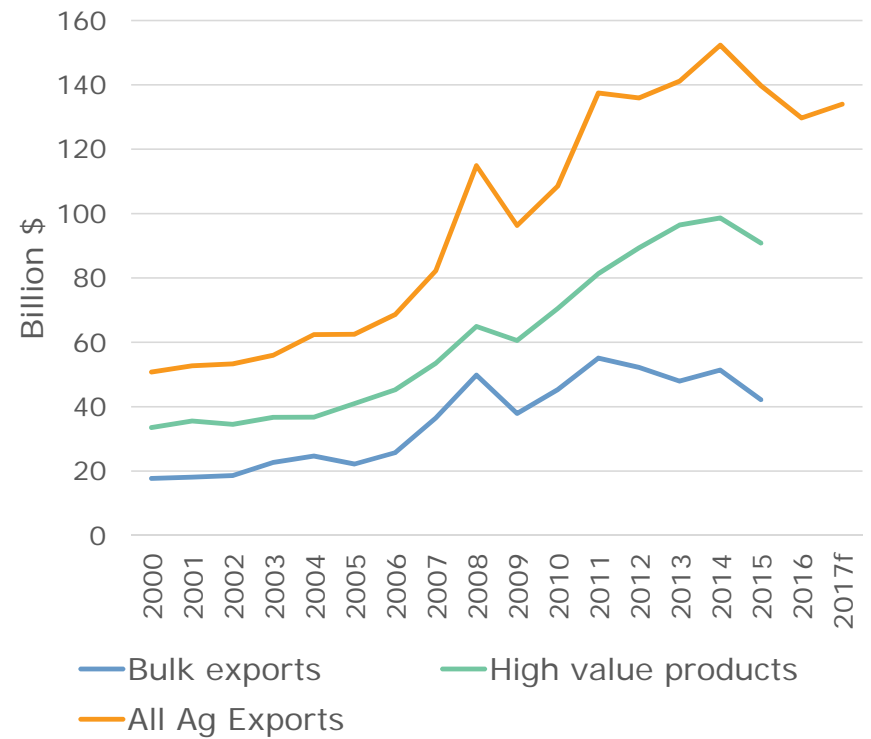
3. Global linkages

Agricultural exports, imports and trade balance



Source: USDA

U.S. exports of bulk and high-value products



Source: USDA

4. Connecting with the consumers

- Consumers want to know more about where their food comes from (most of them know very little)
 - Overwhelmingly farmers and consumers share the same values with respect to environmental stewardship and animal care
- The internet and social media provide a unique tool to generate communities around topics of interest and to bridge the communication and information gap
- The food industry needs to be seen as tech savvy and in touch

U.S. Farmers & Ranchers Alliance

The FOOD DIALOGUES



The consumer has gone digital

People interact through communities

Farmers and Corporates need to get involved



4

How Rabobank is helping address these challenges



Rabobank

1. Remaining close to farmers through cycles

Banking for Food



Banking for Food is Rabobank's approach to addressing the global food security challenge

Our Contribution



Access to finance



Access to knowledge



Access to networks



Global Farmers

For farmers, by farmers

"Global Farmers is a community where farmers can connect, share and learn from each other (and) a great way for Rabobank to share its knowledge"

- Berry Marttin, Rabobank Executive Board

2. Working across the value chain



Rabo Foundation

25 countries
Rabo Development
16 countries

Rabo Development

Financial inclusion for
7.5 mln people incl. 2
mln farmers

Rabobank Group

47 countries
3215 client branches



3. Finding value and growth by getting closer consumers through innovation



FoodBytes!

FoodBytes! Is dedicated to helping investors in the food industry meet new innovative companies in food-related software and applications, distribution, manufacturing, and production

 **Arlon™**

Arlon Group is an investment firm with a global network that supports investments across the entire food supply chain in the Americas

 **ERRA**
by Rabobank + RocketSpace

First-of-its-kind accelerator-type program bringing together the industry's most disruptive startups and progressive corporations

anterra  capital

Anterra Capital is a specialist venture capital investor, with a dedicated focus on technology-driven companies across the food supply chain in Europe or in North America

Thank you



Rabobank