



Global protein market outlook

Investment opportunities in a fast changing world

Nan-Dirk Mulder, 26 June 2019



Rabobank

Rabobank: The financial link in the Food and Agri industry with animal protein as a key focus industry



Rabobank

of Rabobank relationships with global Animal Protein companies:

135

Clients around the globe



53

Pork & Beef



40

Poultry



42

Seafood

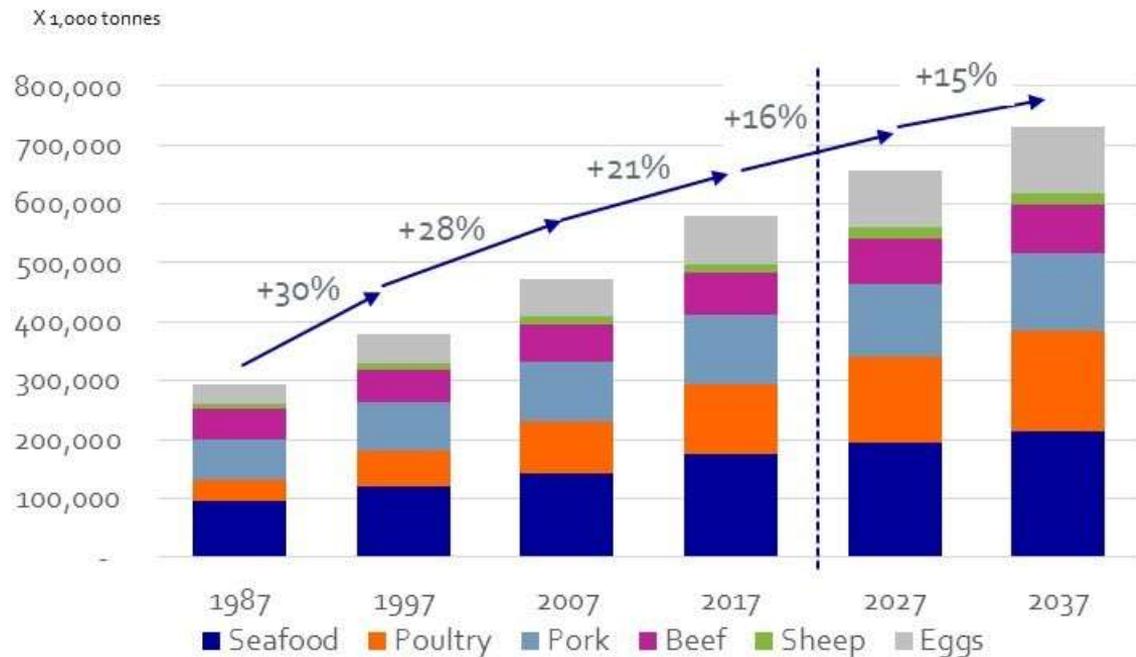
14/20

14 of the **Top 20** global Animal Protein companies are Rabobank clients

Worldwide 35% more demand for animal protein in next 20 years



Global animal protein demand projections 2017-2037f



CAGR: 2017-2037f

Eggs: CAGR +1.6%

Beef: CAGR +1.1%

Pork: CAGR +1.0%

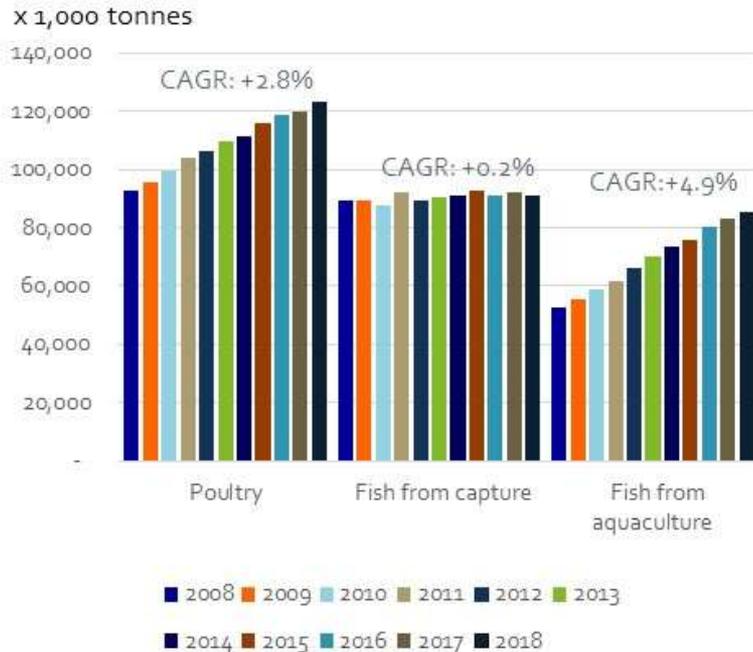
Poultry: CAGR +2.0%

Seafood: CAGR +1.2%

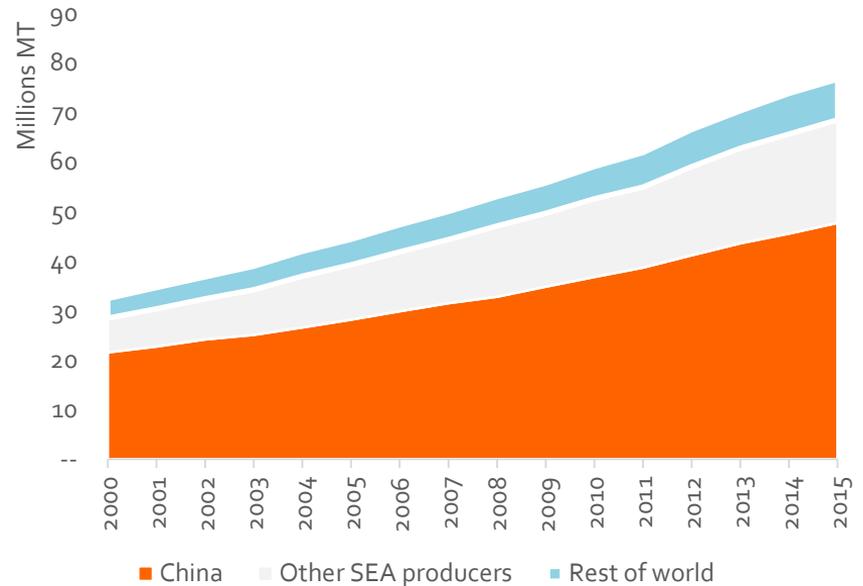
Aquaculture is the fastest growing animal protein industry and 2/3 Asia based



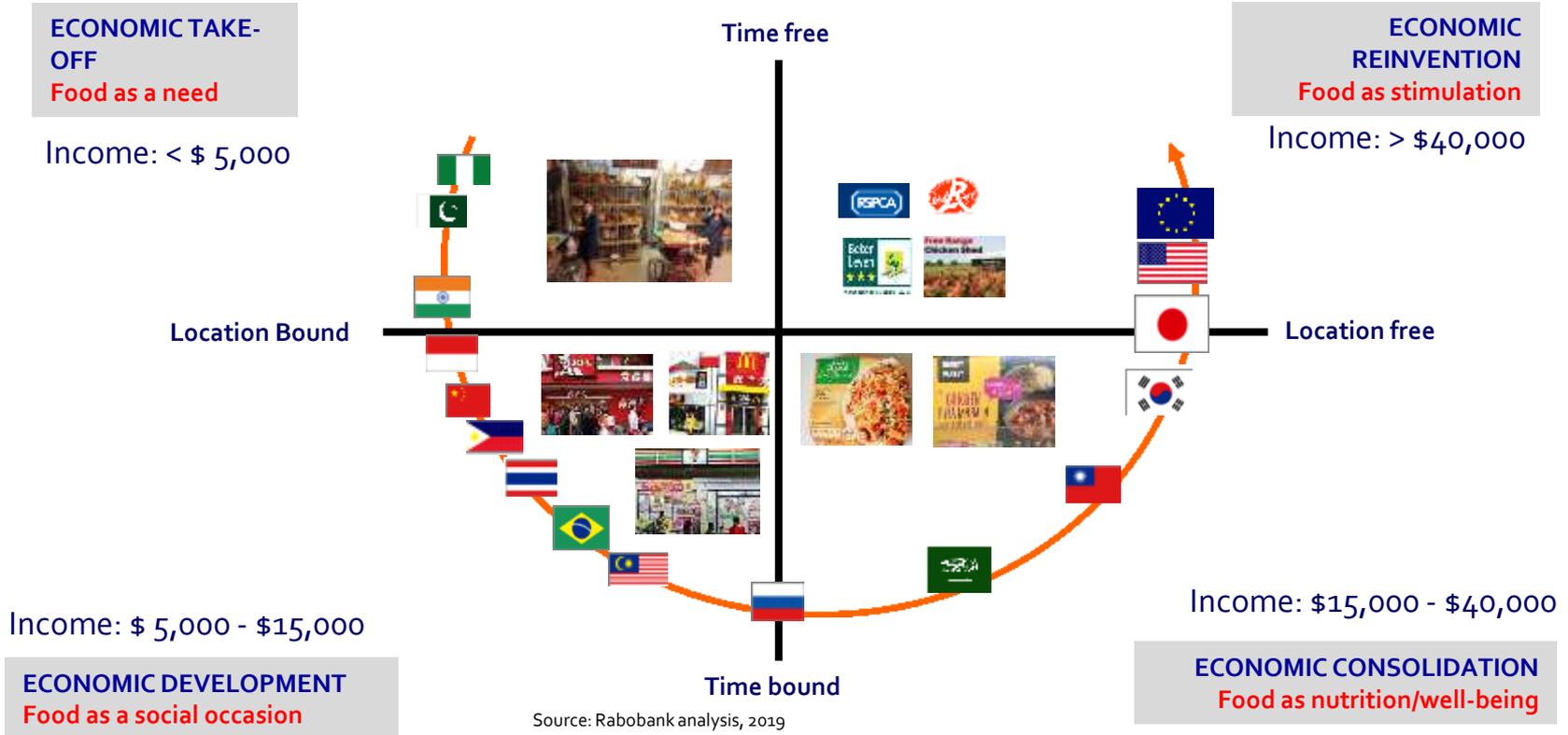
Poultry and aquaculture: key drivers



Global aquaculture¹ supply by region



Consumer demand is changing when economies develop further



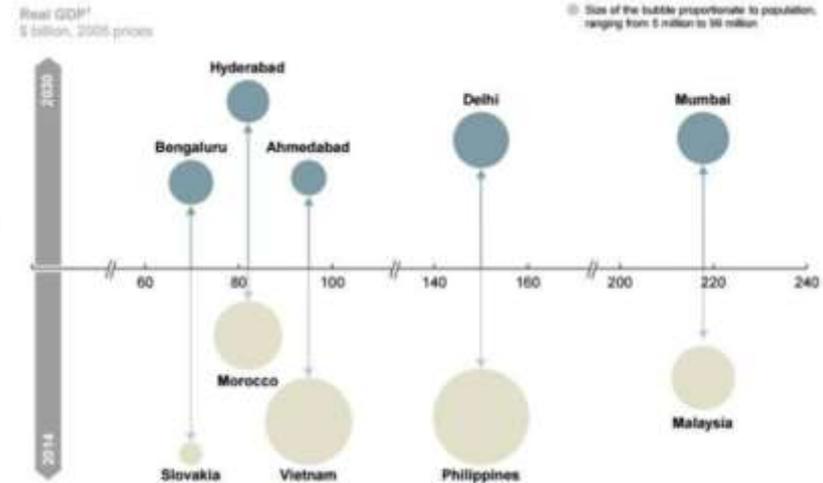
The expansion of the new mega cities



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*Global urbanisation:
many of the leading cities in Asia*

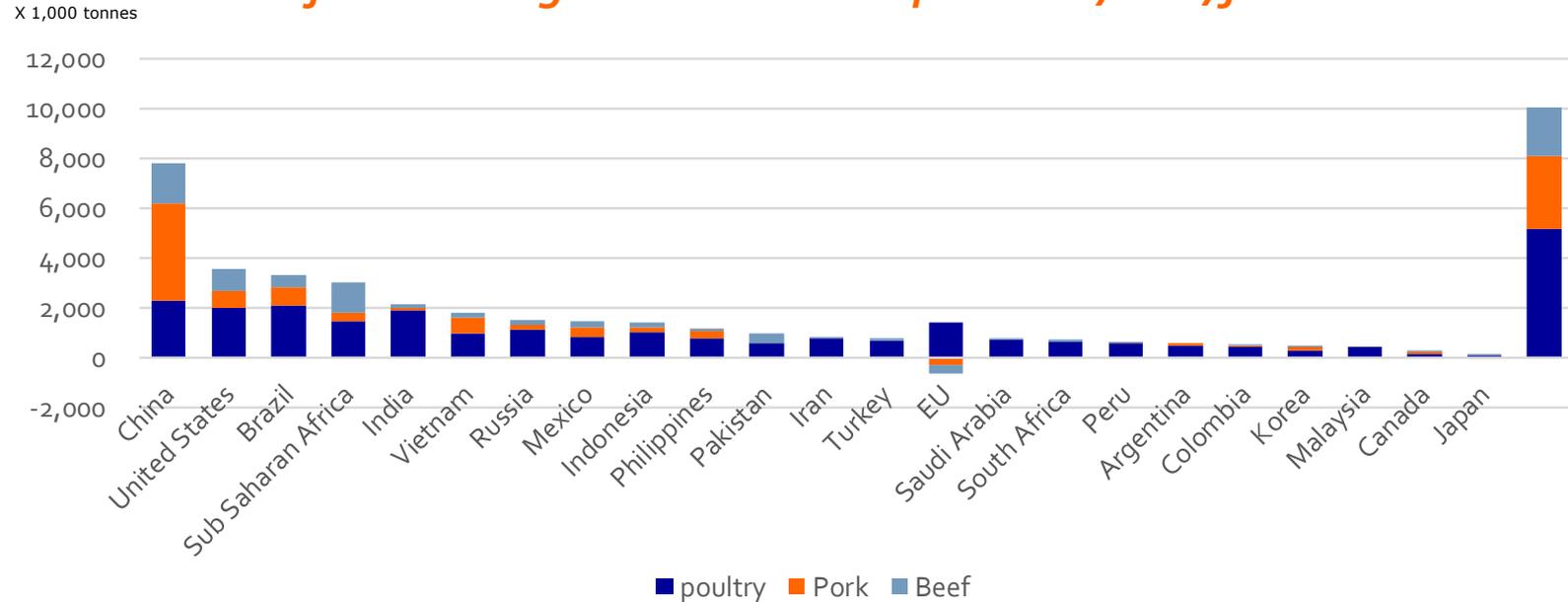
*India's mega city 2030 economy
compared to mid-income economies*



90% of global growth is in emerging markets; 60% in Asia



Projected change in meat consumption 2017-2027f

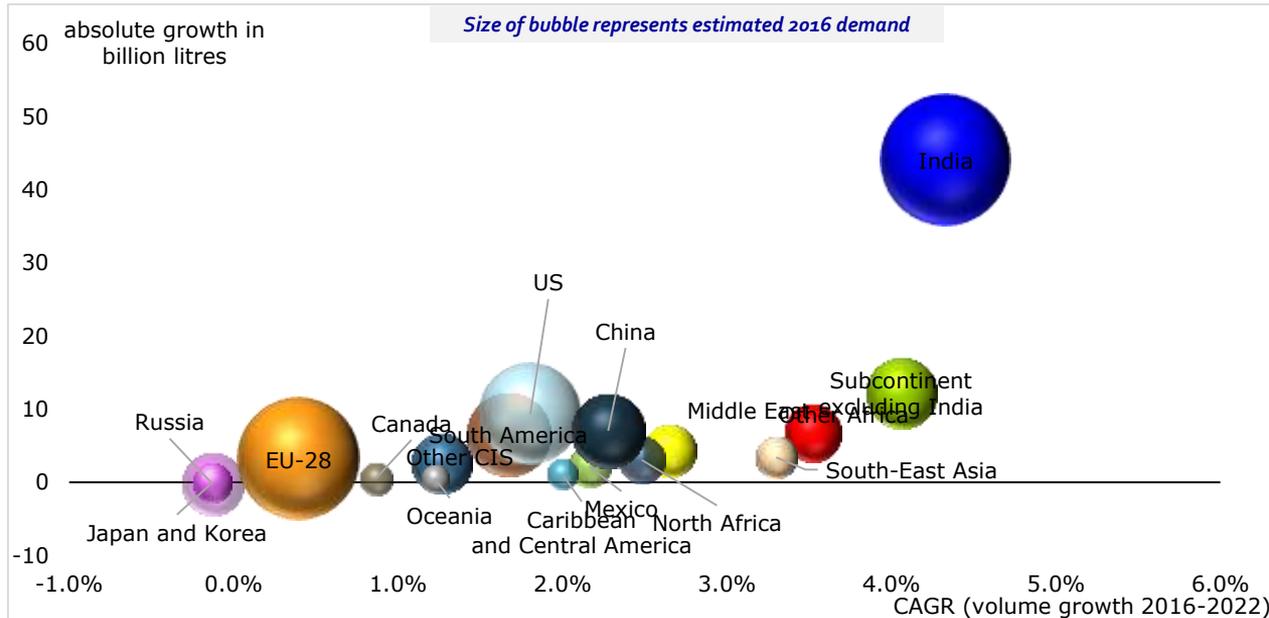


Source: Rabobank analysis based on USDA, FAO and local statistics, 2019

Dairy demand growth is very much Asia focussed



Global dairy demand outlook 2018-2023

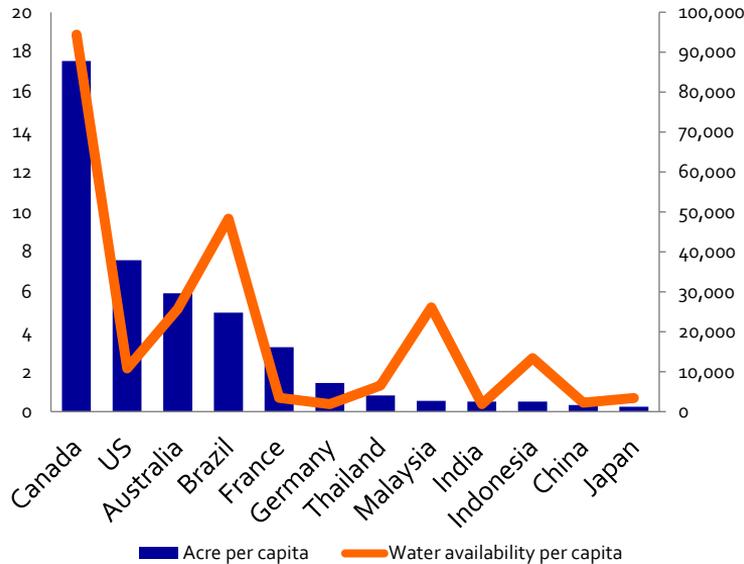


- Source: Various sources, Rabobank
- China include Taiwan and Hong Kong

Global agricultural land use is declining; while especially Asia has limited resources

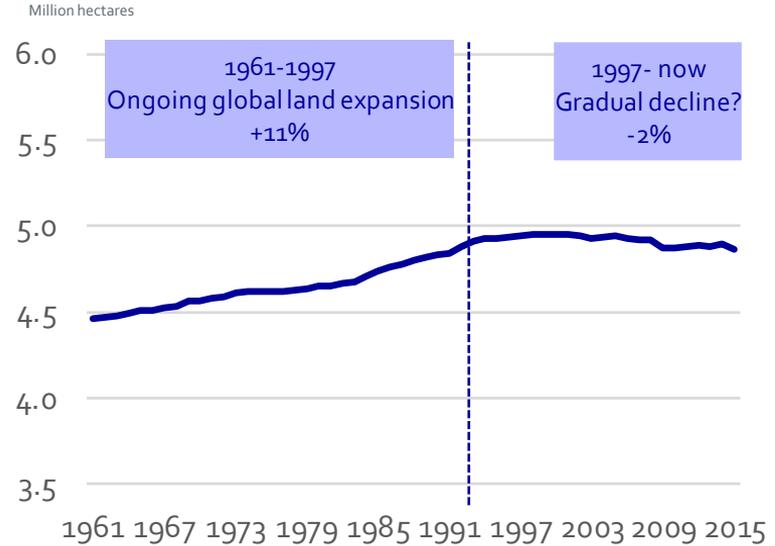


Available land and water per capita



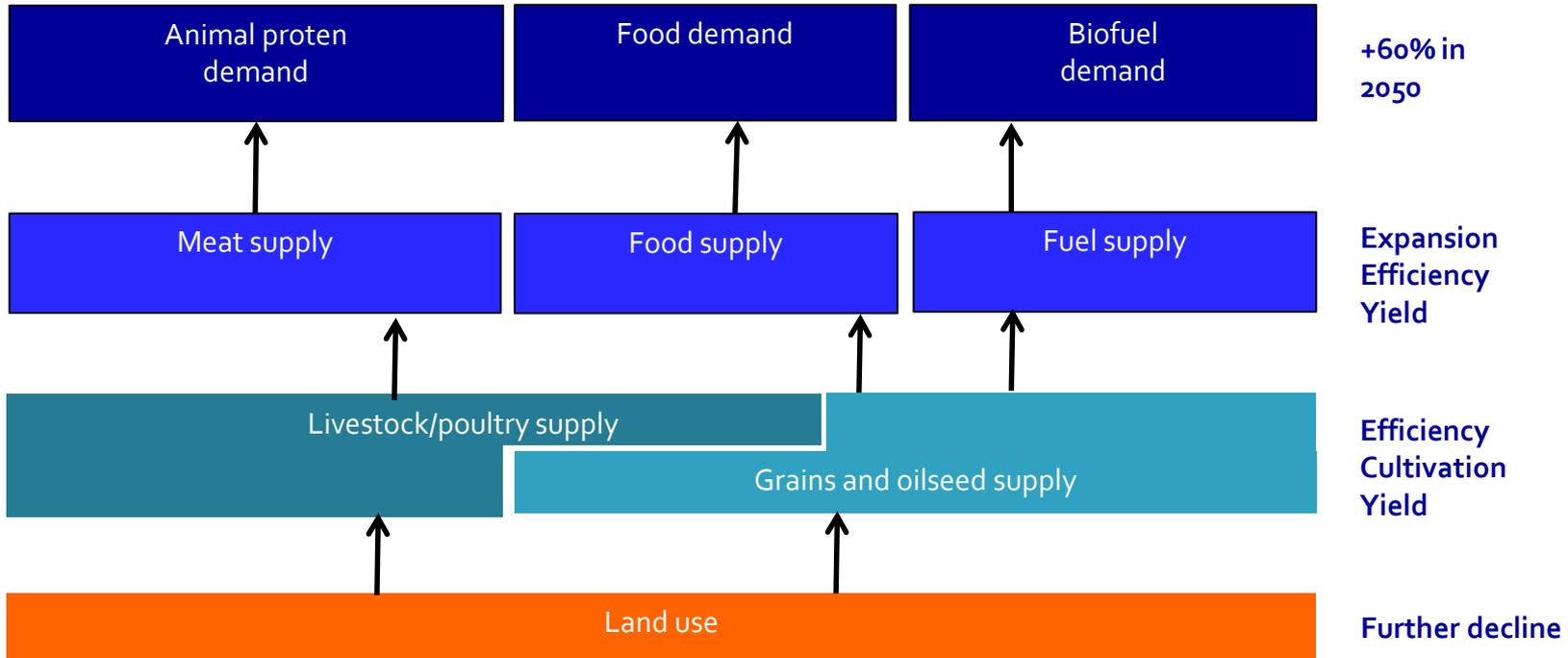
Source: Rabobank, FAO 2019

Worldwide land use 1961-2015



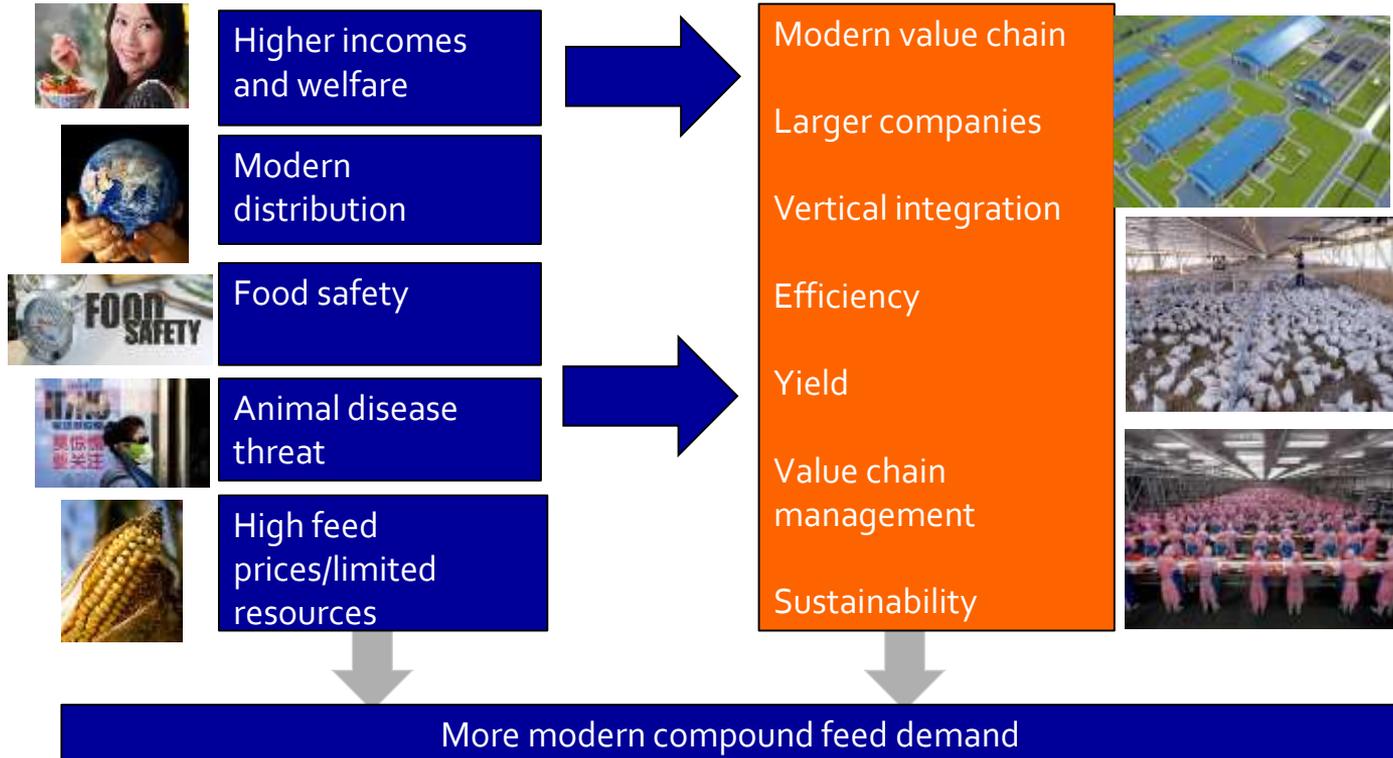
Source: FAO/Rabobank analysis 2019

Global food supply challenge: more focus on yield and efficiency



Source: Rabobank, 2019

Emerging market growth and challenges are driving to modern farming



Efficiency improvement is and will remain a key focus of the industry

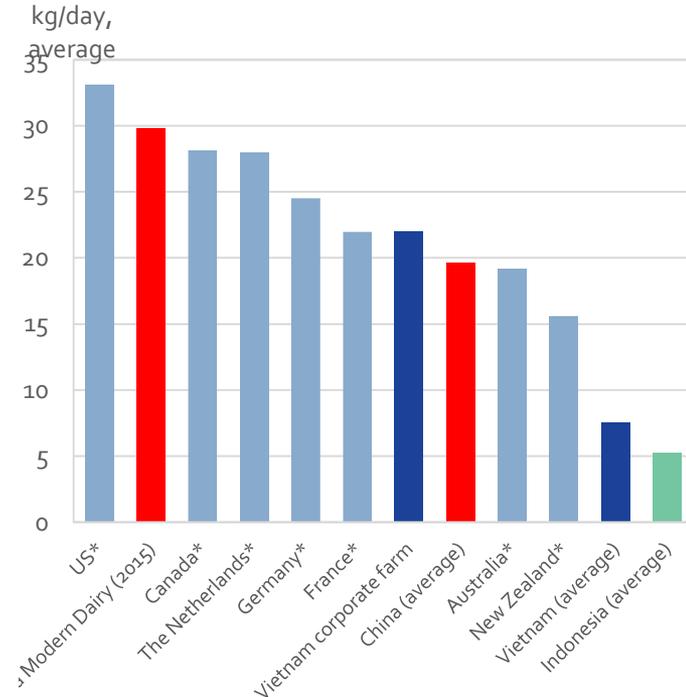


Benchmark costs in broiler production in 2017

	Feed price (EURct/kg)	DOC (EURct/kg)	Feed conversion	Weight	Wage EUR/hour	Processing costs	Total cost whole chicken
China	37.5	23.5	1,85	2.0	3	19	154
France	29.2	30.3	1.67	1.9	20	31	154
Netherlands	31.1	31.1	1.58	2.4	22	33	147
Spain	31.5	32.0	1.72	2.6	14	27	144
Hungary	30.2	30.9	1.63	2.3	5	21	136
Poland	31.4	31.5	1.62	2.3	6	22	134
Thailand	29.6	28.9	1.68	2.4	2	17	120
US	24.1	27.0	1.83	2.7	14	25	117
Ukraine	24.2	32.0	1.74	2.5	2	18	112
Brazil	24.4	22.3	1.79	2.6	3	17	108

Source: Rabobank analysis based on WUR/LEI, 2017

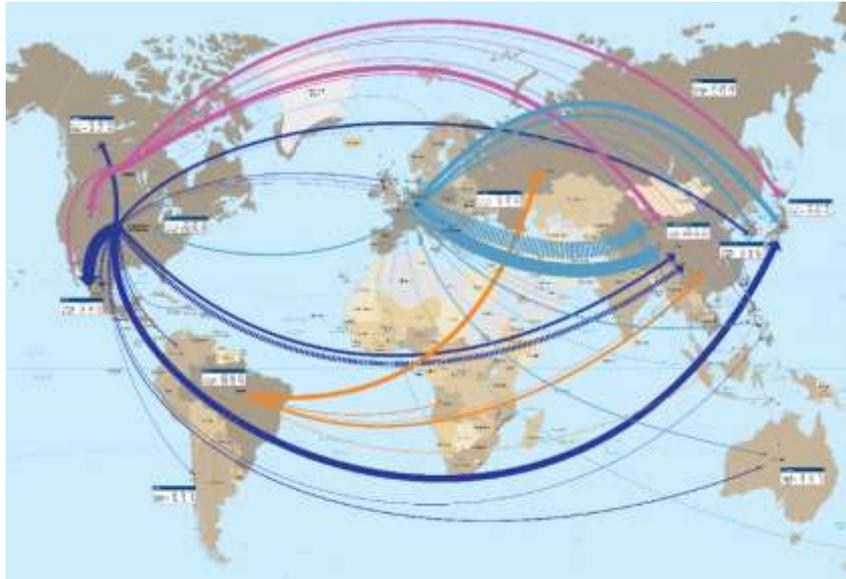
Upside in milk yield comparison



More West – East trade flows to supply Asian markets



Rabobank 2018 global pork trade map



Source: Rabobank, 2019

Rabobank 2018 global poultry trade map

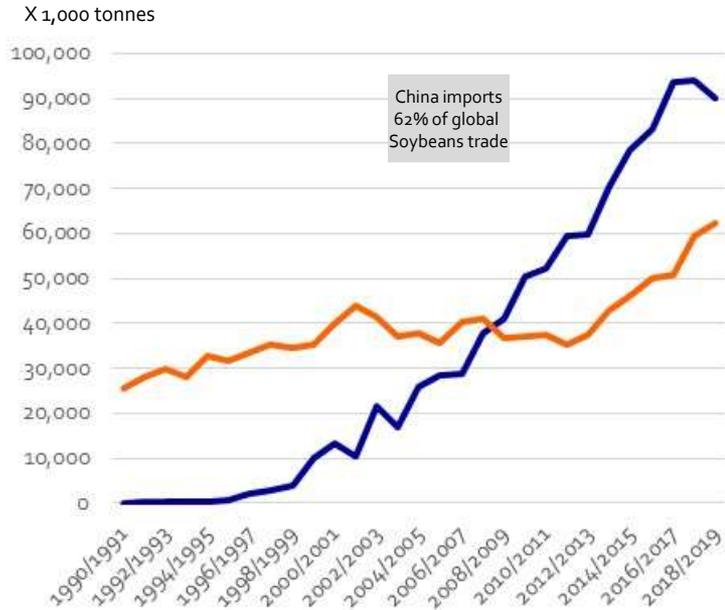


Source: Rabobank, 2019

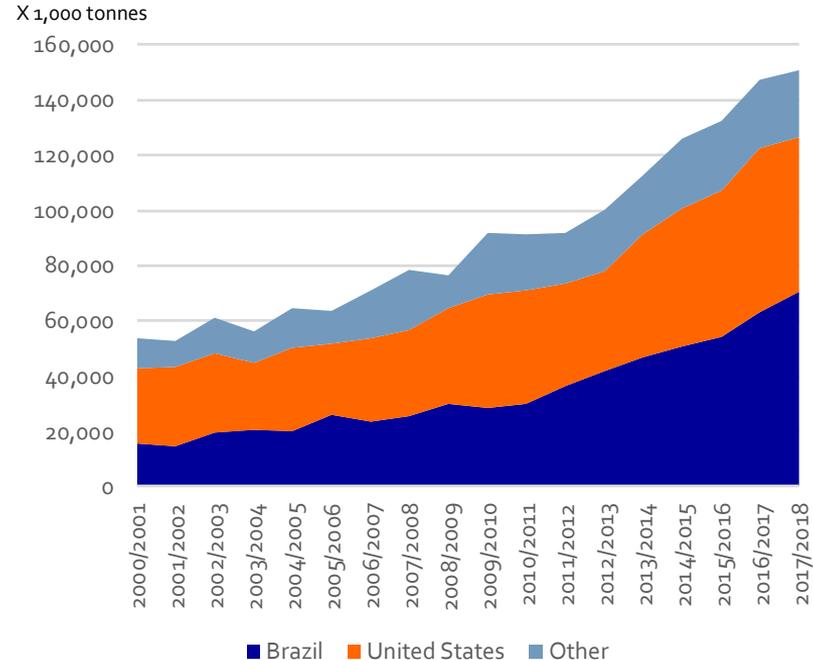
Global grains and oilseed markets: China ASF, US-China trade war, improved supply



Global soybean imports



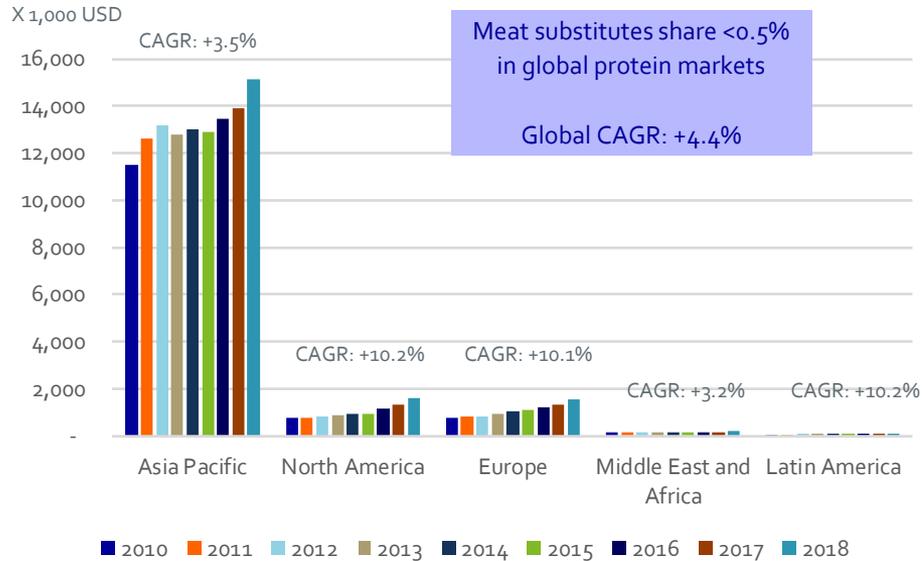
Global Soybean exports



Social changes can impact the outlook for animal protein markets

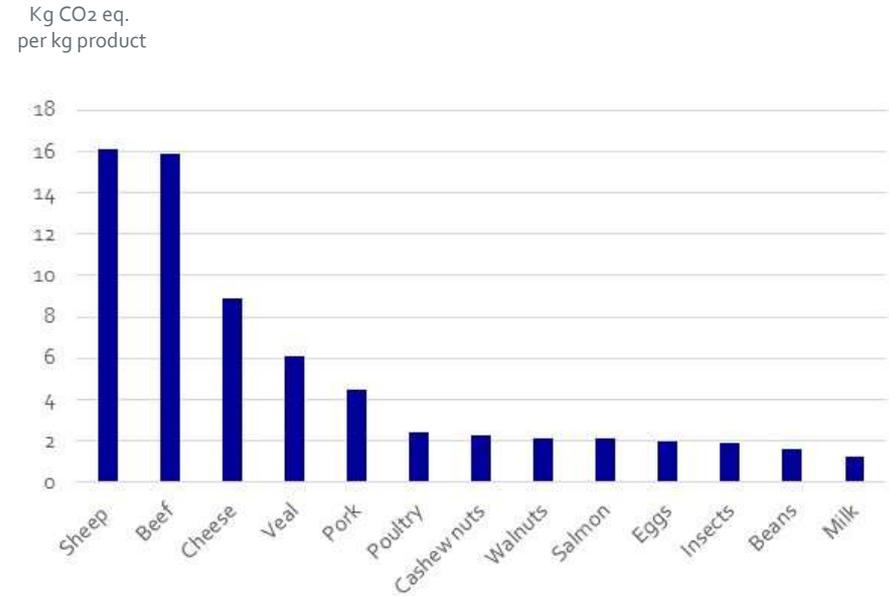


Meat substitutes retail sales



Source: Rabobank analysis based on Euromonitor, 2019

Carbon footprint of food products

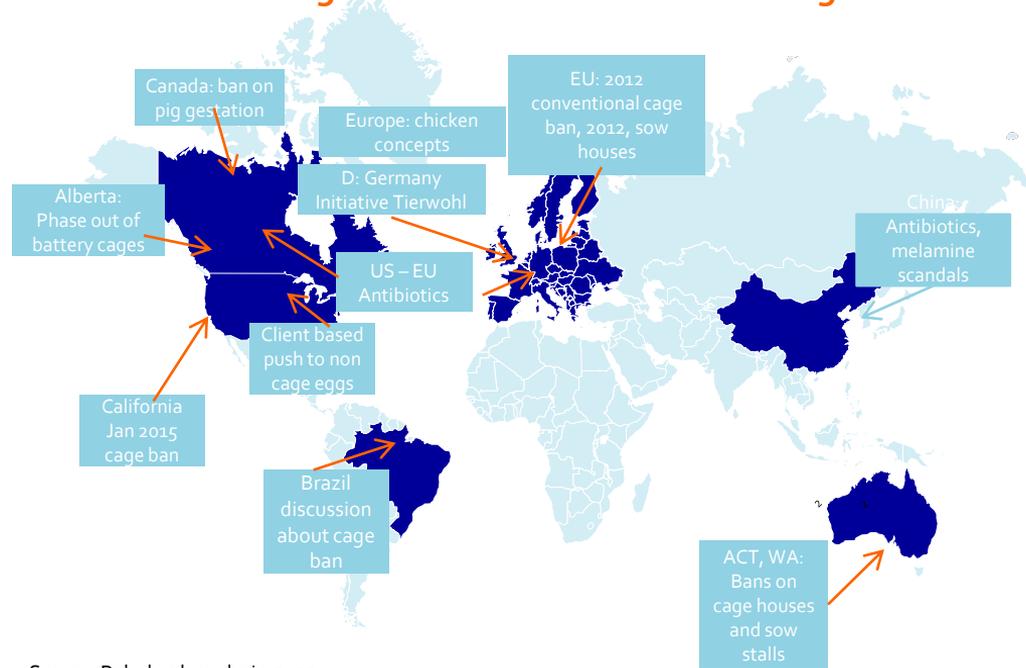


Source: Rabobank analysis based on WUR, 2019

Social concern driven changes are rising globally and impact industry



Selected regional social concern driven changes



Source: Rabobank analysis, 2019

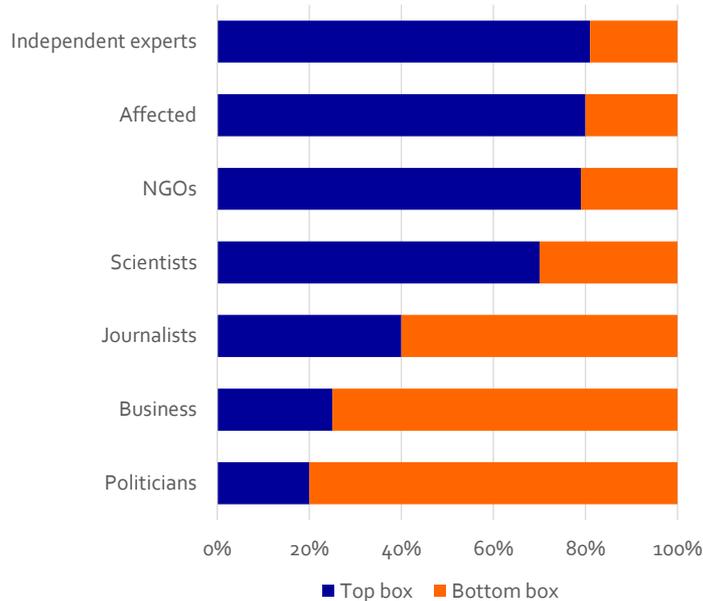
Themes with big global impact



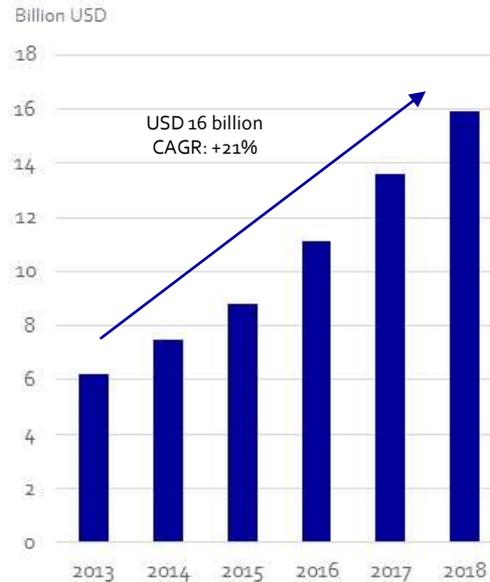
Online is changing the food industry more than ever



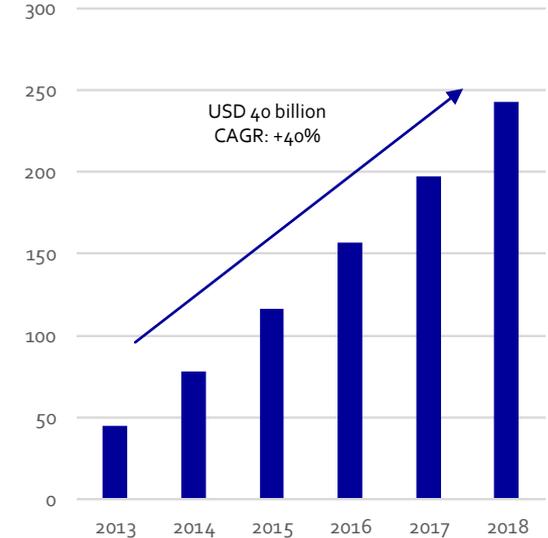
Confidence in opinion leaders in Germany, 2017



On-line food sales in United States



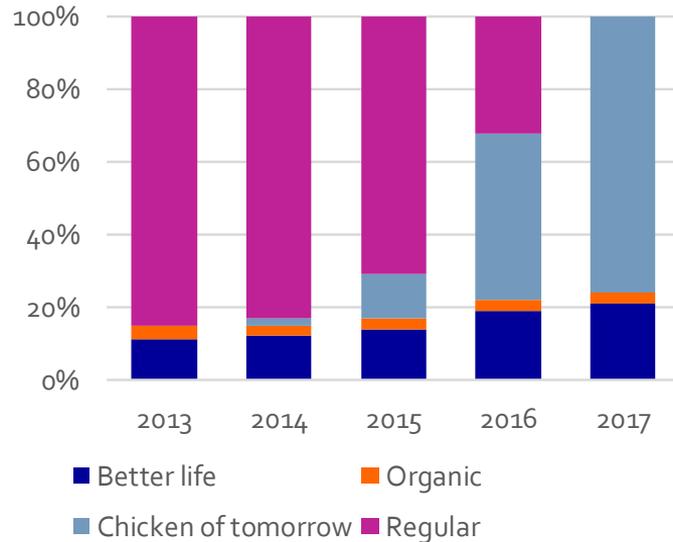
On-line food sales in China (CNY million)



Market demand is changing; more concepts and higher standards



Europe: animal welfare driven change; NL example



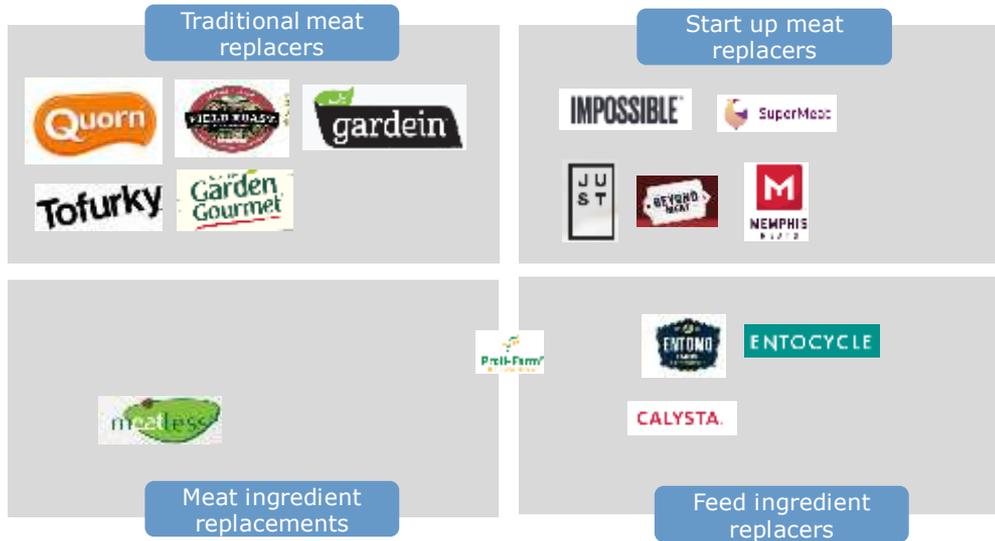
US: Customer driven shift to concepts



Rising investment opportunities in alternative protein segment



Alternative proteins market segmentation



Alternative protein investments

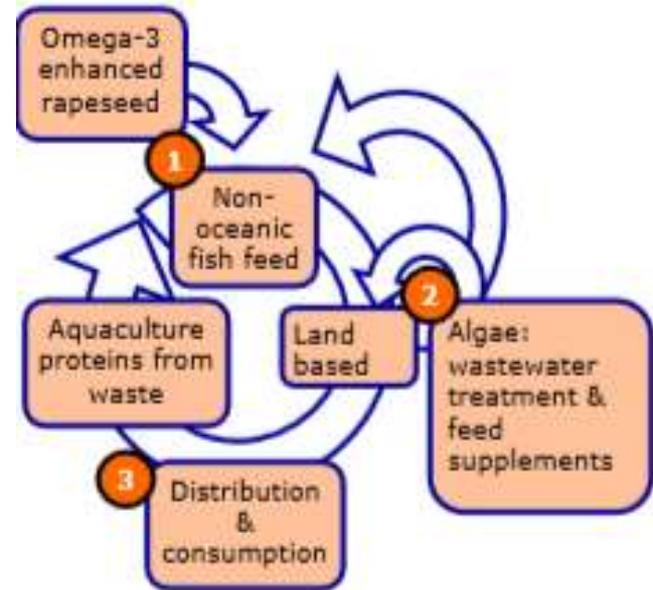
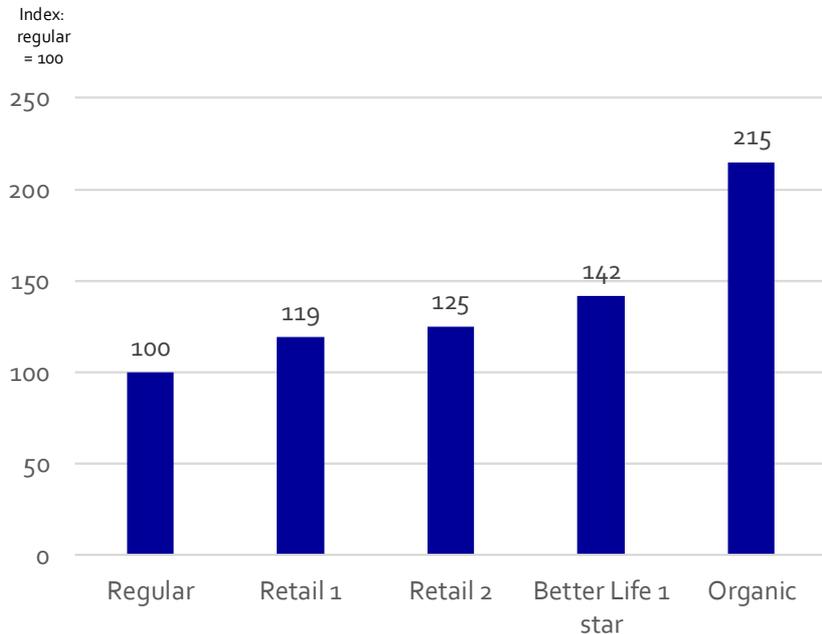
	Startup	Funding	Protein industry investor
JUST	2011	\$387 m	ERMASEK HOLDINGS
IMPOSSIBLE	2011	\$220 m	ERMASEK HOLDINGS, PRALIS
CALYSTA	2012	\$ 85 m	ERMASEK HOLDINGS, Cargill, PRALIS
BEYOND MEAT	2009	\$ 72 m	Tyson
NEMPHIS	2015	\$ 20 m	Tyson, Cargill
SuperMeat	2015	\$ 4 m	Tyson, CALYSTA

The move to concept poultry and other proteins leads to different costs



Broiler concepts cost price comparison in NL

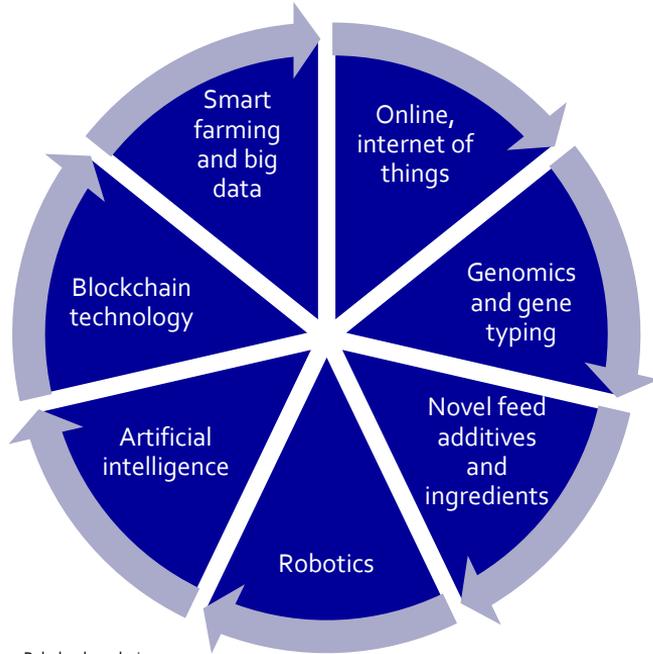
A smarter food chain: more circular



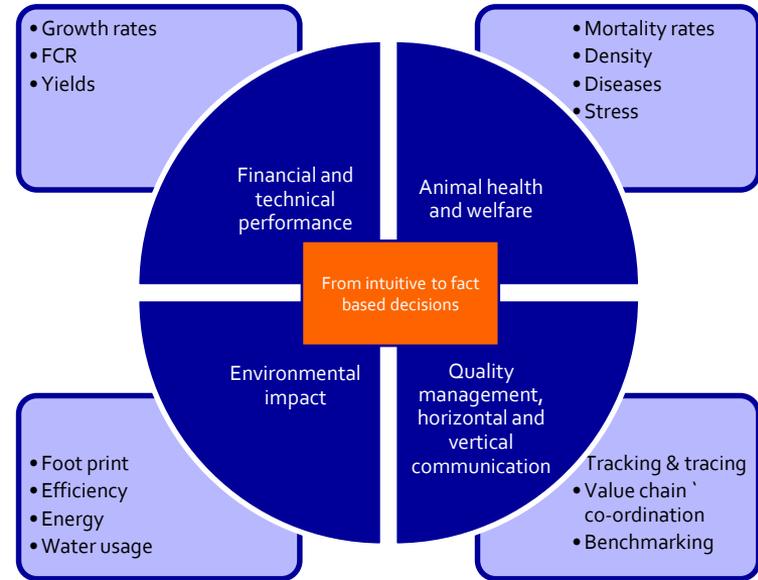
New technology will help to solve key supply and social challenges



Upcoming new technology



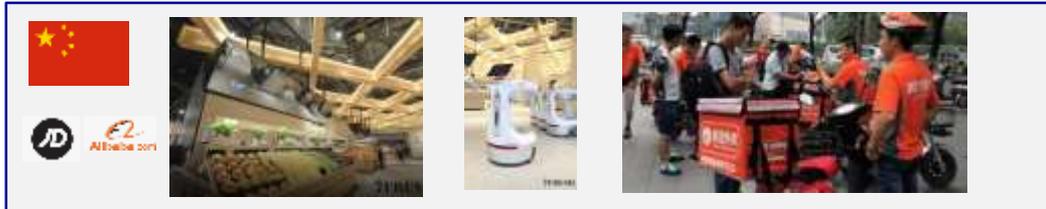
From intuitive to more fact based decisions



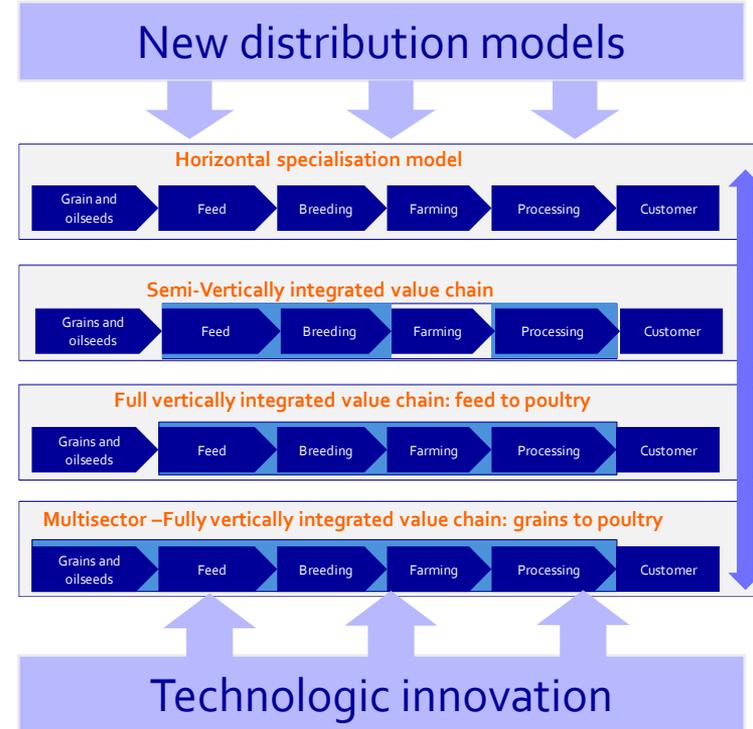
Animal protein supply chains will change fundamentally in next decade



Food distribution: a future revolution



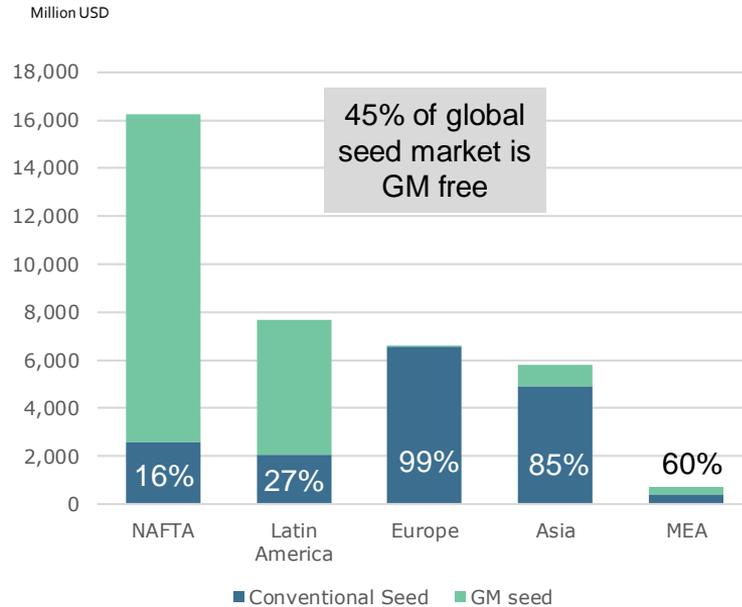
Value chain models need to change



How to supply adequate protein crops to feed rising population?

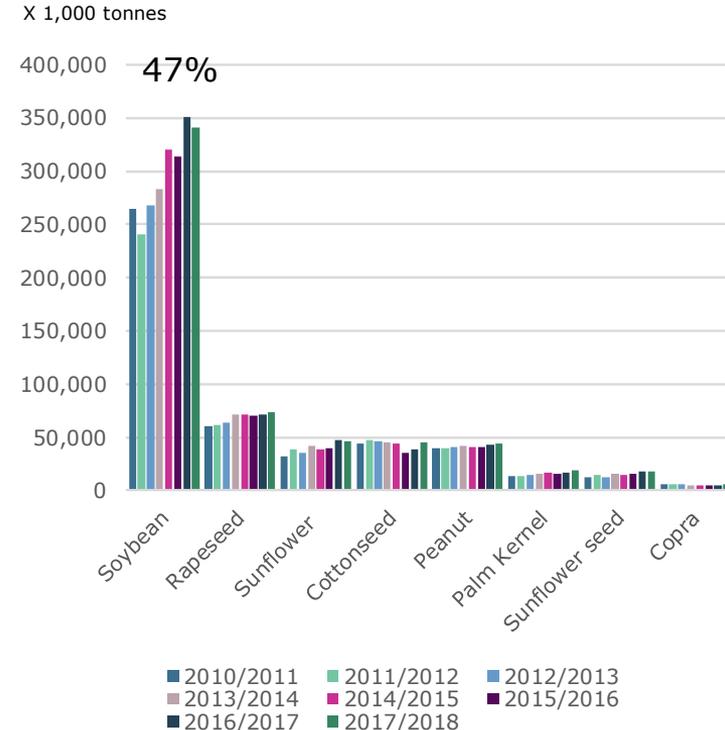


Global GM/GM free seed market by region

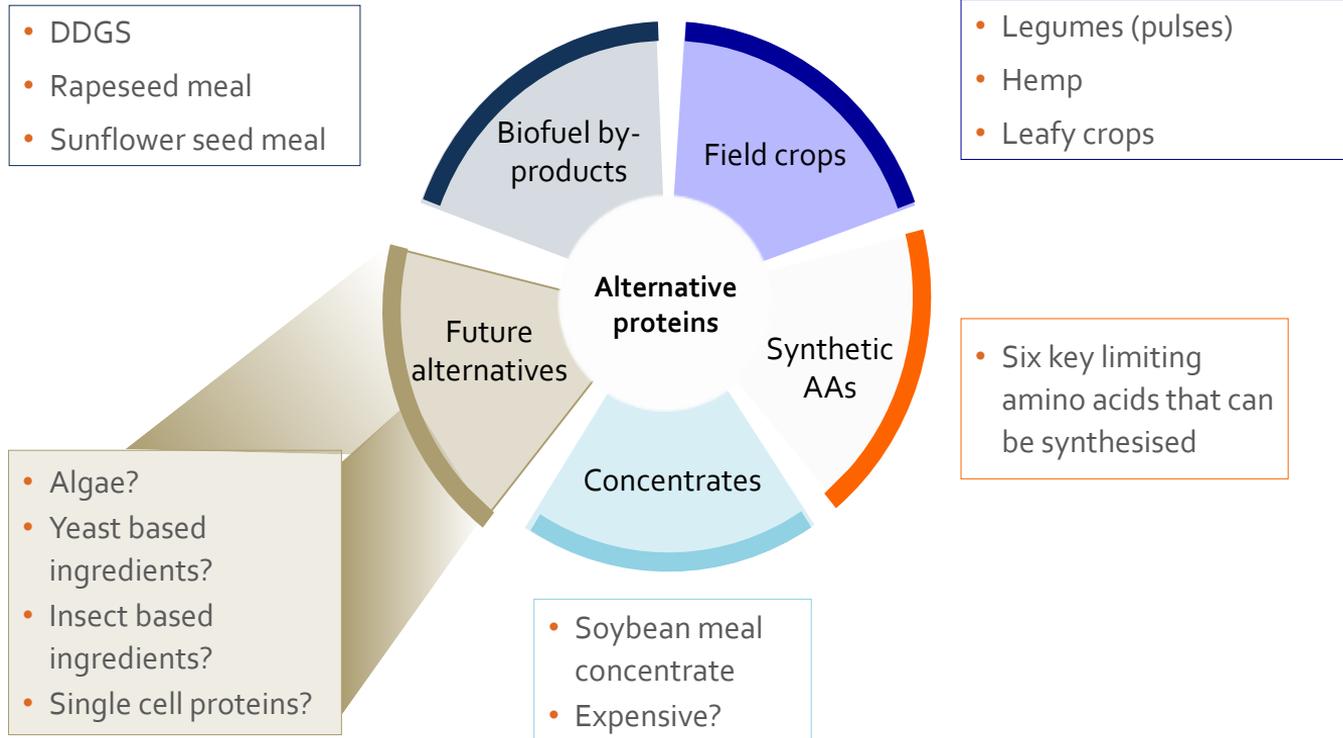


Source: Rabobank analysis, Philip McDougall, 2019

Global protein crop production: alternatives for soy bean?



Alternative protein sources are promising, but not competitive yet



Closer linkages between G&O production and (animal) protein



Global

ADM BÜNGE
 中糧 COFCO Cargill
 LouisDreyfus

Europe

Avril
 invivo
 BayWa dlg
 AGRAVIS

Global

BASF EVONIK
 CJ CHEILJEDANG
 DSM DANISCO

Europe

ADISSEO
 nuscience
 ABVista neovia
 novozymes

Global

nutreco DSM
 Cargill neovia
 ADM

Europe

mixscience
 nuscience
 de heus VILOFOSS
 MILAVIT

Global

Cargill
 新希望集团 NEW HOPE GROUP
 LAND LAKES FEED WENS MEAT

Europe

Farmers
 agrifirm
 de heus dlg
 AGRAVIS

Global

JBS Tyson
 Smithfield
 BRF Cargill

Europe

Vion BIGARD
 DANISH CROWN
 TÖNNIES
 abp Veil Companies

Conclusions



Markets

- 35% global growth; 90% in emerging markets
- More poultry and aquaculture
- On-line will change industries
- Alternative and concept protein market to grow significantly

Supply

- Feeding the world requires efficient supply
- Social concerns to drive concept poultry growth
- Need for alternative feed protein sources
- Global reduction of antibiotics use

Technology

- New technology to support industry challenges
- Big new pending innovation can support industry to solve social challenges



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