

Global egg industry outlook 2035

Long-term egg market and investment perspectives



Introduction

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We are proud to present this landmark publication for the global egg industry, developed in partnership with Rabobank in our first year as the World Egg Organisation.

We want to thank Nan-Dirk Mulder and Rabobank for everything they have done to make this possible. And we would also like to thank all the WEO members who took the time to read and critique this report to ensure its relevance and practicality to egg businesses across all regions.

The world today is experiencing more geopolitical instability than it has for many decades, and this brings with it uncertainty and challenges, but also new opportunities for growth.

The egg industry is challenged by old adversaries, such as avian influenza, but also sees great possibilities through the adoption of new technologies such as HPAI vaccination and the harnessing of artificial intelligence.

We also see the old trend of consolidation within the egg sector accelerating – but with a twist – as new investors enter the market and businesses increasingly look beyond their national borders and across continents to achieve rapid growth.

We believe this report will help leading egg businesses continue to grow and develop, at an ever-faster pace.

Our industry has always demonstrated amazing resilience, not only because of the people driving it forward, but also because of the extraordinary product at its heart. The egg is a true superfood, with an increasingly important role to play in nourishing our ever-growing population.

The importance of the egg is starting to be recognized, not just at a local level but also at a global level. World Egg Organisation, through our strategic partnership with Rabobank, looks forward to continuing to support you on this journey.

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The global egg industry is poised for significant change over the next decade. We have been honored to work closely with the WEO to identify key market and investor trends and themes that will shape the industry's future.

The global egg market is expected to grow by over 22% by 2035, with 90% of this expansion concentrated in emerging markets such as Asia, Africa, and Latin America. For investors, this presents both substantial opportunities and complex challenges. Growth is increasingly driven by rising incomes, urbanization, and evolving consumer preferences – rather than by population growth alone. As markets mature, demand is shifting toward value-added segments including egg products and cage-free, organic, and functional eggs. This evolution is reshaping supply chains, distribution models, and investment priorities.

Digitalization, sustainability, and animal welfare are becoming central to competitiveness. Online food distribution and social media are influencing consumer behavior, requiring producers to rethink branding, marketing, and product development strategies. Meanwhile, geopolitical tensions have led to a greater focus on food and resource security, with a shift toward the localization of production.

For investors, the implications are clear: High capital expenditure will be needed across greenfield expansion, consolidation, cage-free transitions, vertical integration, and the modernization of value chains. Technologies such as AI, robotics, and smart farming will be increasingly more critical to improving efficiency, biosecurity, and environmental performance.

This report provides a comprehensive roadmap for navigating the future of the egg industry from a global perspective – highlighting key trends, risks, and investment themes. It is designed to support strategic decision-making in a rapidly evolving global landscape, where agility, innovation, and sustainability will determine long-term success.

Thank you to the WEO and the steering group who supported us in preparing this report.

Summary: Egg markets to keep growing, but expected industry changes will require strategic decisions with significant investments

This report outlines RaboResearch and the WEO's long-term outlook for the global egg industry through 2035, focusing on market growth, expanding global markets, consumption trends, supply chain evolution, and investment opportunities. It highlights the shift in demand toward emerging markets, the impact of urbanization and income growth, and the increasing importance of sustainability, digitalization, and consumer preferences. The report also emphasizes the need for industry modernization, strategic investments, and adaptation to changing geopolitical and trade conditions.

Market growth and changing consumer behavior

- The global egg market is projected to grow by 2.0% in volume annually, leading to a 22% larger market in 2035.
- Currently, per capita consumption varies widely, from more than 50 eggs per person per year in parts of Africa to over 300 eggs in countries like Mexico and Japan.
- Over the next decade, 90% of growth will occur in emerging markets, especially Asia, Africa, and Latin America due to higher per capita consumption and population growth.
- Consumption growth will slow in high-income regions, with the focus shifting to value-added products like organic, cage-free, and functional eggs and egg products.
- In higher-income countries, growth will be increasingly driven by rising incomes, improved availability, consumer preferences, marketing, and product development rather than population growth.

Shifting sales channels and consumer trends

- Grocery retail will remain the dominant sales channel, especially in developed markets, while emerging markets will see a rapid shift from traditional markets to grocery retail and online food distribution.
- Foodservice channels are growing quickly in emerging markets, offering new opportunities for egg products and breakfast solutions.
- Online food distribution is booming, especially in Southeast Asia, China, and India, driving digital transformation.
- Younger consumers are more digitally engaged and socially conscious, influencing product development and marketing strategies.
- Key drivers besides price include health, sustainability, convenience, taste, and animal welfare.
- Functional foods (e.g., omega-3 and vitamin-enriched eggs) present strong growth potential, and animal welfare-driven concepts are also gaining global market share.

Supply chains, trade, and industry modernization

- As the egg industry continues to move from a global to a local focus, most global supply chain investments will concentrate on growing consumer markets with localized supply chains.
- The industry is shifting its focus from volume to value, with increased vertical integration, efficiency, and biosecurity.
- Cage-free systems are expanding, especially in Western markets but also increasingly in emerging markets.
- Digitalization and smart farming are becoming essential for competitiveness.
- Global egg trade remains limited (only 2% of production), with a trend toward local-for-local production.
- Dried egg products are the most internationally traded egg category.
- Trade is affected by bird flu and biosecurity concerns as well as geopolitical tensions.

Investment outlook

- Growing global markets and changing demand and distribution channels will require high capital expenditure across greenfield expansion, cage-free transitions, and value-added segments.
- Strategic investments will focus on modernization, digitalization, and sustainability.
- Integration models vary globally, with full vertical integration gaining traction in emerging markets.
- Innovation is accelerating in most parts of the industry including in genetics, animal nutrition, equipment, and digital value chains.
- Technologies like AI, robotics, genomics, smart farming, horizontal and vertical data exchange, and benchmarking will drive future efficiency and sustainability.

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Global egg market outlook 2035



Global egg market forecast from 2025-2035: 2.0% YOY growth

Global egg market to grow by 22% in next decade, largely driven by rising incomes and consumer preferences

Figure 1: Global egg market: Gradual slower annual growth, 1995-2035f

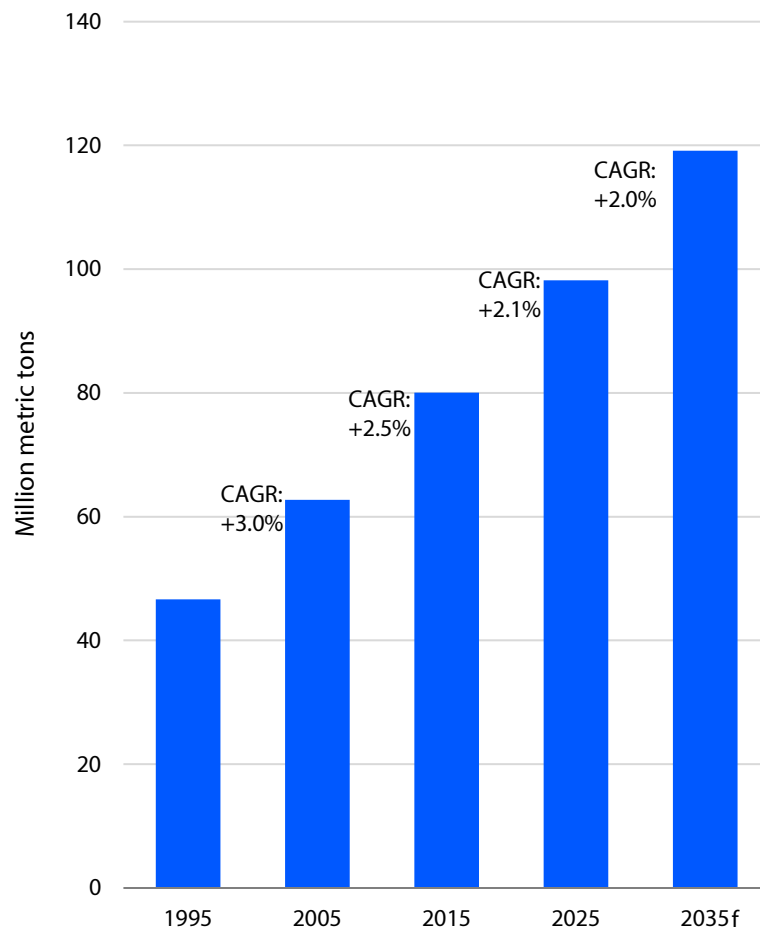


Figure 2: Egg market growth: 19% population growth, 81% other growth drivers, 1995-2035f

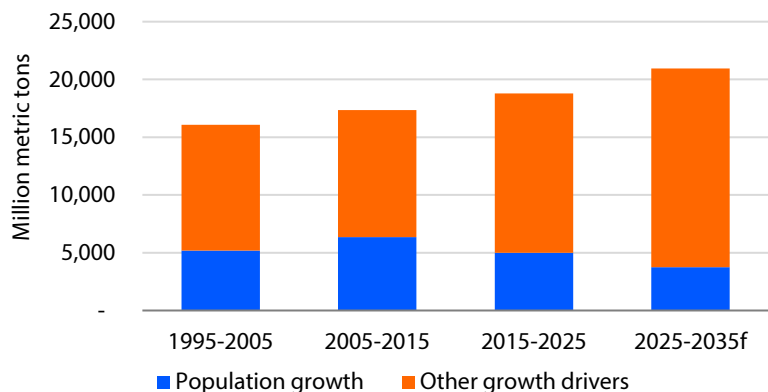
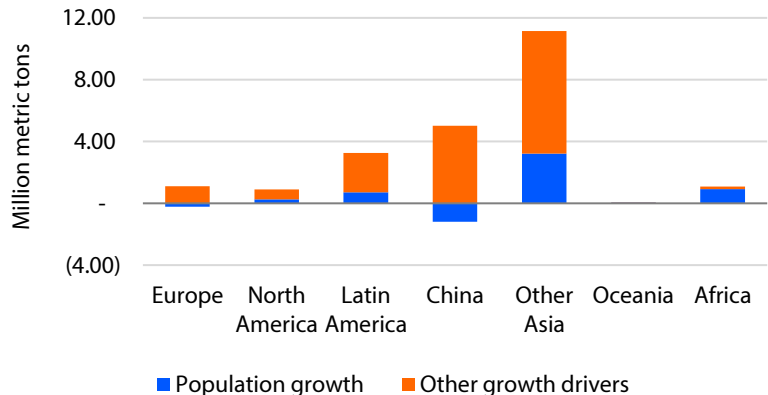


Figure 3: Growth drivers by region: Population growth still relevant in Africa and Asia 2025-2035f



Global egg demand 2025-2035

The global egg market has grown rapidly over the past three decades, with total egg production more than doubling – from 46 million metric tons in 1995 to 99 million metric tons in 2025 (see figure 1). Although growth has slowed – from 3% annually between 1995 and 2005 to 2.1% over the past 10 years – the egg market was among the fastest-growing animal protein markets in the last decade, alongside poultry meat (+2.5% YOY growth). Growth in other animal protein markets has been lower, with seafood growing 1.5% YOY, pork up 0.6%, and beef up 1.1%. Demand for egg replacements has also been growing but is now facing slower growth, and its market footprint is still below 1% of the total egg and egg replacer market.

RaboResearch forecasts that eggs will maintain their strong market position compared to other proteins, although growth is expected to slow slightly to approximately 2.0% YOY over the next decade.

The main drivers of global growth are:

- Population growth.
- Income growth/affordability.
- Consumer preference.
- Availability.
- Marketing and product development.

The influence of population growth is gradually declining (see figures 2 and 3). It remains a major driver only in Africa and South/Southeast Asia. In other regions, population growth is slowing, and market growth is increasingly driven by improved availability and market-driven initiatives, including investments in marketing and product development.

Source: RaboResearch estimates and projections based on Food and Agriculture Organization of the UN (FAO), WEO, and regional statistics, RaboResearch 2025

Key macro drivers of growth: Income and population growth

Shrinking population in Europe and China, fast population and income growth in southern Asia and Africa

Figure 4: Global population growth: Concentrated in Asia, Africa, and Latin America, 1995-2035f

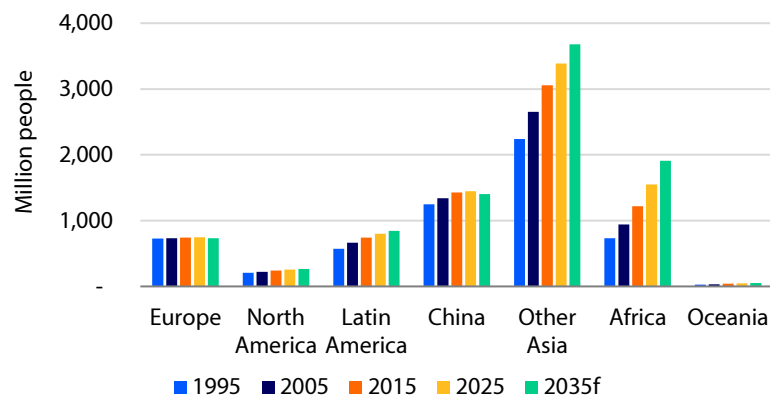


Figure 5: Global urbanization rate: From 45% in 1995 to 63% in 2035

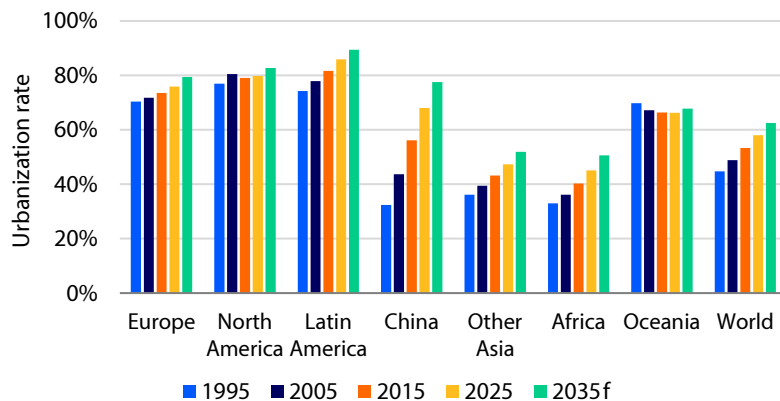
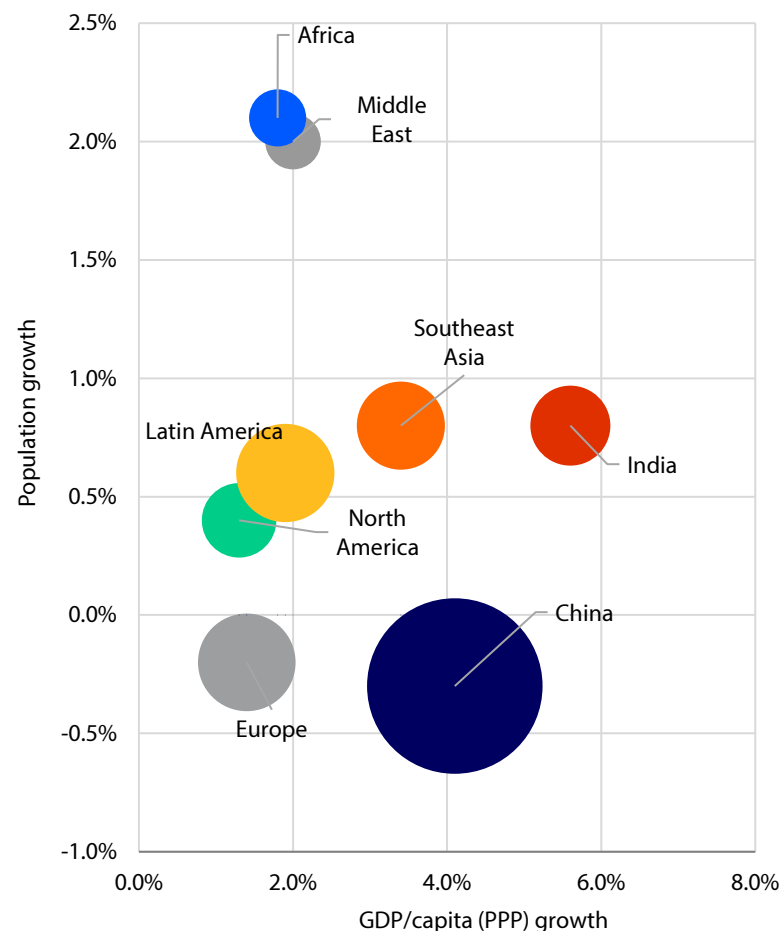


Figure 6: Population growth vs. GDP per capita (PPP) growth, 2025-2035f



The macro trends influencing egg markets

In recent decades, population growth and urbanization were key drivers of global egg consumption. As figures 2 and 3 indicate, approximately one-third of global growth has been driven by an expanding world population.

We expect gradual changes in the coming decade. According to the UN, the population in Europe is projected to slightly decline (-0.2%), while North America (+0.4% YOY) and South America (+0.6% YOY) will continue to experience modest annual growth (see figures 4 and 6). The most notable shift is expected in China, where, after years of population growth, the UN forecasts a slight decline – from 1.45 billion people in 2025 to 1.4 billion in 2035. Other Asian countries' populations, especially in southern Asia and the Middle East, will continue to grow (+0.9% YOY). Africa is expected to see the fastest annual growth (+2.1% YOY).

In emerging markets – China, India, Southeast Asia, the Middle East, and Africa – the focus will increasingly shift toward the impact of urbanization (see figure 5) and income growth. The rise of megacities in these regions will necessitate changes in distribution, marketing, and product development. Rising incomes will support the creation of value-added products but may also lead to growing social concerns related to health, local economies, and production methods.

Source: RaboResearch estimate and projections based on FAO, International Monetary Fund (IMF), RaboResearch 2025

Global egg market growth continues to rise

All regions increase egg consumption, with 90% of growth in emerging markets

Figure 7: Global egg consumption: Market doubled between 1995 and 2025

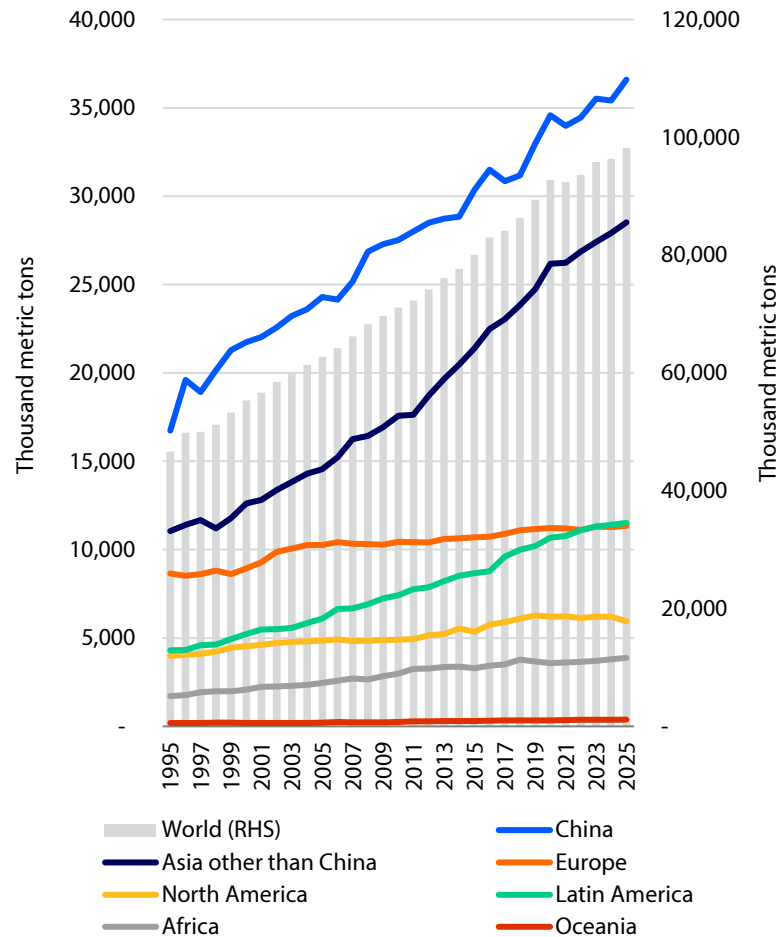
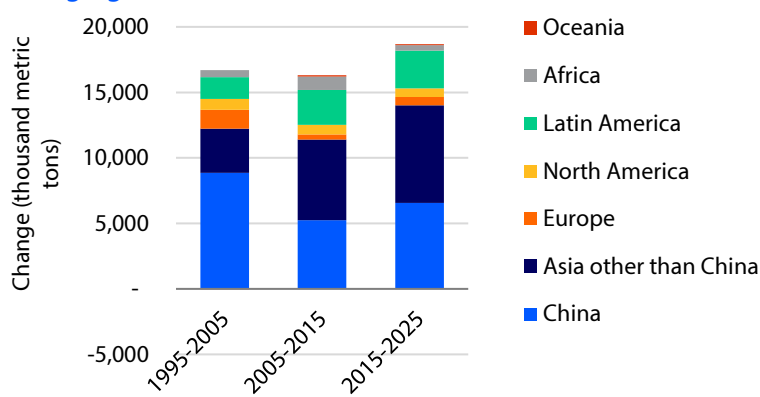


Figure 8: Annual egg consumption growth by region, 1995-2025

	Change 1995-2005	Change 2005-2015	Change 2015-2025f
China	3.8%	2.3%	1.9%
Other Asia	2.8%	3.9%	2.9%
Europe	1.7%	0.4%	0.6%
North America	2.0%	1.0%	1.1%
Latin America	3.5%	3.6%	2.9%
Africa	3.7%	3.0%	1.7%
Oceania	0.5%	4.1%	2.3%
Global	3.0%	2.5%	2.1%

Figure 9: Egg consumption growth by region: 90% in emerging markets, 1995-2025



Egg consumption growth: Mainly emerging markets

Global egg markets have more than doubled in size over the past 30 years, and growth is expected to continue by another 20% in the next decade.

However, global growth is not evenly distributed. As Figures 7, 8, and 9 indicate, more than 90% of the increase in egg consumption between 2015 and 2025 occurred in emerging markets – 35% in China and 40% in the rest of Asia. Latin America accounted for approximately 15% of global growth.

Growth in advanced economies is slowing due to slower population growth, more mature market conditions, supply challenges such as avian flu, and rising social concerns. Still, the industry will continue to grow in the next decade: in Europe by 0.6% annually, in North America by 1.1%, and in Oceania by 2.3% per year.

We expect these trends to persist in the coming decades, although overall industry growth is projected to slow to 2.0% annually. Growth will be slower in higher-income emerging markets (such as China, parts of the Middle East, and Latin America), with a further shift toward gains in South and Southeast Asia, Latin America, and increasingly, Africa.

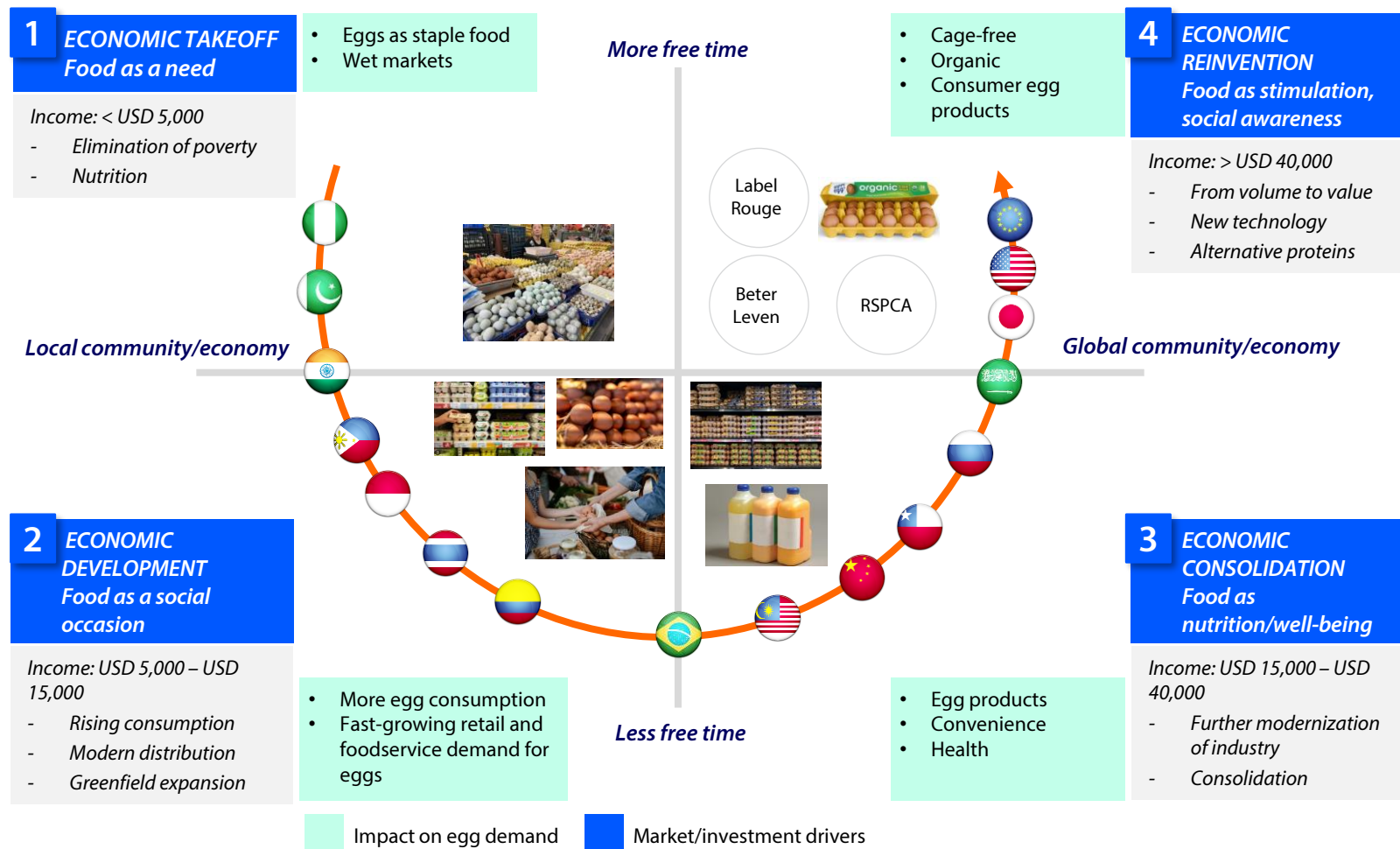
Egg industries in markets experiencing slower growth will need to focus more on marketing, product development, and improving egg availability as key growth drivers.

Source: RaboResearch projection based on FAO, WEO, regional statistics, RaboResearch 2025

Changing consumer preferences are linked to income growth

Egg consumption and preferences are changing in line with economic development

Figure 9: Egg consumption change and economic development



Changing economies, changing preferences

Consumer preferences for eggs are evolving over time. Income plays a significant role, but it is not the only driver. Other factors such as marketing, product development, and availability are also important (see figure 9).

In general, eggs are the most affordable source of animal protein for consumers in low-income countries and often the first protein they purchase. Availability is also a key factor, as layers are easy to raise in backyards in rural communities. Most eggs are bought directly from farms or wet markets (Stage 1).

As incomes rise (Stage 2), economies begin to modernize with growing urban populations, and egg consumption increases significantly. People can afford to buy more eggs, and consumers gradually shift to purchasing through more modern channels such as supermarkets, restaurants, and convenience stores. Online food delivery also begins to grow rapidly.

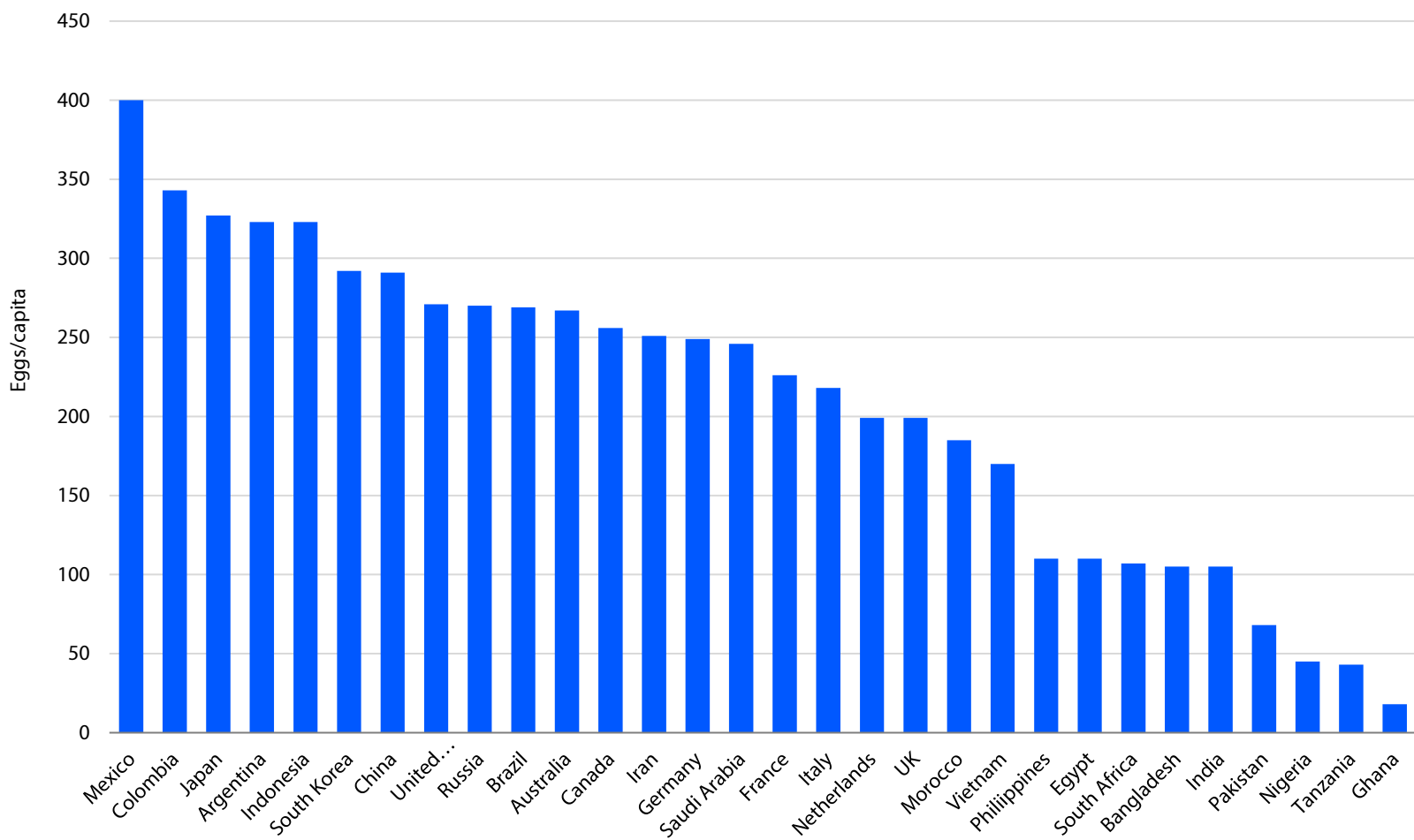
In Stage 3, as incomes rise further, growth in egg consumption slows, and consumers begin to purchase higher-value products. Health and convenience become more important. This is also the stage where sales of industrialized egg products grow rapidly.

In Stage 4, incomes are high, consumption is high, and ethical considerations become more important. Consumers begin to buy more organic and free-range eggs.

Egg consumption per capita by country

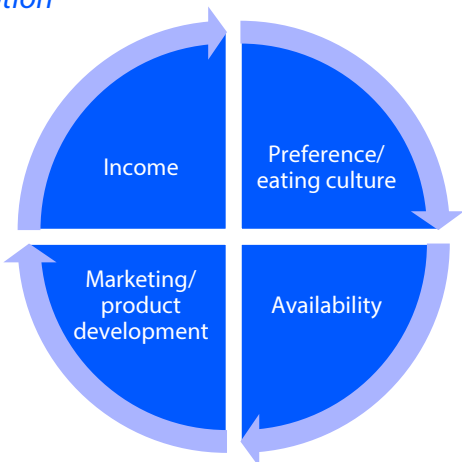
Income level, preference, eating culture, and availability are driving differences in per capita consumption

Figure 10: Consumption of eggs per capita by country, 2024



Source: RaboResearch estimate based on WEO, FAO, regional statistics, RaboResearch 2025

Figure 11: Drivers of differences in per capita egg consumption



Analysis: Differences in egg consumption by country

Figure 10 highlights the significant differences in per capita egg consumption between countries. This ranges from low levels in African countries such as Uganda, Ghana, and Tanzania (under 50 eggs per person per year) to more than 300 eggs a year in Mexico, Argentina, Colombia, Indonesia, and Japan.

It shows that growth in egg consumption tends to slow upon reaching Stage 2 in economic development (see figure 9) and due to other factors (see figure 11) such as cultural preferences and traditions (e.g., Mexican cuisine). Industry marketing and product development has also helped significantly increase consumption in recent years, as in Latin American countries like Argentina, Colombia, and Brazil.

Projected egg market growth by country/region

China and EU to keep growing despite population decline, with greater growth in emerging markets

Figure 12: Global egg market growth by country, 1995-2035f

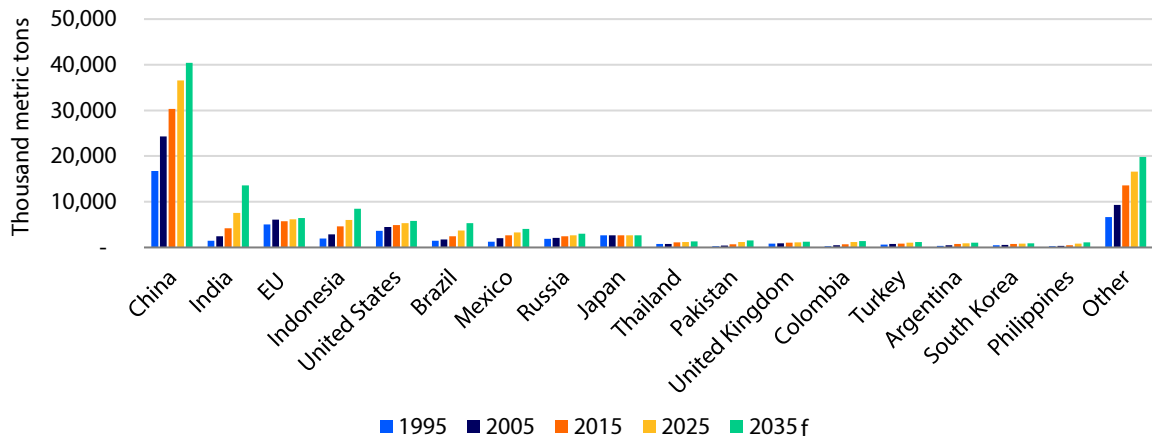


Figure 13: Change in consumption by country, 2025-2035f

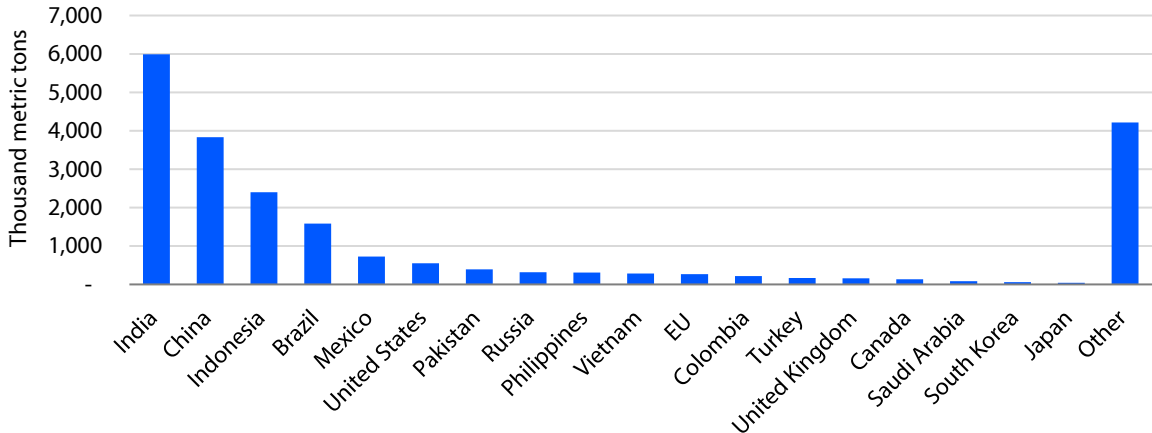


Figure 14: Global egg market growth by country, 2025-2035f

	Europe	North America	Latin America	Asia/Oceania	Africa
Slow growth (0%-1.5%)	EU UK Russia	United States	Chile	Japan South Korea China	South Africa
Moderate growth (1.5%-3%)		Canada	Mexico Argentina Paraguay	Thailand Malaysia Turkey Philippines Saudi Arabia Australia	Morocco Nigeria Egypt Ethiopia Ghana Zambia
Fast growth (3%-5%)			Brazil Colombia Peru	Indonesia Pakistan	Tanzania Kenya Uganda
Very fast growth (>5%)				India Vietnam	

Where is the growth in egg markets over the next decade?

In line with macroeconomic and geographic forecasts, we expect global egg consumption to grow rapidly in Asia, Africa, and Latin America through 2035 (see figures 12, 13, and 14).

Consumption growth in advanced economies such as the EU, Japan, and South Korea will be slow (between 0% to 1%), while North America and Australia will see slightly higher growth (just above 1%) due to higher population growth. Countries in Stage 3 of the development diagram in figure 9, such as China, Russia, and Chile, will also slow to approximately 1% growth.

From a volume growth perspective, India is expected to overtake China as the largest growth market by 2035 (see figure 13), driven by a combination of income and population growth, improved availability, and marketing. Indonesia and Brazil are also expected to experience rapid growth.

Source: RaboResearch estimate and projections based on FAO, WEO, regional statistics, RaboResearch 2025

Global egg products market to grow by 2%-2.5% YOY

The egg product industry is concentrated in developed markets, with quickly increasing production in emerging markets

Figure 15: Global egg products market, 1995-2035f

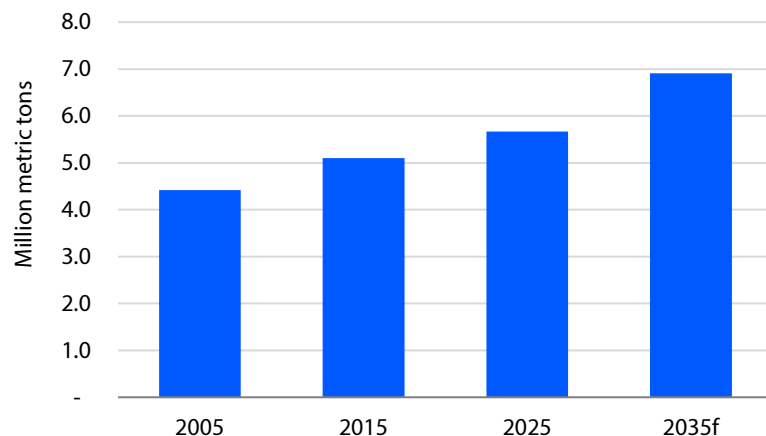


Figure 16: Egg products' estimated share of total egg consumption, 2024

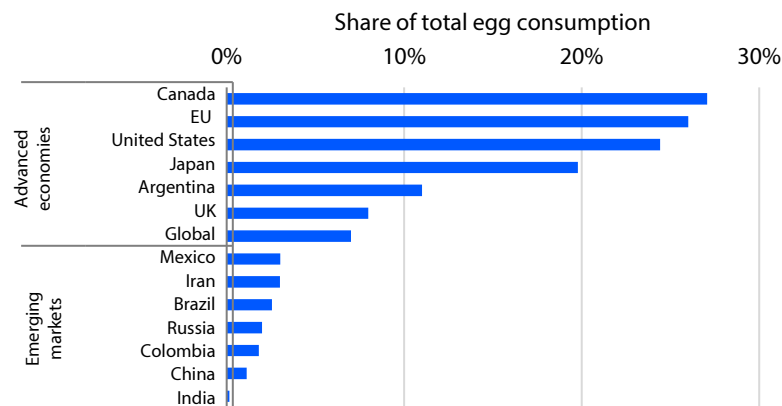
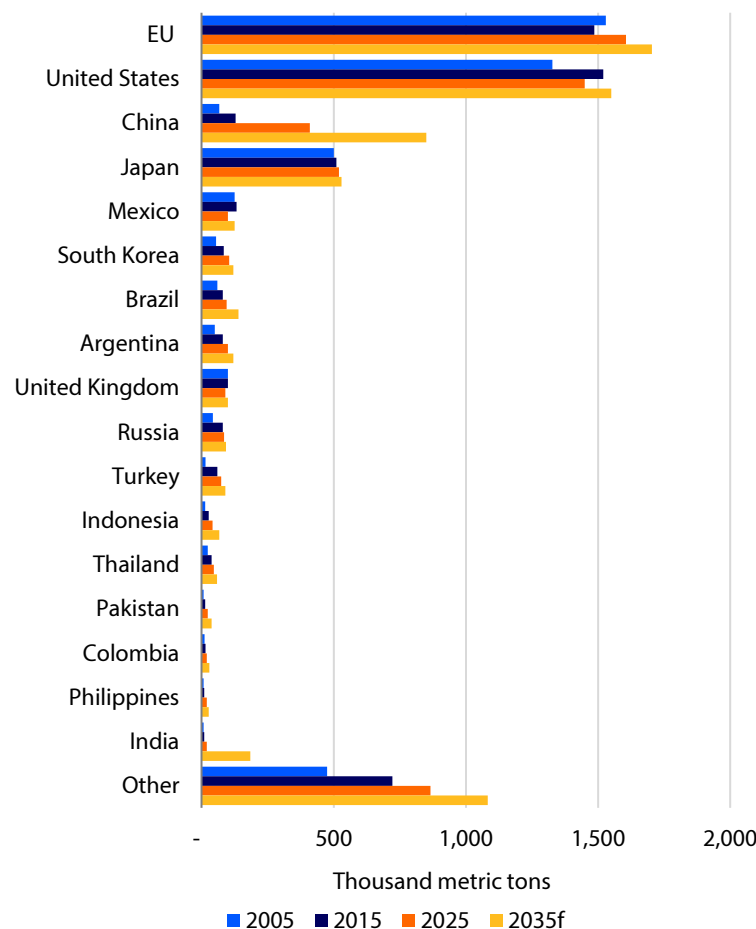


Figure 17: Global egg products market growth by country, 2005-2035f



Key drivers of egg product demand

Egg consumption can be divided into three main categories:

1. Whole-shell egg consumption for direct use (often at breakfast).
2. As an ingredient in meals.
3. As an ingredient in food products (e.g., bakery, ice cream, sauces, soups, desserts).

In most cases – especially in Stages 1 and 2 of the consumption development diagram (see figure 9), consumers or producers buy eggs and process them manually. As incomes gradually increase, food industries develop rapidly and demand for processed eggs rises due to food safety concerns, higher labor costs, and benefits from economies of scale. This leads to an increase in industrialized egg products. The initial growth typically begins in Stage 2 of the consumption matrix, with swift expansion of egg processing industries in Stages 3 and 4.

Currently, approximately 7% of global egg production is processed through specialized egg processing. Most of this industry is in advanced economies (see figures 16 and 17), with the EU, the US, and Japan traditionally having the largest egg processing sectors.

Rapid economic growth and industrial changes in China are driving massive investments in egg processing, with two to three new plants opening each year. This trend is expected to continue, with projected annual growth of 5% to 10% through 2035. India's processed egg demand is also growing quickly, with high expectations due to income growth and industry modernization. Looking ahead, other emerging markets such as Indonesia, Brazil, and Turkey are expected to follow.

Source: RaboResearch estimate, and projections based on FAO, WEO, regional statistics, RaboResearch 2025

Changing egg demand and consumer trends



Key global consumer trends and marketing opportunities

Global megatrends will significantly impact future product development and marketing

Figure 18: Key global consumption trends and related product development, distribution, and marketing opportunities

Consumer trends	Explanation of trend	Marketing opportunities for eggs
Young people in emerging markets	<ul style="list-style-type: none"> Over 75% of consumers in emerging markets will be aged 15 to 34 by 2035. 	<ul style="list-style-type: none"> Link eggs more effectively to social media. Develop dedicated egg concepts.
Retired and ready to spend	<ul style="list-style-type: none"> There will be a growing share of people aged 65+ in advanced economies. There will be an increasing number of wealthy retirees in emerging markets. 	<ul style="list-style-type: none"> Offer functional food claims for eggs. Offer small packs with health claims.
The squeezed-but-splurging middle class	<ul style="list-style-type: none"> Continued pressure on middle-income consumer spending in advanced economies is expected. 	<ul style="list-style-type: none"> Provide cost-efficient solutions.
More brand exploration and the rise of discounters	<ul style="list-style-type: none"> Brand loyalty has declined since Covid-19. Advanced economies will see continued growth of private label brands and discounters. 	<ul style="list-style-type: none"> Build preferred supplier relationships with retailers. Lead category development in collaboration with retailers.
Sustainability focus	<ul style="list-style-type: none"> Young consumers are more sustainability-focused than older generations. Willingness to pay a premium for sustainability has decreased. 	<ul style="list-style-type: none"> Differentiate products based on social concerns. Optimize price/value balance.
The worldwide wellness trend	<ul style="list-style-type: none"> The appetite for wellness spending in emerging markets is three times higher than in advanced economies. Different consumer segments – Gen Z, Gen X, and baby boomers – have different wellness needs. 	<ul style="list-style-type: none"> Offer high-protein products. Develop protein powders and egg-based food products. Promote natural health benefits of eggs.
The new urban hotspots	<ul style="list-style-type: none"> In advanced economies, there is a shift to secondary cities. Emerging markets are seeing rapid urban population growth and the rise of megacities. 	<ul style="list-style-type: none"> Align egg products with urban megatrends. Focus on online sales, home delivery, and social media.
Social commerce takes flight	<ul style="list-style-type: none"> Emerging markets lead in linking online food sales with social media. Gen Z and millennials are driving this trend. 	<ul style="list-style-type: none"> Position egg distribution and marketing more effectively on social media.

Source: McKinsey, RaboResearch 2025

Consumer trends and egg demand

As discussed in the previous chapter (and shown in figure 11), rising incomes and population growth are key drivers of global egg consumption growth – but they are not the only factors. Marketing and product development are also major contributors to both regional and global growth in egg consumption.

Figure 18 outlines some of the main global trends influencing egg consumption and highlights the opportunities they present for the egg industry. Key trends include urbanization (e.g., young populations in emerging markets and urban hotspots), the rise of social media, and online food distribution. Demographic shifts such as aging populations and pressure on the middle class also play a role.

Additionally, there is a growing focus on wellness, health, and sustainability – areas where younger generations tend to show stronger commitment than their predecessors.

These megatrends offer significant opportunities for producers to innovate, develop new products, and target markets more strategically.

Grocery retail growth in emerging markets to trigger egg market and industry development

Strong link between economic development and growth in modern grocery retail

Figure 19: Consumer spending per capita in grocery retail, 2024

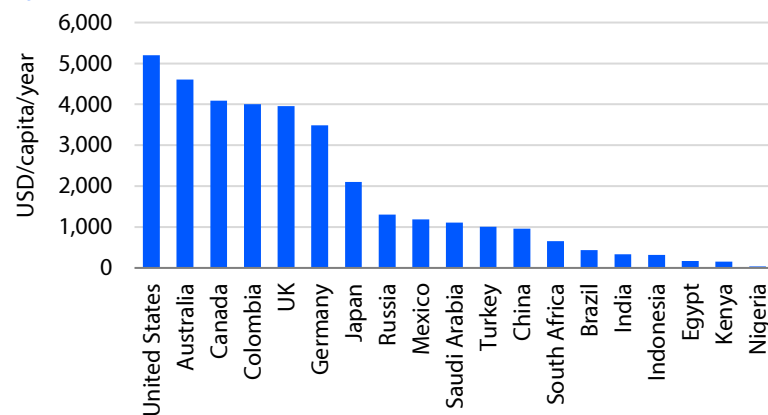


Figure 20: Modern grocery retail by region, 2010-2024

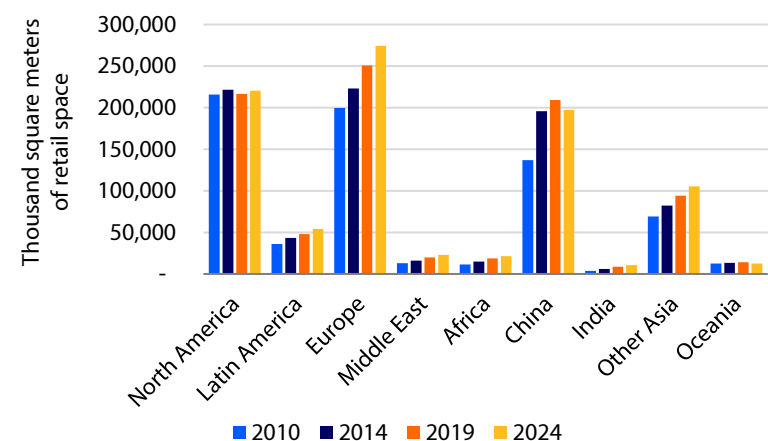
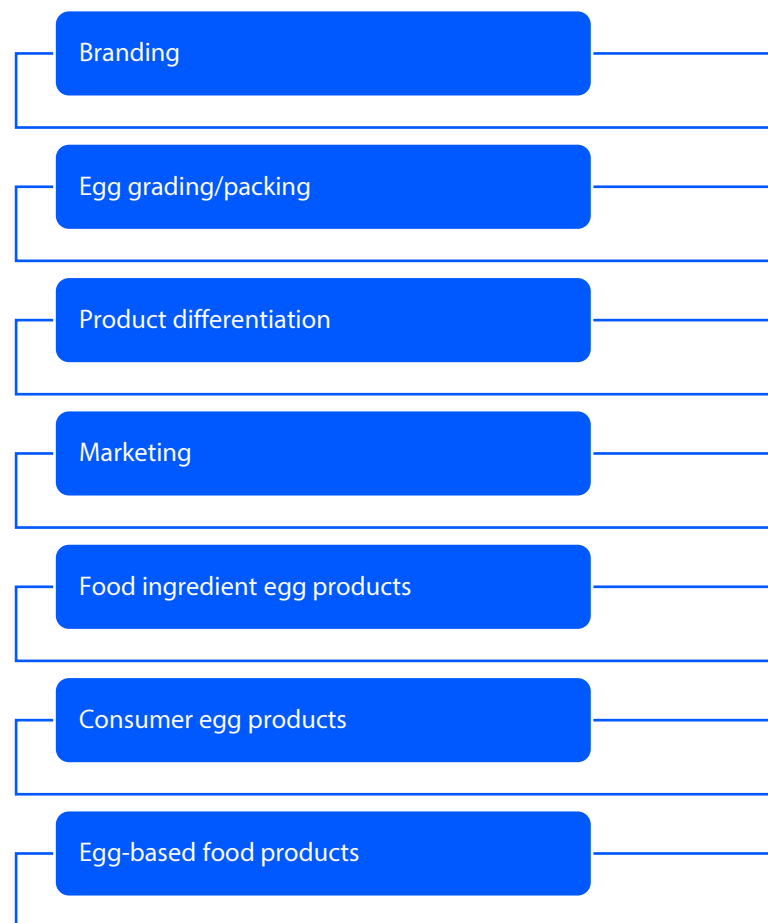


Figure 21: Egg market opportunities related to retail growth



Retail growth as driver for industry change

In more developed countries, grocery retail has traditionally been the primary sales channel for eggs, accounting for 70% to 90% of all egg sales. This is reflected in high consumer spending in countries like the US, Australia, Canada, the UK, and Germany, all ranging between USD 3,500 to USD 5,000 per capita per year (see figure 19).

This is significantly higher than in emerging markets such as Mexico, Turkey, and South and Southeast Asian countries, where spending in grocery retail channels is below USD 1,000 per capita per year.

Income is not the only driver – eating culture (e.g., high out-of-home consumption in Asia), price levels, and the rise of online food distribution also play significant roles.

For producers, grocery retail will remain a major sales outlet, with rapid growth expected in emerging markets. While some countries will gradually shift toward more online home delivery, grocery retail will remain important.

Producers focusing on grocery retail must capture consumer wallet share through marketing and product development, which will significantly impact investments and industry focus (see figure 21). Alongside shell egg sales, egg product sales will also grow – both as food ingredients and consumer products.

Relatively fast growth in consumer foodservice

Fast-growing foodservice channels in Asia and Africa offer opportunities for the egg market

Figure 22: Per capita consumer spending in foodservice by country, 2024

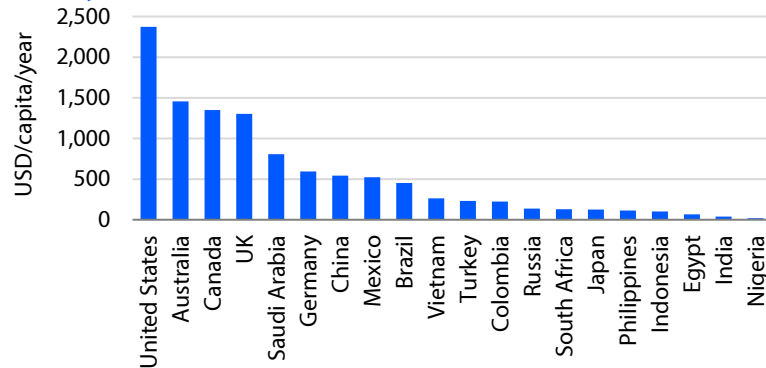


Figure 23: Expected annual growth in consumer foodservice, 2024-2029f

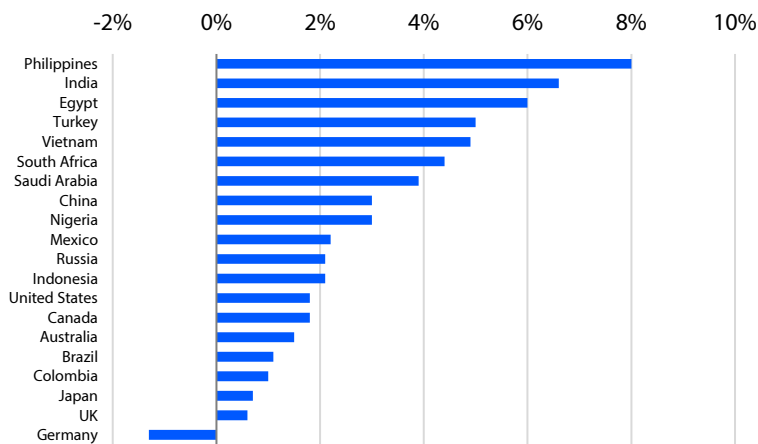
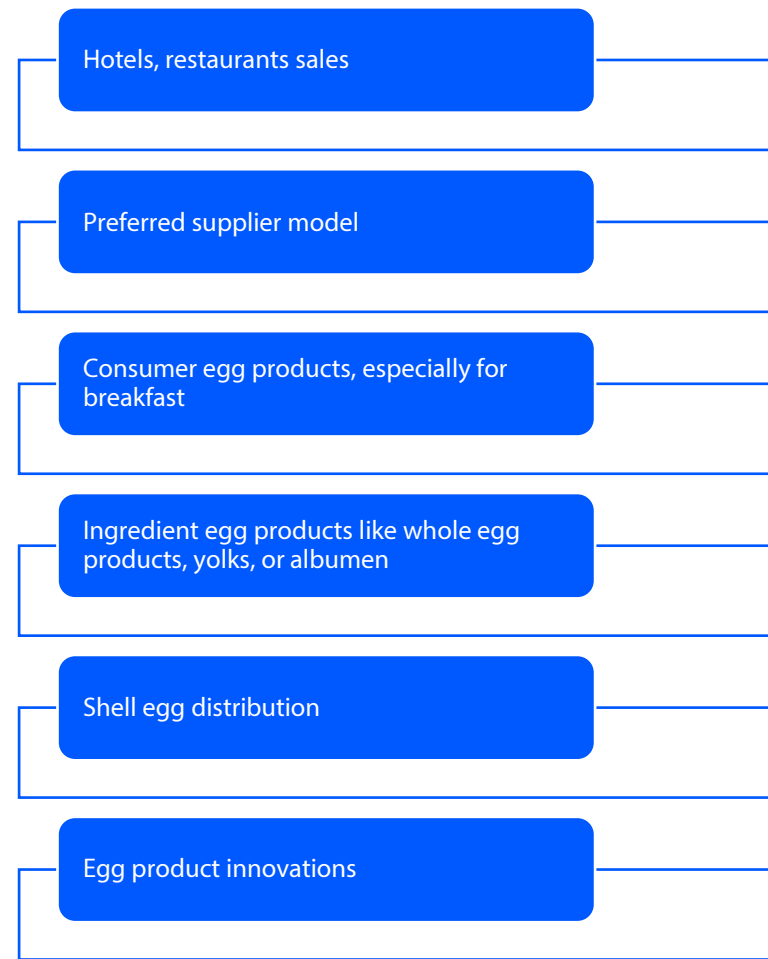


Figure 24: Egg market opportunities related to foodservice



Egg market opportunities amid expanding foodservice

Consumer foodservice channels are the other main outlet for egg sales, alongside grocery retail. The US has the largest consumer foodservice market and the highest per capita spending in the channel (see figure 22), followed by Australia, Canada, and the UK.

In the next five years, further growth in foodservice is expected. Growth in advanced economies will range from 1.8% YOY in the US to -1% in Germany due to price-conscious consumers and inflation.

Emerging markets such as the Philippines, India, Egypt, Turkey, and Vietnam are expected to see foodservice growth between 3% and 8% YOY through 2029 (see figure 23), although affordability will remain a concern. This may lead to slightly slower growth than in previous years and increased demand for affordable solutions like quick-service restaurants.

For producers, this growth presents many opportunities, such as selling shell eggs or egg products to hotels and restaurants or establishing preferred supplier models (e.g., producing egg sandwiches for quick-service restaurants). Some companies specialize in breakfast solutions, which can be expanded to include items like potatoes, rice, or other proteins like cold cuts or sausages. Continuous innovation in this channel is essential to fine tune offerings to changing consumer trends.

Source: Euromonitor, RaboResearch 2025

Global bullish development of online food distribution

Fast growth of online food distribution is a major driver of industry development

Figure 25: Global food distribution, CAGR 2020-2023

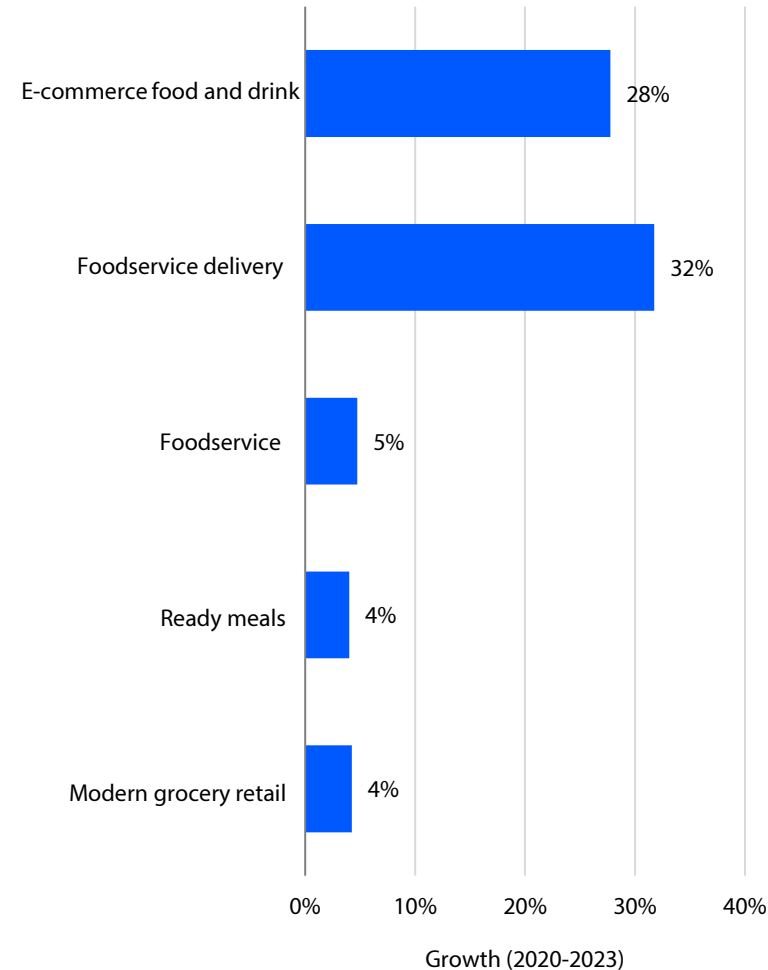


Figure 26: Share of consumers purchasing items on social media, 2023

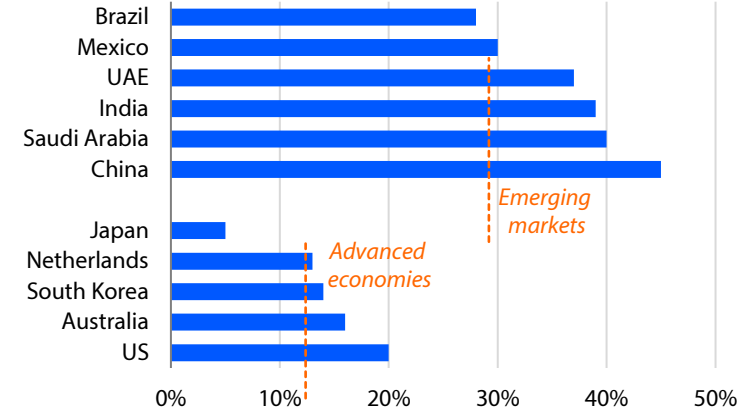
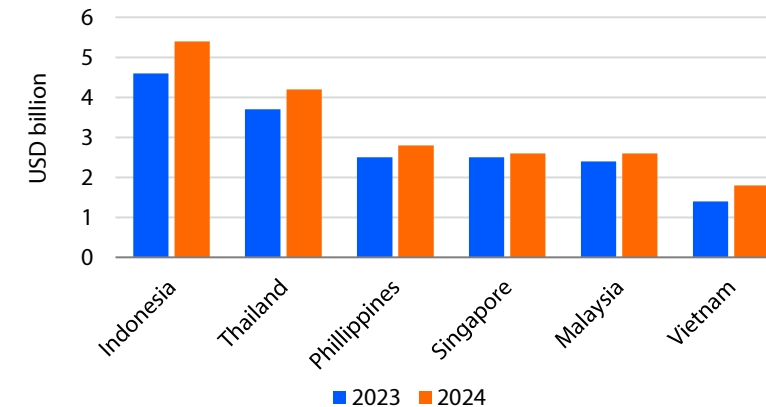


Figure 27: Southeast Asia's booming online food delivery, 2023 vs. 2024



Online food distribution, a key driver for change

The most significant change in food distribution over the past decade has been the rapid growth of online food distribution (see figure 25). Restaurants, retailers, and specialist stores have embraced this opportunity, and the channel has grown substantially worldwide.

The Covid-19 pandemic accelerated this trend, but long-term drivers – especially among younger generations in emerging markets – are even stronger. These consumers are spending considerable time on smartphones, online platforms, and social media (see figure 26), driving swift growth in online food sales.

Asia is seeing the fastest growth in online channels, with platforms like Grab, Shopee, Gojek, and Flipkart, and growth is accelerating in countries like China, Indonesia, Thailand, and Vietnam. Specialized platforms offering fast delivery of fresh items like meat, eggs, fruits, and vegetables are also growing. For younger generations, these platforms are increasingly replacing wet markets.

This trend has major implications for the industry. Companies must rethink marketing and distribution strategies, with digitalization becoming essential. It also challenges the role of wet markets, requiring modernization of supply chains to support direct delivery to distribution centers of online platforms.

Each stage of market development requires different focus

Industries in advanced economies and Asia will increasingly shift focus from volume to value

Figure 28: Egg market and investment focus areas based on market development

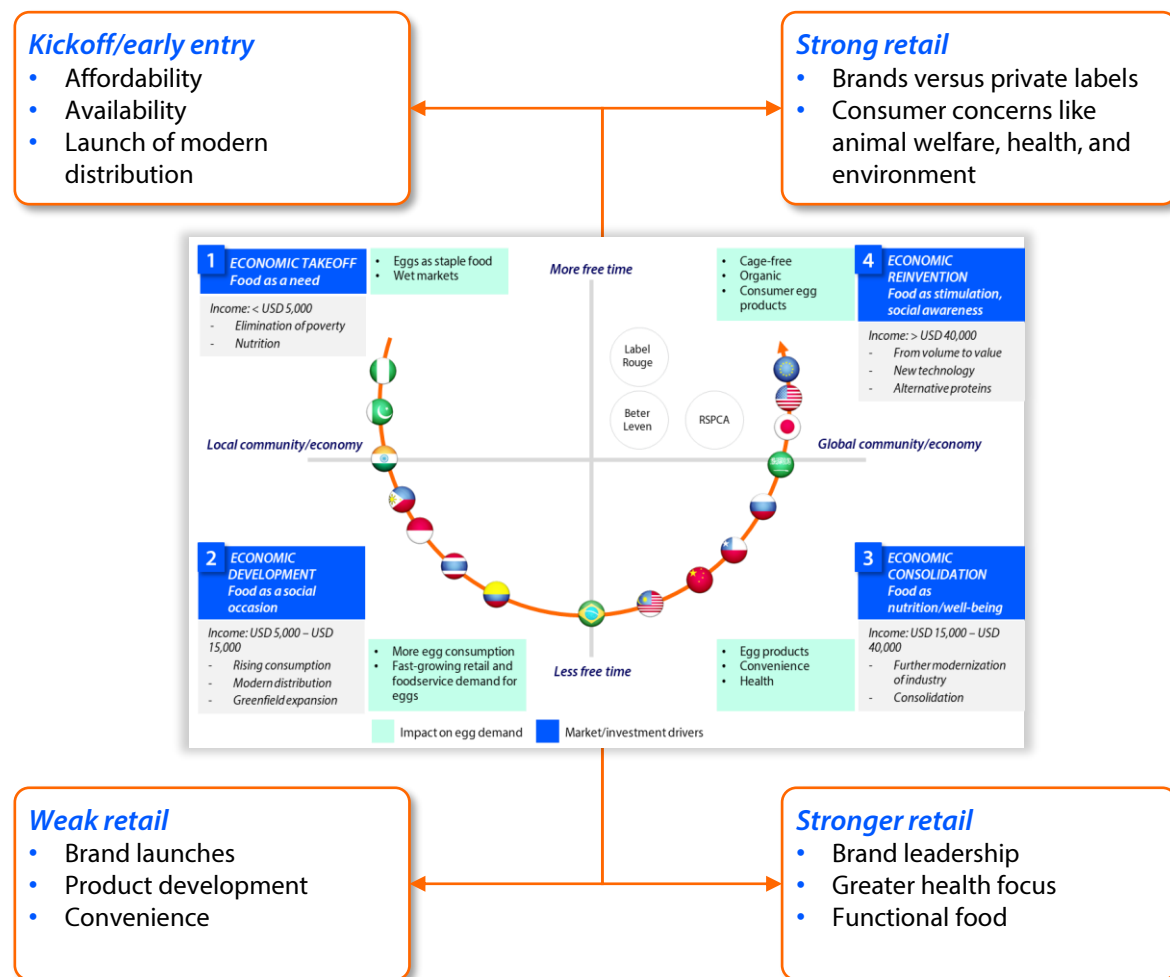


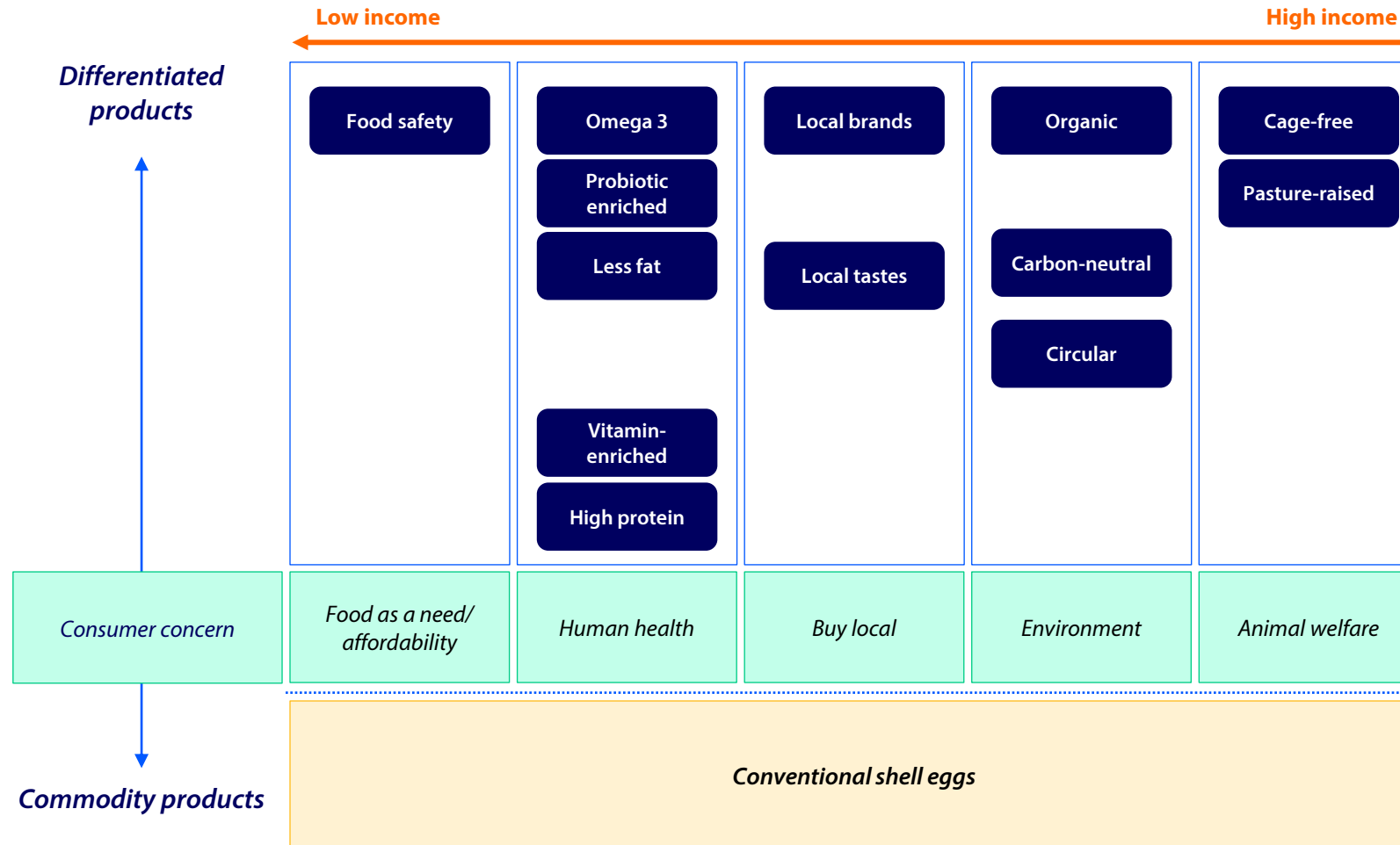
Figure 29: A shift from volume focus to value through marketing and product development



Consumer concerns as opportunity for differentiation

Health, local sourcing, environment, and animal welfare concerns as building blocks for product concepts

Figure 30: Social concerns as basis for product differentiation



Each stage of development requires a different approach

Each stage of market development, as shown in figure 28, requires a different approach:

Stage 1: There is primarily backyard egg production with the early development of small food stores. The focus is on availability and affordability, as consumers are highly price-sensitive.

Stage 2: There is rapid development of modern distribution channels and rising consumption. Branding and product innovation accelerates, and competition intensifies.

Stages 3 and 4: Consumption growth slows. Branding remains important, but private labels emerge. Health, convenience, sustainability, and animal welfare concerns rise.

Social concerns as driver for product and market development

Stages 3 and 4 require a shift in strategy, with companies increasingly focused on social concerns. These concerns influence regulations (e.g., health standards, animal welfare, environmental and labor standards).

Consumer concerns – affordability, health, local sourcing, environmental friendliness, and animal welfare – are now key drivers for product differentiation. This has led to the development of free-range, organic, vitamin-enriched, regional, and environmentally friendly egg products.

Shell egg color: Gradual shift to more white eggs

Global preferences in egg color differ; these are gradually changing

Figure 31: Global egg market by color, 2000-2035f

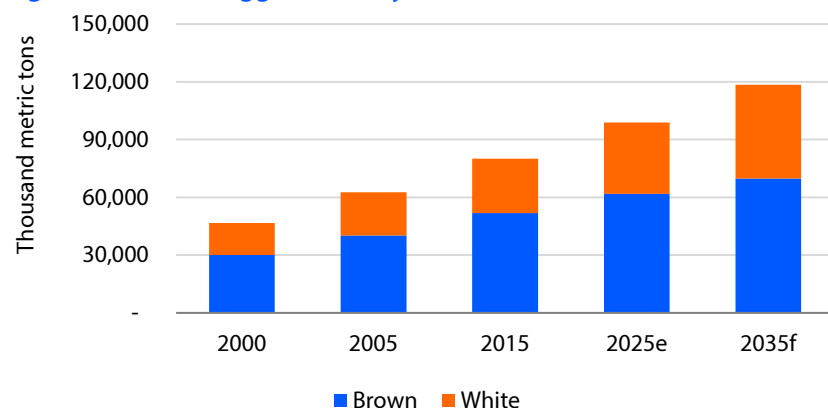


Figure 32: Global egg market by color and country, 2024

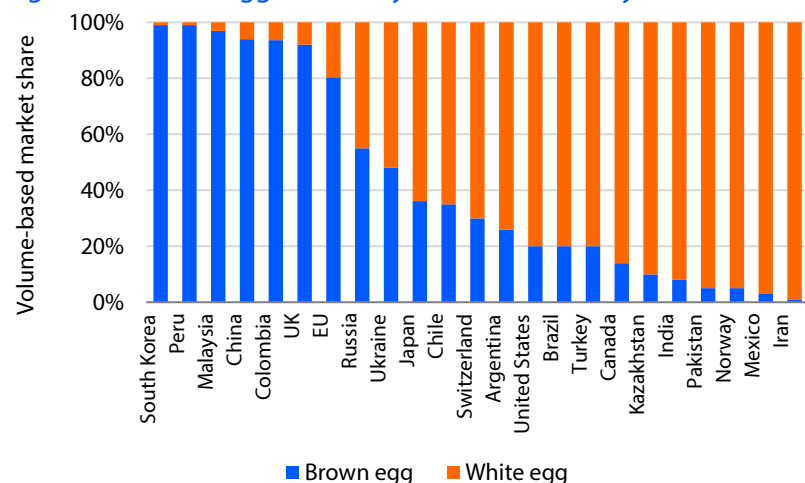
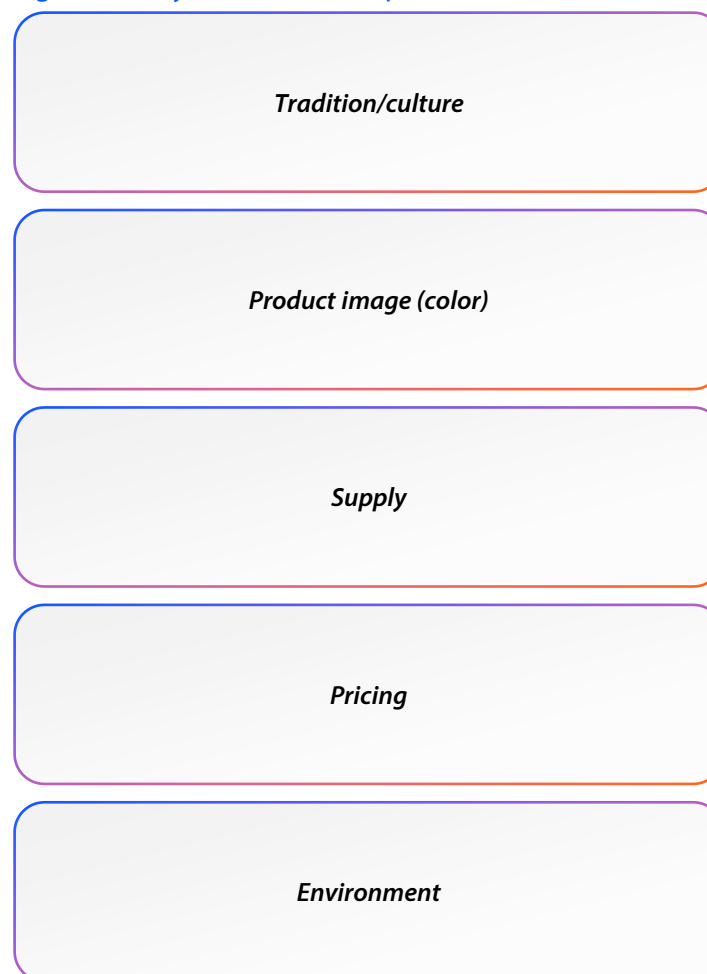


Figure 33: Key drivers of color preference



Egg color: Global differences, white eggs gain market share

One of the most noticeable distinctions in egg consumption is color preference (see figure 32). While brown and white eggs dominate most markets, some countries, like China, also have pink eggs, a hybrid of the two, making up nearly 50% of the local market.

Preferences are shaped by health beliefs, production methods, and farming traditions (see figure 33). For example: South Korea prefers brown eggs, while Japan prefers white eggs; the EU and UK traditionally prefer brown eggs, while the US, Canada, and Australia prefer white eggs.

White egg market share is expected to rise globally – from 37% in 2025 to over 40% by 2035 (see figure 31). In countries like the Netherlands and Germany, there is an ongoing shift from brown to white eggs due to cost and environmental benefits. Some retailers promote white eggs to reduce their carbon footprints.

**Note: Several countries, like China, have also a category of pink or red eggs, which is approx. 50% of the market.*

Source: RaboResearch estimate and projections based on FAO, WEO, regional statistics, RaboResearch 2025

Health focus: High consumer interest in Asia and Latin America

Consumers in emerging markets are increasingly interested in spending on wellness and fitness

Figure 34: Intent to spend more on fitness and wellness, 2023

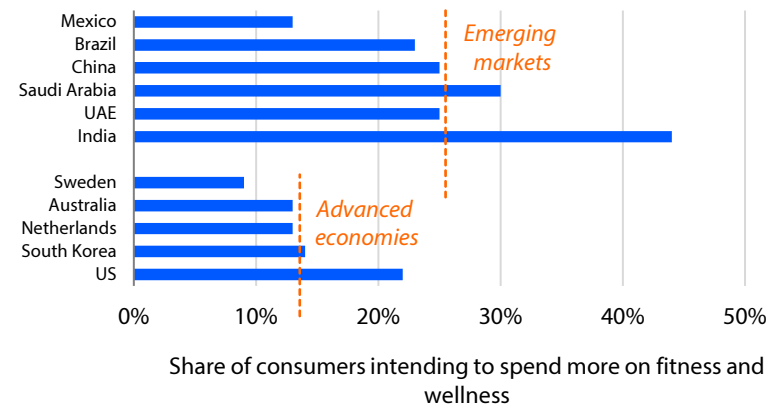


Figure 35: Intent to spend more on vitamins, supplements, and over-the-counter items

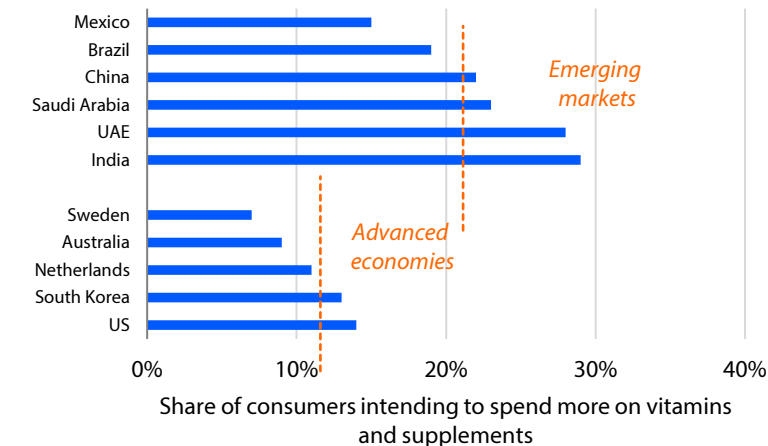


Figure 36: Opportunities related to health trends



Rising health focus in emerging markets

Health is a major concern for consumers worldwide, with regional differences. Consumers in emerging markets show higher concern due to less developed value chains, while those in advanced economies have more confidence in established systems (see figures 34 and 35).

Consumers in emerging markets like India, China, Brazil, Mexico, and high-income Middle Eastern countries (e.g., Saudi Arabia, UAE) show greater interest in vitamins, supplements, and health-related products than those in countries like the Netherlands, Australia, or the US.

Protein-rich products are a major global trend and present strong opportunities for eggs. Figure 36 outlines strategies for integrating health claims into egg industry marketing, branding, and product development.

Rising health awareness: Health claims and functional foods

Producers need a strategic approach to capitalize on functional food opportunities

Figure 37: Opportunities in functional foods

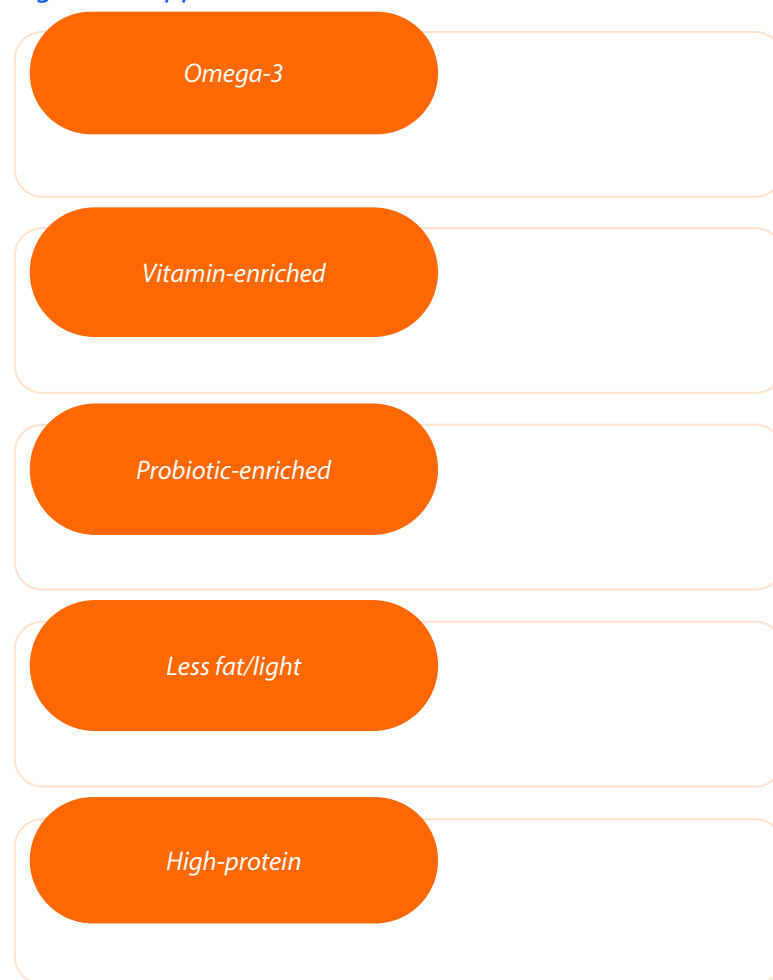


Figure 38: Toolbox for functional food strategies



Functional food markets in eggs

Health is a major consumer trend, offering opportunities for the egg sector to promote health benefits and add functional claims. The dairy sector has led in this area, but egg producers are increasingly adopting similar strategies.

Figure 38 provides a toolbox for developing functional food strategies. These should be part of long-term marketing plans and include market research, product development, corporate social responsibility (CSR), and compliance with health regulations.

CSR strategies – with particular attention to corporate affairs and legislation – are key. In many regions, functional food claims need to be approved by relevant health authorities, though there are big differences in requirements between regions but also by type of claims.

Figure 37 highlights key health claims. While vitamin-, probiotic-, and omega-enriched eggs are common, protein-enriched products are gaining traction in emerging markets.

Due to differences between regions, market research is important.

Animal welfare: A central theme in Western markets

Producers are differentiating products with animal welfare-friendly concepts

Figure 39: Share of animal housing systems by country, 2024

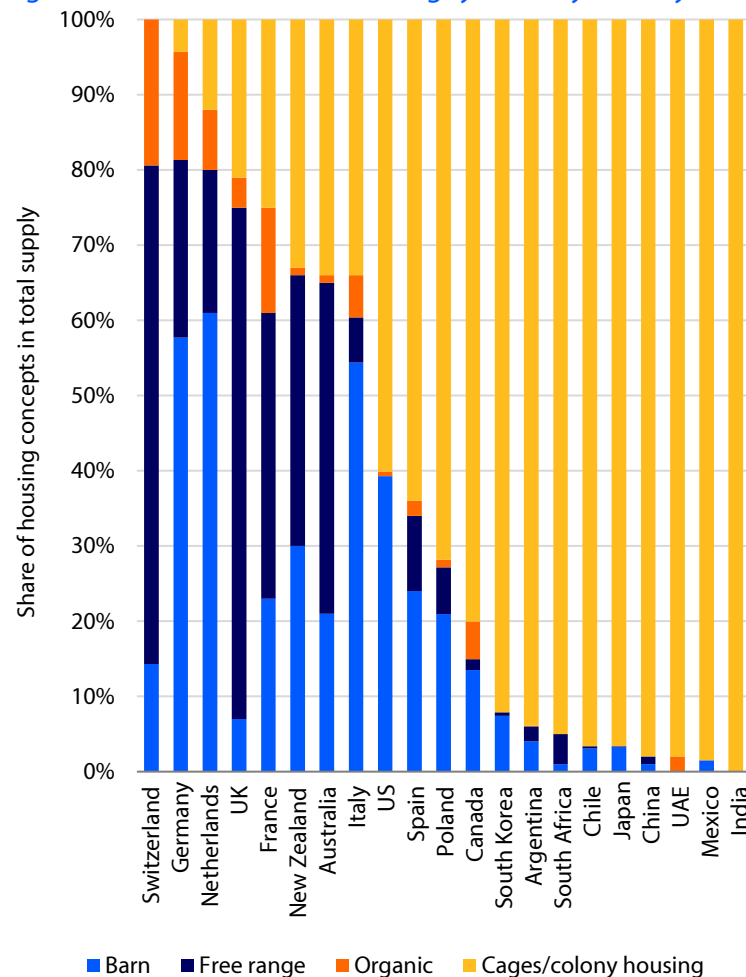
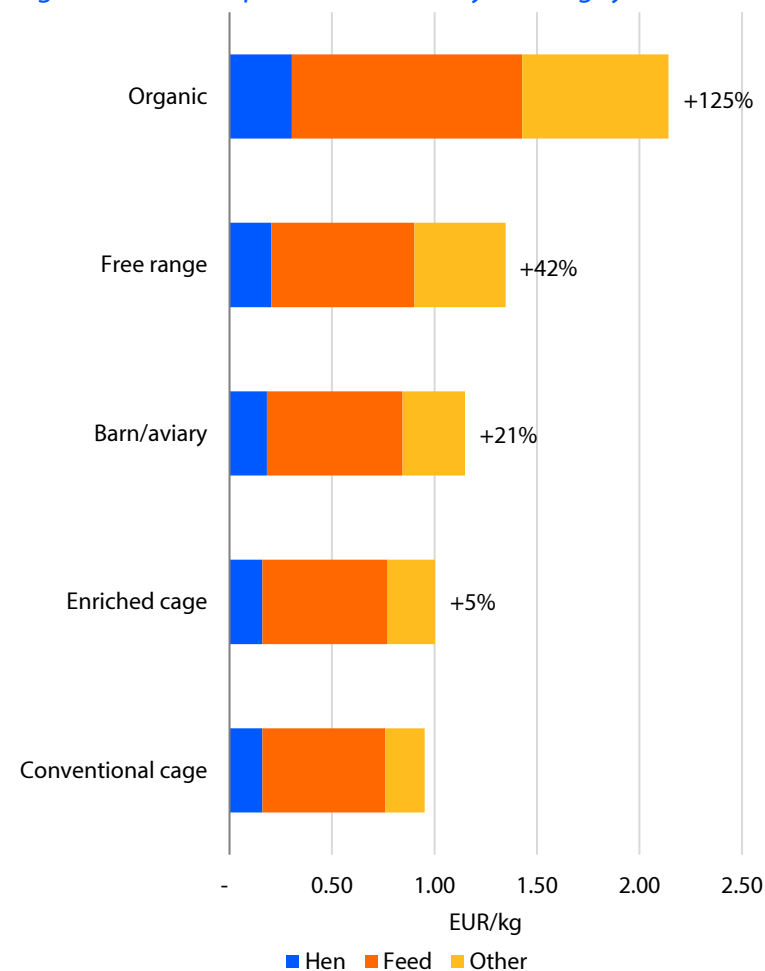


Figure 40: EU cost price differences by farming system, 2021



Animal welfare as driver of change in Western markets

Animal welfare is a growing concern for consumers, especially advanced economies such as Europe, North America, and Oceania. This has led to:

- Government conventional cage bans (e.g., EU in 2012, New Zealand in 2024).
- Customer standards (e.g., taking cage eggs out of the assortment).
- Producer strategies (e.g., selling cage-free, barn, free-range, and organic eggs).

These changes have led to major differences in bird housing formats worldwide (see figure 39).

For example, New Zealand, the UK, and France have a relatively higher share of free-range egg production, while the US and most of the EU are more focused on barn eggs, though free-range has also significant market share in Europe. Organic egg sales are growing in emerging markets but remain under 5% due to high price differences (see figure 40).

Price remains a key reason why conventional cage systems dominate in emerging markets. As figure 38 shows, organic egg production costs are 100% higher than (enriched) cage eggs and 80% more than eggs produced in barn or aviary systems.

Source: WEO, RaboResearch 2025

Source: Wageningen University & Research (WUR) 2023, RaboResearch 2025

The supply perspective



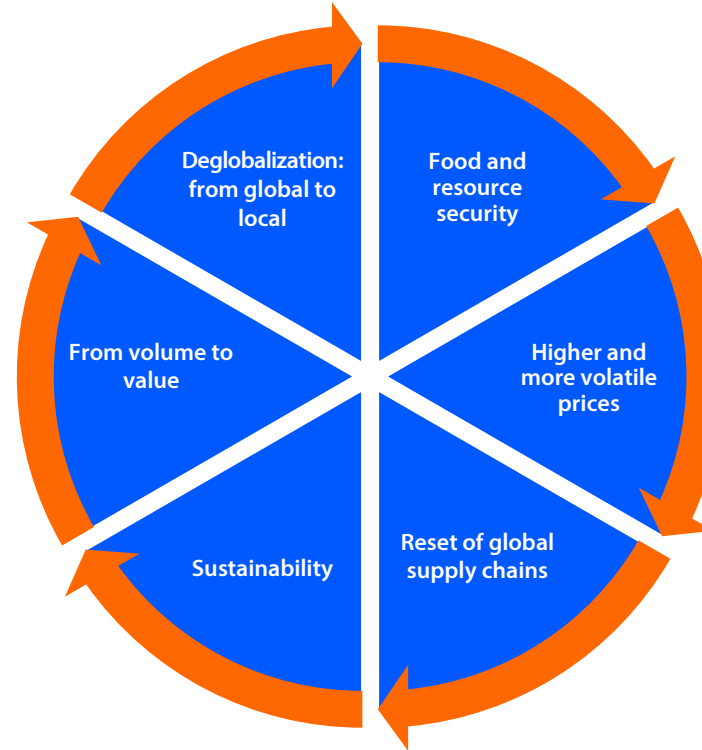
Global market and investment landscape to change

Growth, emerging markets, sustainability, supply chains to become more strategic

Figure 41: Rapidly changing industry conditions

Food demand increase by 2050 vs. 2025	<ul style="list-style-type: none"> + 40% animal protein + 50% eggs
Shifting growth drivers	<ul style="list-style-type: none"> 90% of growth is expected in emerging markets by 2035 vs. 2025. Western markets will grow more slowly, focusing more on high-value claims and marketing.
Geopolitical tensions and competition	<ul style="list-style-type: none"> Shifting geopolitical and economic power dynamics. Resource and technology race. Fragmentation of global cooperation.
Major government and industry sustainability commitments	<ul style="list-style-type: none"> Government and industry emissions reduction objectives. COP28 Dubai commitment to triple renewable energy capacity by 2030. UN Sustainable Development Goals, regional/private commitments.

Figure 42: A changing global investment perspective



Changing global market conditions' impact on egg supply

Global food markets are expected to grow by approximately 30% by 2050, with animal protein demand increasing by 40% and egg demand by around 45% to 50%. These are impressive figures, but growth is slowing due to reduced population growth and increasingly mature markets (see chapter 1).

The biggest challenge for producers will be determining how and where to produce, especially as resource availability, sustainability, and geopolitical tensions become more pressing (see figure 41). Notably, 90% of growth in the next decade is expected in emerging markets, mainly in Asia, but increasingly in Africa and Latin America as well.

Global resources are limited, and agricultural land is declining. Most of the growing markets in Asia have limited arable land resources compared to their population size, posing a growing challenge for animal protein production. Feed – primarily soybeans, corn, and wheat – accounts for 60% to 70% of input costs. Climate change may further exacerbate water, land availability, and productivity challenges.

Geopolitical tensions are also reshaping how governments and producers approach future investments. There is a growing focus on food and resource security, such as making food value chains more strategic – including for inputs like genetics, animal nutrition and health, equipment, knowledge, and farming skills.

This will likely lead to a shift from global to local investments in egg value chains, with more volatile markets and higher prices. Efficiency improvements, innovation, strategic sourcing, and sustainability will become increasingly important.

Global egg markets to localize further

Trade's share of production is declining, with the fastest production growth for domestic markets

Figure 43: Global egg production, share of egg trade, 1995-2035f

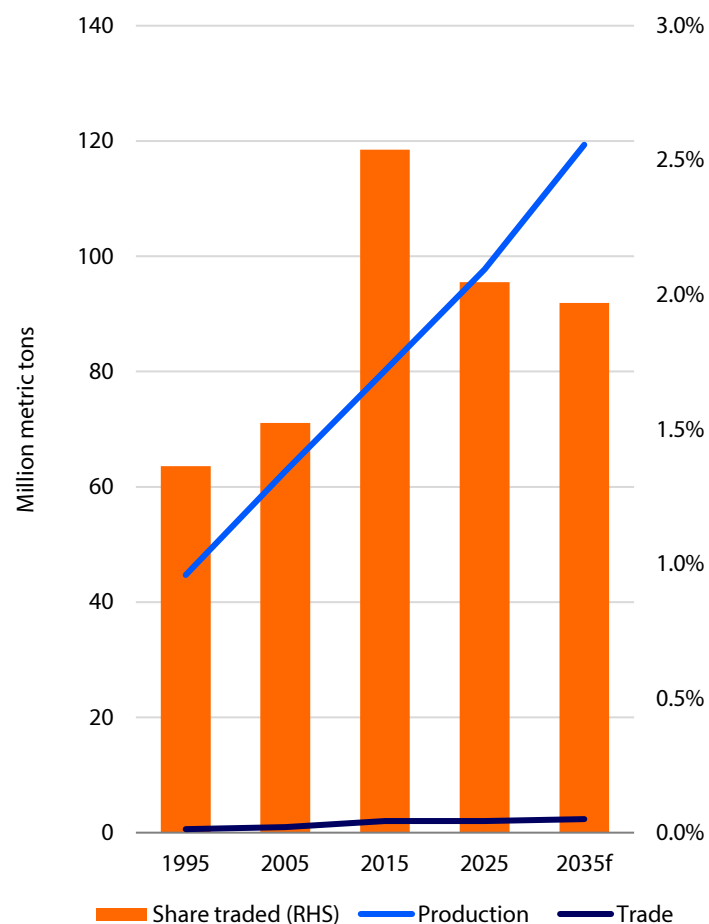
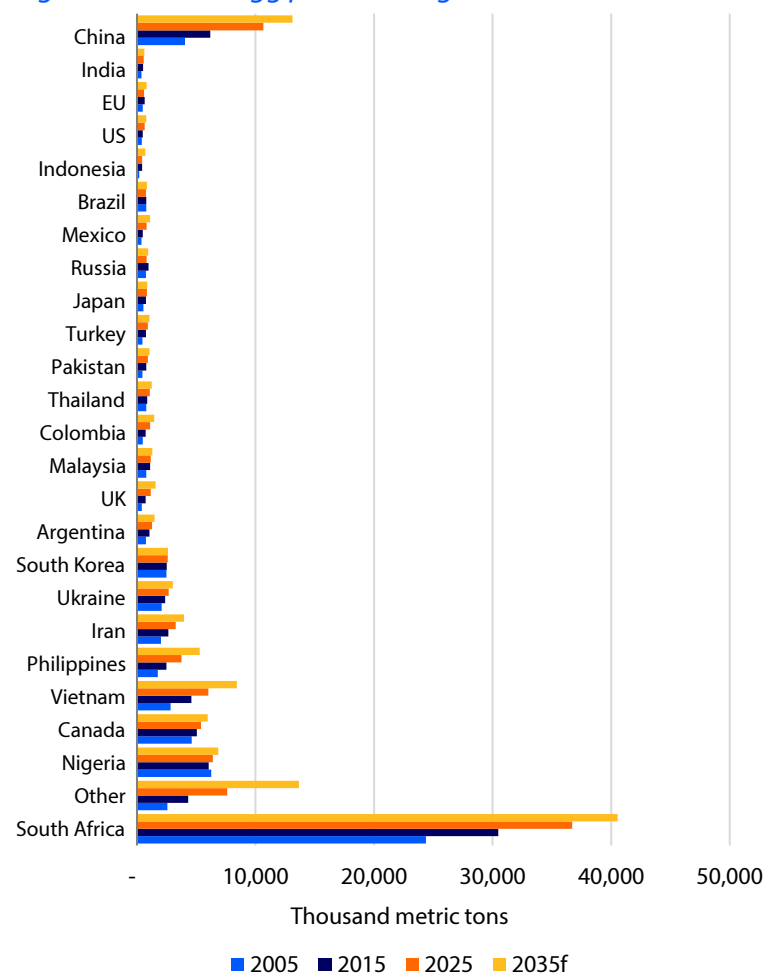


Figure 44: Global egg production growth, 2005-2035f



Where to invest?

Global egg markets are expected to grow by approximately 22% over the next decade. A key question is whether production will occur in low-cost production regions or closer to high-growth consumption markets.

Egg trade is traditionally limited (see figure 43); only 2% of global egg production is traded internationally. This is low compared to beef (20%), poultry (13%), and pork (11%). Reasons include low product value relative to transport costs, the perishable nature of eggs, and government protection of local industries. Since 2015, trade has declined due to rising protectionism and bird flu-related restrictions.

For investors, this means most growth will occur near high-growth regions – especially Asia, and increasingly Africa and Latin America (see figure 44). Countries like India, Indonesia, Brazil, and China (despite slowing growth) will capture a significant share of global production growth.

Source: RaboResearch estimate and projections based on FAO, WEO, regional statistics, RaboResearch 2025

Global trade has slowed since the 2010s amid limited market openings and disease restrictions

Dried egg products are the most globally traded and will increasingly drive future growth

Figure 45: Market segments in global egg trade, 2005-2024

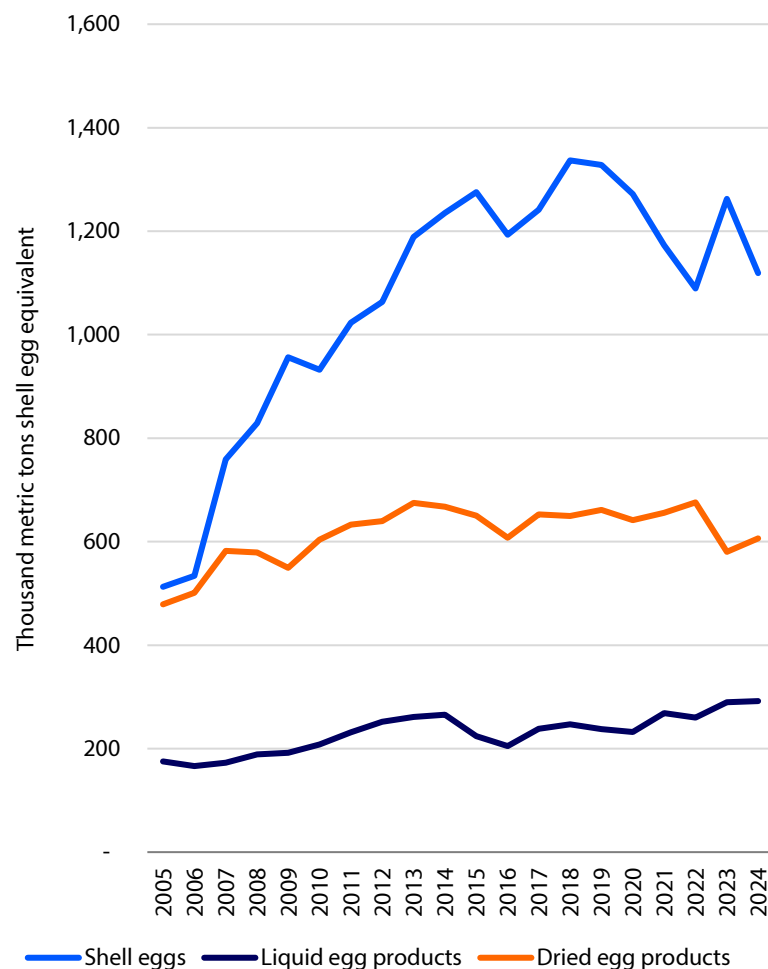


Figure 46: Share of production traded, by category, 2005-2025

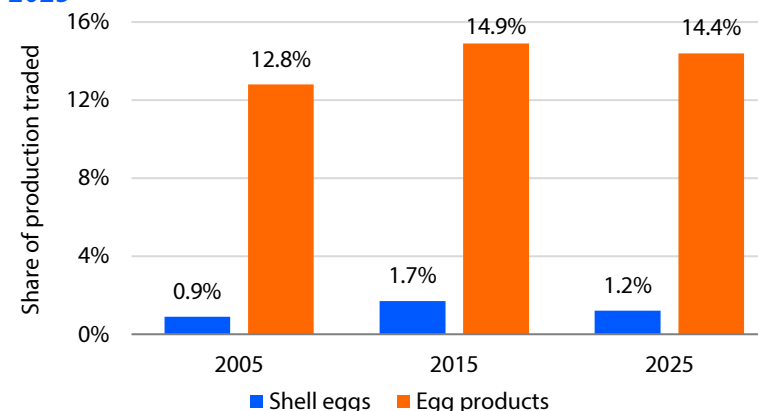
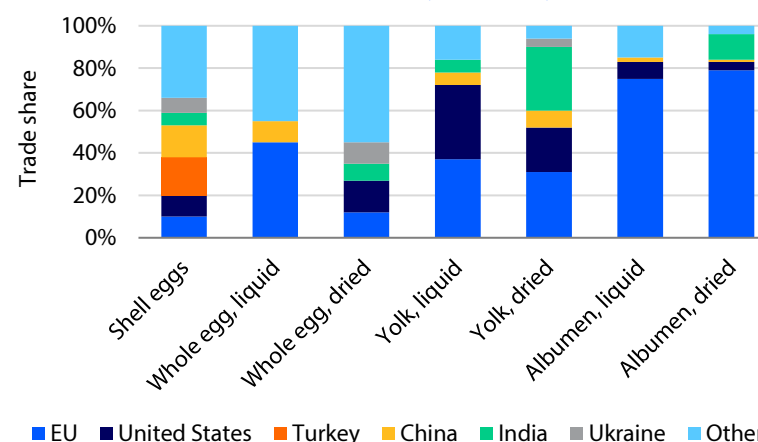


Figure 47: Export market shares by category, 2024



Global trade in eggs: Limited growth expected

Although global egg trade is limited, there are significant differences between product categories (see figure 46). Only 1.2% of shell eggs are traded globally, while 14.4% of egg products are traded, especially dried egg products (see figure 45).

Global egg trade has shown limited growth since 2015 and has become more volatile due to bird flu, Covid-19, and geopolitical tensions.

Dried egg products are the most commonly traded egg product internationally. Liquid egg products are more difficult to trade – over 90% are chilled, and only 10% are frozen. Chilled products are typically sold within 1,000 to 2,000km of production, while dried products are more easily transported globally.

Product preferences also influence trade. European markets favor yolks, while North America and Japan prefer egg whites. This creates trade opportunities due to regional product imbalances and price differences. Europe leads in egg white exports (see figure 47), while the US and India focus more on the egg yolk trade.

Source: RaboResearch estimate based on FAO, USDA, Trade Map, RaboResearch 2025

Trade to keep growing – but below market growth

Despite big differences in production costs, trade to remain limited and mainly regional

Figure 48: Global egg exports: The rise of Turkey and China, 2005-2025

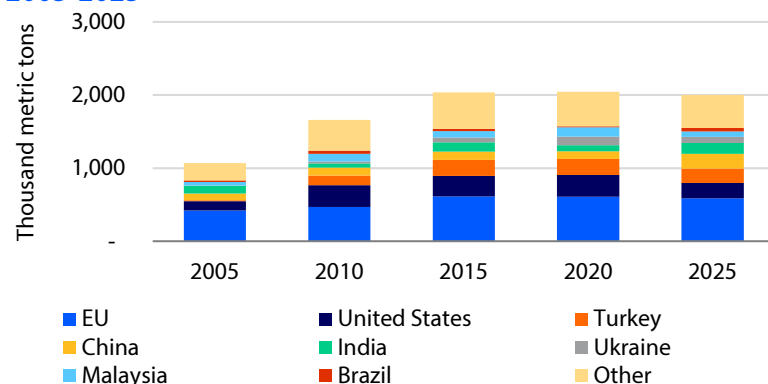
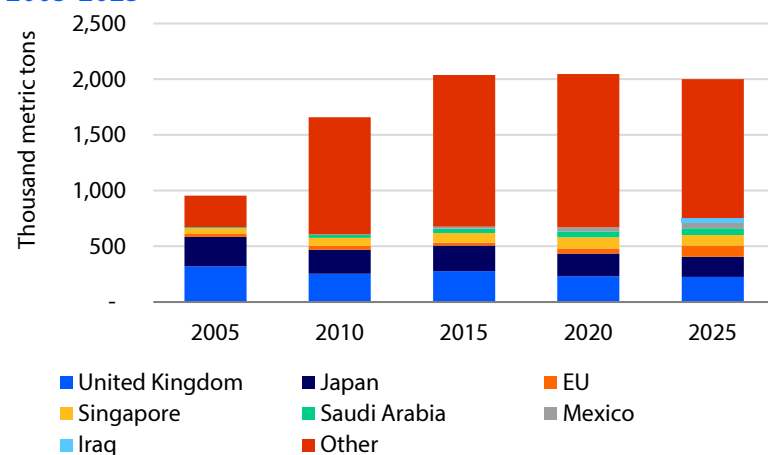
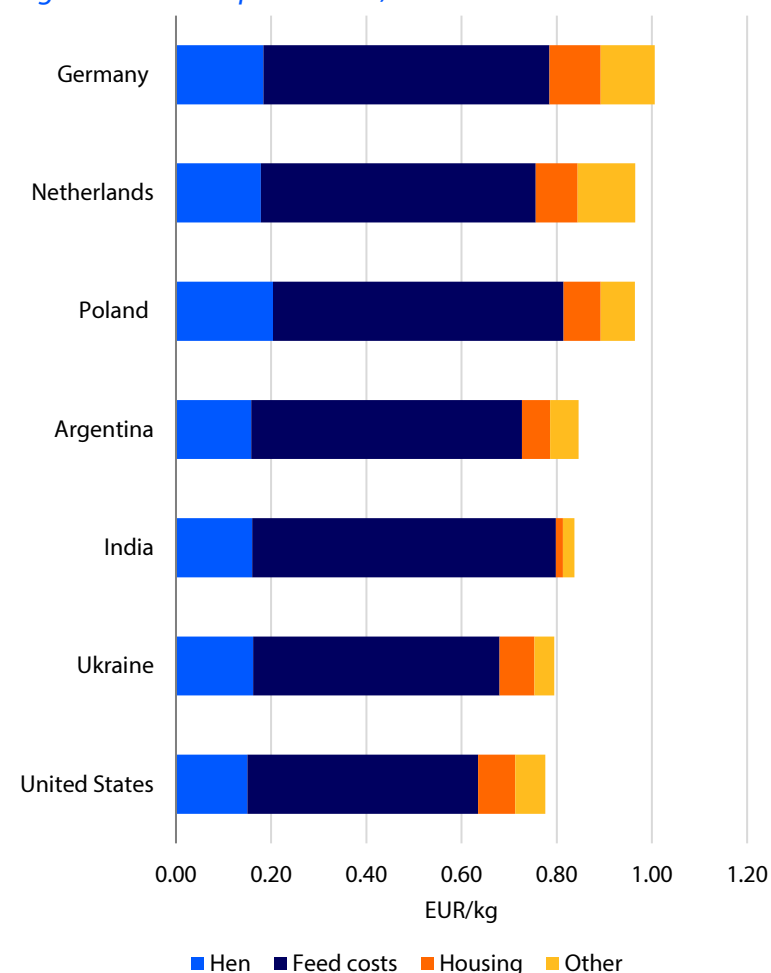


Figure 49: Global egg imports: Very diverse, highly regional, 2005-2025



Source: Trade Map, RaboResearch 2025

Figure 50: Cost of production, 2021



Source: WUR, RaboResearch 2025

Global trade: Key drivers and shifting trade flows

Despite limited global trade, the EU and US remain dominant egg exporters. However, emerging market exporters are gaining ground.

Key factors include:

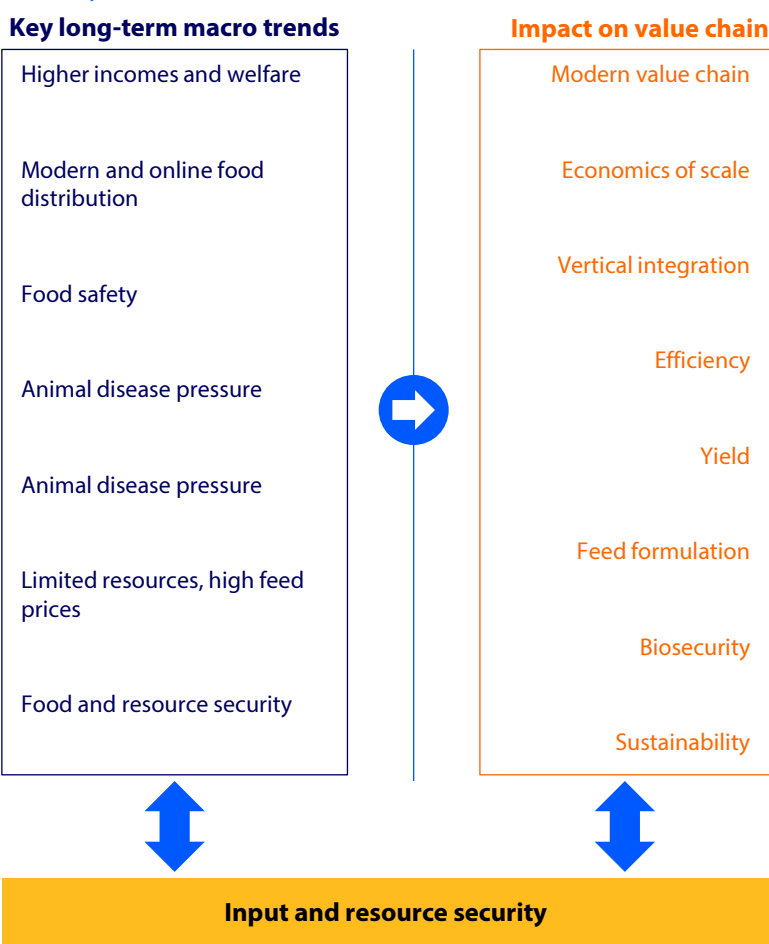
- Production costs (see figure 50): Countries with local grain and oilseed production, like the US, Brazil, Ukraine, India, and Argentina, have cost advantages.
- Preference differences: Low local demand for certain products (e.g., egg whites in the EU) creates export opportunities.
- Geographic advantages: Proximity to high-growth markets in Asia benefits producers in China, India, and Turkey.
- Risk mitigation: Traders seek to diversify supply sources amid disease and geopolitical risks.

These factors are shifting the market landscape, with pressure on traditional exporters (the EU and US) and the rise of new players like Turkey, China, India, Ukraine, and Brazil (see figure 48). While many emerging markets restrict imports, egg processing growth may increase trade opportunities in the longer term.

Social and consumer trends push further modernization

Industry modernization is expected to drive further investment in egg sector

Figure 51: The ongoing trend to modernization in the egg industry



Source: RaboResearch estimates 2025

Figure 52: Modernization rates in the egg industry, 2024

	Country
Very high (90% to 100%)	US
	EU
	Japan
	UK
	South Korea Canada
High (80% to 90%)	Brazil
	Mexico
	Russia
	Ukraine
	Thailand
	South Africa
Moderate (70% to 80%)	China
	Turkey
	Colombia
	Argentina
	Malaysia
Average (60% to 70%)	Indonesia
	Philippines
	Egypt
	Morocco
Relatively low (50% to 60%)	India
	Pakistan
	Vietnam
Low (<50%)	Iran
	Nigeria
	Kenya
	Tanzania

Ongoing modernization in egg value chains

Rising global egg demand, resource constraints, geopolitical tensions, and a focus on food and resource security as well as sustainability are driving a shift toward localized production.

With 90% of production growth occurring in emerging markets – including 60% in Asia, where feed resources are limited – modernizing value chains is essential (see figure 51). Other drivers include income growth, modern food distribution channels, disease pressure, and the need for vertical integration, efficiency, and biosecurity.

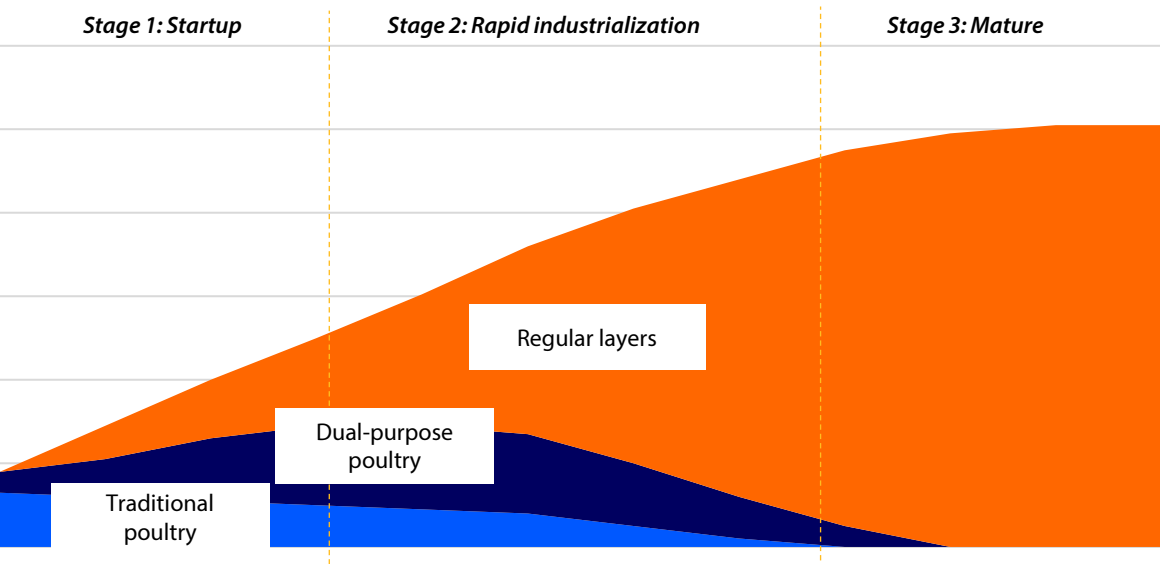
This will push the industry to modernize egg production value chains with a greater emphasis on vertical integration, benefits of scale and efficiency, and yield and biosecurity improvements.

Sustainability will play a growing role, driven by societal, governmental, and corporate social responsibility pressures. Figure 52 shows RaboResearch's estimates of current modernization levels across regions. All regions are expected to invest heavily in modernizing value chains to meet evolving market conditions, especially in emerging markets.

The egg industry's ongoing move toward modernization

Different stages of development offer opportunities for different products

Figure 53: Industrialization as driver for modern genetics demand



Egg industry modernization in different stages of development

The push for modernization (see figures 51 and 52) will reshape industry structures and investments. The FAO classifies poultry sectors into four types:

- Sector 1: Traditional/backyard (light blue)
- Sector 2: Informal commercial (dark blue)
- Sectors 3 and 4: Commercial (orange)

The sector structure changes during the three different stages of development. As incomes rise and investment conditions improve, industries evolve from backyard to informal and then to commercial farming. In addition to influencing farming practices and value structures, sector changes also impact the market for poultry genetics, which shift from traditional to dual-purpose to regular breeds.

Figure 54: Egg production systems per stage of development

	Stage 1: Startup	Stage 2: Rapid industrialization	Stage 3: Mature
Industrialization level	0% to 40%	40% to 70%	70% to 100%
Dominant sector	Sector 1	Sector 2, and gradual sector 3 and 4	Sector 3 and 4
Egg consumption	Low but taking off	Rapid growth	Slow growth/mature
Compound feed use	Very low	Increasing fast	Mature to declining
Genetics use	Underdeveloped	Increasing fast	Mature to declining
Industry standards	Low	Improving fast	High and increasing
Product portfolio	Mainly traditional and dual-purpose chicken	More standardization to regular chicken	Need for diversification, social concerns

This evolution affects value chains, product demand, and investments (see figure 54). As modern farming expands, genetics and feed use change, and vertical integrators invest in advanced technologies with higher biosecurity standards.

This impacts global farm input companies, which must adapt supply strategies to meet growing demand. Similar modernization is expected in processing, with a shift from small plants (<1,000 birds per hour) to large-scale operations (12,000 birds per hour) and greater focus on processed poultry and cold chains.

Source: FAO, RaboResearch 2025

Feed and feed ingredient supply: Rising volatility and shifting flows

Most feed demand growth is in emerging markets with limited grain and oilseed supply

Figure 55: Layer feed production by country, 2019 vs. 2024

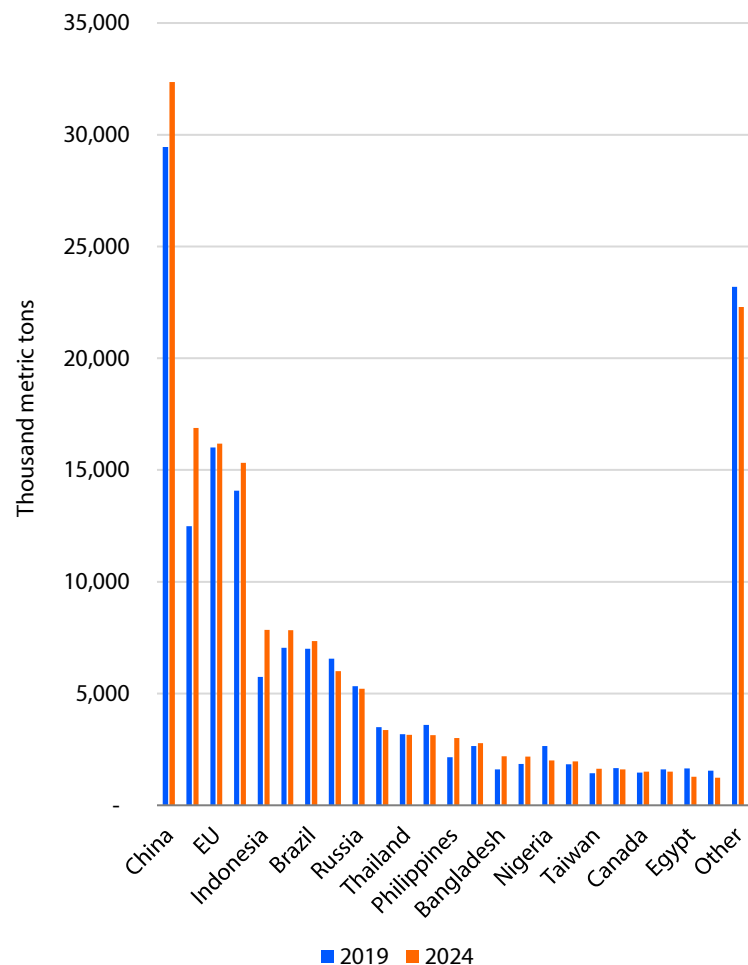


Figure 56: Key global suppliers of three main feedstocks, 2025

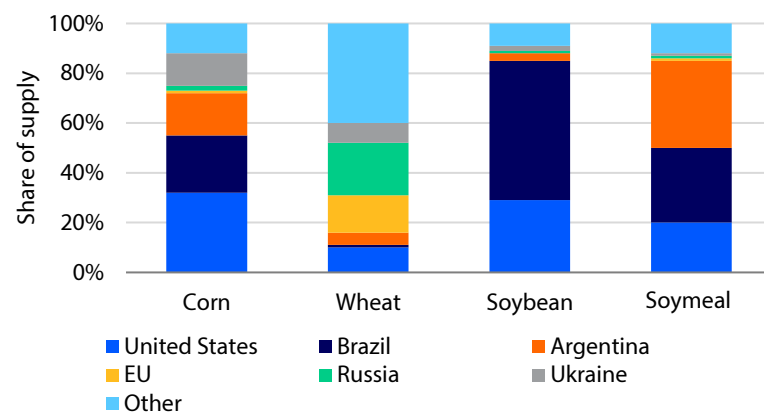
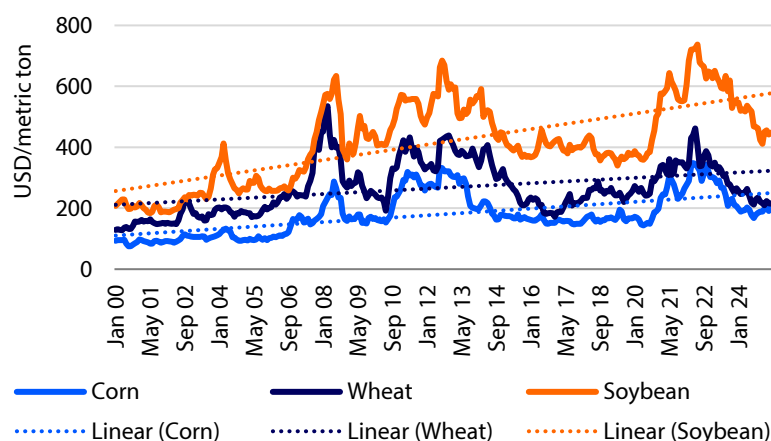


Figure 57: Grain and oilseed prices higher and more volatile



Outlook 2035: Layer feed production

Global layer feed production is currently estimated at 10.5 billion metric tons, concentrated in China, India, the EU, and the US (see figure 55).

Feed production will grow in line with egg markets, though efficiency improvements (better genetics, lower feed conversion) will slow growth in advanced economies.

In emerging markets, modernization will drive demand for agri commodities (corn, wheat, soy), premixes, concentrates, and additives. Countries tend to prioritize local egg production and import feed ingredients as needed. Food security and sustainability goals will push for local sourcing, though this may increase exposure to price volatility (see figure 57).

Avian influenza has been a major challenge for the egg industry over the last two decades

Bird flu is an ongoing global challenge; new prevention tools are evolving, including vaccination

Figure 58: Reported outbreaks of bird flu in commercial and wild animals 2020-2025

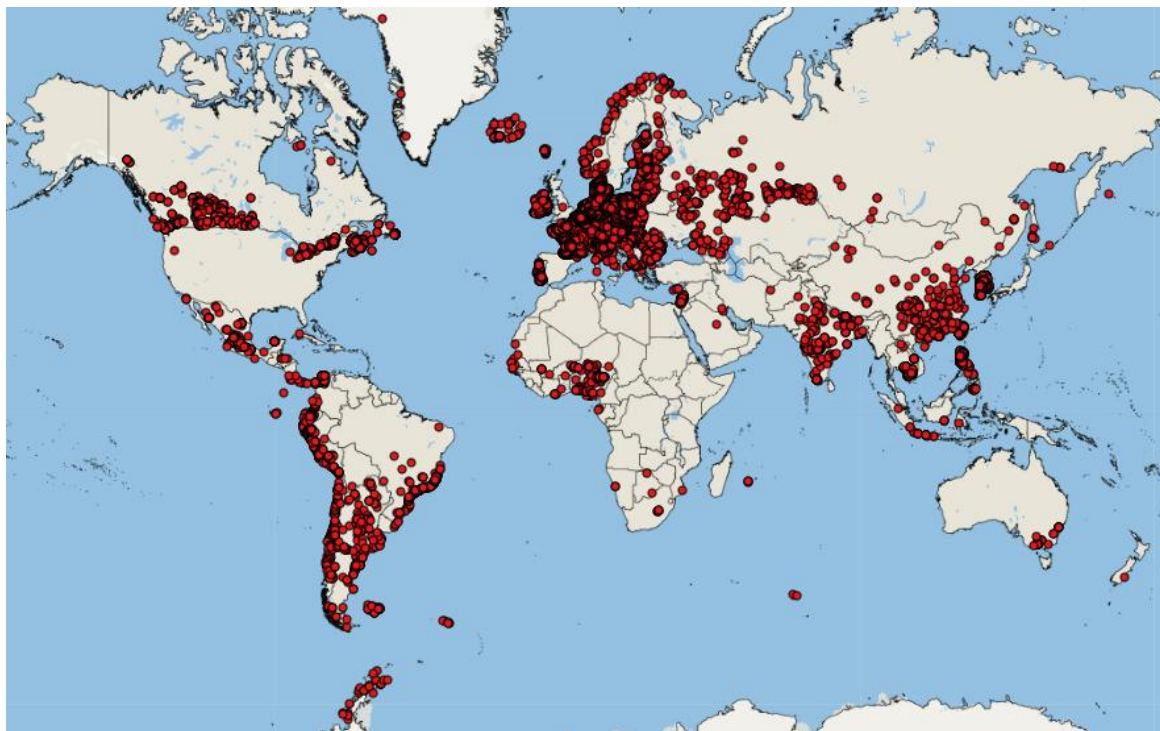
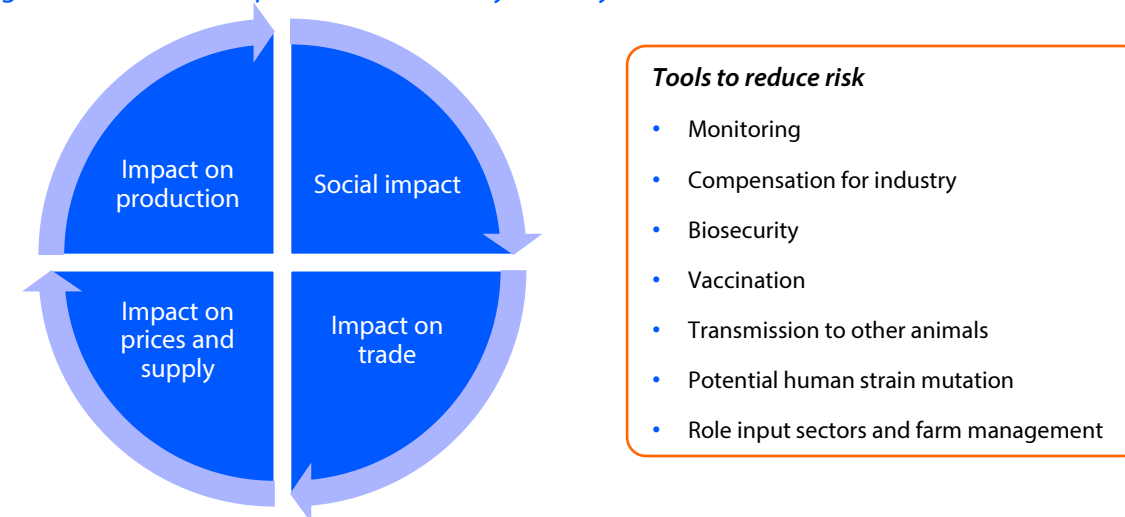


Figure 59: Bird flu's impact on the industry and key tools to reduce risks



Dealing with bird flu risks – a top priority for governments and the industry

Avian influenza has been a persistent challenge, with a rise in global outbreaks over the past five years (see figure 58). It affects production (culling, buffer zones), trade (import bans), market price volatility, and social costs (animal welfare, compensation costs).

The dominant strategies are implementing high biosecurity, monitoring, and stamping out. Some countries offer producers compensation for lost birds, though this is rare in emerging markets.

Outbreaks are now more frequent and year-round. While wild birds are a known source, transmission via other animals, such as cattle, has also been observed.

Vaccination is a growing topic. Though effective vaccines exist, use is limited due to trade concerns. In the long term, vaccination is expected to become a key tool alongside biosecurity measures.

Farming systems: Global differences, rising cage-free share

Western markets are moving to cage-free production, with share also rising in emerging markets

Figure 60: Global egg market: Cage vs. cage-free eggs, 2005-2035f

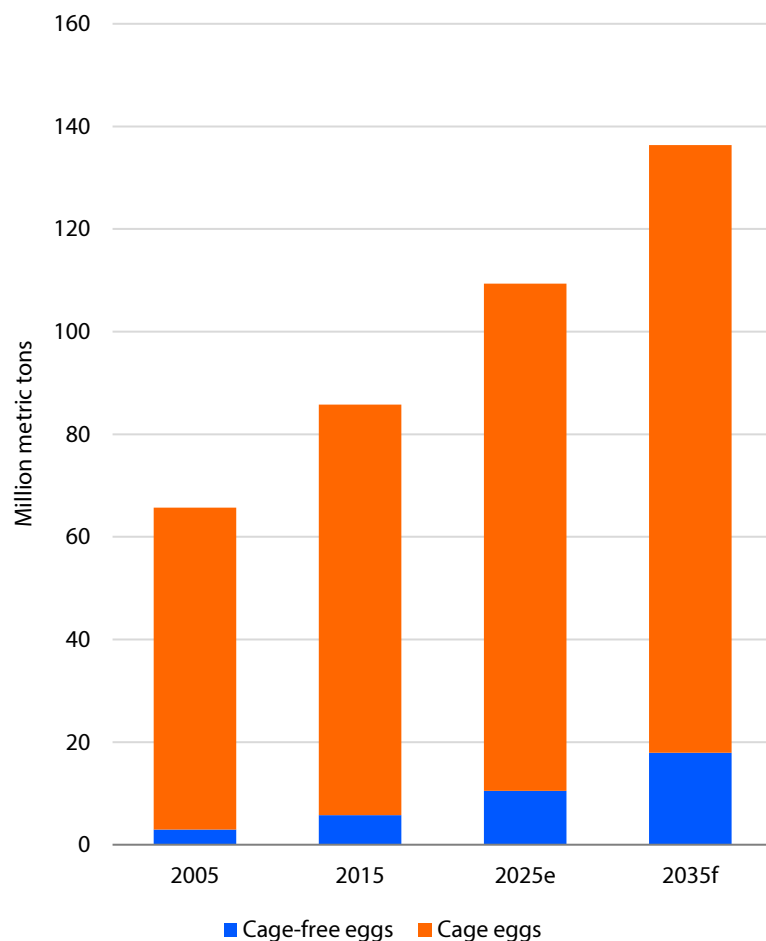
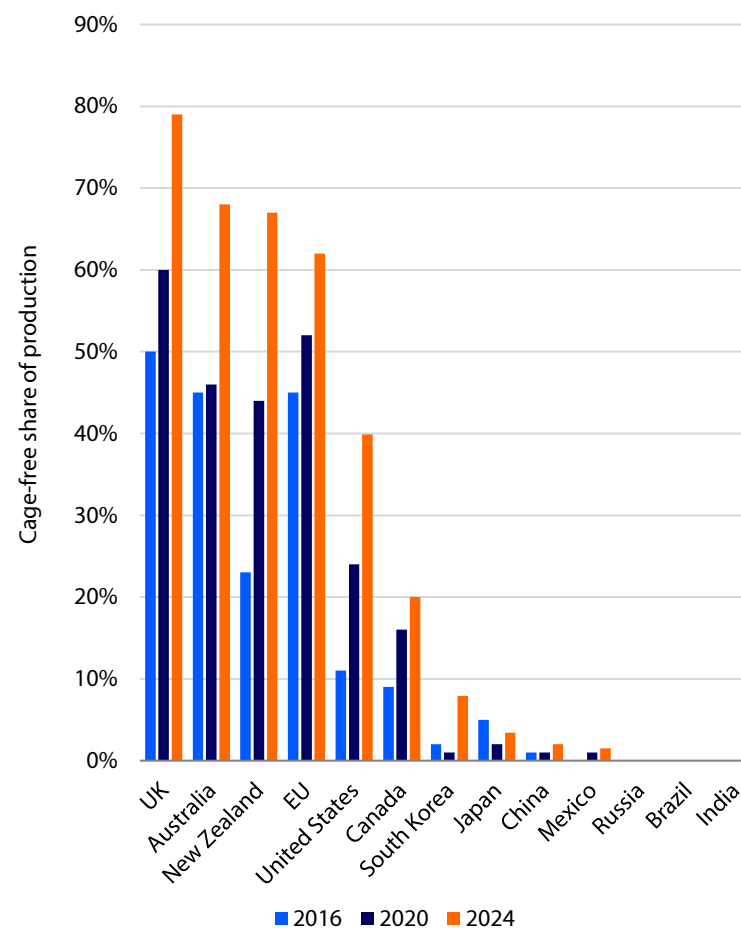


Figure 61: Share of eggs produced via cage-free production systems, 2016-2024



Farming changes: More cage-free production

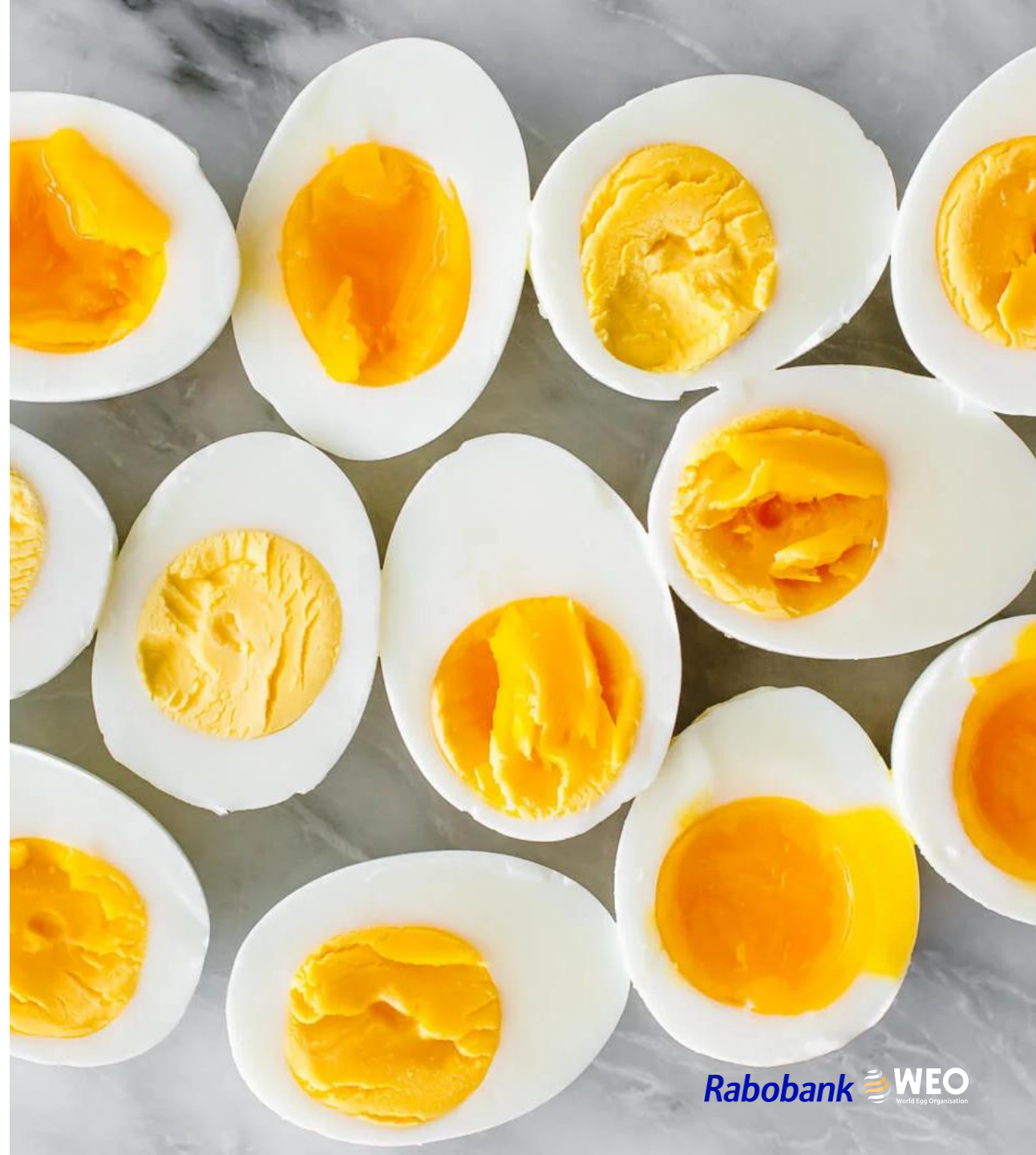
One of the most visible changes in the egg industry over the past 15 years has been the shift to cage-free systems (see figure 37). This ongoing change is driven by government regulations, customer standards, and market strategies.

Many countries have undergone major transitions, investing heavily in cage-free systems. The global share of cage-free eggs rose from 5% in 2005 to 11% in 2025 and is expected to reach 15% to 20% by 2035 (see figure 60).

The biggest changes have occurred in the UK, New Zealand, the EU, and Australia, where cage-free shares exceed 60%. (Note: The EU banned conventional cages in 2012, allowing only enriched cages.)

In emerging markets, cage-free shares remain low, but investments are increasing to meet modern distribution standards.

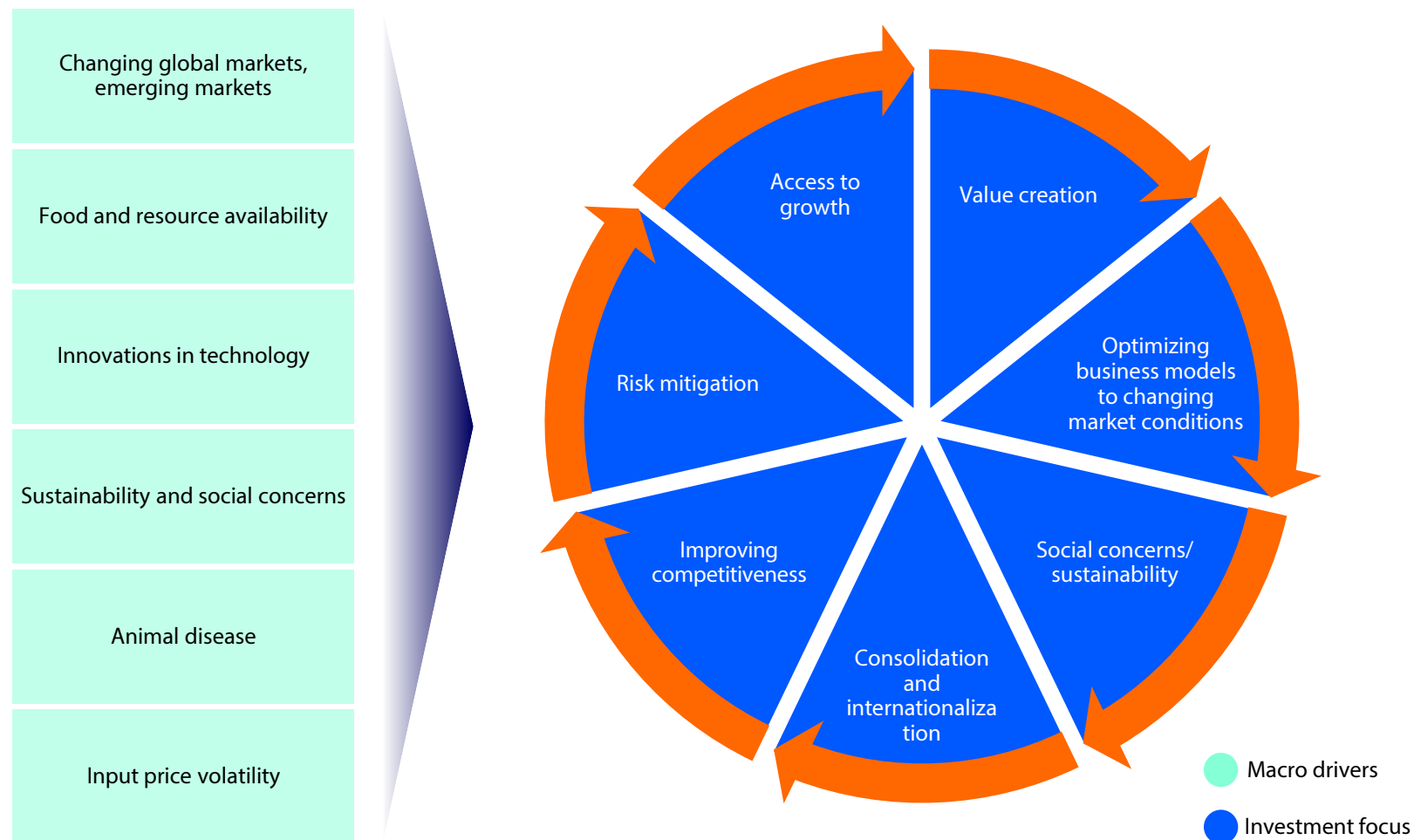
Key investor perspectives



Key investment themes 2025-2035

Changing global market condition require a shift in investment focus

Figure 62: Global macro investment drivers and their impact on investment focus



Source: FAO, RaboResearch 2025

Changing global investment conditions

Global investment conditions are changing rapidly. Egg markets are expected to continue growing worldwide, with most growth occurring in emerging markets. Consumer demand is evolving quickly, increasingly influenced by online trends and social media.

At the same time, production value chains must adapt to changing government strategies and customer and consumer strategies regarding food supply, social concerns around sustainability, animal welfare, and disease pressure (see figure 62).

As a result, international investors in the egg industry need to reevaluate their strategies. Key themes include accessing market growth from both global and local perspectives (e.g., improving marketing and research to align with changing consumer behavior). Value creation will be especially important in slower-growing industries in advanced economies.

Improving supply chain models is essential. Key considerations include supply security, dealing with increased input and sales price volatility, and the impact of concerns around social issues. Risk mitigation and improving competitiveness will require investments in efficient production technologies, resource optimization, and economies of scale through greenfield expansion, consolidation, or internationalization.

The changing face of the global egg industry

Large investment opportunities to align industry with changing market and society

Figure 63: Strategic investment opportunities in the global egg value chain

Greenfield expansion

- Market growth
- Integration versus specialization
- Industry modernization
- Shift to different production methods



Consolidation

- National
- Regional
- Globalization



Value-added products

- Product differentiation
- Consumer egg products
- Industry-to-industry egg products

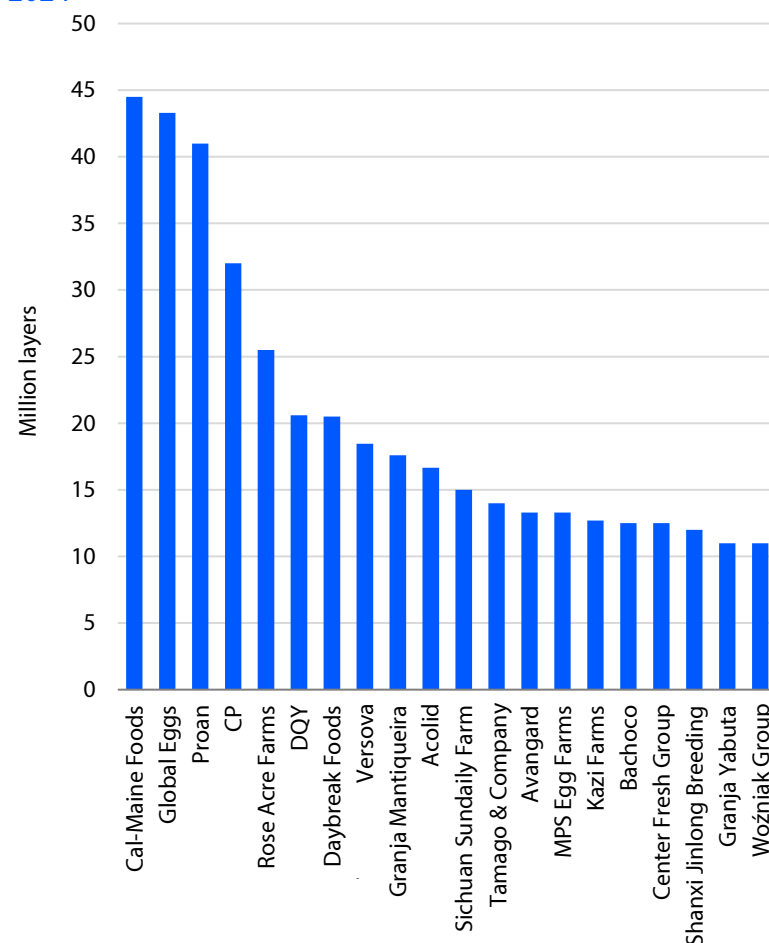


Value chain modernization

- More vertical integration
- Access to farm capacity to become strategic



Figure 64: Global top 20 egg producers by number of layers, 2024



Capital expenditure to rise significantly

One major consequence of these investment themes is that capital expenditure in the global egg industry will be high.

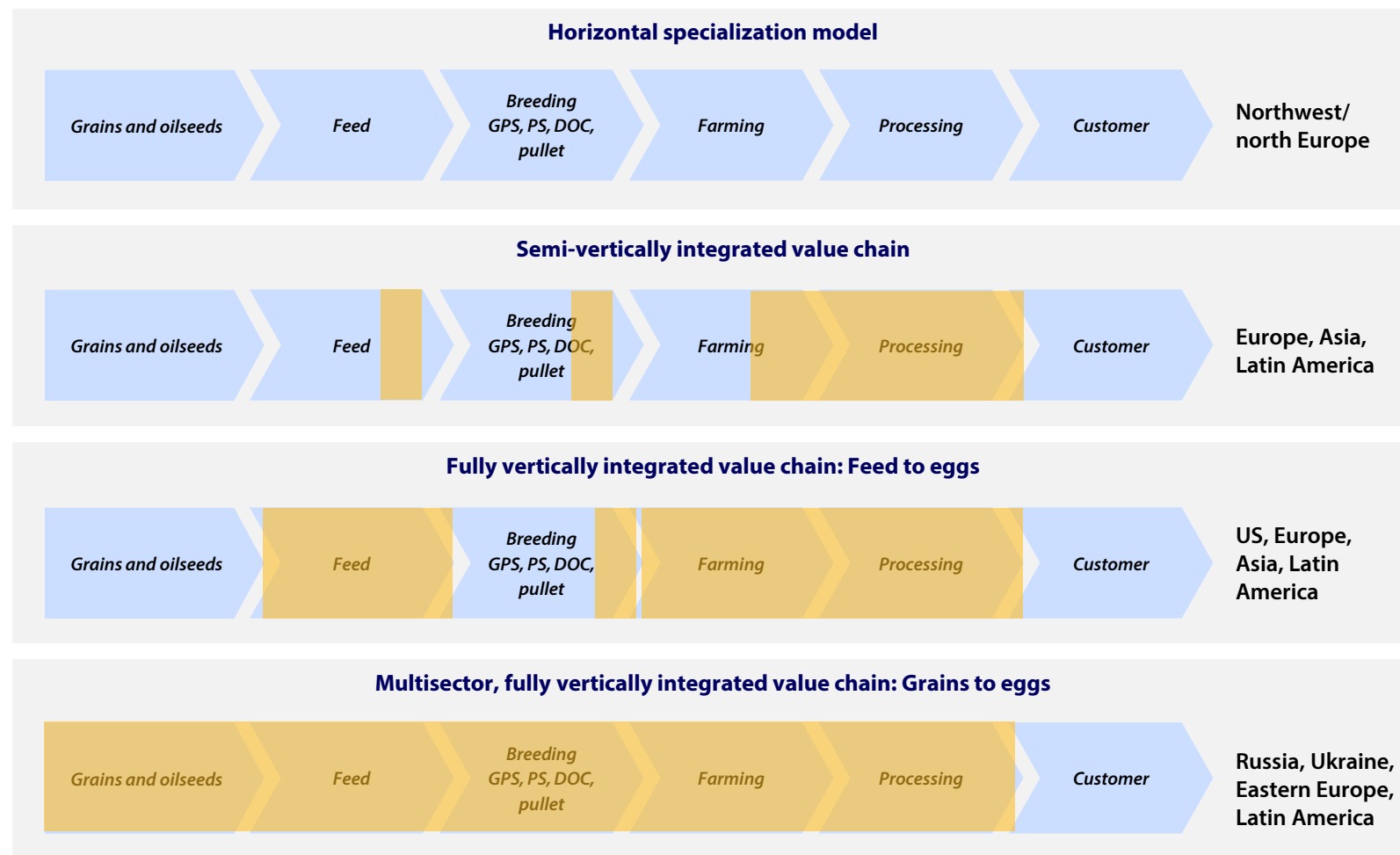
Investment priorities will focus on several key areas:

- **Greenfield expansion:** Investments to meet rising demand and modernize distribution, especially in growing markets in emerging markets.
- **Cage-free transition:** Ongoing investments will be needed in both advanced and emerging markets.
- **Vertical integration:** The role of vertically integrated companies will expand to improve efficiency, to secure supply and to manage supply chains in an increasingly smart and digital environment.
- **Consolidation and globalization:** globalization in the egg industry will accelerate in the next decade to access global growth and create business synergies.
- **Premium segments:** More companies will invest in branding, market development, and premium or value-added egg products.

Changing value chain models in the egg industry

Expanding industries in emerging markets tend to use more integrated models

Figure 65: Value chain models in the egg industry: Increasing level of integration



Source: RaboResearch 2025

Major differences in value chain models

There are significant global differences in value chain models in the egg industry. The most common model involves farms investing in grading and packing lines to supply eggs to customers – often through trading, modern distribution, or direct-to-consumer channels. These companies often own pullet farms and feed mills, forming a semi-vertically integrated model.

In some regions, such as northern and northwestern Europe, industries are more specialized, with independent farmers, feed millers, packagers, and processors.

In areas with strong access to feed grains, integration extends to crop farming, as seen in eastern Europe.

The major benefits of more integrated models are better supply control and adaptability to demand changes.

The major benefits of more specialized models are greater opportunities for innovation and efficiency gains and the ability to distribute investment across multiple stakeholders.

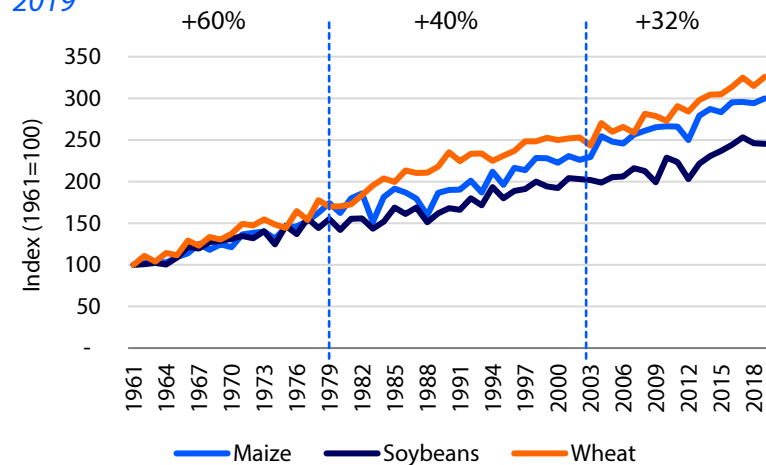
Value chain efficiency is increasing significantly in the sector

Higher yields and efficiency in layer farming, higher-yielding crop farming

Figure 66: Technical indicators in US layer farming, 2005-2021

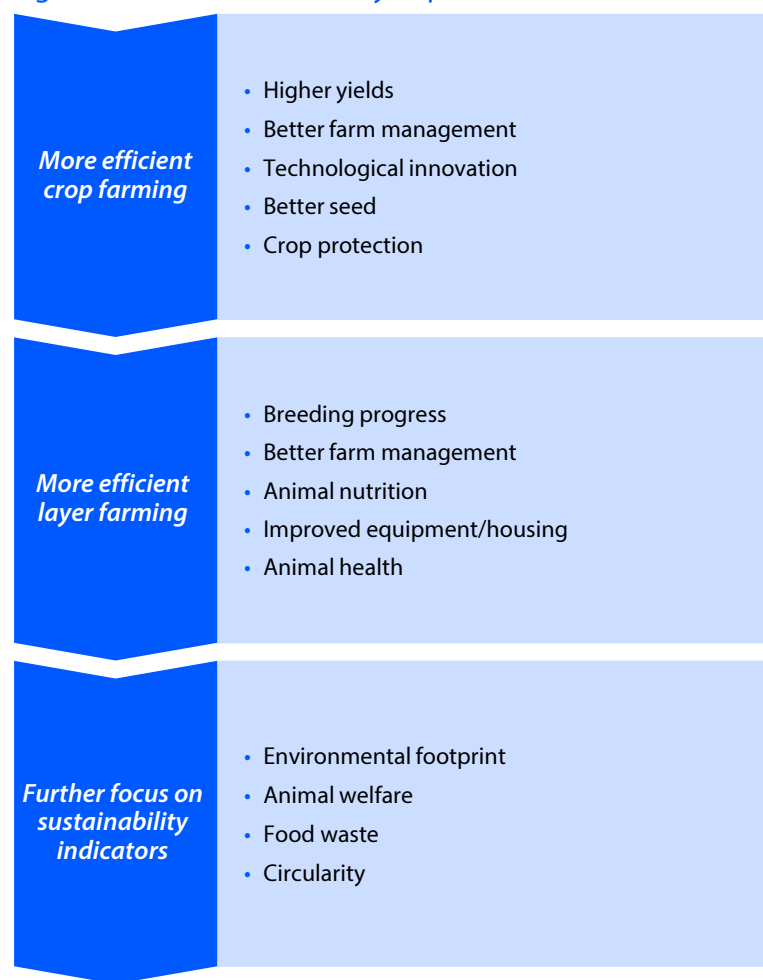
	2005	2008	2011	2013	2017	2021
Laying period (days)	400	415	420	420	490	490
Eggs/hen	324	348	352	352	414	430
Egg weight (gram/egg)	61.3	61.3	60	60	60	60
Feed conversion ratio	2.09	2.05	2.06	2.06	1.98	1.96

Figure 67: Global grain and oilseed yields per hectare, 1961-2019



Source: WUR, USDA, RaboResearch 2025

Figure 68: Drivers of efficiency improvement



Value chain efficiency to rise further

As global food demand rises and land resources decline, improving efficiency and yields will be critical.

Figure 69 shows that full value chain optimization – from grains to egg production to processing – with major efficiency and yield gains. This challenge increasingly requires a multidisciplinary approach that incorporates environmental and animal welfare considerations.

Figures 66 highlights improvements in the US egg industry:

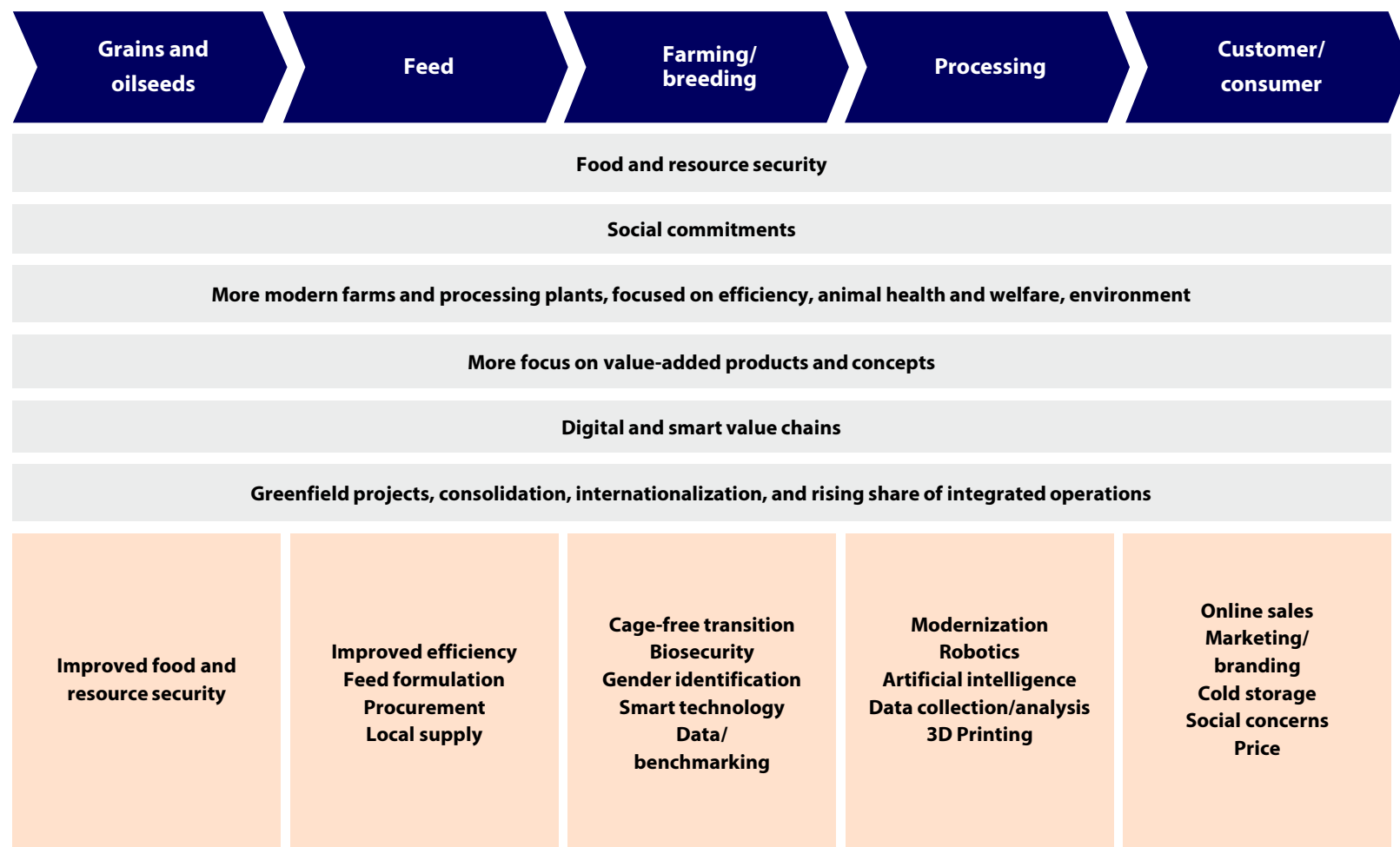
- Eggs per hen increased by 30% over 16 years.
- Hens' laying period extended 20%.
- Feed conversion ratios improved from 2.09 to 1.96.

Grain and oilseed yields have also improved, though at a slower rate. Continued progress is expected, with 500 eggs per hen likely achievable in the coming years, driven by improved genetics, farm management, nutrition, equipment, housing, and health innovations.

Market and social changes will accelerate investments in the value chain

Value chain focus to shift toward modernization, digitalization, and efficiency

Figure 69: Changing animal protein value chains in advanced economies



Value chain models will change in the coming decade

Significant changes are expected in global egg value chains. The nature and extent of change will vary by market.

In emerging markets, the focus will be on increasing supply to meet growing local demand and adapting to modern distribution. This will require massive expansion and modernization, moving toward business models used in advanced economies.

In advanced economies, investment priorities will shift. Figure 69 outlines expected changes, including:

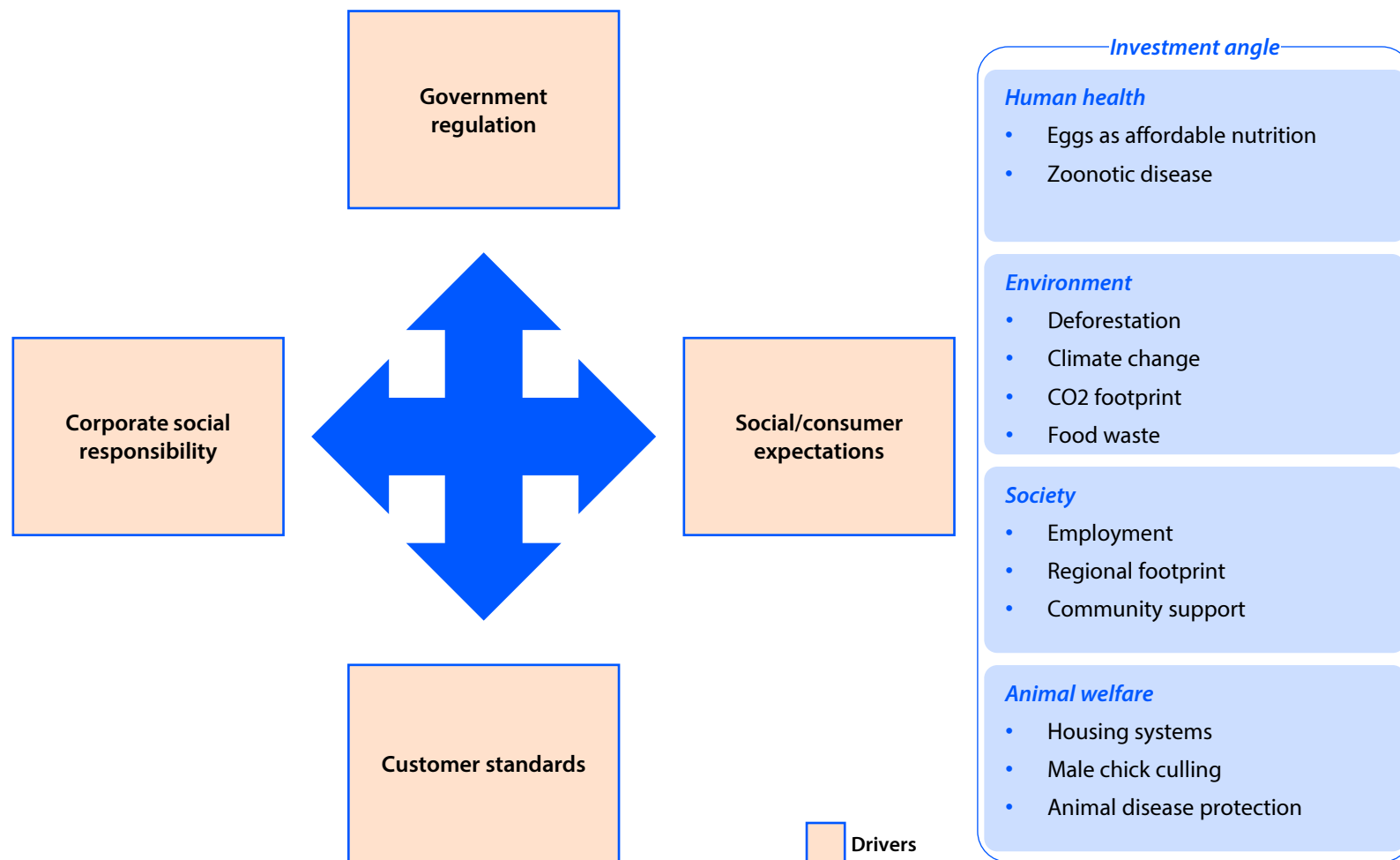
- Continuing to feed the world with affordable, nutritious eggs, with a stronger focus on food and resource security.
- Strengthening the industry's social commitments.
- Creating value in slow-growth markets.
- Investing in efficiency amid limited resources.
- Accelerating digital value chains linked to online food distribution.

Investments will span local and international value chains. Innovations will include smarter, more digital farms and increased adoption of cage-free and alternative farming concepts.

The industry will continue to focus on sustainability

Producing more with less in an urbanizing market will keep sustainability on the agenda

Figure 70: Key drivers of sustainable investment and investment angles



Corporate social responsibility will be central in industry strategies

Producing more food with fewer resources in an increasingly urban and digitally connected society presents major challenges.

Corporate social responsibility is becoming central to industry strategies, requiring proactive engagement in discussions about social issues – especially online. Governments, society, and customers are evolving their sustainability expectations.

Key sustainability angles for the egg industry to consider include:

- **Human health:** Eggs offer affordable, high-quality protein, vital for vulnerable groups.
- **Economic impact:** Egg production supports rural communities through employment.
- **Environmental impact:** Key themes for the industry include deforestation, climate change, carbon footprint, and waste reduction.
- **Animal welfare:** Further investment is expected in the continued shift to cage-free systems and gender identification to reduce male chick culling.

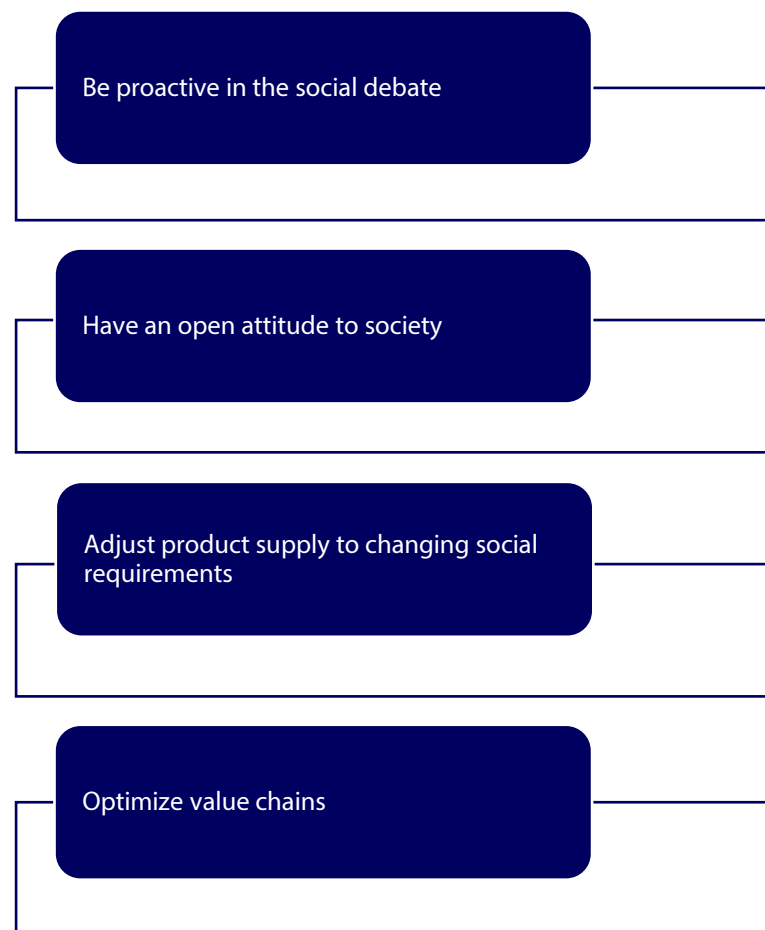
Urbanization and the rise of social media leads to evolving industry CSR approaches

An open dialogue with consumers is more important than ever

Figure 71: Changing social landscape and requirements



Figure 72: A changing social focus means new requirements for the industry



The key role of corporate social responsibility

By 2050, 65% of the global population will live in cities (up from 35% in 1960), increasing the distance between producers and consumers.

Social media's influence has grown massively and will continue to do so. Younger generations – especially in emerging markets – rely on online platforms for information and purchasing decisions.

The industry must adopt a more proactive, transparent approach in social debates, both off- and online. Explaining production practices and value chains is essential.

In high-income markets, concerns about the industry's license to operate are rising. In some countries, new farm construction is nearly impossible, and production reduction programs are underway (e.g., in the Netherlands). This highlights the urgency of addressing social concerns and to secure a license to operate.

Investments in innovation will improve egg value chain efficiency and sustainability

The industry is moving toward digital, smart, and more multidisciplinary value chains

Figure 73: Focus areas for value chain innovation

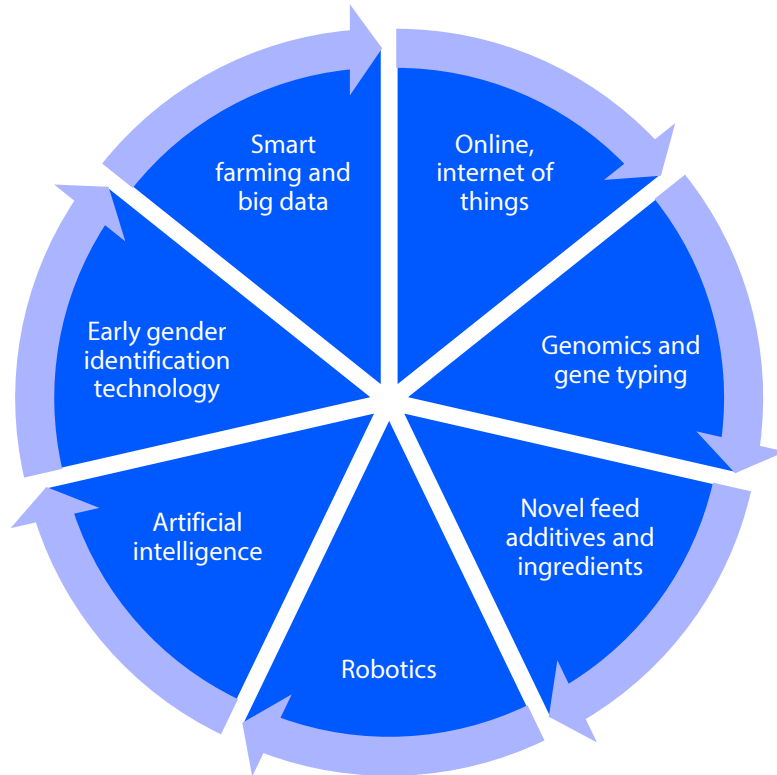
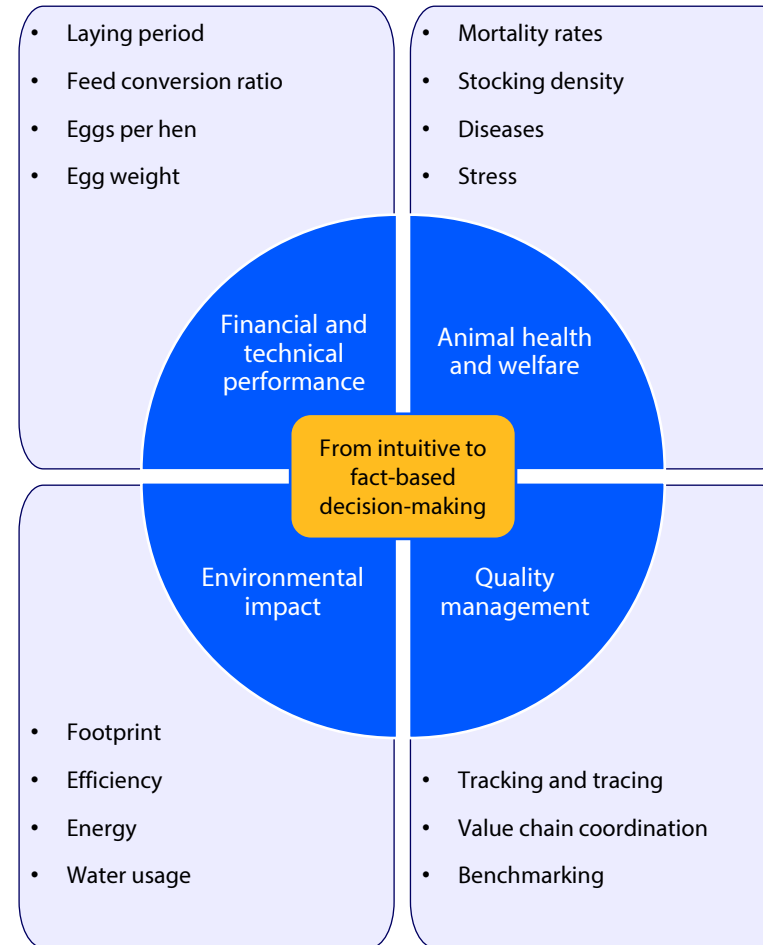


Figure 74: More multidisciplinary approach to production



Innovation as driver for further growth

Innovation will be crucial in the coming decades, especially to improve efficiency and yield amid resource scarcity.

Figure 73 outlines promising innovations that could be adopted by the value chain:

- Smart farming and value chains: Benchmarking and improvement via multidisciplinary approaches, including financial, technical, environmental and welfare indicators.
- Digitalization: More data exchange in the value chain via horizontal and vertical approaches, with use of more innovative benchmarking technology.
- Emerging technologies: AI, robotics, early gender identification, novel feed additives, and genomics.

In the future, there will be increased focus on value chain efficiency and sustainability and improvement from a vertical value chain perspective, in addition to the more common horizontal industry perspectives.

New technology and value chain models will help move the industry from more intuitive to fact-based decision-making based on a multidisciplinary approach and vertical and horizontal value chain perspectives.

Online food distribution growth to accelerate digitalization

New available technology and strong synergy to push smart and digital value chain

Figure 75: Rapid growth in the digital value chain

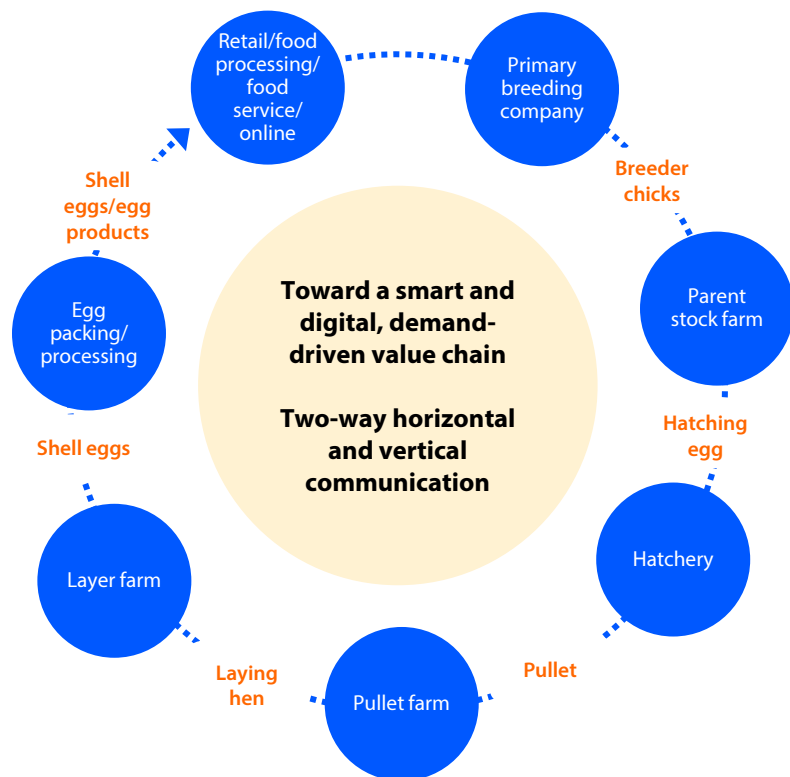
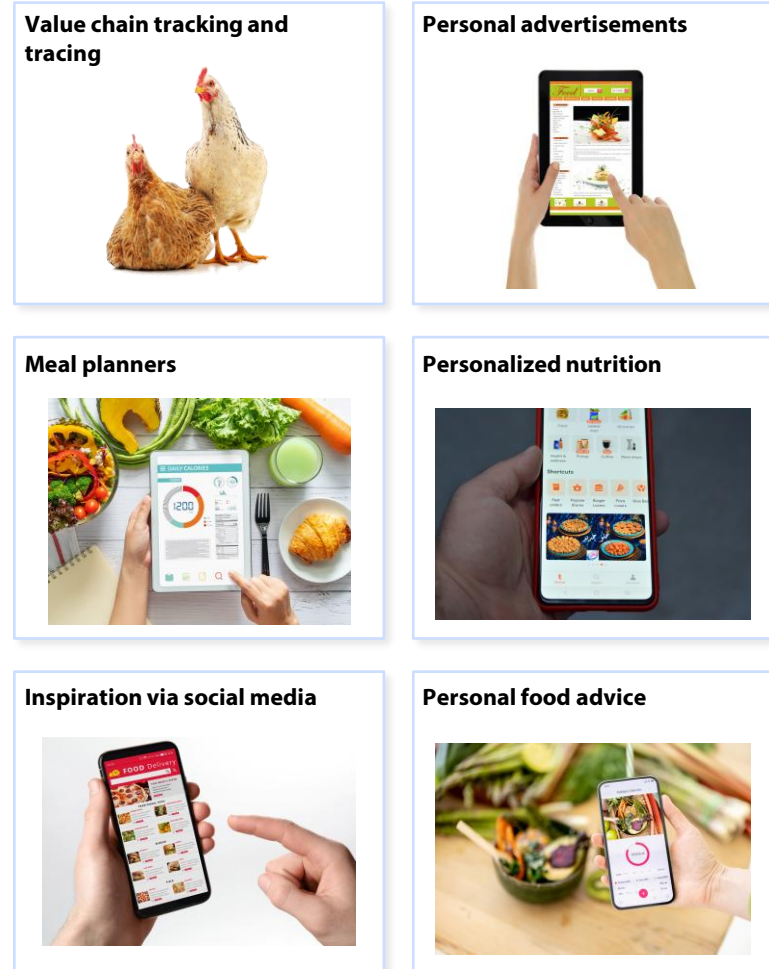


Figure 76: Ample growth opportunities due to digitalization



The rising impact of digitalization on the industry

A major shift in the next decade will be toward digital value chains (see figure 75). Most laying hen operations are not yet digital, but the potential is significant.

Benefits of digitalization include:

- Efficiency improvements via benchmarking.
- Tailor-made feeding.
- Camera-based egg quality checks.
- Robotics for labor replacement.
- Early disease detection.

Digitalization is also connected to online food distribution and social media. Figure 76 shows opportunities such as:

- Connecting farmers to consumers.
- Personalized ads and meal planners.
- DNA-based food choices.
- Social media-driven inspiration.

To capitalize on these developments, producers must prioritize digital transformation and allocate resources accordingly.

The future role of layer genetics

The genetics industry is playing an essential role in meeting industry efficiency and social objectives

Figure 77: Changing market requirements in the layer genetics industry

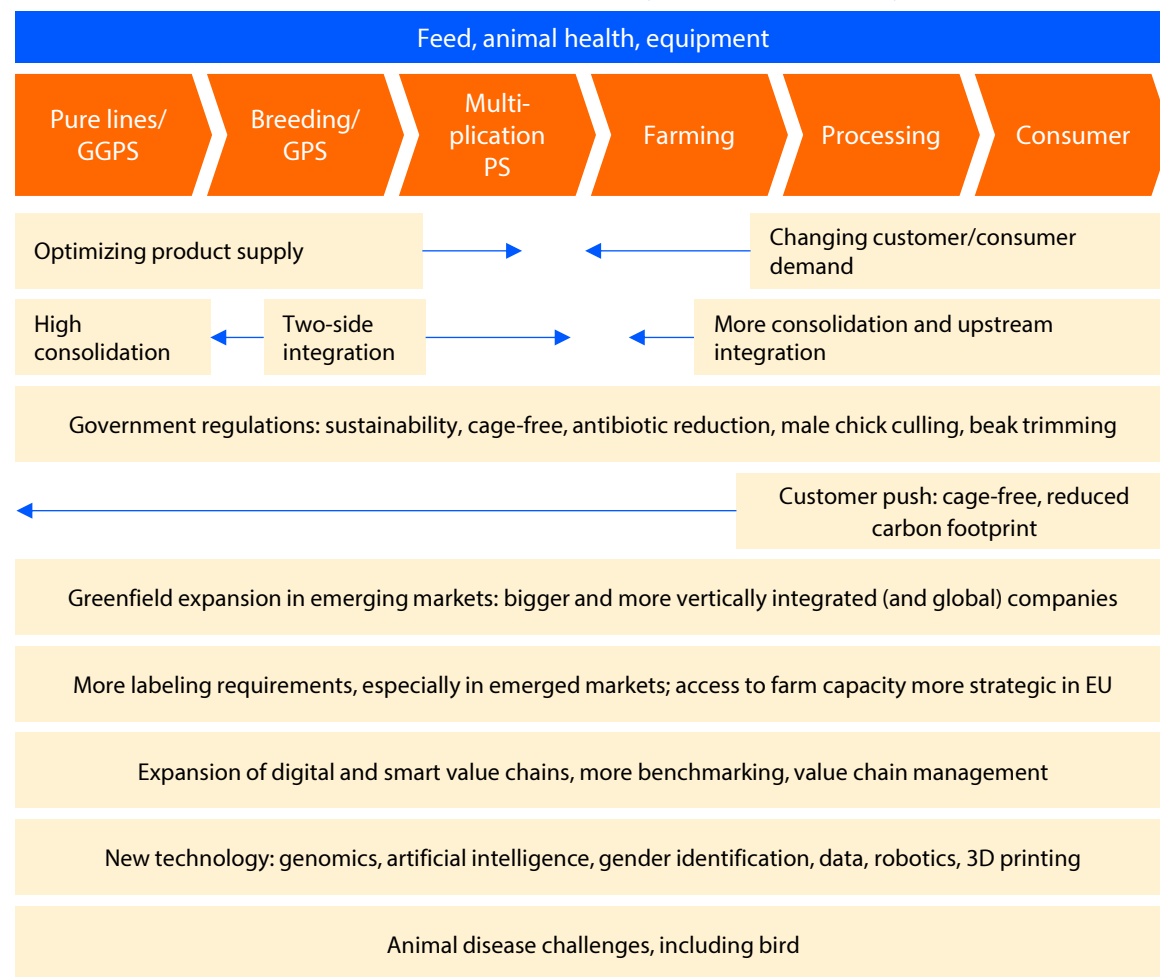
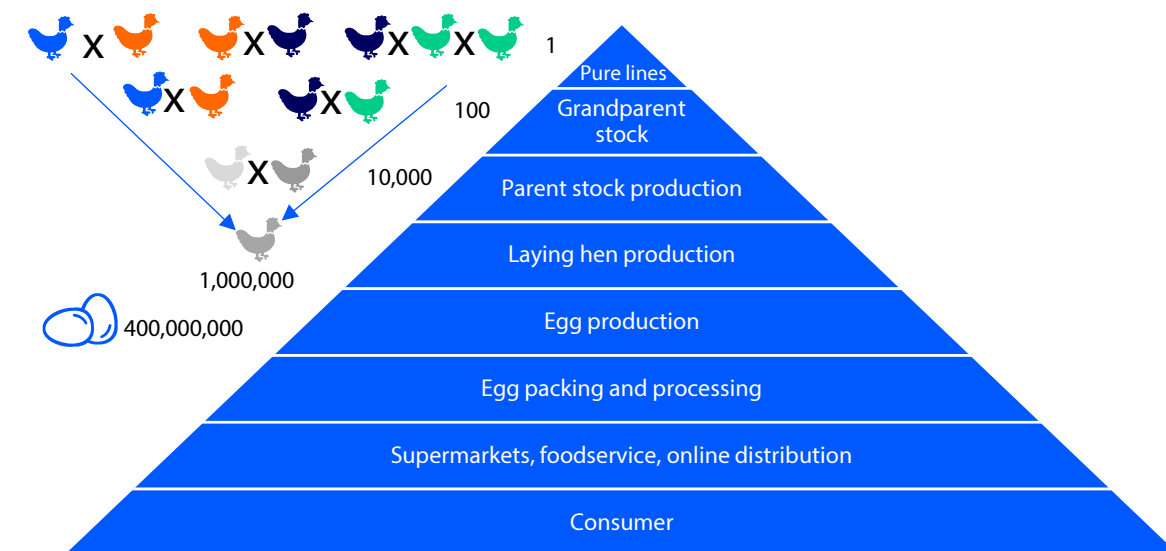


Figure 78: Egg production value chain



Expected trends in layer genetics

Animal genetics is a key driver of innovation. Improvements in egg yield and feed conversion ratio are largely due to better laying hen genetics and improved farm management, nutrition, housing, and health.

Meeting future goals requires supplying the right bird quality. However, the R&D-to-product cycle takes over four years due to hybridization and multiplication models, adding uncertainty.

Breeding companies expect egg production per hen to exceed 500 eggs in the next decade, reducing the number of hens needed and lowering feed requirements and environmental impact.

The changing context of animal nutrition in the egg industry

More strategic sourcing needed in times of increased geopolitical tensions

Figure 79: Factors affecting animal nutrition and supply in egg industry

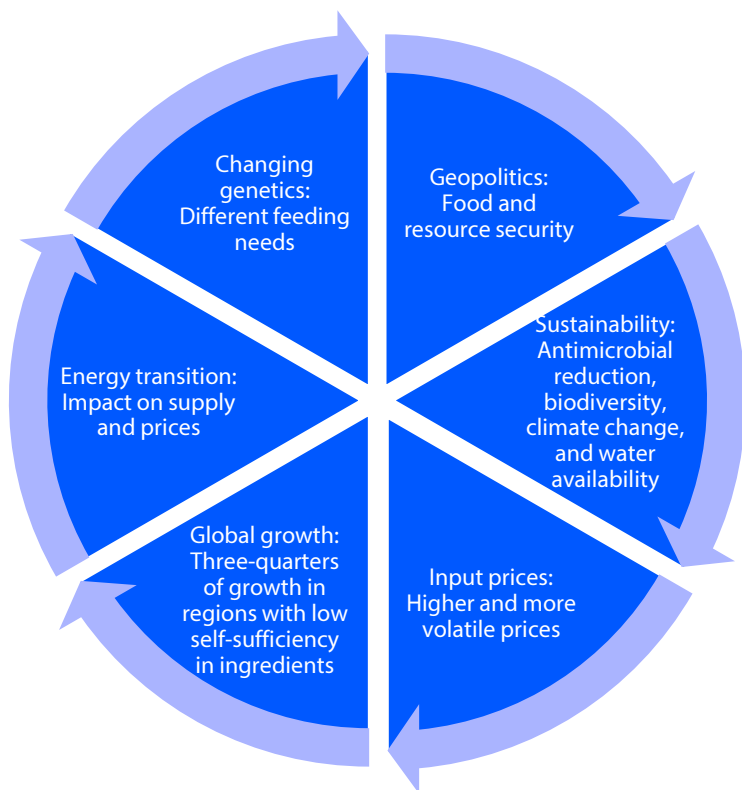
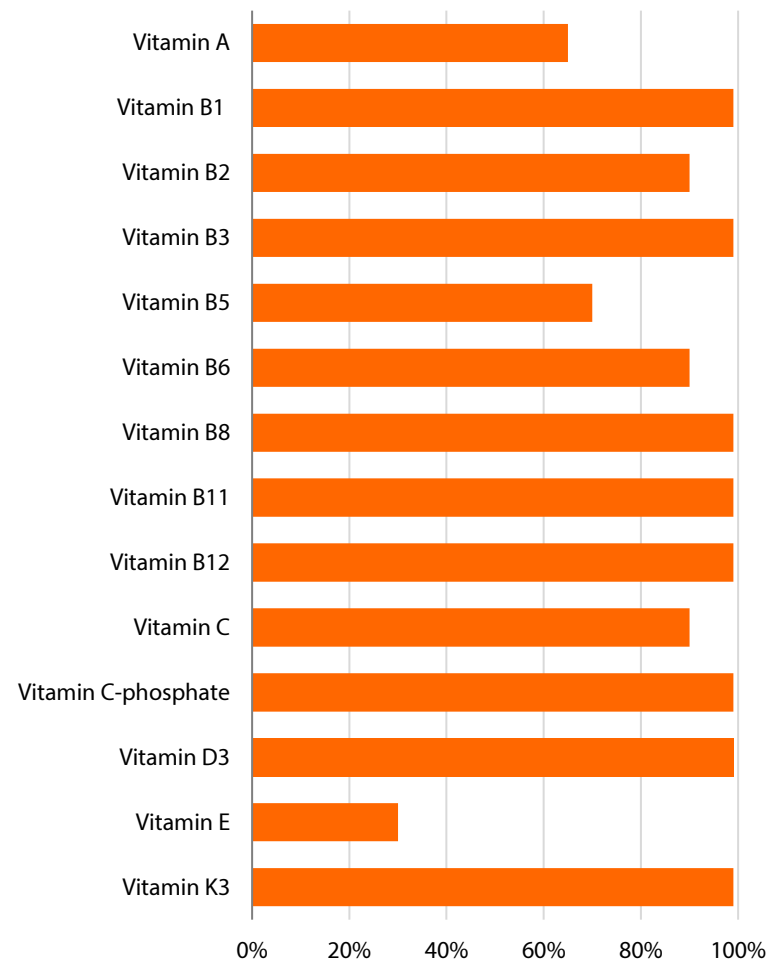


Figure 80: China's share in vitamin markets, 2024



Animal nutrition outlook for eggs through 2035

Animal nutrition accounts for 55% to 70% of egg production costs and is a major contributor to the sector's carbon footprint.

Increasingly more compound feed production has become part of egg supply chains as vertical integration in the egg industry is increasing, especially in emerging markets.

Feed formulation and procurement will become even more important as markets localize and sustainability strategies evolve. These strategies include:

- Using more local ingredients.
- Incorporating crop and food waste into feed.
- Labeling feed ingredients for environmental impact.

Geopolitical factors may affect ingredient availability. For example, China dominates amino acid and vitamin supply (see figure 80), prompting more diversification efforts by importers, partly related to resource security programs.

Most growth for nutrition companies will occur in emerging markets due to modernization. In advanced economies, feed demand volume growth will be below egg market growth due to further efficiency gains.

Layer housing and processing equipment innovation

Poultry housing equipment and processing to remain key area of innovation in egg industry

Figure 81: A changing equipment industry in the coming years



The equipment industry's leading role in industry

The equipment industry plays a vital role in improving efficiency, sustainability, and labor productivity through automation and digitalization.

Different regions require tailored solutions (see figure 81), and equipment needs vary by development stage ([see slide 9](#)).

Emerging markets will demand greenfield investments, while advanced economies will focus on modernization and cage-free transitions. Innovation will be driven by social requirements, with attention to affordability, animal welfare, and environmental impact.

Labor-saving technologies like robotics and wall-to-wall solutions will grow. Innovations include AI, big data, benchmarking, and gender identification at hatcheries.

Most leading equipment companies are based in advanced economies, but rising production in Asia (and especially China) is reshaping the global equipment landscape. Existing equipment companies will need to increasingly reposition themselves by demonstrating leadership in innovation, service, and market access.

Source: RaboResearch 2025

Key takeaways: Global egg industry outlook 2035

The global egg market is expected to grow 22% by 2035, with 90% of growth concentrated in emerging markets. This will be driven by population growth, rising incomes, urbanization, improved availability, and evolving consumer preferences.

Value-added segments, such as consumer-based egg products, cage-free eggs, and functional eggs, are reshaping demand, especially in mature markets. This will require producers to adapt product portfolios and branding strategies.

The egg products market is growing 2% to 2.5% annually, with China and India leading industrialization. Processed eggs are gaining traction, especially in the food ingredients market due to rising food safety concerns, higher labor costs, and benefits from economies of scale, but also increasingly in consumer markets as incomes rise.

Geopolitical tensions and resource constraints are making food and resource security a more strategic priority for governments, leading to the acceleration of localization of production.

Consumer concerns – health, environment, animal welfare, and local sourcing – are driving product differentiation, especially in advanced economies. In a changing social landscape, securing a license to operate is a growing priority and will require the industry to have a more open, proactive attitude.

Digitalization and online food distribution are transforming consumer engagement, particularly among younger demographics. **Social media and e-commerce are now critical sales channels.**

High capital expenditure is expected to support greenfield expansion, cage-free transitions, vertical integration, and modernization. **AI, robotics, and smart farming will be key enablers of efficiency and sustainability.**

Modernization of value chains is accelerating globally, with rising investment in more integrated models and a strong focus on efficiency, sustainability, and digital transformation. **Industry business models are expected to become more consolidated and international.**

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