



CUSHMAN &
WAKEFIELD

FUTURE OF
CITIES

FUTURE OF FOOD CHAINS

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The world we live in is changing at a rapid pace, with global communities facing a climate emergency, a cost-of-living crisis, and a rapidly growing burden on the health sector. Food is at the forefront of these challenges, and directly related or attributable to all. Food chains are one of the most complex supply chain types, handling vast variety of products all with varying characteristics sell by dates and safety regulations and volatile demand profiles owed to restless and evolving consumer preferences. Real estate plays a critical role in facilitating structural changes in food chains, and through this report we hope to educate, challenge and broaden the thinking of decision makers within the real estate sector.

1 INTRODUCTION

The way we live is changing. The global Covid-19 pandemic forced widespread adjustments to the way we work, live and play.

The accepted 'norms' have been challenged, and for some, permanent changes have been made. However, independent of the seismic shifts to what were once deeply embedded lifestyle habits, one key pillar remains seemingly constant, food. However, supply chain pressures, changing consumer preferences and climate change are changing the way we produce transport and purchase food.

While these pressures have brought a focus on the availability and price of food as of the present day, the megatrends of deglobalization, technological advancement and climate change will see an evolution of food chains across the globe, through our cities and on to our table.

This report looks at four long-term macro trends that are highly likely and, in some instances, certain to impact future food chains. By understanding the drivers behind these trends and interpreting the likely real estate impacts we have arrived at our vision for the Food Chains of 2040, detailing the relevance for real estate along the way.

OUR VISION

We anticipate that by 2040, the global food chain will look very different from that of today.



HEALTH AND SUSTAINABILITY

The diets of the general population will have shifted towards a balanced health-centric and sustainable diet, as societies and cities transition to less carbon intensive foods and carbon transparency becomes prevalent. Individuals will consciously seek to optimize nutritional intakes, balancing health with cost and environmental impact.



FOOD PRODUCTION

The role of alternative forms of farming in the UK will grow and play a key role in mitigating against climate risk, and labour challenges within the agriculture sector. Urban and vertical farming will allow us to intensify the use of real estate in urban locations and safeguard against the risk of crop failure, disease, and volatile growing conditions. Efficiencies will be facilitated by the adoption of new production methods, and automation.



SUPPLY AND STORAGE

Supply chains are likely to both widen and shorten, resulting in less reliance on international freight, and a reduction in carbon impact. Supply chains will become more specialised resulting in greater agility to reduce spoil risk, keep pace with food trends, and reduce food waste.



CONSUMPTION

Households will source and purchase a growing proportion of their food via the E-grocery market, thus reducing waste whilst maximizing convenience and experimentation. As a result, supermarkets will re-focus efforts on revitalizing store concepts, with a drive to quality, variety and retained custom through detailed knowledge of consumer habits. Repositioning and repurposing will affect under-performing and over-sized assets.

These shifts will drive not only an evolution of our existing real estate and its specialised clusters, but also supercharge intensification of assets and create innovative and new real estate asset classes.

2 THE GROWING ISSUE OF FOOD SECURITY

In 2022 the Government Food Strategy report produced by DEFRA outlined the challenges in balancing availability, price, security, and health.

The report states that those countries dependent on imports tend to be characterised by less choice and higher prices. This focus on domestic security suggests that growth and innovation within the domestic production markets is critical in maximising choice, health, and pricing, and will allow for gains in food security and consumer welfare. Furthermore, the inflationary environment, as well as climate events that have created food shortages, have put the issue of food security at the top of the public agenda.



The Global Food Security Index is an international benchmark for food security, that looks at the global food environment and its position in safe-guarding food supply. The most recent edition, published during 2022 found that Food security has continued to deteriorate for a third consecutive year. The UK ranks 9th globally in terms of overall score, but has scored relatively low for availability, quality and safety when compared to other advanced Western Economies.

9TH
THE UK RANKS 9TH GLOBALLY IN TERMS OF OVERALL SCORE, BUT HAS SCORED RELATIVELY LOW FOR AVAILABILITY, QUALITY AND SAFETY WHEN COMPARED TO OTHER ADVANCED WESTERN ECONOMIES.

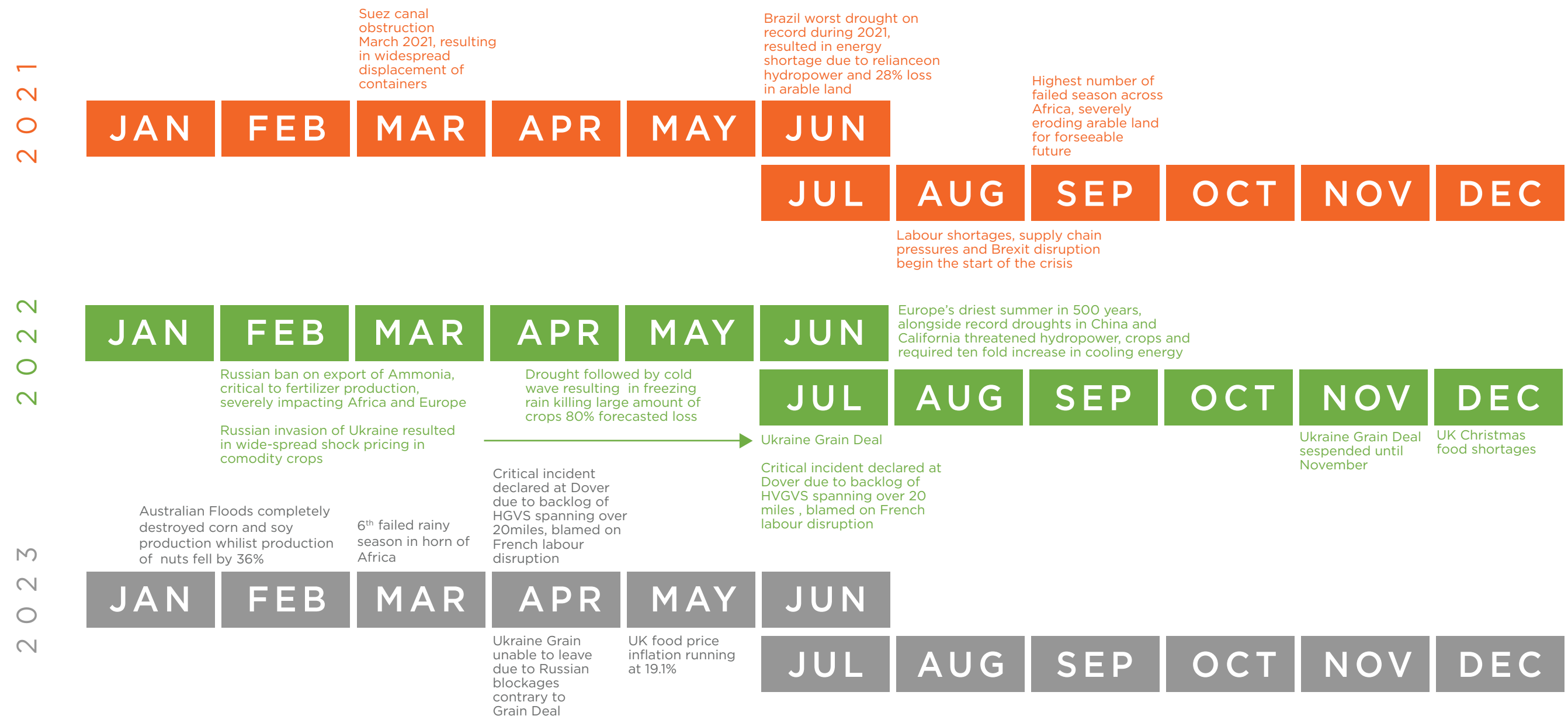
THE INDEX IS COMPRISED OF FOUR COMPONENT PARTS

Real estate plays a critical role in facilitating food security

FOOD SECURITY ELEMENT	REAL ESTATE IMPACT
AFFORDABILITY	Facilitate operational efficiency through specification, configuration, and pricing.
AVAILABILITY	Facilitate supply chain agility, ensure inventory security
QUALITY AND SAFETY	Fit out and specification must be compliant with food handling regulations and reduce spoil risk
SUSTAINABILITY & ADAPTION	ESG compliant and net zero buildings critical in reduction of overall supply chain impact for food chains

THE GROWING ISSUE OF FOOD SECURITY

FOOD CHAIN DISRUPTION TIMELINE



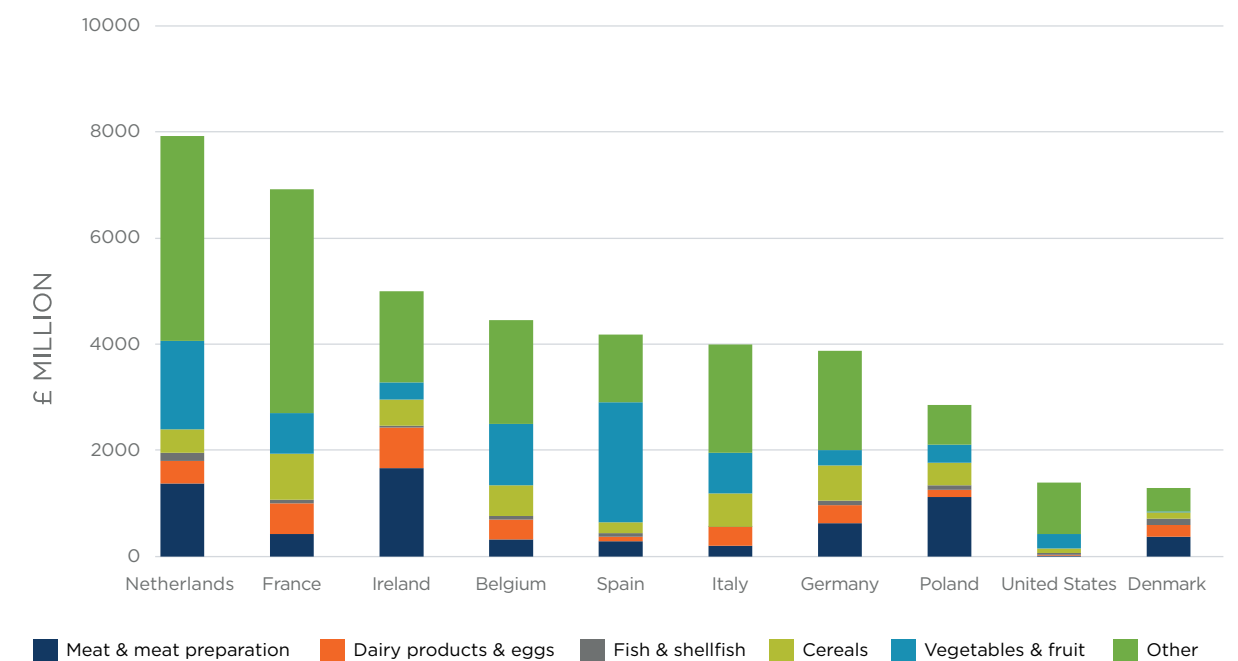
3 UNDERSTANDING THE CURRENT FOOD CHAIN IN THE UK

DIET AND THE UK AGRI-FOOD SECTOR

The agri-food sector in the United Kingdom accounts for approximately 6% of national GVA and is comparable to the Education and Construction sectors in terms of its contribution to the economy. It also employs over 4 million people, almost double of that of the construction sector.

The UK consumer diet has undergone rapid transformation over the last 30 years, transitioning away from a carbohydrate and root vegetable heavy diet, towards a more global and diverse food offering. Whilst the types of foods and influences has diversified markedly, the food groups being utilized has in some places narrowed, favouring key ingredients such as wheat, maize, and grain. As a result, the UK is heavily reliant on imports for its supply of food. During 2022, the UK recorded a balance of food trade deficit of £32.9 billion. During 2022, 68% of total food imports were derived from its 10 key trade partners, and over 30% alone was imported from Netherlands, France, and Ireland.

2022 FOOD IMPORTS BY ORIGIN AND TYPE



Source: ONS 2023

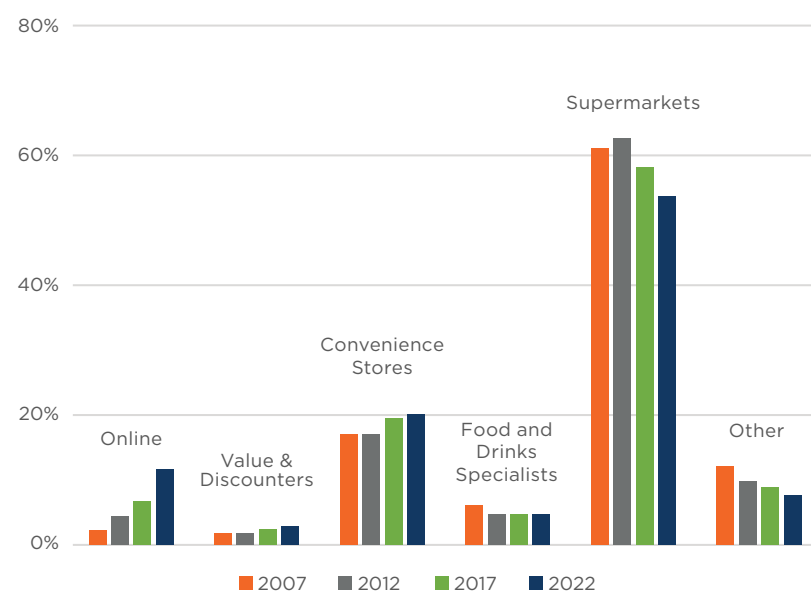
UNDERSTANDING THE CURRENT FOOD CHAIN IN THE UK

THE KEY PLAYERS

In the United Kingdom food is typically purchased through the traditional supermarket model, but consumers have begun to diversify spending patterns, resulting in the rise of subscription meal kit providers, a growing proportion of food purchased through the online e-grocery sector, and an increase in purchasing through wholesale convenience, and non-food specialist stores.

During 2013 the UK had a three firm concentration ratio of 64%, which has been eroded over the last ten years and now stands at 56%, highlighting a diversification of power within the sector.

FOOD & GROCERY SALES CHANNEL SHARE OF VALUE



Source: Global Data, 2023

Most notably, discounters such as Aldi and Lidl have seen the largest gains in market share, with Aldi recently leapfrogging Morrisons in terms of market share.

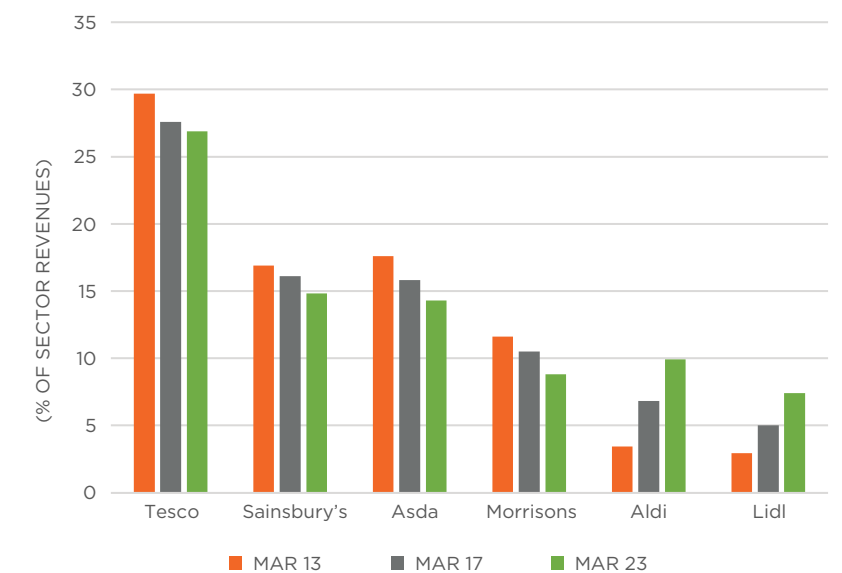
Owed to the strength of the supermarket sector in the United Kingdom, supermarket and food anchored retail have proved to be robust investments owed to inelastic demand for goods, and high levels of liquidity associated with the sector. From a consumer perspective the scale of the major incumbents within the sector has allowed consumers to benefit from relatively low pricing, owed to the economies of scale and purchasing power of the major retailers.

However, recent inflationary pressure has challenged consumer loyalty in the UK, up-rooting longstanding relationships with local supermarkets and intensifying the battle for market share. The latest evolution of the supermarkets battle for market share is naturally focusing on discounting and value. As a result, significant effort is being placed on price-match campaigns, exclusive discounts

for loyalty scheme members, and investment into own brand product lines.

The current competitive tension in the supermarket sector combined with the opportunity within e-commerce has also spurred a new wave of sales-channels. And as a result of greater choice and inflationary pressure many consumers are now diversifying their purchasing channels, utilising discount retailers, online subscriptions services, and regularly rotating between the markets major brands.

SUPERMARKET UK MARKET SHARE



Source: Kantar; 2023

DEFINING NEW SALES CHANNELS:

Pureplay e-grocery – Ocado, Motatos

Retailers with no physical retail space, utilising direct to consumer fulfilment for grocery items.

Subscription supermarkets & meal kits – Hello Fresh, Gousto

Retailers offering subscription based meal plans, and fulfilment of perishable household goods on a repeat order basis.

Q-Commerce – Getir, Gorillas, GoPuff

Retailers offering rapid fulfilment of convenience goods, typically found in urban areas.

Gig economy fulfilment – Deliveroo, Starship

Labour or technical solutions solely focussed on the rapid fulfilment of goods picked through the retail network.



Since 2008, the food chain has accounted for 76 million sq ft of prime industrial and logistics space (in units over 50,000 sq ft), averaging 5 million sq ft per annum.

This is just a portion of the market, with many units held in freehold or in long term occupation. Since 2007, the average lease term signed has been 14.5 years, with a number of 30+ year leases also signed in that time.

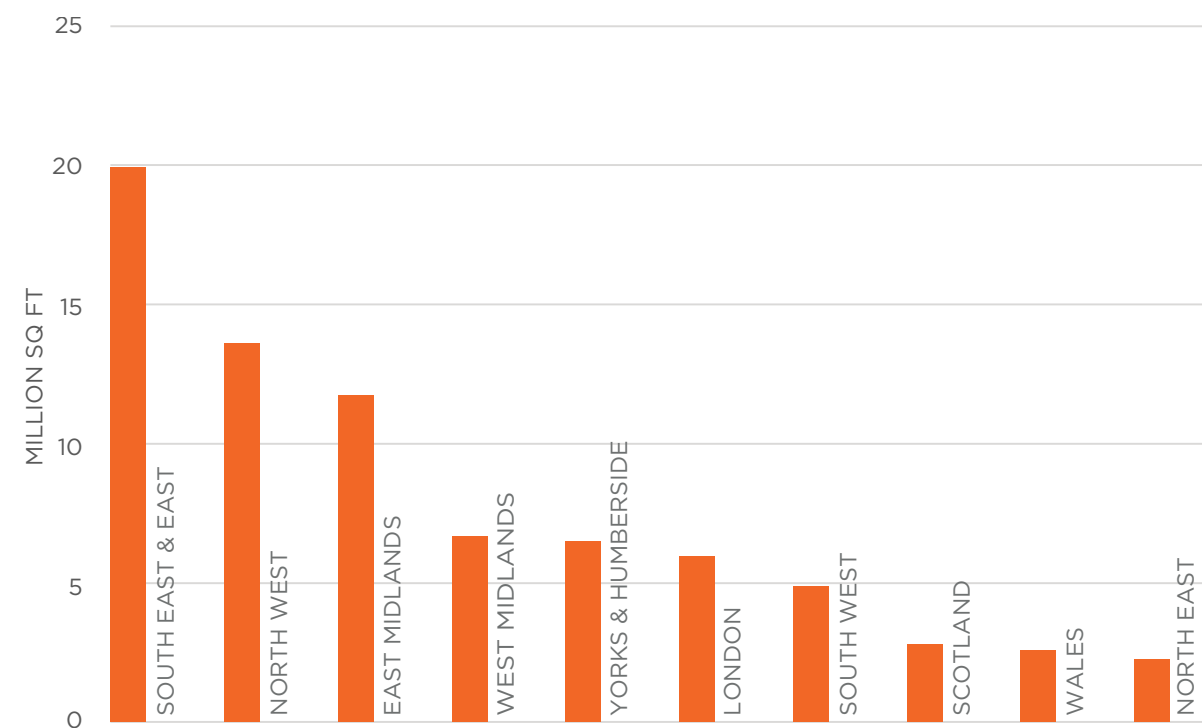
During 2022 alone, the sector accounted for 5 million sq ft. To put that figure into perspective, this is similar to the levels driven by e-commerce operators.

Occupational demand from food related operators has favoured the South East & East, which has accounted for 26% of food take-up since 2008.

This preference is a result of its close proximity to London, and its connectivity to seaports such as London Gateway and Felixstowe which are responsible for handling large quantities of produce imported from mainland Europe.

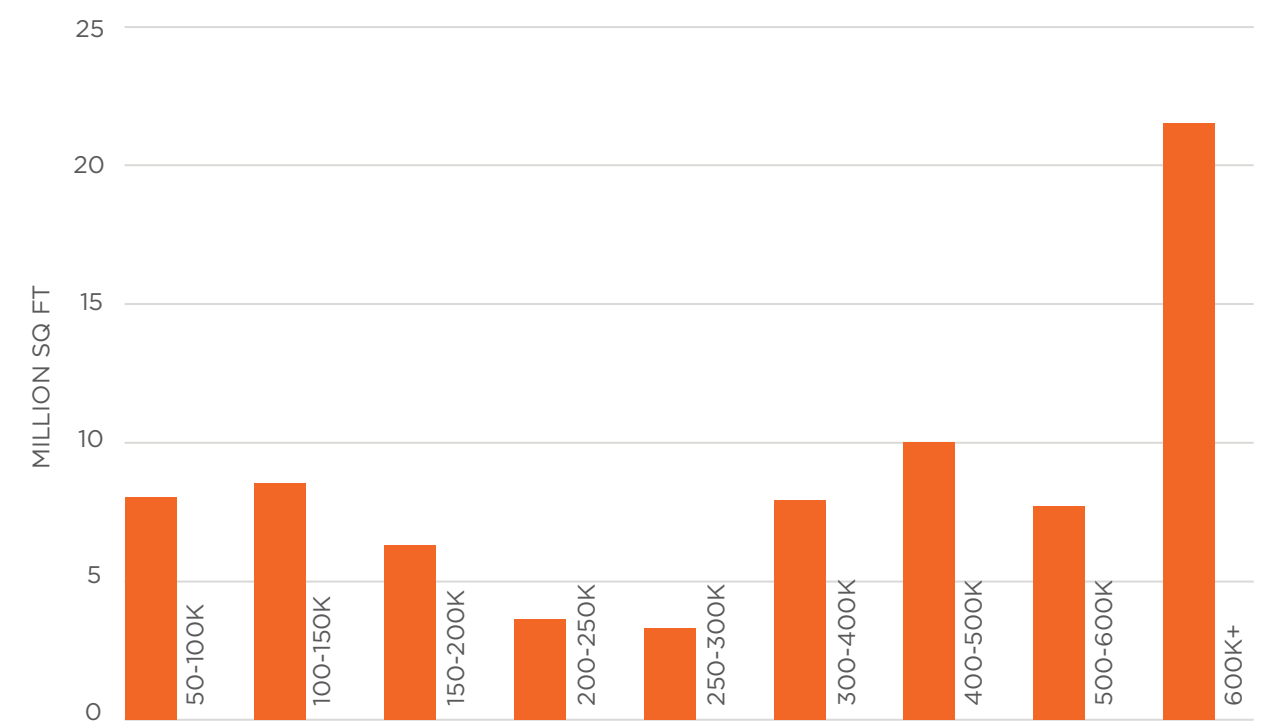
In addition to a preference for locations connected to critical sea ports, and urban conurbations, we have further identified that a 37% of this footprint is located in units of 500,000 sq ft and above, which is largely attributable to the existing supply chain model that utilises regional and national distribution centres in handling and moving food goods.

TOTAL FOOD TAKE-UP BY REGION (2008 ONWARDS)



Source: Cushman & Wakefield

TOTAL FLOORSPACE BY UNIT SIZE (2008 ONWARDS)



Source: Cushman & Wakefield

2022 KEY FOOD LEASING DEALS

During 2022, demand for Industrial space from food related business remained strong, with a number of key deals recorded across the national market



DANISH CROWN

MONARCH 330 MANCHESTER

SIZE
328,000

RENT
£7.50

LEASE TERM
15

OPERATION TYPE
MANUFACTURING



AM FRESH

HUNTINGDON

SIZE
300,000

RENT
£6.70

LEASE TERM
25

OPERATION TYPE
COLD STORAGE, PRODUCTION AND LOGISTICS



FARMFOODS

SUPER W WARRINGTON

SIZE
433,310

RENT
£6.25

LEASE TERM
20

OPERATION TYPE
REGIONAL DISTRIBUTION CENTRE



ICELAND

OMEGA WEST WARRINGTON

SIZE
505,000

RENT
£8.25

LEASE TERM
20

OPERATION TYPE
REGIONAL DISTRIBUTION CENTRE



HELLO FRESH

SMART PARC DERBY

SIZE
433,310

RENT
£6.25

LEASE TERM
20

OPERATION TYPE
DISTRIBUTION CENTRE

2022 FOOD INVESTMENT DEALS

Investment appetite for industrial business with food related tenants remained strong, with a number of key deals being recorded, with strong financial performance traits



THE CO-OPERATIVE GROUP

AVONMOUTH

DATE
AVAILABLE

SIZE
439,005

PRICE
£51.7M

NIY
5.00%

PURCHASER
TBC



ICELAND

SWINDON

DATE
OCT-22

SIZE
220,994

PRICE
£30.1M

NIY
4.68%

PURCHASER
CBRE CAPITAL ADVISORS



TESCO

DONCASTER

DATE
SEP-22

SIZE
444,180

PRICE
£44M

NIY
4.65%

PURCHASER
JD.COM



SUPER W

WARRINGTON

DATE
AVAILABLE

SIZE
246,136

PRICE
£32.09M

NIY
4.96%

PURCHASER
LEFTFIELD



ICELAND

WARRINGTON

DATE
AUG-22

SIZE
505,000

PRICE
£88.6M

NIY
4.35%

PURCHASER
AVIVA

4 DIETARY CHANGE: HEALTH AND SUSTAINABILITY

THE COST OF FOOD

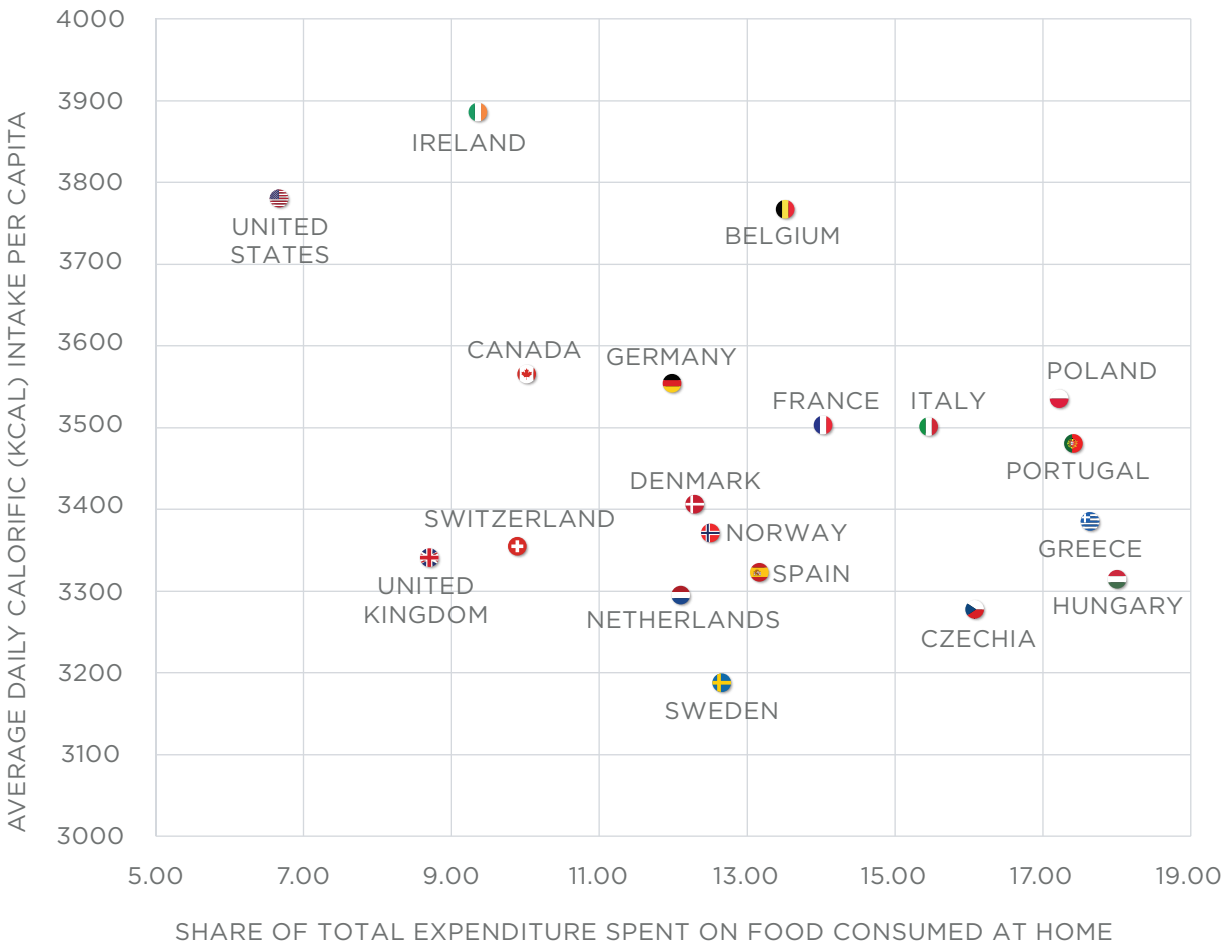
The average UK diet, while in many ways similar to diets in other western advanced economies, consists of a high average calorie intake of approximately 3,400 daily calories per capita, and despite recent increases requires a relatively low food spend when expressed as a percentage of total expenditure.

The low relative cost of food is due to supermarket competition, robust trade networks and advances in food production. In addition to dietary preferences allowing for a relatively low cost of food, the UK has benefitted from strong international trade relations, streamlined supply chains, and the buying power of its retail network, which over time has seen the cost of food in the UK reach relatively low levels.

OUTLOOK

The current inflationary environment, sustained population growth, and continued environmental pressures, mean that food prices are likely to outpace real income growth, resulting in a greater share of total expenditure on food.

SPEND VS CONSUMPTION



Source: Moodys, 2023

PRICE COMPARISON

	BUTTER 250G	APPLES /KG ROYAL GALA	CHICKEN / KG BREAST	LETTUCE
UNITED KINGDOM - TESCO	£1.89	£2.60	£6.32	£0.70
FRANCE - CARREFOUR	£1.97	£2.59	£9.47	£0.86
UNITED STATES - WALMART	£1.59	£3.16	£8.27	£1.49
AUSTRALIA - WOOLWORTHS	£2.43	£5.45	£8.69	£2.77

Source: Independent Price Comparison, Primary Data, C&W

DIETARY CHANGE: HEALTH AND SUSTAINABILITY

HEALTH IS WEALTH

The impact of a healthy and balanced diet are well known and understood globally.



The British freedom to consider equally all the choices available has led to it developing perhaps one of the most sophisticated food cultures anywhere.

Ha-Joon Chang
Edible Economics

Often overlooked however is the impact on health, its transmission into productivity, and the challenges of maximizing nutritional and energy sufficient diets subject to budgeting costs and time pressures. Whilst culinary culture in the United Kingdom has evolved substantially since the 1980s in terms of global cuisines, new condiments, and the emergence of new food groups, the UK has also developed a plethora of unhealthy habits – obesity currently costs the NHS a total of £6 billion, this figure is expected to rise to £9.7 billion by 2050.

The UK's dietary preferences come with significant health and environment implications and as such must evolve in order to meet both sustainability targets and reduce the diet related health burden. Transitioning to a healthier more sustainable diet will likely induce; new demand from businesses expanding within the food sector, changes to occupier preferences relating to specification and ESG, and a need for R&D and incubator space to nourish innovative brands and food start-ups.

THE GLOBAL DIET

As the world has become increasingly globalised, incomes have risen, and Western culture has become ever popular, societies have gradually converged towards a global homogeneous diet, leaving behind diversified food types, local delicacies and pantries formerly stocked with seasonal local produce.

The problem of the global homogeneous diet is a pertinent one, bringing with it increased impact on the environment, exposure to supply chain risks due to a concentration of power from key exporters, reduced biodiversity, and excessive use of artificial additives preservatives and growth supplements such as ammonia-nitrate based fertilizers in order to intensify outputs.

As well as globalisation, industrial farming is a significant contributor to the problem of homogeneous diets as government grants and scale operators within industry have favoured crops that have a significant impact on the environment.

FAD FOOD NATION

Dietary change and food culture is driven by an array of forces, all impacting diets in one way or another.

The UK is one of the most trend driven countries globally, and London is recognised globally as a trend leader. This means that more so than in other countries households in the UK respond rapidly to the latest changes in fashion and culture. This combined with a lack of engrained food culture, (think tapas, aperitifs, bistros) means that the diets of the UK are particularly responsive to emerging trends, and liable to change to a greater extent than some European counterparts. We believe that the two key trends likely to impact dietary change are the environment, and personal wellbeing.



Of the 6,000 plant species humans have eaten over time, the world now mostly eats nine, of which just three – rice, wheat and maize – provide 50% of all calories. Consumption of meat and dairy has soared, with pork the most widely consumed meat.

Bloomberg



DIETARY CHANGE: HEALTH AND SUSTAINABILITY



EATING FOR 1.5 DEGREES

Our reliance on industrial farming particularly within a concentrated selection of foods is likely to accelerate climate change.

As crop failures and worsening conditions persist greater volumes of arable land are likely to be deployed for rice, wheat and maize, compounding the environmental impact of our food chains. Industrial food production and agriculture has a significant impact on our environment, due to three broad factors, the amount of fresh water deployed, the amount of land deployed, and the logistics of handling processing and moving food types.

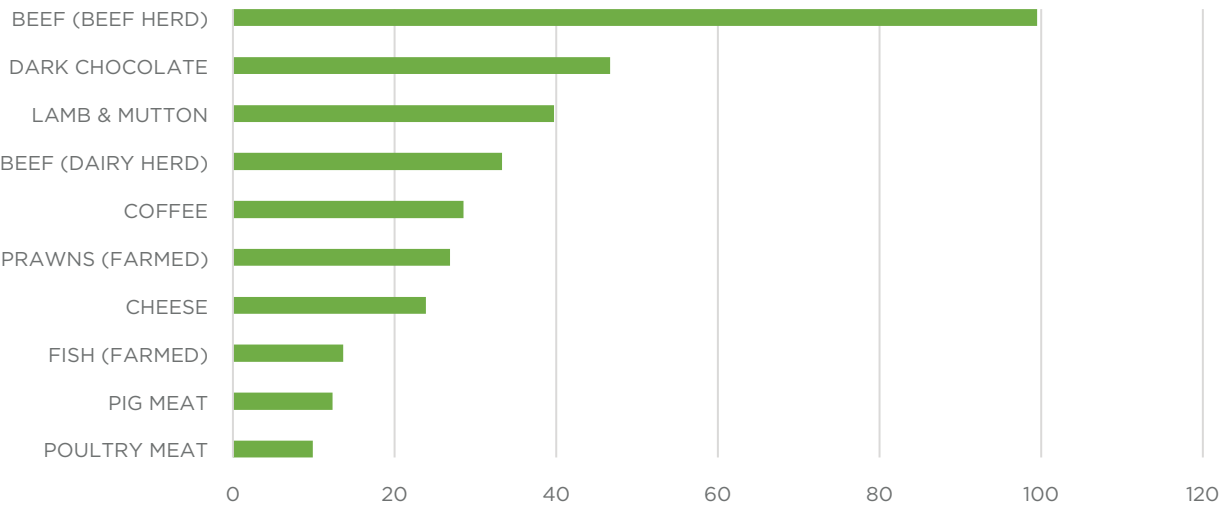
A whopping 26% of Global green-house gas emissions are attributable to the food chain (OurWorldinData,2022), in the UK this value represents 35% of total UK territorial emissions, 23% of which is attributable to waste (WRAP, 2023).

26%

A WHOPPING
26% OF GLOBAL
GREEN-HOUSE GAS
EMISSIONS ARE
ATTRIBUTABLE TO
THE FOOD CHAIN



GHG EMISSIONS PER KILOGRAM (CO2 EQ. KG)



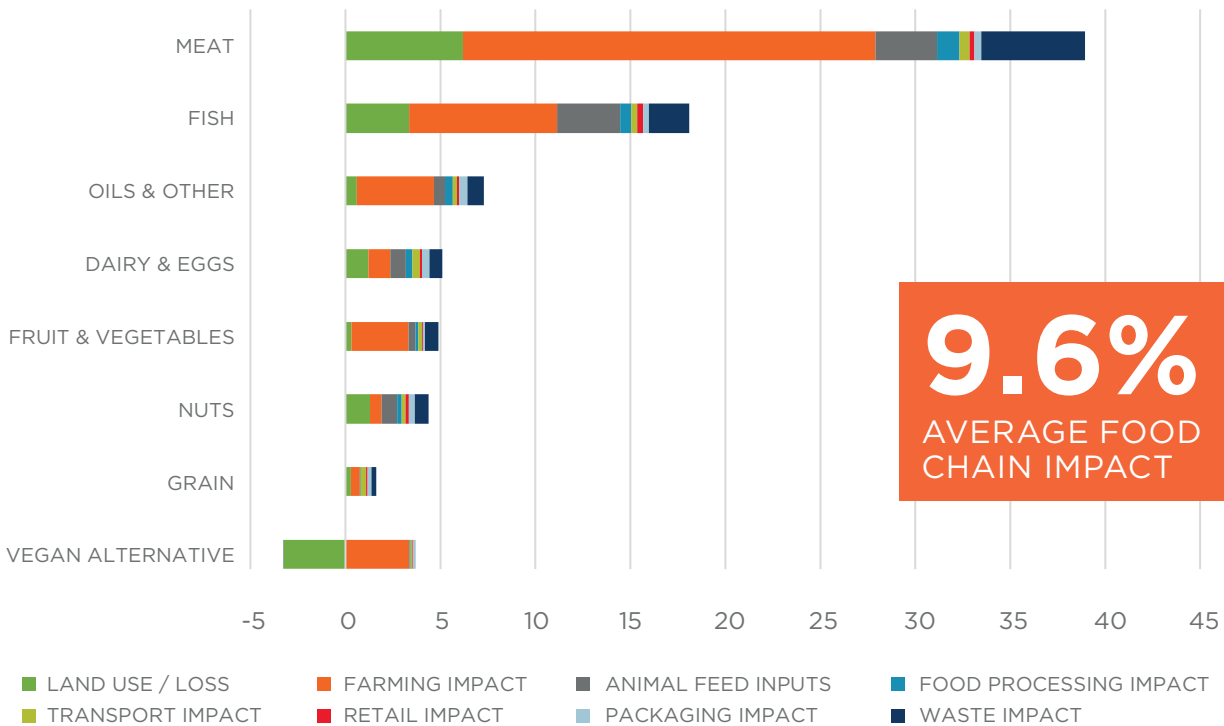
Source: Our World in Data, 2022

On average over 83% of total food chain emissions are derived from change of land use, methane emissions associated with the production and farm processes and food waste, a result of supply chain failure. Foods that require extensive inputs and space, often meat, have the highest impact on the environment. Although significant emphasis is often placed on food miles, sustainability gains and efficiencies within global shipping have meant the relative impact of transport is relatively low, averaging 9.6% across key food groups.

While real estate can contribute to efficiencies made through the supply chain, where it can potentially be more impactful is enabling environments that facilitate dietary innovation and change, and more about facilitating efficient dietary change without impacting consumer welfare.

While supply chain improvements and increased domestic production will not only minimise transport emissions but have the impact to significantly reduce waste.

GHG EMISSIONS PER KILOGRAM PER FOOD TYPE (CO2 EQ. KG)



9.6%
AVERAGE FOOD
CHAIN IMPACT

Source: Our World in Data, 2022

5 DIETARY CHANGE: HEALTH AND SUSTAINABILITY

SUPER-SUBS

The time-scarce nature of the population in most advanced economies such as the UK, has resulted in changes leaning heavily towards substitutions in diet and nutrition and greener eating.

Academic literature has found that humans tend to prefer substitutions and gradual change over the introduction of significant changes, on the basis that it's easier to make substitutions than it is to introduce new habits.

Britons are now increasingly making healthier greener substitutions within their diets, favouring un-processed, fresh, and quality produce, and introducing food based supplements as a preventative measure against health issues.

The UK benefits from a low health premium substitute cost, with an equivalent of \$0.30 required in order to substitute to a health adequate diet. This is low when compared to developed economies, suggesting a transition to healthier diets bares a relatively low financial burden in the UK.

We also anticipate that future government regulation, similar to

existing regulations such as the sugar tax and HFSS advertising ban, will continue to reduce the health premium across all price bands, helping to aid dietary substitutions without marginalising less financially stable households and enabling greater choice when making healthier substitutions.

Dietary change in the United Kingdom is both inevitable and necessary as we look to 2040. We anticipate that diets in the UK will continue to gradually evolve, comprising of a number of

substitutions over coming years. The greatest reductions in the environmental impact of our food chains can be achieved through a reduction in the consumption of land-based meat as the primary protein source.

This will likely require and result in substitutions to protein rich-plants, minimally processed foods such as Tofu and Seitan and the adoption of meat alternatives in the processed food sector.

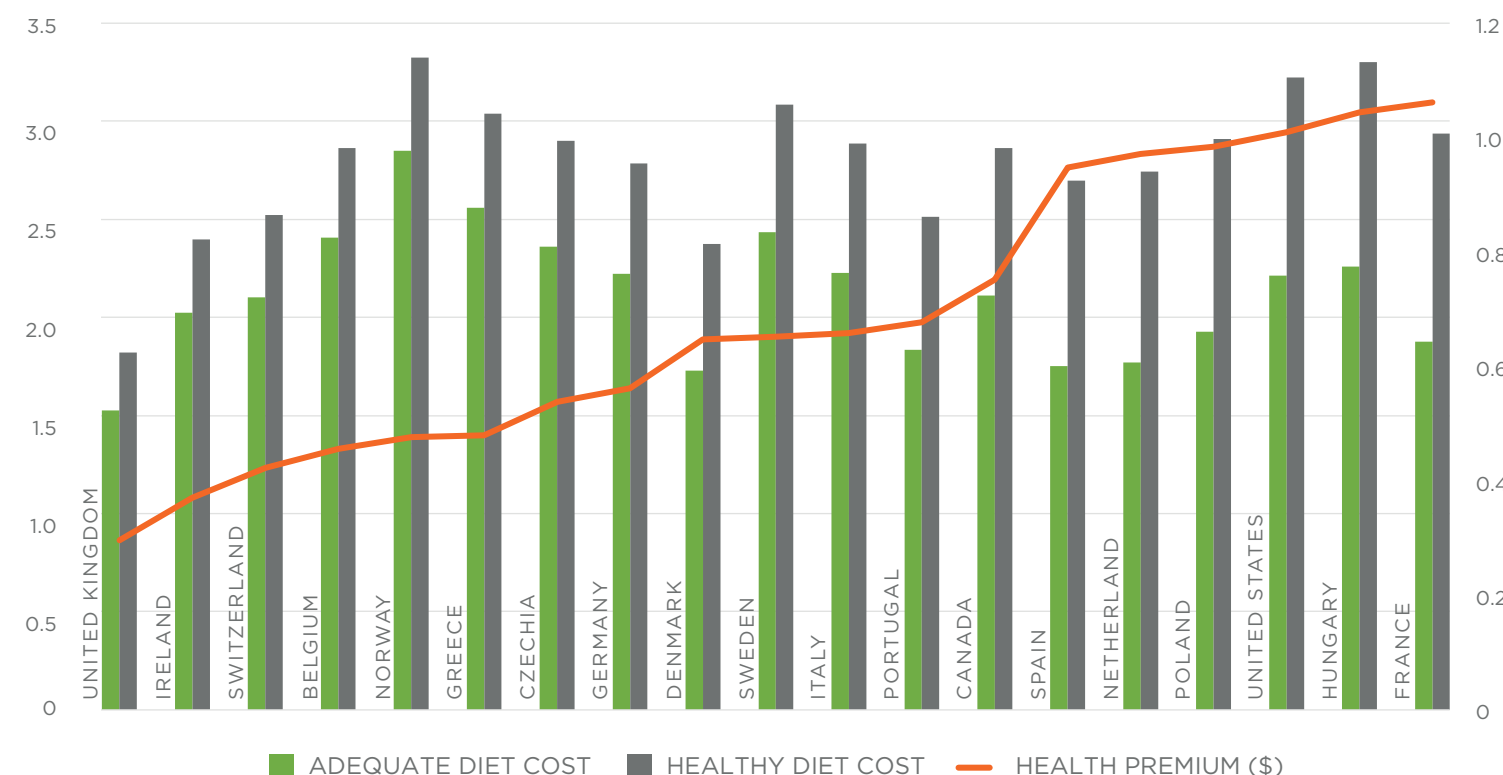
OUTLOOK

The result for supply chains is an inherent need to be able to pivot capacity in order to serve and facilitate new product lines and ranges, and to be able to operate at efficient speed helping to extend shelf lives of fresh and seasonal produce.

Assets located along key supply routes for fresh and quality produce, are likely to see outperformance over the long term, as their demand is relatively inelastic due to the critical role played in just in time and rapid fulfilment for sought after perishable goods.

Additional food chain clusters may arise in locations within proximity to arable land, or in proximity to new SME's that emerge within infant markets such as plant based meat alternatives, and immune support food products.

Retail spaces will evolve to accommodate new product lines and food types, resulting to changes in the size and layout of the retail network.



Source: Our World in Data, 2022

FOOD PRODUCTION: RE-SHORING THE UK'S FOOD SUPPLY

THE IMPORTANCE OF SMALL BUSINESS IN DRIVING INNOVATION

Food production has the most significant impact on overall carbon emissions from the food sector and it is estimated that the UK Food system accounts for 35% of total UK domestic emissions (WRAP, 2022). As such government regulation on food supply, production, and processing is likely to be stepped up as we approach carbon neutrality. Increasing government regulation is likely to be aided by the rise of conscious consumerism, which will induce a need for brands to innovate and adopt new technologies and provide greater visibility as to the environmental impact of food.

The growing need for improvement in our food system is likely to result in the emergence of new production methods, and innovative asset classes. The role of alternative forms of farming, will grow accordingly and play a key role in mitigating against adverse weather conditions and poor yields, whilst simultaneously facilitating the gradual transition to a diversified healthy and sustainable diet.

UK FOOD SYSTEM
ACCOUNTS FOR

35%

OF TOTAL UK DOMESTIC
EMISSIONS (WRAP, 2022).

Food production networks are inherently de-centralised, and are often saturated by a variety of business types with unique ownership and management structures, typically specialising in relatively niche food types. And whilst this fragmented nature provides a number of advantages, it also poses several challenges. Throughout recent years, several industry groups have emerged bringing with them network efficiencies, and collaboration. Voluntary agreements such as the Courtauld Commitment are driving reform, innovation, and a collective effort to transform our food chains, bringing together a community of businesses both local and global alike.

The importance of small businesses and their ability to innovate in an agile manner is widely understood. However, one of the biggest obstacles threatening essential dietary change is a lack of penetration from new food brands launching food types within the sustainable and health categories. Put simply, dietary change can only happen if greener and healthier products themselves are both desirable and affordable. Innovative SMEs producing often superior products are typically

faced with a lack of access to critical supply chain capacity, limitations in gaining operational efficiencies and know how, and subject to the tough buying criteria set by dominant supermarket. Whilst growth in production from innovative food SMEs is both necessary and likely, the extent to which this can be achieved is largely dependant on the ability for small companies to access dedicated research and development space and establish operationally efficient production footprints and supply chain networks.

OUTLOOK

The implication for real estate therefore is a need to facilitate a diverse range of occupiers within the food sector across a range of asset classes. Assessments should be made around spare capacity within the existing food network, and the appropriate configuration of space within new industrial clusters, allowing for the establishment of dedicated space enabling SMEs to research, test and scale their commercial operations.

Significant opportunities for new food manufacturing, handling and processing clusters therefore exist. Owed to the inherently different nature of start-ups and innovators these clusters will not be defined by the market dynamics that affect the general industrial and logistics sector.



CASE STUDY: SMART PARC DERBY SEGRO



Food chain real estate in the United Kingdom is already evolving.

The UK government has recently pledged £12m in funding to support the launch of Smart Parc located in the East Midlands. SmartParc SEGRO Derby, with its strategic position in the East Midlands, offers a way for the food industry to collaborate to meet the challenges of sustainable production whilst addressing the need for efficient, direct routes to consumers.

The 2m sq ft campus style hub offers flexible “state of the art” spaces ranging from starter units at 3,500sq ft to manufacturing units up to 400,000 sq ft.

Space is has been specifically developed with food operators in mind, providing a range of shared common services. The site will also be home to a “Food Manufacturing Technology Centre of Excellence” to future-proof the food industry, offering education and career opportunities to secure both the local and global food supply chains.

The flagship site will be home to the first low-carbon food manufacturing community offering a shared distribution hub and services whilst working together to improve sustainability and reduce costs.

FOOD PRODUCTION: RE-SHORING THE UK'S FOOD SUPPLY

AGRI-CULTURE

The agricultural sector within the UK is undergoing a period of structural change, owed to a range of factors including climate change, a post-Brexit labour shortage, and inflation for inputs. Whilst the industry has struggled to navigate challenges largely outside of its control, we anticipate that agriculture in the UK will continue to be a key sector. The United Kingdom is well positioned to seize opportunities from the rapidly growing ag-tech and automation industries which looks to offer technological solutions from managing variability in weather, to optimizing land allocations, and minimizing barriers to entry for new small and independent farming operations.

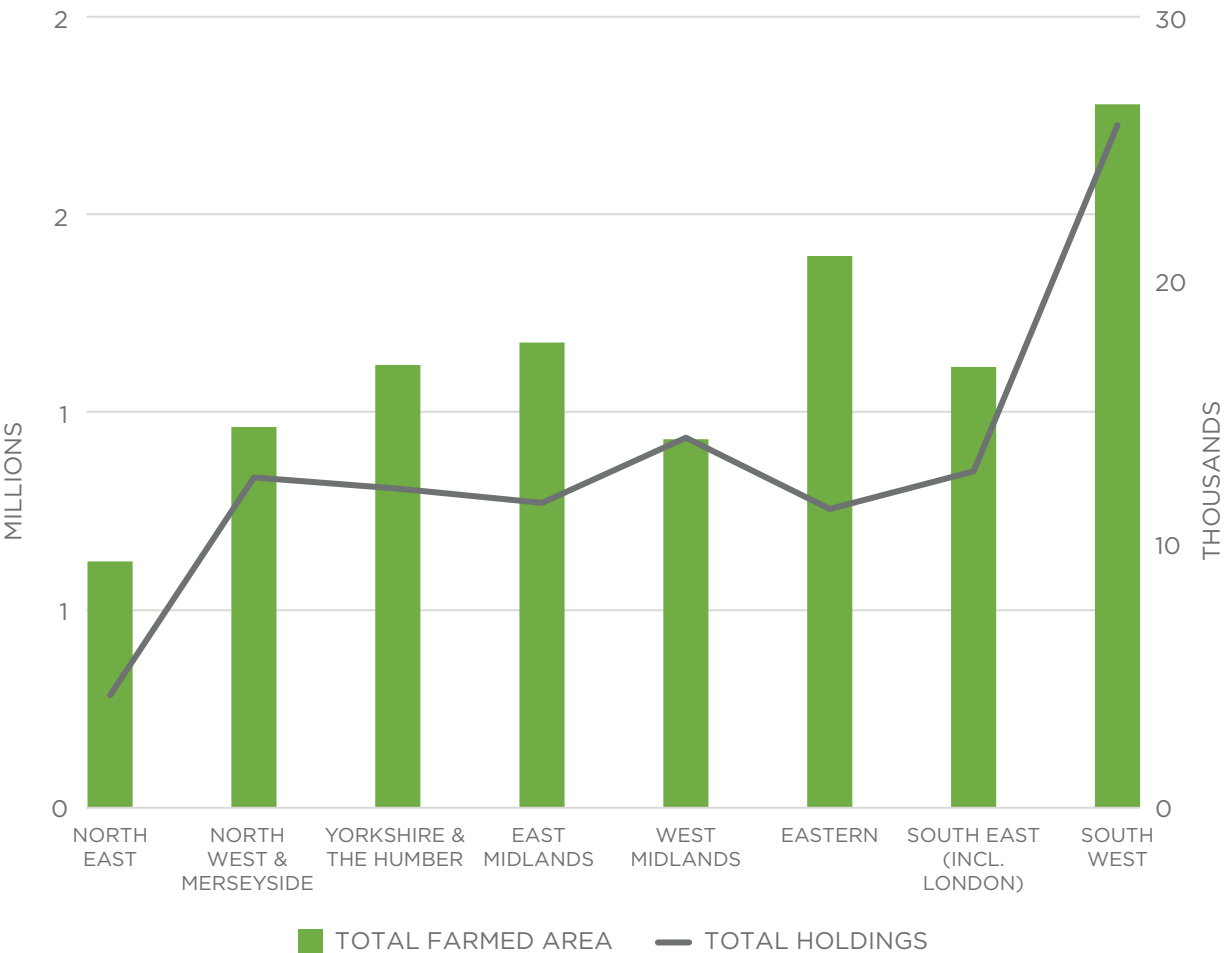
At present, 71% of the UK's land is comprised of utilized agricultural area, totalling 9 million hectares and comprised of over 100,000 holdings in England alone, over a third of which is allocated for grazing livestock and dairy herds.

A further 32% of which is allocated for cereals, of which a significant proportion is used to feed cattle. The majority of agricultural land is located in the South West (20%), South East and East (27%) and the Midlands (23%). The distribution of agricultural land in the UK is dictated by different factors than when compared to traditional Industrial and Logistics demand, relating to arable land in rural areas, to climate and soil conditions, and longstanding farming communities that have become associated with specialised food groups.

71%

AT PRESENT, 71% OF THE UK'S LAND IS COMPRISED OF UTILIZED AGRICULTURAL AREA, TOTALLING 9 MILLION HECTARES AND COMPRISED OF OVER 100,000 HOLDINGS IN ENGLAND ALONE.

DISTRIBUTION OF FARM HOLDINGS ENGLAND



Source: Defra, March 2023

FOOD PRODUCTION: RE-SHORING THE UK'S FOOD SUPPLY

CLIMATE CHANGE - THE CLIMATE CONUNDRUM FACING FOOD CHAINS

In addition to public interest and government intervention an element of this change is likely to be driven by a change in the climate and the ability to grow more in the UK.

A rise in average temperatures is gradually transitioning the nation as a viable producer of fruits not previously grown here, Champagne producers of the prestigious French region are now acquiring land within the UK, pegging to it their hopes of securing future supply, amidst changes to the climate in their native region.

The Met Office UK Climate Projections report outlines that all areas of the United Kingdom are expected to experience significant increases in mean air temperatures over coming years. Bringing with it a greater chance of warmer wetter winters, and hotter drier summers.

While in the UK climate change will pose significant challenges, it will also enable growth of summer produce such as tomatoes and courgettes usually imported from elsewhere.

Further opportunities also exist through the potential to deploy new technologies such as vertical and urban farming, utilising industrial real estate to facilitate growing within the UK. The resulting impact for real estate is the need for multiple supply chains to facilitate and support the movement of domestic produce, without impacting the time from field to fork.



FOOD PRODUCTION: RE-SHORING THE UK'S FOOD SUPPLY

VERTICAL FARMING - THE SKY IS THE LIMIT

Critical to managing a healthy food chain is the ability to re-shore and near-shore production of some food groups, safeguarding against supply chain and climate risk. Pitfalls associated with existing industrial farming methods also highlight a need to diversify and hedge growing methods used within our food chains.

Vertical farming is a new farming technology that offers many solutions to the challenges impacting traditional industrial farming methods. In principal it transposes growing environments from horizontal to vertical, often within industrial warehousing settings, but in some cases within other awkward or under-performing spaces. The process requires artificial temperature, light, water and humidity to replicate the perfect growing environment, in turn providing optimised crop yields in a low labour intense environment.

In addition to the simulation of perfect growing conditions, it also safe-guards crop from pests and disease, meaning the requirement for pesticides and other synthetic growing materials is negated. The application of vertical farming is also not limited to food, with some global facilities already in place supplying the pharmaceutical sector.

Hydroponic technologies and vertical or hanging gardens are nothing new, and date as far back as the hanging gardens of Babylon 2,5000 BC. However, scaling of the vertical farming sector and rapid gains in technology and innovation have allowed the industry to reach a point where commercial and wide spread impact is now inevitable rather than plausible.

Current application of vertical farming methods is somewhat limited to a select range of produce, typically favouring vegetables and herbs grown in a shallow layer of soil that have relatively short growing cycles. The method comes with a number of efficiency gains, vertical farms allow farmers to use 98% less water and 99% less land, and cultivated yields are typically in excess of 200x that of traditional faring methods, owed to year round growing.



VERTICAL FARMING IS A NEW FARMING TECHNOLOGY THAT OFFERS MANY SOLUTIONS TO THE CHALLENGES IMPACTING TRADITIONAL INDUSTRIAL FARMING METHODS.

HOWEVER, THE MARKET REMAINS IN ITS RELATIVE INFANCY FACED WITH A NUMBER OF SHORT TERM CHALLENGES, AND HAS SEEN A NUMBER OF OPERATORS START PRODUCTION AND HALT PRODUCTION OWED TO THESE ISSUES:



ENERGY

Typically account for 25% of operators total cost, recently spiked to 40%



CAPITAL EXPENDITURE

Significant fit out costs associated with racking and hydroponic framing



WATER

Requirement for rain water harvesting or substantial pull from grid network

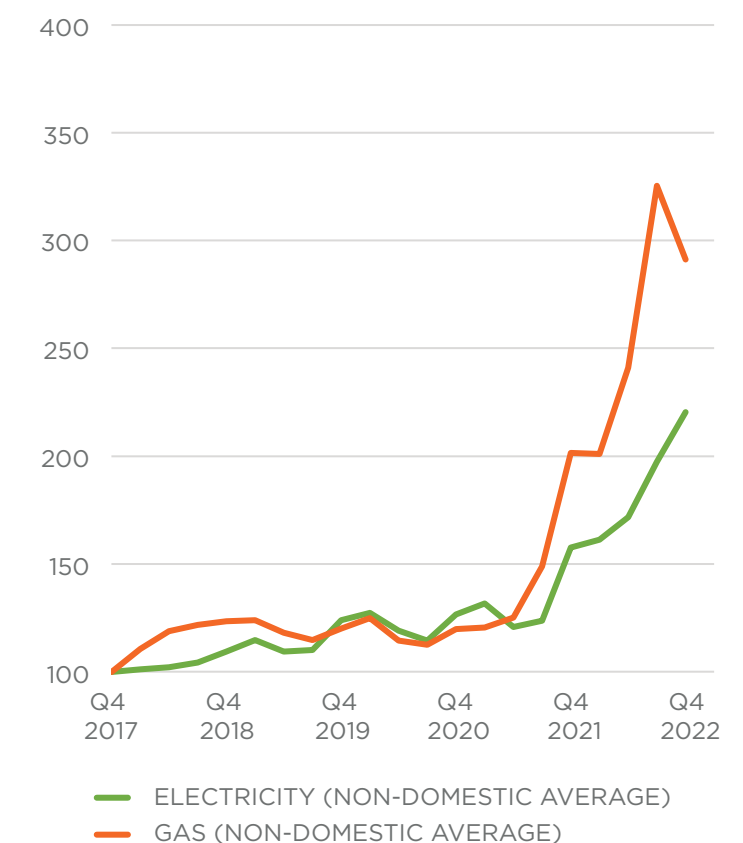
Increased renewable energy generation – particularly on-site, with the harnessing of battery storage will greater enable production.

OUTLOOK

Current challenges within the UK are currently holding back the scaling of vertical farming sector.

However, as we look to 2040 it is likely that the market will continue to grow globally, before returning to the UK armed with new learnings and greater agility. As food supply experiences growing pressure as a result of climate risk and reduced international trade, Supermarkets will look to vertical farming to provide secure and quality produce. In the meantime small integrated vertical solutions are likely to arise in retail and restaurant environments, or small spaces surplus to requirement.

NON DOMESTIC ENERGY PRICES UK AVERAGE



Source: ONS, 2023

FOOD PRODUCTION: RE-SHORING THE UK'S FOOD SUPPLY

Feeding our cities is a complex task, owed to higher population densities, variations in retail networks and store formats, and tight supply chains that must meet urban access restrictions.

However, the city offers a unique blend of opportunities, through a higher density of artisan and speciality markets enabling consumers to go direct to producers, a strong supply of underutilised awkward spaces such as railway arches, higher population densities allowing the trial of new technologies such as automated fulfilment, and large gig economies allowing food operators to outsource and overcome exacerbated labour challenges. Food production, whilst traditionally not considered a key sector within cities is playing a growing role in urban food chains, with over 500 farms in the greater London area.

Growing more food in this country is going to become more and more critical over the next ten years. This will have to come from a much broader base than currently exists and there is a role for small, medium and large sized food producers working on existing farmland and new and unconventional urban spaces.

CULTIVATING THE CAPITAL, LONDON ASSEMBLY 2010

The **Urban Farming** sector is set to play a greater role in city food chains. A greater focus on biodiversity, increased transparency and reducing waste through shorter supply chains is helping underpin increased demand for urban farming. The displacement of arable land, and fierce competition from other commercial uses has also put pressure on farming land on the periphery of cities such as the London Green belt, which had originally been designated for agricultural use.

The acceleration of the above trends is driving proliferation of the below forms of urban farming. While many elements of urban farming are only likely to ever have a minimal impact on the commercial production and supply of food, in its entirety, the University of Lancaster estimates that it could potentially make up as much as 40% of vegetable and fruit productions.

URBAN FARMING WILL BE DRIVEN IN A NUMBER OF DIFFERENT WAYS:

MICRO-GARDENING

Growth of vegetables, fruit, herbs and salad on personal or shared real estate. This could be balconies and gardens, but could also take form in urban allotments, roof gardens and allocated public realm.

BEEHIVES

Bee Pollination contributes £690 million to the UK economy, with a number of commercial and residential buildings housing beehives in order to increase biodiversity. The Princesshay bee project started in 2012 and now houses 240,000 bees, with honey sold in the shopping centre below.

INSECT FARMS

Protein-rich insects are increasingly being farmed as a source for food. Entocycle operated in railway arches at London Bridge, feeding waste to insects, for animal food. Better Origin provides insect farms for Morrisons, while Yum Bug farms crickets – and is already distributing to a number of restaurants across London.

BUILDING INTEGRATED AGRICULTURE

Integrated Rooftop greenhouses (iRTGs) intensify use of commercial real estate buildings, taking advantage of access to rainwater and direct sunlight – and surplus building energy during the night – in addition to photovoltaic panels. Gotham Greens' Brooklyn ventures are a good example of this type of farming

RE-UTILISATION

Changes in the way we shop and work will create opportunities for repurposing obsolescent real estate to vertical farming. This has already been harnessed through railway arches and is a feature in some stores such as M&S where herbs and leafy greens are grown and sold in store.

UNDERGROUND FARMS

Underground space can be utilised using environment controls and LED technology in otherwise un-utilised underground space – Zero Carbon Farms grow their salad 33 metres underground in Clapham. There have been urban underground mushrooms farms in Exeter – Grocycle – and using the mail rail in London – Pop Down.

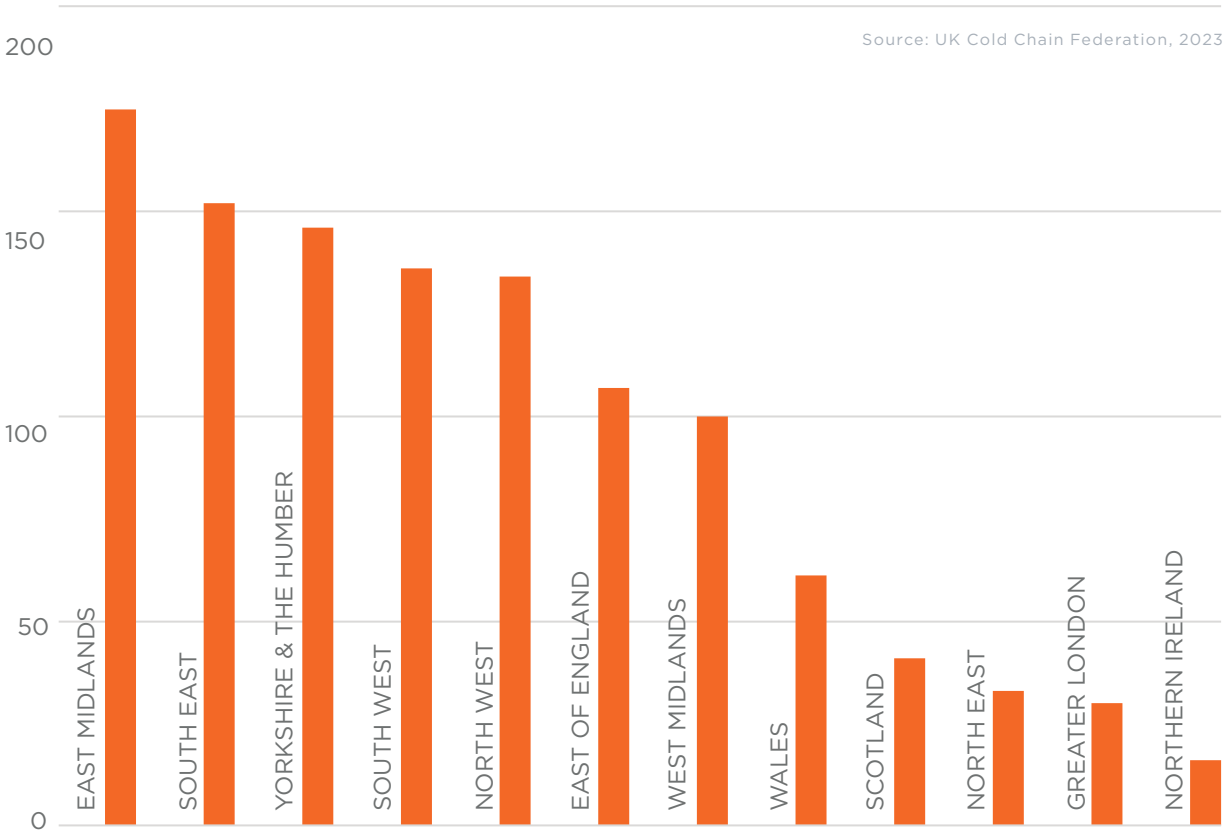
SUPPLY AND STORAGE: RESHAPING FOOD CHAINS

COLD STORAGE

Another critical component of the food chain is the cold storage network responsible for handling food goods that require non-ambient temperatures.

As well as predominantly handling food, the cold chain network has seen an increase in demand as a result of both rising inventory levels and secondary customer groups such as the pharmaceutical sector requiring additional space to handle cold stored pharmaceuticals.

DISTRIBUTION OF COLD CHAIN FACILITIES



Cold chain facilities often operate in facilities close to sea-ports with strong connectivity to urban conurbations, and regional and national distribution centres. As such the distribution of cold storage units within the United Kingdom has favoured the South East (15% of properties), and the Midlands (24% combined East and West).

OUT WITH THE (C)OLD

Fundamental changes to the composition of the food chain network, as a result of dietary change, and structural changes are likely to impact both size of the cold chain market, and the function of the assets in use.

As a result of re-shoring UK food supplies we are likely to see growth of cold storage units in proximity to key food production clusters. As we see an increase on overall increase in cold inventories, the requirement for modern cold storage is likely to increase.

Furthermore existing cold chain infrastructure is largely dated, relying on cold stores built during

the 1990's and early 2000's, as a result of gains in construction methods, many of these are inefficient when compared to modern solutions. As such in order to meet our sustainability targets, and reduce the emissions associated with food chains, significant investment is required in order to upgrade old assets, requiring a new wave of cold chain assets in the UK. The UK Cold Storage Federation suggests a newly built facility is up to 6x more efficient operationally, than a unit built during the 1990's due to these gains.

BLAST FROM THE PAST

Cold storage and cold processing facilities are also likely to play a growing role within our diets, as we transition to alternative protein sources cold specific processes such as freeze blasting are likely to increase.

Traditionally the cold chain focussed on the cold storage function, across a range of product types, but growing use of cold facilities for value added services such as blast freezing, quality testing. As of current just 15% of facilities in the United Kingdom offer blast freezing as an additional value add service, we believe this figure is likely to rise substantially as a result of dietary change.

IN FROM THE COLD

Investor interest has increased over recent years, due to confidence in the markets underlying fundamentals and a shift towards long term income and secure returns.

Transactional evidence in the real estate sense is largely limited due to the complexity of cold storage assets, significant opportunities exist through overcoming capacity and challenges relating to ageing stock and energy efficiency.

SUPPLY AND STORAGE: RESHAPING FOOD CHAINS

CHANGING THE USE OF COLD STORAGE

The types of goods handled by the cold chain are segmented based in their storage requirements.

As the temperature of goods stores gets lower each sector has a higher energy intensity, thus resulting in a need for greater efficiency to mitigate against losses in refrigerant materials and temperature leakage. The frozen, deep-freeze and ultra-low cold storage environments are therefore those most likely to see significant investment, owed to the greatest potential for savings.

ENERGY INSTENSITY

BANANA 12 TO 14°C	PHARMACEUTICAL 2 TO 8°C	CHILL/ REFRIGERATOR 2 TO 4°C	FROZEN 0 TO -20°C	DEEP FREEZE 0 TO -20°C	ULTRA LOW -40 TO -70°C
• Fruits Tropical fruits • Vegetables	• Wide range of pharmaceutical items and biotech products	• Fresh meat • Dairy • Fruits • Vegetables • Baked goods • Flowers and plants	• Frozen meat • Frozen bakery • Frozen vegetables	• Frozen fish / seafood • Ice cream • Pharmaceuticals & vaccines	• Pharmaceuticals & vaccines

A range of building solutions currently exist within the market, with traditional cold storage usually taking the form of a building built within an existing warehouse often referred to as “box in box”. As the requirement for agile cold storage increases, we anticipate that innovation in the sector is likely to result in a range of new building solutions, allowing space to pivot and serve other product segments and value add services.

Automation and the reduction of human labour will allow cold storage areas to reduce, bringing with it greater storage densities and thus operating efficiencies. As such we expect to see a reduction in building sizes, whilst maintaining growing levels of throughput owed to gains in productivity and automation.

TRADITIONAL COLD STORAGE CONSTRUCTION:

INSULATED STRUCTURE

Buildings use a similar basic construction type to an ambient warehouse, however the building envelope is sealed to provide vapour control and air tightness and the cladding is insulated to provide the appropriate level of information for the temperature level needed.

BOX IN BOX

This is the most common option when retro fitting Cold Storage (or it forms a minor component of the space). It is also commonly used in multi temperature environments or where chambering is needed.

The ‘Box is an internally constructed insulated structure which sits within a conventional warehouse structure.

CLAD RACK / RACK SUPPORTED

This solution is ideal for heavily automated sites and allows for significant benefits in stock density.

The racking or automation install is completed first and the outside of that is then clad with insulated panels to provide weather proofing and a sealed structure.

COLD STORAGE OF TOMORROW

Cold storage solutions will comprise of a range of new construction methods and configurations, undertaking a range of primary and value add services. These buildings will utilise new materials that reduce heat loss, engineering methods that limit chamber opening times, and configurations that reduce the impact of product load. Automation will reduce requirement for physical labour, onsite and renewable energy and combined heat power technologies will reduce grid requirements offering new location opportunities.

SUPPLY AND STORAGE: RESHAPING FOOD CHAINS

SUPPLY AND STORAGE

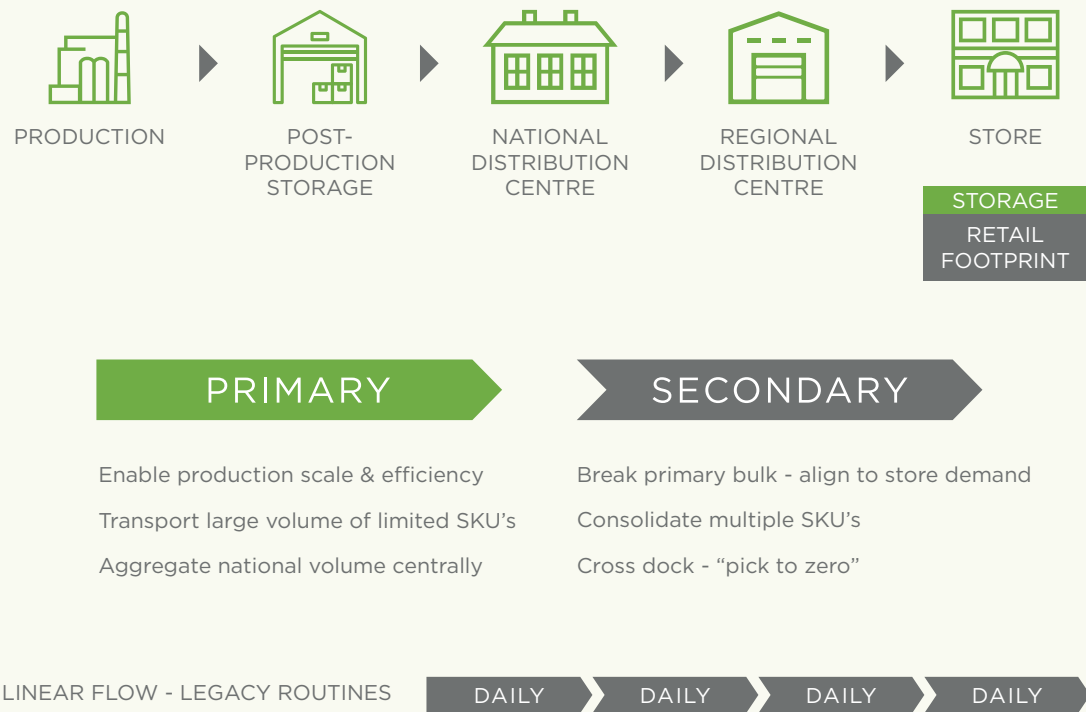
At present, supply chains largely operate under a single supply chain model following the traditional flow for all food related items.

These supply chains are usually demand led, meaning retail inventories are ordered to match demand profiles, normally as part of very short lead times. Operating under this lean just in time (JIT) supply chain model has allowed food chains to use relatively low levels of storage space, in turn saving on real estate costs and keeping the overall cost of food relatively low within the UK.

However, JIT supply chains are often fragile and can be described as linear & inflexible due to operating at levels close to capacity, leaving the ability to pivot the use of space limited, resulting in limited agility.

TRADITIONAL SUPPLY CHAIN

ONE SIZE FITS ALL



UNDER PRESSURE

Such reliance on this model has amplified the impact of supply chain pressures and contributed to availability and pricing issues within the UK.

Existing supply chain models within the UK, and a reliance on imports has left the UK exposed to a reater extent than other countries. Furthermore, disaggregated food chains create issues around transparency for increased reporting around sustainability. In order to mitigate against these issues, the UK must rapidly re-evaluate and innovate food supply chains.

We believe that by differentiating the flow of products based on their supply chain characteristics it is feasible to unlock greater agility, enhance risk management procedures and reduce the impact of supply chain shocks with greater end-to-end resiliency.

In assessing product flow in this manner, opportunities can be leveraged in buying gains, store storage optimisation, network optimisation and estate cost reduction, availability & waste. However,

ALL GROCERY RETAILERS BALANCE TWO KEY METRICS:

LOST SALES

As a result of limited availability, or safety comprise (demand volatility)

WASTE

As a result of handling errors, or excess availability (perishability)

SUPPLY AND STORAGE: RESHAPING FOOD CHAINS

FOOD SUPPLY CHAINS OF TOMORROW

Products within retail supply chains should be categorised into four key groups based on the two key metrics retailers must balance - demand volatility and perishability.

Current supply chains based on the national and regional distribution networks often come with significant cost, due to size, scale, operational solutions, short lead times, and strategic locations.

By segmenting supply chains, operators unlock the ability to deploy varied supply chain solutions specific to the characteristics and demand profiles of each food group.

By using this approach of diversified supply chains, operators can unlock operational efficiencies through specialisation and cost savings.

For example, why would you spend significant money on channelling low value non-perishable stable demand products such as jam, through the same lean, high tech expensive supply chain used for high value fresh perishable goods such as Avocados, when you can channel these through low cost facilities, with storage solutions optimised specifically for these goods types, at a lower trunking cost?

However, disaggregating and broadening supply chains also comes with considerable challenges and cost, owed to a need for a greater number of supply chain assets, and various operating models and procedures both at the distribution centre level and retail level.

Structural change in supply chains, like diets, is likely to be gradual and incremental. In order to transition to specialised segmented supply chains the industry must collaborate, and where necessary gain the advantages of expertise and economies of scale externally from the 3PL and 4PL sector.

THE DIAGRAMS BELOW OUTLINE PRODUCT CATEGORIES BASED ON THEIR CHARACTERISTICS, AND SUPPLY CHAIN IMPLICATIONS. EACH FOOD GROUP HAS A DIFFERENT LEVEL OF RISK, EITHER ORIGINATING FROM LOST SALES, OR OVERAGE/WASTE. BY SEGMENTING PRODUCTS BASED ON THEIR CHARACTERISTICS, WE CAN IDENTIFY SPECIFIC REAL ESTATE NEEDS.



SUPPLY AND STORAGE: RESHAPING FOOD CHAINS

BREAKING THE CHAIN

The outcomes of taking this approach results in multiple diversified supply chains, appropriate to the characteristics and order profiles of different food groups

Reducing risk, and better allocating the right product through the right flow with the right resource and infrastructure at lowest end-to-end cost.

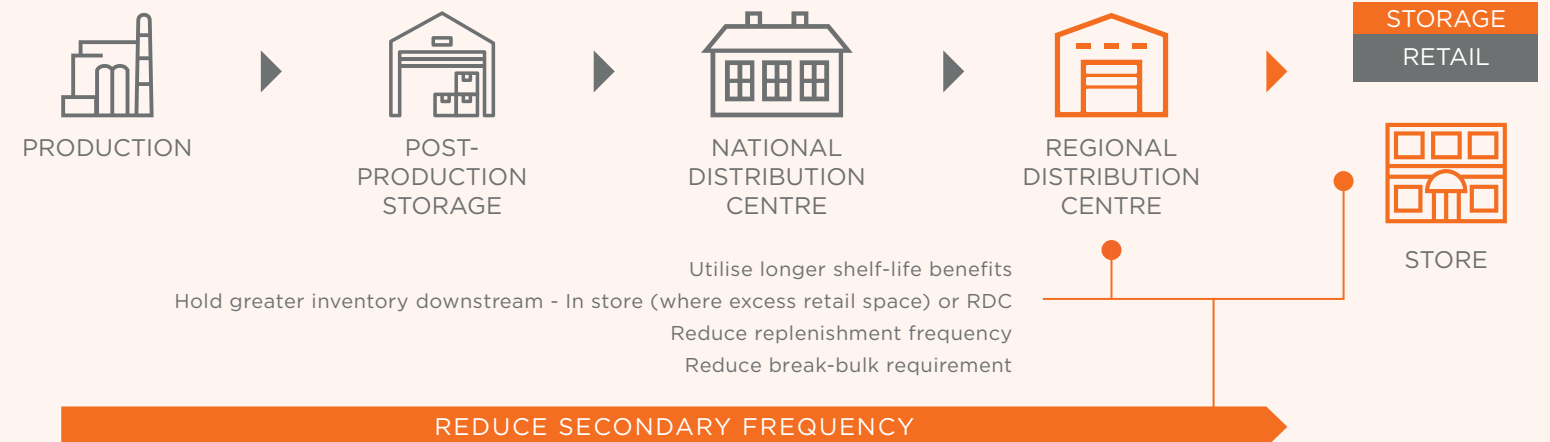
In terms of real estate this would also result in a greater spread of food chain locations, for supply chains focusing on supply-led models real estate should be acquired in markets where rental values are relatively low.

For demand-led supply chains strategic location analysis will be key, with proximity to key retail channels and urban populations critical in facilitating quick fulfilment times.

LONGER SHELF LIFE PRODUCTS

APPROPRIATE FLOW
& UTILISATION OF
INFRASTRUCTURE & ASSETS

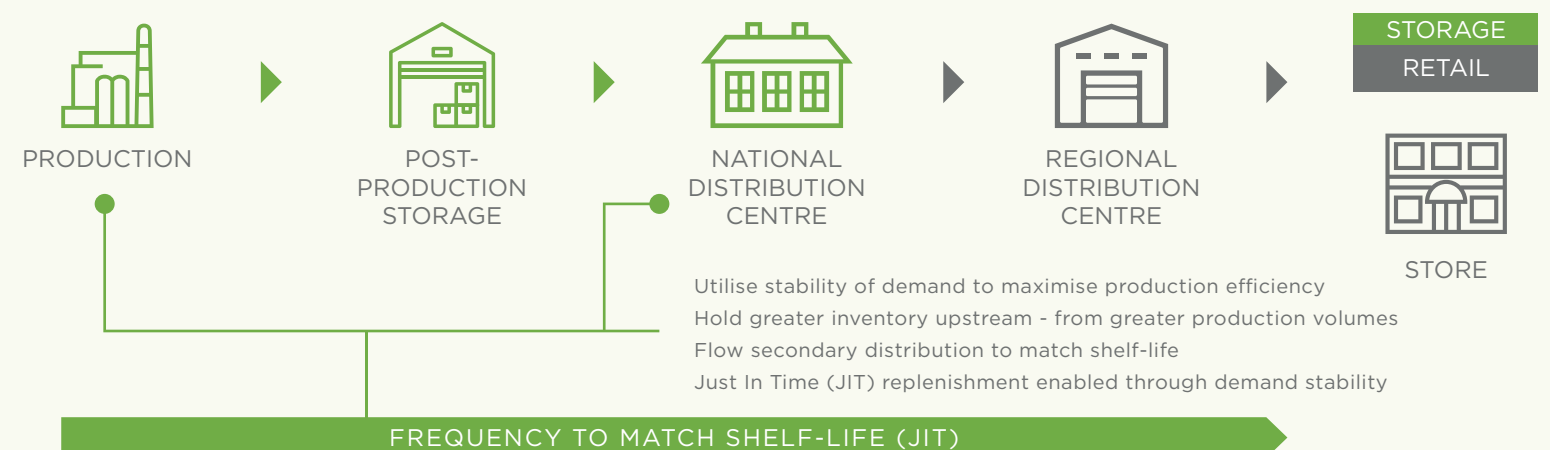
DEMAND LED
SUPPLY CHAIN →



STABLE DEMAND PRODUCTS

APPROPRIATE FLOW
& UTILISATION OF
INFRASTRUCTURE & ASSETS

SUPPLY LED
SUPPLY CHAIN ←



VOLATILE PERISHABLE PRODUCTS

APPROPRIATE FLOW
& UTILISATION OF
INFRASTRUCTURE & ASSETS





CASE STUDY: FRESH PARK VENLO

Fresh Park is Europe's biggest fresh & food produce specific business park located in Venlo Netherlands.

The site has been operational for over 75 years comprising of over 130 hectares and 400,000 m² of warehouse space, home to 100 companies.

The site's location between the port of Rotterdam/Antwerp and consumers in the greater Rhein area, has attracted a diverse range of occupiers from fresh food processing, food waste recycling, and food logistics providers.

The sites flexible warehousing solutions come with high specification fit outs specific to the requirements of food occupiers, such as cool- and freeze-cells as well as FPV facilities.

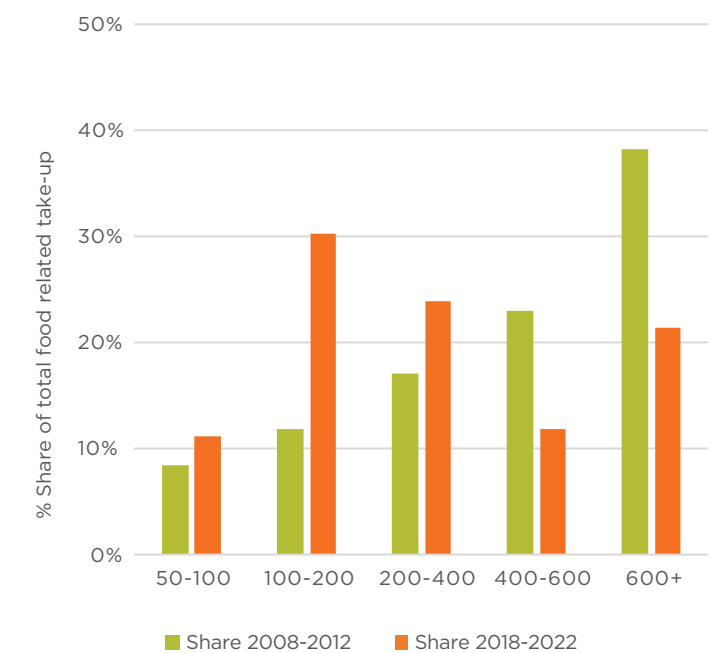
The parks management also strive to ensure smooth day to day operations, with an in depth understanding of its occupiers operations and regular forums for communal site improvements, this has resulted in the site delivering a global benchmark for clean working standards, and a strong strategic plan to deliver ESG compliance. In summation everything is tailored to helping firms deliver their consumable goods. Which is complimented by the sites amazing transport links.

The site is a great place for food companies to potentially collaborate and come up with new products making it attractive to many food companies. This could inspire other developers to follow suit.

OUTLOOK

Structural changes within Supply Chains are likely to diversify the types and sizes of building utilised within the network. We have already seen significant changes in the composition of take-up when compared to previous periods, with a growing share of food take-up being signed for in mid-box units (100,000 -200,000 sq ft). We expect this to persist as the food chain evolves.

FOOD RELATED TAKE-UP BY BUILDING SIZE BAND



7 CONSUMPTION

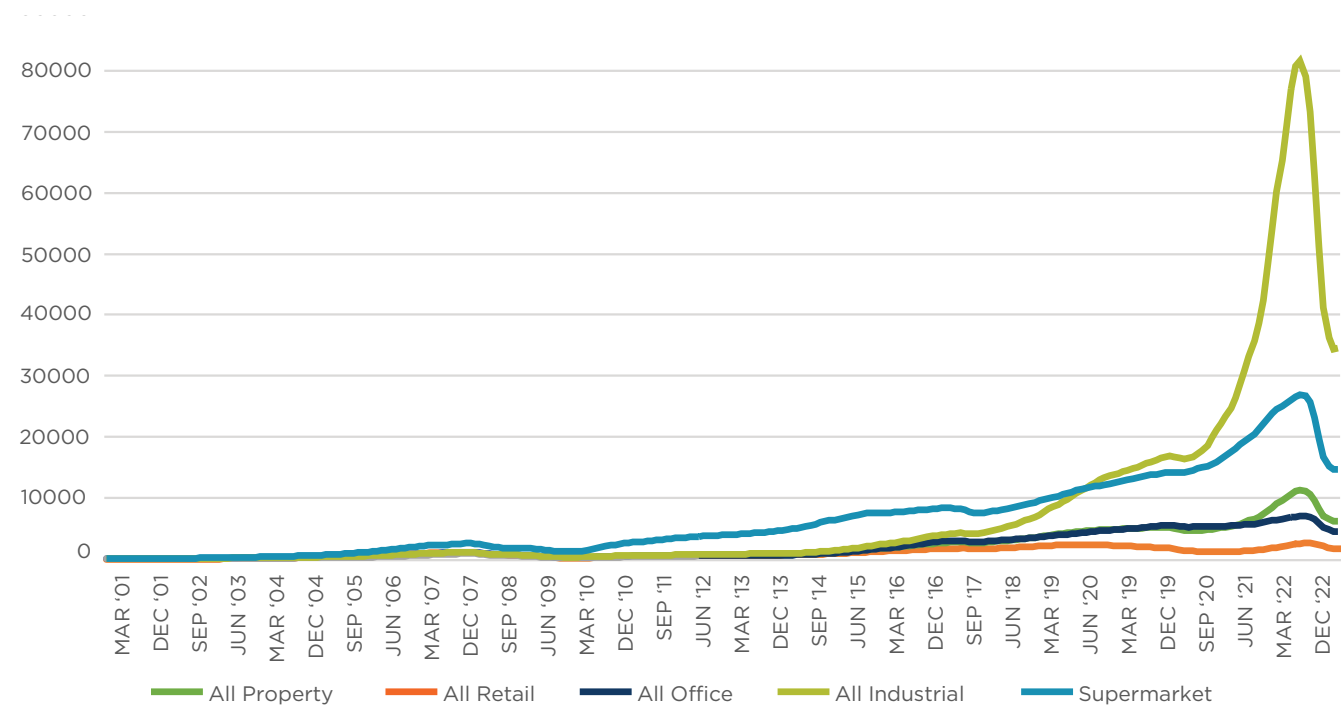
THE FUTURE OF THE SUPERMARKET

Supermarkets have outperformed other retail assets over recent years, owed to relatively inelastic levels of demand, strong occupier covenants with typically long WAULTs, and the often direct link between rent levels and the pricing levels of the goods sold within them achieved through RPI-linked rental reviews.

The sector as such has attracted strong investor interest, and consistently trades at a yield premium when compared to other retail assets.

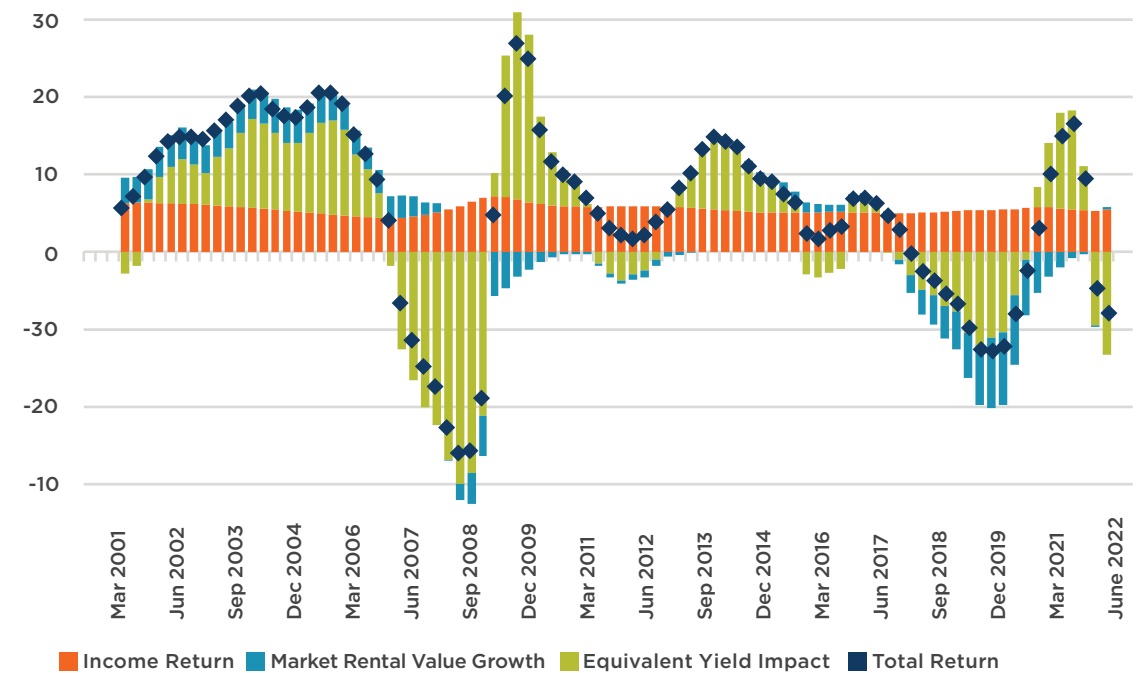


TOTAL RETURNS MONTHLY INDEX BY SECTOR (MAR 2000 = 100)

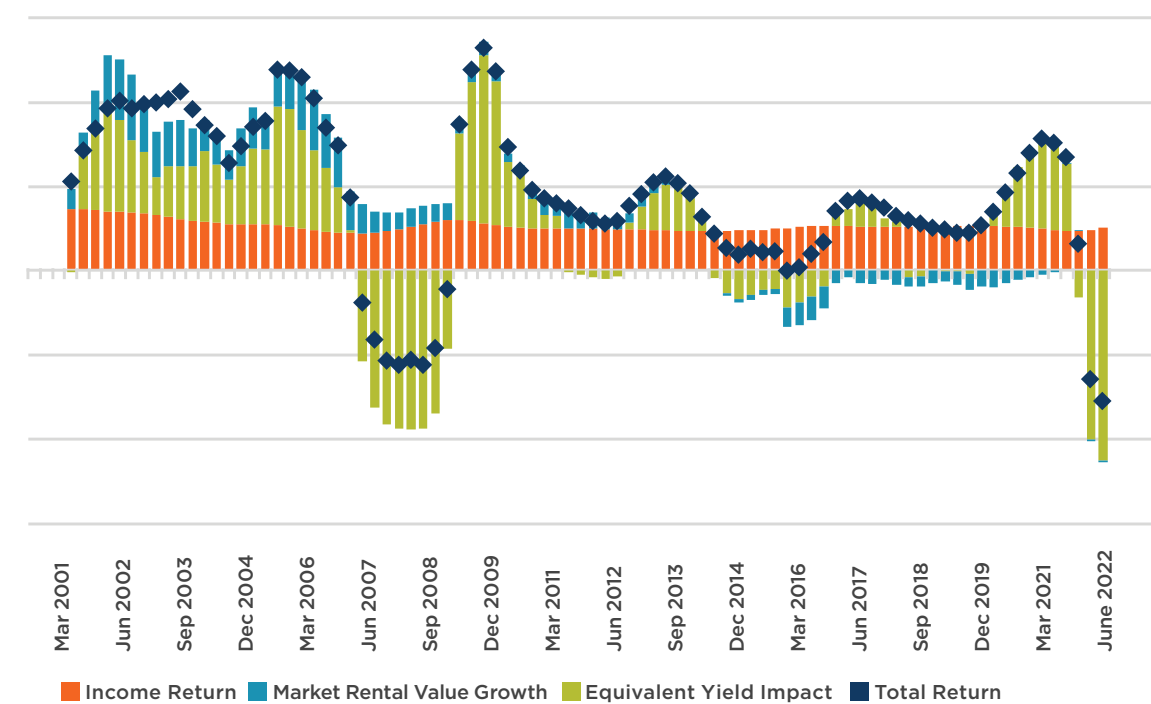


The food-store sector also proved to be relatively unfazed by the outbreak of Covid-19, showcasing its resilience and robust performance. This re-affirmed the strength of the sector, with Supermarket performance also being lesser effect during the global financial crisis than its retail counterparts.

ALL RETAIL - ANNUALISED



ALL SUPERMARKETS - ANNUALISED



CONSUMPTION

RETAIL RESILIENCE

There was a significant change in market dynamics affecting the food supermarket sector from late 2012 onwards, a period when the country's leading food supermarket retailers re-evaluated their property expansion requirements.

Prior to this change significant emphasis had been placed on gaining additional footprint, often in the large store format – the space race.

The market saw a significant reduction in demand from Asda, Morrisons, Sainsburys and Tesco for traditional full range supermarkets as growth in retail floor space has focused on convenience store formats (e.g. Sainsbury Local and Tesco Express), discount formats (Aldi, Lidl etc) and premium formats (Simply Food and Waitrose).

This has posed questions around the role of large supermarket spaces, typically referred to as hypermarkets.

The rapid rise of online retailing during the pandemic also had a substantial impact the role of food stores, resulting in increasing deliberation around sales area configurations and the most efficient use of space – with many supermarkets already adapted to self checkouts, scan and go.

Many operators were forced during this time to utilise their stores to fulfil online orders, reconfiguring space to serve bumper online volumes whilst simultaneously trying to reduce impact on customer experience.

As a result of a rapid need to fulfil online orders, a range of solutions have been employed by supermarkets, all with varying levels of automation, and implications for real estate.

More recently real estate has served as a critical tool for Supermarket operators in aiding liquidity through sale and leasebacks, during economic downturns and challenging macroeconomic conditions, as a result institutional investors have acquired food chain assets, often for low yields, owed to the perceived strength of the sector and its covenants, and the long-term relatively secure and fairly priced rental income.

Whilst shopping habits have begun to normalise to pre-pandemic levels, some larger format stores have repurposed excess space for non-food retailing. Significant emphasis is now being placed on maximising the value per sq ft, and as a result retailers are beginning to reposition previous sales space.



CONCESSIONS

Increasingly Supermarkets are sub leasing sales space within the store in order to diversify the value proposition, and drive footfall.



PARTNERSHIPS

Supermarkets have launched a series of partnerships both in terms operational tasks, but also in terms of product ranges.



RE-POSITIONING

Supermarkets have increasingly re-positioned space, in some cases doing away with butcher and deli counters, and in others reducing the footprint of non-food products to facilitate greater sales area for food goods. In some cases space has been partitioned and sublet for other uses.



DRIVING VALUE THROUGH THE ESTATE

Hypermarkets in particular with large car parking areas are increasingly open to a range of income diversifying activities, including parcel lockers, modular retail space for public uses such as hair dressing, and haberdashery. Increasingly value is being driven through EV charging points, and PV generation on site.



CASE STUDY: ASDA BLETCHLEY, MILTON KEYNES



ASDA, one of the UK's biggest supermarkets has recently undertaken a large refurbishment and re-positioning exercise at their Milton Keynes Bletcham way store, with a major makeover which is estimated to of cost over £6.5M.

The store has opened a range of different foot concessions including Cinnabon, S'barro, Panku street food as well as Asda pizza and takeaway stalls. This addition will help to drive additional footfall, and diversify the income generated by the stores 190,000 sq ft sales area.

As well as adding a range of hot and quality food concessions, ASDA opened a beauty treatment concession named 'Rawr Beauty' which will be offering customers cosmetic treatments such as nails and brows and has launched product partnerships with Decathlon and My Protein in the health and exercise segment, and Claire's, Accessorize, and Little mistress in the clothing segment.

Furthermore, the store has also reduced its total sales area, through partitioning the store creating to create a new retail unit, which is now occupied by Ninja Warrior UK, adding experiential leisure to the site's footprint.

This store typifies the range of re-positioning options likely to impact our future supermarkets.

CONSUMPTION

OVER-SIZED

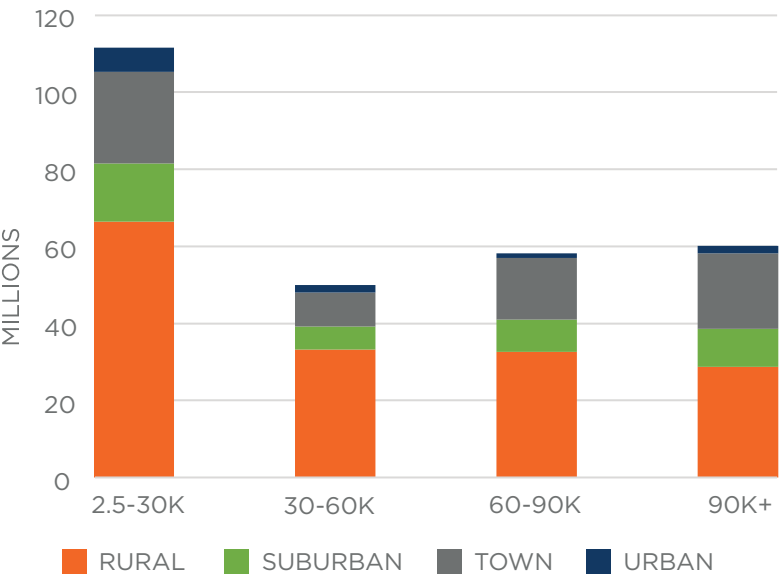
Occupational demand for Supermarket space has evolved rapidly in recent years, with a movement away from hypermarket and mega-store formats.

Many of the large stores acquired during the 00's and 90's remain in use, but are now oversized relative to the operating models of today.

The proliferation of the discount retail model, pioneered and scaled by operators such as Netto, and more recently Lidl and Aldi, has posed a series of questions about the best size and configuration of supermarket space.

The chart below breaks down the total supermarket footprint in the United Kingdom by size and demographic traits.

DISTRIBUTION OF SUPERMARKET SALES AREA BY LOCATION AND UNIT SIZE



Source: Storepoint.geo, 2023

Within the UK there is 118 million sq ft of retail space across 1300 stores that have a footprint of over 60,000 sq ft.

Of this space 61m is located in rural locations, and 35m is located in town locations. Of the 118 million sq ft, 60 million is within units of over 90,000 sq ft, which we would deem to be oversized.

Owed to the changing dynamics within the Supermarket sector, this reflects a considerable proportion of space that would be liable to re-positioning.

RE-IMAGINED

Repositioning Supermarket space is dependant on a range of factors and is likely to involve a blend of uses.

Dependant on the stores location it may be that space can be re-positioned to undertake and perform omni-channel retail operations such as micro fulfilment. This is particularly likely in locations where there is a lack of suitable or affordable warehousing space, or where labour challenges can be overcome through a high density of gig economy labour as seen in urban areas.

Supermarkets located within markets with a low online penetration may favour an increase in in-store inventories, transitioning sales area to storage functions.

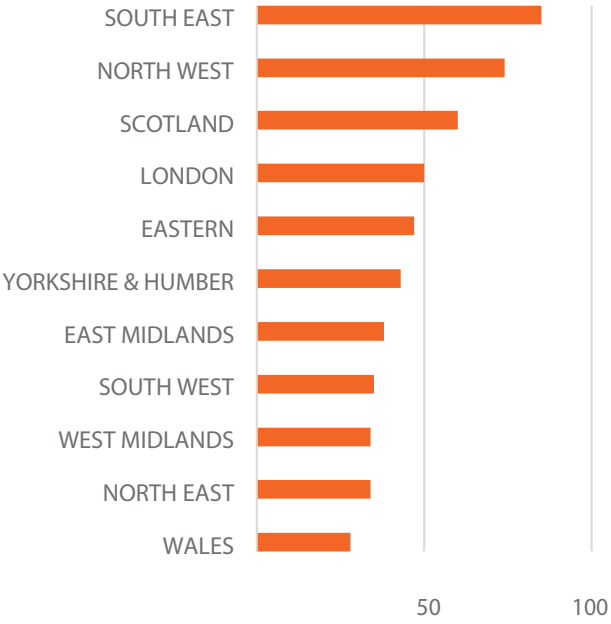
Locations in rural locations with limited amenities may re-position space to include public services such as pharmacies, barbers, and opticians.

OUTLOOK

The composition of supermarket space is likely to remain largely unchanged in terms of footprint, as operators are keen to maintain footprint.

However, as consumer preferences drive change, it is likely that larger retail spaces will have to be managed proactively to ensure value is still driven through real estate. Oversized supermarkets in rural locations are prime to undertake micro-fulfilment operations as online penetration of the E-grocery sector grows over time.

NUMBER OF STORES 90,000 SQ FT +



Source: Storepoint.geo, 2023

CONSUMPTION

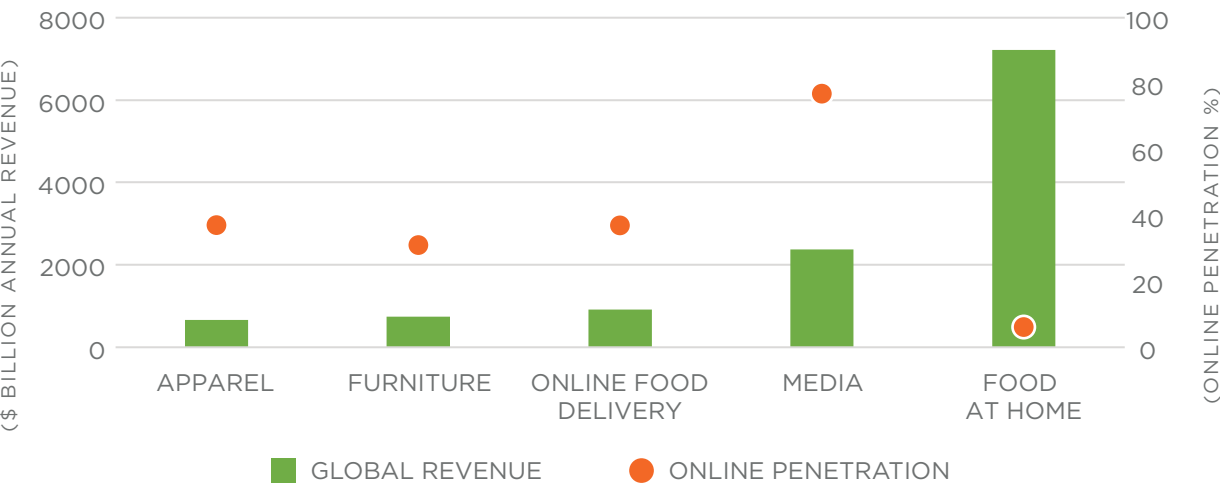
E-GROCERY

Households will source and purchase a growing proportion of their food via the E-grocery market, reducing waste, while maximizing convenience and experimentation. As a result, supermarkets will re-focus efforts on revitalizing store concepts, with a drive to quality, variety and retained custom through detailed knowledge of consumer habits.

The online grocery market the largest product category globally accounting for nearly half of global consumption, it is also the most severely lagging sector in terms of online penetration. With the online penetration rates for food significantly below that of other categories. This is largely due to the innate preference of consumers wanting to touch, see and smell their food in order to ensure quality.

Further challenges also exist for retailers, scaling a profitable online grocery operation remains a key challenge for the sector, owed to the complexity of consumer baskets and the associated costs of assembling, handling and processing a high frequency of orders.

GLOBAL SECTOR REVENUE & ONLINE PENETRATION

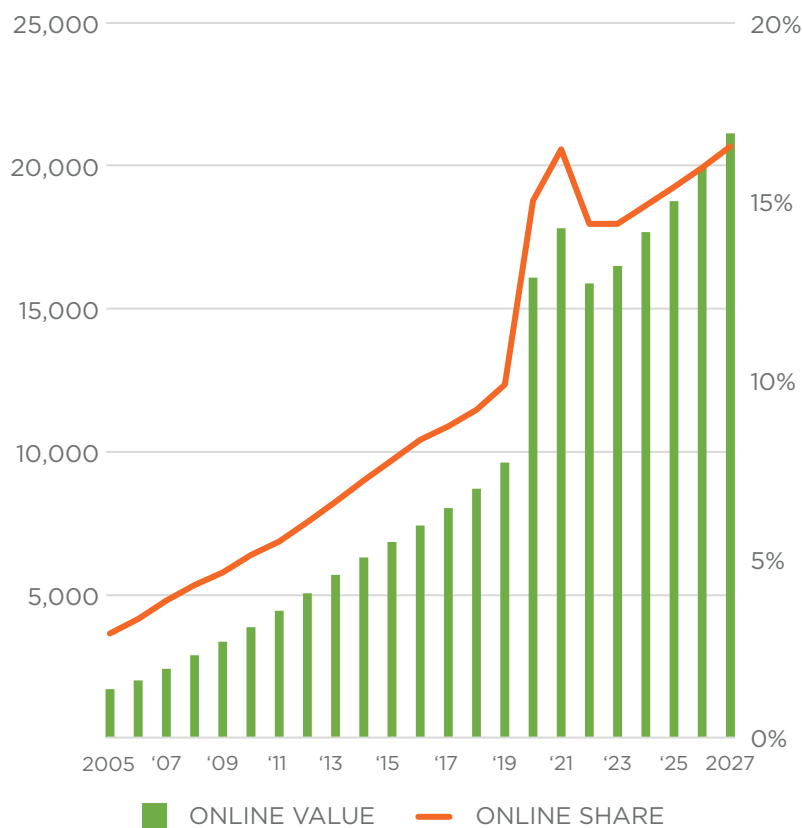


However, technology, automation, and increasing urban population densities are quickly aiding retailers to overcome these challenges, increasing the scale of opportunity posed by the E-grocery sector.

Twinned with changes in consumer preference, greater digital literacy, and preferences for home delivery, the scope for growth within the online food sector is large.

Add to that a wave of healthy competition from new market entrants and innovators, and the sector is set to greatly change how we purchase food substantially, with likely emphasis placed on efficient omni-channel operations over coming years.

ONLINE FOOD & DRINK VALUE & PENETRATION



TECHNOLOGY, AUTOMATION, AND INCREASING URBAN POPULATION DENSITIES ARE QUICKLY AIDING RETAILERS TO OVERCOME THESE CHALLENGES, INCREASING THE SCALE OF OPPORTUNITY POSED BY THE E-GROCERY SECTOR.

CONSUMPTION

THE SUBSCRIPTION SUPERMARKET

Moreso than ever, consumers are taking a liquid approach within their purchasing decisions, typically balancing time, cost, and convenience whilst looking to maximise value.

The subscription meal kit market has grown rapidly over recent years, with the market now well over £1bn in the United Kingdom, rising from £420m during 2017.

In addition to generating additional demand for Logistics and Industrial space in the UK, this has induced competitive tension for supermarkets, who have rapidly looked to expand their meal kit and pre-prepared food offerings.

Pureplay meal kit providers such as Hello Fresh and Gousto, benefit from lower total real estate costs owed to a lack of retail footprint. Operators also benefit from a lower product packaging and marketing spend with produce arriving with minimal labelling and no requirement for branding, meaning procurement costs for meal kit operators can be kept low relative to branded supermarket products.

Another significant advantage for the sector, owed to its make to order approach, is its ability to rapidly pivot product ranges, specifically utilising produce that can be bought at lower cost prices owed to fluctuations in seasonal supply, and excess capacity from suppliers. From a supply chain perspective, the subscription meal kit model allows operators to utilise shorter demand led supply chains, facilitating agile operational practices resulting in better network efficiencies.



As well as being labour and process intensive fulfilment of meal kits is largely undertaken by third party carriers such as DPD at current, requiring meal kit providers to be in close proximity to fulfilment hubs.

As a result, fulfilment and labour costs currently form a significantly higher percentage of total operating costs for meal kit providers when compared to comparable supermarket distribution operations.

As such, access to lean supply chains, affordable labour, and connectivity is critical for meal kit companies looking to manage pricing, and maximise consumer experience.

OUTLOOK

As we look to the future, growth in the meal kit industry and the scale of key operators such as Hello Fresh and Gousto is likely to unlock the potential for a greater degree of automation and integration.

It is likely that new facilities, acquired to meet rising demand, will see significant automation in order to overcome labour challenges.

And in some cases, where scale allows integrated fulfilment solutions will likely reduce the reliance on third party fulfilment providers. This will result in greater freedom of operators to locate close to key supply hubs.

8 A VISION FOR OUR CITIES

Large supermarkets will see partial **re-purposing** through distribution, additional retail and footfall-driving leisure uses

Mainstream adoption of battery storage will enable **viability of vertical farming**

Microfarming will add biodiversity and self-reliance for individuals and families, as well as providing additional income streams for landlords, operators and residents

New developments will include
Rooftop greenhouses

Roof to plate restaurants will emerge, with many restaurants farming produce either on-site or within very close proximity

Innovation will drive demand for **R&D and incubator** space

Subscription food services can be picked up **at food points**, with minimal lead-in time

Large scale restaurants and hotels
will have their own **insect farms**,
accounting for waste

Subscription market has been scaled and is available through **retail offering**

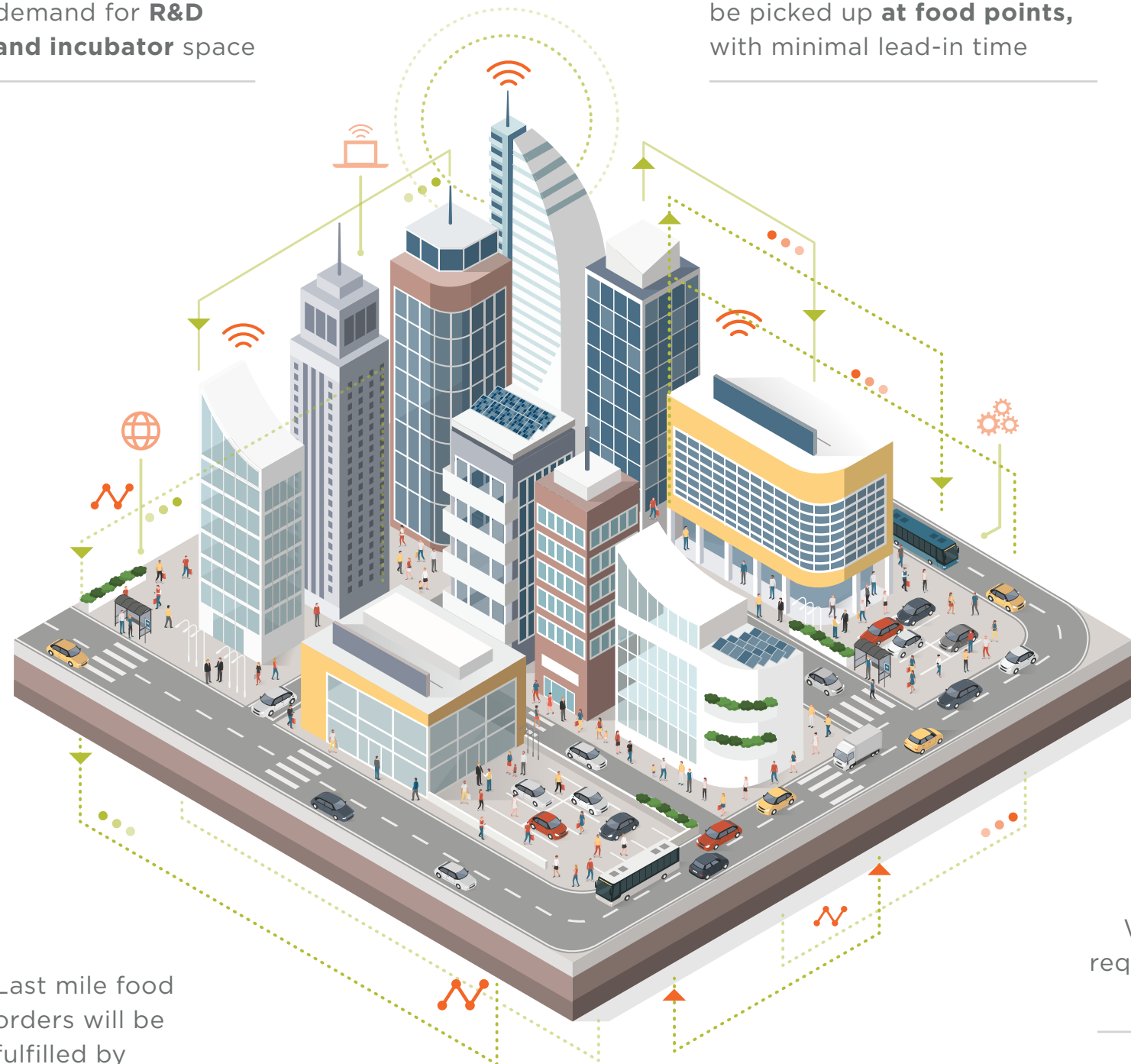
Long-term vacant buildings
will have **meanwhile farms**

**Health positive,
carbon and nutrition
transparent
retail is the norm**

Collaboration between brands through delivery

Where road transport is still required, universal adoption of **electric** delivery fleets

Last mile food orders will be fulfilled by **Delivery robots**



FUTURE OF FOOD CHAINS

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This paper is authored by Cushman & Wakefield; a leading global real estate consultancy.

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About Cushman & Wakefield

Cushman & Wakefield (NYSE: CWK) is a leading global commercial real estate services firm for property owners and occupiers with approximately 52,000 employees in approximately 400 offices and 60 countries. In 2022, the firm reported revenue of \$10.1 billion across its core services of property, facilities and project management, leasing, capital markets, and valuation and other services. It also receives numerous industry and business accolades for its award-winning culture and commitment to Diversity, Equity and Inclusion (DEI), Environmental, Social and Governance (ESG) and more. For additional information, visit www.cushmanwakefield.com.

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