Study and workshop ‘Fresh 4 E-commerce’ in India

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Institute: Wageningen Food & Biobased Research

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Contents

Summary

This report summarizes the contents and outcomes of the Fresh 4 E-commerce India workshop, which was organized in November 2020. During the workshop, topics were addressed related to online marketing of fresh food products in India, including logistics, business models, packaging, and sustainability issues.

The workshop consisted of three substantive presentations:

- Moving from the traditional food supply chain to online and (near) home deliver (Joost Snels, WUR)
- The good fresh e-commerce practices (Xuezhen Guo, WUR)
- Temperature management in e-commerce (Leo Lukasse, WUR)

In addition, a plenary discussion of trends, challenges and opportunities in the sector. As preparation for the workshop, a literature study was conducted on the 'state of the art' in e-commerce and related logistics, as well as the current state of the market in India.

This final report consists of a brief workshop report, and a full outline of the workshop contents in the form of a PowerPoint presentation with the discussion outcomes, the contents of the literature study, the workshop presentations, and the results of a MentiMeter poll among participants.

1 Workshop report

In the Fresh 4 E-commerce India workshop, participating organizations from India discussed trends, challenges and opportunities in the e-commerce market for fresh food products in India, including logistics, business models, packaging and sustainability issues. The workshop consisted of a mix of presentations by experts from Wageningen University & Research, and a plenary discussion among the participating companies. This first chapter of this report first provides a brief summary of the presentations, giving context to the slides presented in Chapter 2. Secondly, the most important outcomes of the plenary discussion are presented in a summary form, including the overarching challenges faced by the Indian e-commerce business and possible follow-up actions.

1.1 Summary of presentations

In the first presentation, Joost Snels gave an overview of the current challenges in the (global) fresh food e-commerce market. An overarching challenge is that the sector stakeholders need to deal with increasing complexity in the sector. First, there is a proliferation of (sometimes interconnected) logistics models, including tiered networks with small-scale local distribution centers to facilitate fast last-mile delivery, and a wide array of delivery modes, sometimes also intertwining e-commerce models and conventional stores, with pickup and fulfillment in brick-and mortar stores and pickup points. Second, complexity is introduced by varying demands from customers, and the need to make sure they receive their fresh food delivery in time and in good order. Differentiating with home delivery, store delivery, and pickup points facilitates this, but home delivery may be complicated by a customer not being home during the delivery.

The second presentation, by Xuezhen Guo, outlined some good practices in fresh food e-commerce. Dr. Guo also pointed to the increasing complexity of the sector, with a set of important decisions to be made (e.g. economies of scale in supply and/or demand, delivery cost versus speed and frequency, competitive advantage compared to traditional retail, deliveries from centralized and/or decentralized warehouses). Good practices include the use of existing networks (e.g. e-commerce grocery deliveries by existing milkman routes, or e-commerce firms diversifying to fresh produce with their existing model), flow consolidation, and crowdsourcing deliveries. Ultimately, an integrated chain approach should provide a long-term effective solution.

The third presentation was delivered by Leo Lukasse, on temperature management in e-commerce supply chains. Whereas a supermarket consumer is responsible for quickly storing bought products at the right temperature, an e-commerce company that delivers is responsible for quality control up until the customer's doorstep. These delivery rounds are characterized by numerous stops, small parcels, and products with differing requirements. Innovative packaging of individual shipments with insulation and cool packs can provide a solution, but also increases the amount of waste material. Commentary from participants highlighted that an uninterrupted cold chain is not always the priority of e-commerce firms, especially when the expected delivery time is short.

1.2 Summary of the plenary discussion

The plenary discussion provided space for participants to engage on the issues in the Indian e-commerce sector they found the most relevant. One of these overarching issues is the focus on food quality and safety. This is a multi-dimensional challenge, that stakeholders aim to address in a variety of ways. Some companies[1] extend their scope towards the farmers that supply their products by offering opportunities for contract farming, education on quality and safety, better alignment of

[1] The example of Fresh2Home is mentioned.

demand and supply, and shortening chains. One aspect that was not addressed, but may bring additional opportunities is providing farmers with resources (inputs, seeds, varieties, and access to cold storage) for better shelf life and quality, and to support farmers to produce specifically for e-commerce quality demands. Other companies focus on closing the cold chain in last mile deliveries, improving traceability and quality monitoring along the chain, or by introducing innovative packaging for temperature control.

A second overarching issue is sustainability, particularly in cities, where quality of life suffers due to pollution and congested infrastructure. E-commerce activity, with disposable packaging and expansive last-mile delivery operations, is closely linked to these challenges. While the current sense of urgency is low, in the medium- to long-term the sector's ability to deal with these issues determines its success – if not, operational efficiency will suffer due to congestion, and the acceptance by society and government is reduced due to increasing and unmitigated externalities of e-commerce activity (congestion and pollution from packaging).

1.2.1 Overarching challenges

In addition, numerous specific challenges were discussed, which all in some way relate to the main overarching challenges mentioned previously. Before and during the workshop the participants were asked to fill in a Mentimeter poll to get a clear picture of what is going on in the Indian e-commerce business. The results of the Mentimeter can be found in section 2.4.

The first challenge mentioned was meeting stringent and rapidly developing demands from customers, while also keeping operations efficient. In business to business settings, customers demand deliveries in the same timeframe (early in the day), leading to peak demands in this timeframe and idle time and excess capacity otherwise. In business to consumer settings, customers demand fast delivery by the e-commerce company at a moment that suits them, otherwise risking failed deliveries when a customer is not home. In the last mile, major efficiency gains can be made to increase the load factor of delivery vehicles, and to reduce congestion and emissions. Meeting these customer demands in an efficient and cost-effective way is a major challenge for the sector, but also creates opportunities for innovative business models that facilitate matching of demand and supply and mitigation of variability and uncertainty. Bundling of flows is also a major opportunity in this domain, facilitating efficiency gains by pooling food and non-food flows from different players - often consisting of small shipments - on the same delivery service to benefit from economies of scale.

Secondly, packaging is tied to current and future sustainability challenges. While providing opportunities for better quality control and food safety, disposable (plastic) packaging also leads to pollution. Reuse and recycling are currently not priorities of firms in the sector, although firms are aware of the challenges. It is to be expected that – barring resolute collective action by the sector – governments (local and/or national) will take on a more steering role with regulation and standard setting. If reusable and recyclable packaging becomes an imperative, companies need to think about service models that include return flows, cleaning and/or recycling of packaging material. For example, relieving customers of the disposal task can become a valuable service to the customer. Expansive packaging will remain a necessity for fresh food e-commerce due to the safety and quality demands.

The third challenge is related to this last aspect of packaging, namely ensuring safety and quality. Ensuring closed cold chains remains difficult, especially in a market with growing complexity and diversity of products and demands. Packaging remains necessary for temperature management and protection from mechanical damage. Especially in the last mile a closed cold chain is far from guaranteed, due to repeated openings of the cooled space for parcel deliveries, products with different temperature requirements in one space, road congestion, and deficient equipment. Opportunities in this domain relate increasing last mile efficiency and addressing packaging challenges (see above), but also a growing market for cold storage solutions at various scales.

1.2.2 Follow-up opportunities

A discussion on potential follow-up opportunities highlighted that the companies' main priority is managing their own growth: serving more customers and exploring new markets, scaling up their logistics, and expanding their product and service offering. It might be expected that most of the potential investments will be weighted by the degree to which they contribute to this expansion of the company, and businesses will prioritize the ones that contribute the most. It is recommended to take this into consideration when engaging with Indian e-commerce companies.

Another major focus areas for firms in the sector is quality and safety as a main KPI – not only improving cold chain performance, but also implementing monitoring and traceability solutions. Although costly, this can help meet demands from particularly discerning, quality-conscious consumers who are used to cherry-pick their own products at brick-and-mortar stores. A follow-up opportunity that extends beyond the fresh food e-commerce logistics sector is the role of e-commerce distribution in the context of 'smart cities', more effectively embedding logistics in cities and reducing externalities from emissions and congestion - hence improving quality of life, through fresh food and more. Although the sustainability challenges are identified, they are not (yet) earmarked as a priority for the participating companies.

2 Workshop contents

In this chapter, first the presentations given during the workshop are shown. Secondly, the results of the literature study are presented, which was carried out in preparation for the workshop. Subsequently, a compact summary of the outcomes of the discussion is given, to end with the results of the Mentimeter poll among workshop participants.

2.1 Slides with the outcomes of the discussion

Presentation 1 – Overview of challenges (Snels)

- Overall agreement that complexity has increased and will likely keep increasing
- Proliferation of logistics models (e.g. pickup points, tiered networks) → see next slide (*)
- First time delivery (i.e. unable to deliver shipment due to consumer not being home) also a problem in India, despite many households having personnel

"We are trying 2 models - using our own bright stores as dark stores in cities, and employing rural women entrepreneurs as distributors in villages"

"Challenge in rural areas are 1) working capital financing of rural entrepreneurs 2) inventory planning for them, as demand is patchy"

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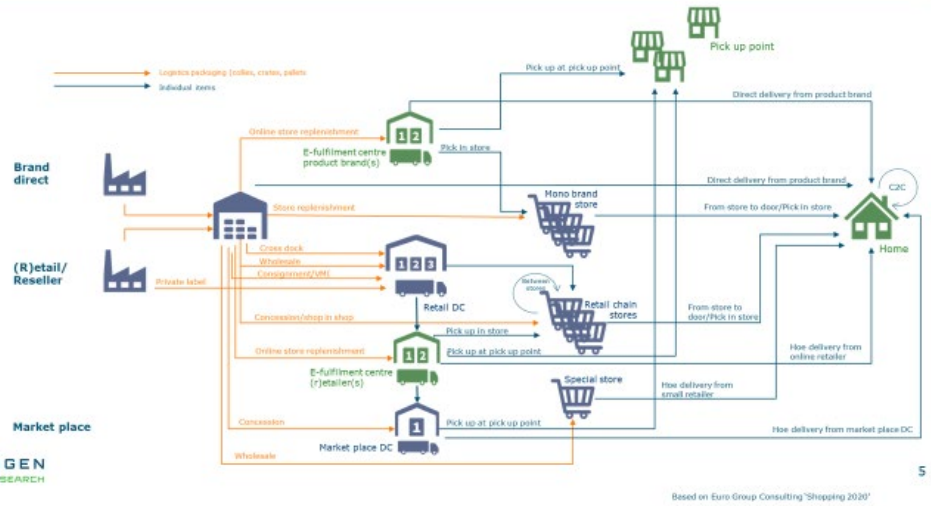
(*) Growing complexity and proliferation of (hybrid) business models



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Based on Euro Group Consulting "Shopping 2020"

Presentation 2 – Good practices (Guo)

- Store pickup model (e.g. order online, picked up from physical store) is becoming more relevant for India

Our online delivery partners pick the products from the local store and deliver to consumer

for vegetables & fruits its usually same day delivery or next day delivery.

For meat, most of the customers expect the delivery in 60-120 minutes and rest of the customers do also plan for scheduled orders which is the consecutive days. Also, dairy would have a shorter lead time.

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Presentation 3 – Temperature Management (Lukasse)

- Most companies are aware of quality and temperature issues. Cold chain is not always used, especially when lead time is short
- Ongoing experiments (e.g. Amazon) with alternative packaging for recycling, to a lesser extent to improve temperature management

Packaging in Last Mile isn't an issue in Groceries since we deliver everything in totes. For other supply chains, we are working on green packaging solutions and there is a concerted effort to move away from plastic to more sustainable packaging.

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Plenary discussion: main topics

- Focus on food quality and safety can already start at the farm (e.g. seeds and varieties for better shelf life and closing the cold chain)
- Moment to act is now for India on sustainability issues (packaging, congestion, quality of life in cities)
  - In B2B setting packaging is perceived as a less surgent issue, but some progress is made (e.g. natural material buffer packing) showing growing interest
  - In medium -to long term- these issues will affect operational efficiency (congestion) and societal license to operate (sustainability) of e-commerce firms

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Plenary discussion: Challenges

- Delivery challenges
  - B2B customers want deliveries more or less within the same timeframe during the day
    - Peak demands on warehouses and fleet
    - Idle time and excess capacity outside this timeframe
  - B2C consumers expect fast delivery

→ Challenge: How to smooth peaks and better utilize capacity?

- Packaging challenges
  - Companies are aware of risk of plastic pollution
  - At this moment biodegradable plastics are not within focus of companies (no business case, perceived as not feasible)

→ Challenge: How could the government and sector set standards and steer towards reuse and recycling?

- Product quality & food safety challenges
  - Main KPI for fresh food e-commerce companies but closing the cold chain is difficult

→ Challenge: How ensure product quality with growing, complexity, congestion, and growing demand for more diverse fresh products?

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Summary: Challenges and opportunities

- Logistics models
  - Matching demand and supply, mitigating variability and uncertainty
  - Meeting customers' demands in an efficient way
  - Addressing last mile issues: Failed delivery, returns, transportation (low load factor, congestion, emissions)

- Packaging
  - For product safety and quality: preventing mechanical damage and facilitating temperature management
  - Facilitating reuse and recycling: Can be part of service model (return logistics as service to consumers), cleaning for reuse
  - Relatively little interest now, but there can be a business case (Jiang et al. 2020)
  - Requires steering from policy side (standard setting, regulation) (Accorsi et al. 2014, Liu et al. 2020)

- Cold chain and temperature management
  - Means to ensure product quality and safety
  - Packaging can help: Isolation and passive cooling (cold packs)
  - Ensure in last mile: Fast delivery time helps, but many stops (and door openings), small parcels with different temperature requirements, road congestion, and lack of isolation contributes to risk

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Summary: Challenges and opportunities

- Bundling flows
  - Food and non-food
  - Consolidating small shipments from different players
  - Cooperation or 3rd party services to consolidate and coordinate

- Shortening supply chains
  - Mitigate challenges of limited cold storage, demand and supply uncertainty, and infrastructure
  - Shortens link between producers and e-commerce companies
    - Better matching of demand and supply
    - Support farmers to produce for e-commerce quality demands

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Follow-up opportunities

- Companies predominantly focus on growth (own company and market growth overall)
  - Serving more customers (in existing markets, and peripheral cities in urban agglomerations)
  - Scaling up of logistics
  - Expanding product and service offering to better meet customer needs
- Growing focus on quality monitoring and traceability
- 'Smart cities' – Linking logistics and city distribution issues, mobility and congestion, and quality of life

Timeline

- 8-12 February 2021 – Virtual Economic Mission to India (see next slide)
  - Topics: Water, Renewable Energy, Food
- 2021 – Consortium formation

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NICCT The Netherlands India Chamber of Commerce & Trade

Topics:
- Water
- Energy
- Food

More information available at: https://www.nicct.nl/event/virtual-economic-mission-to-india-8-12-february-2021/

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2.2 Literature study

Research questions

- What are the overall challenges and best practices (including logistics design, infrastructure, packaging, and sustainability) in the e-commerce supply chain for fresh products?
- What is the current Indian e-commerce situation for fresh products?

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State of the art – Logistics (1)

- E-commerce supply chains overall benefit from pull to push model (Xiao & Chen 2012)
  - → Demand forecasting
  - → Shorter chains
- Logistics efficiency increases when information on product quality is integrated in distribution plan (Yu-Hsiang et al. 2018)
- Distribution centers:
  - Ownership: Self-built and –operated, 3rd party, or hybrid (Lingyu et al. 2020)
  - Location:
    - Location decision by demand density (Prajapati et al. 2020)
    - Inventory location models differ: 1) Distribution centers - Tiered system with large regional DCs and smaller replenishment centers. 2) Using inventory from brick and mortar stores (Lingyu et al. 2020)
  - Food hubs: Clustering of distribution from multiple sellers, with active coordination function and permanent facilities, linked to existing supply chain infrastructure. Allows increase of last mile delivery frequency and load factor, also by combining fresh and non-fresh e-commerce flows (Morganti & Gonzalez-Feliu 2015)

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State of the art – Logistics (2)

- Last mile delivery decisions (Lingyu et al. 2020)
  - Lead time (same day vs next day) – Critical for fresh products
  - Consumer at home (attended delivery) or not (doorstep delivery)
  - Delivery (home) vs pickup (brick and mortar store or pickup point)
  - Modality (van vs bike) – Tradeoff between speed, cost, range, and sensitivity to congestion
- Challenges (Lo & Lam 2015)
  - Safeguarding fresh food quality (cold chain integrity)
  - Ensuring traceability
  - Matching demand and supply, especially with long chains
  - Lack of standardization
  - High transaction costs, lack of market access for smallholder farmers

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State of the art - Packaging

- Relatively little specific research on packaging in fresh food e-commerce
- Food delivery leads to more plastic packaging waste (Song et al. 2018)
- Reusable packaging can significantly reduce waste and environmental impact (Accorsi et al. 2014)
  - Requires well-organized reverse logistics
  - Requires (centralized) packaging cleaning
  - Requires incentives (e.g. deposit system) for end-users to return packaging (Jiang et al. 2020)
- Packaging should meet sustainability requirements but most importantly ensure product quality

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State of the art – Business models

- Food e-commerce models (Hongfei 2017):
  - Farm to consumer (F2C) – Also called Community Supporting Agriculture (CSA)
  - Consumer to consumer (C2C) – Home chefs offer meals online (USDA 2015)
  - Online to offline (O2O) – Hybrid model, online orders fulfilled by local suppliers
- 5 models of e-commerce (general) (Lo & Lam 2015)
  - Integrated B2C e-commerce marketplace: Brands and producers sell online and arrange logistics themselves
  - Vertical B2C e-commerce platform: Platform controls entire logistics chain in select regions, sometimes with 3PLs
  - E-commerce platform operated by logistics company that controls entire chain and last mile delivery. Other sellers can use the platform to sell, but arrange own logistics
  - O2O model by retailers (supermarket): Retailer uses own logistics network, consumer picks up order at local store, may use express delivery companies for last mile home delivery
  - Community O2O model: Fresh food and prepared meals picked up from supermarket/grocery store/farmers market (similar to F2C), delivered within the hour. Operates on community scale

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The Indian case (1)

- $3bln online groceries market, ~20% of which fresh produce - ~600bln market
- Concentrated in major cities
- Big player examples:
  - Specialized online grocery companies:
    - BigBasket – Hub-and-spoke model with 'dark stores' (local, small warehouses serving relatively smaller area), express delivery.
    - Grofers – Online to offline (O2O) model with local merchants, Grofers organizes last mile delivery.
    - FreshToHome – Perishables only, focus on quality and traceability. Manages end-to-end cold chain, with own factories and processing facilities and hub-and-spoke delivery model.
    - DailyNinja (acquired by BigBasked) – Delivers groceries (ordered online) using existing milkman rounds. Innovative practice of combined delivery using existing network (Sharma 2020).
  - Specialized niche players, focusing on one commodity (e.g. Licious offering meat) with a focus on quality
  - Retailers (Dmart, Easyday) and 'regular' e-commerce companies (Flipkart, Amazon) enter fresh food e-commerce market as well

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The Indian case (2)

- General challenges in Indian fresh food supply chains (Arshinder & Balaji 2019)
  - Limited cold chain capabilities (esp. on farm and in first mile)
  - Uncertainties in arrival (transportation/infrastructure deficiencies)
  - Excessive/repetitive packaging and repackaging
  - Manual handling
  - Narrow margins for most farmers – disincentive to invest or improve
- Trends (similar to China)
  - Consolidation: Smaller companies acquired by larger companies (e.g. BigBasket buying DailyNinja)
  - Vertical integration: Specific companies try to control end-to-end chain (e.g. FreshToHome's network with own facilities and direct sourcing)
  - Growth and specialization in niches (e.g. Licious in meat)

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2.3 Workshop contents

Fresh for E-commerce Workshop

Netherlands Embassy invites You

November 24, 2020 | 15.00-17.00 IST/
10.30-12.30 CET | Zoom

With the ongoing digitalization of modern society, a profound change in lifestyle for consumers has been underway. The new-normal shows a generation that tends to live a faster and more spontaneous life. This shift of lifestyle requires food supply chains to become more agile than in the past to flexibly fulfill consumers' volatile demands for goods and services, where food safety and food quality are the conditions for and license to deliver.

One of the major shifts in services is online shopping and home delivery. Covid19 has accelerated this development, also in India. With this major shift major logistical challenges were also introduced. Terms such as order completeness and fulfillment, service level, and food safety are taking on new challenging dimensions. For example, the responsibility of the quality and safety of the food is transferred from the retail outlet to the customer's front door, the packaging must be suitable for the online channel, and then there are challenges related to last-mile delivery.

In this workshop experts from Wageningen University & Research will address the aforementioned challenges related to online food supply chains. The first part of this workshop will cover the most important challenges. In the second part experts will show several best practices from around the world addressing these challenges. The third part of this workshop will discuss some for the Indian situation relevant challenges in more detail. This workshop ends with a Q&A and discussion. In case of sufficient interest, the Dutch government may explore further ways of collaboration on this topic.
As the e-commerce scene in India is changing at a fast pace, the workshop will be broad-based to include traditional retailers and logistics service providers.

Host: Ilse van Dijl (Netherlands Embassy)
Moderator: Heike Axmann (Wageningen UR)
Speaker List: Joost Snels (Wageningen UR)
Xuezhen Guo (Wageningen UR)
Leo Lukasse (Wageningen UR)
Location: Zoom

Workshop Program

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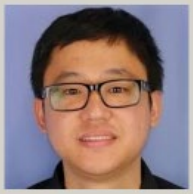
Agenda

Opening Remarks: 15.00-15.15 IST/ 10.30-10.45 CET		5 minutes: general introduction and welcome 10 minutes: introducing the participants and speakers. Short introduction of 'way of working' for the Workshop	By: Ilse van Dijl, Netherlands Embassy and Heike Axmann, Wageningen UR
Workshop 1: 15.15-15.35 IST/ 10.45-11.05 CET: An overview of all aspects of the supply chain	This workshop will give insight in the most important challenges related to moving from the traditional food supply chain to fresh food E-commerce and (near) home delivery. Topics addressed include logistic model and last-mile challenges, keeping product quality (closing the cold chain, packaging, managing shelf life), order fulfilment and reliability	15 minutes: presentation 5 minutes: 1 to 2 questions from the chat	By: Joost Snels, Wageningen UR Moderator: Heike Axmann, Wageningen UR
Workshop 2: 15.35-15.55 IST/ 11.05-11.25 CET: Best Practices (use cases of projects done globally)	In this workshop several best practices from around the world dealing with the challenges will be presented	15 minutes: presentation 5 minutes: 1 to 2 questions from the chat	By: Xuezhen Guo, Wageningen UR Moderator: Heike Axmann, Wageningen UR
Virtual break: 15.55–16.05 IST/ 11.25–11.35 CET			
Workshop 3 16.05-16.25 IST/ 11.35-11.55 CET: Packaging for ecommerce	Workshop 3 16.05-16.25 IST/ 11.35-11.55 CET: Packaging for ecommerce In this session we go into more depth with regard to the packaging of fresh food in the E-commerce chain. Topics that will be discussed are food quality and safety, usability, sustainability, cost and the 'interaction' of packaging and cooling	15 minutes: presentation 5 minutes: 1 to 2 questions from the chat	By: Leo Lukasse, Wageningen UR Moderator: Heike Axmann, Wageningen UR
Plenary discussion 16.25-16.50 IST / 11.55-12.20	Plenary discussion with speakers and workshop participants with the aim of identifying the most relevant and crucial challenges in the development of e-commerce for food in India in the coming 5 years		Moderator: Heike Axmann, Wageningen UR
Closing Remarks: 16.50-17.00 IST / 12.20-12.30 CET			By: Ilse van Dijl, Netherlands Embassy

The presentations

Joost Snels

Moving from the traditional food supply chain to online and (near) home delivery



Xuezhen Guo

The good fresh e-commerce practices

Leo Lukasse

Temperature management in e-commerce

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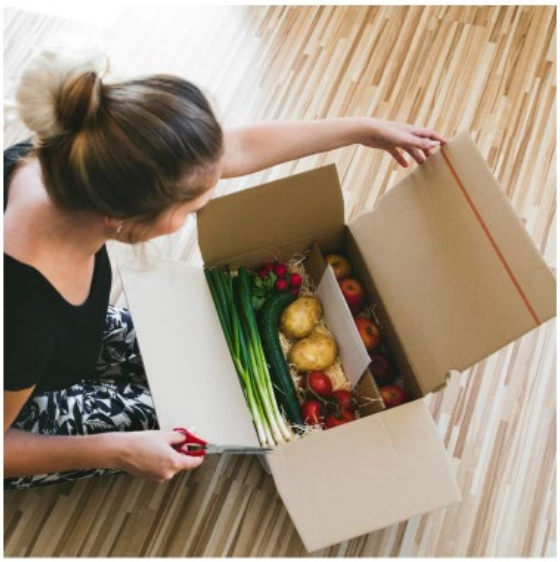
Moving from the traditional food supply chain to online and (near) home delivery

An overview of the supply chain challenges

Speaker: Joost Snels



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Growth

- In India currently, only ~0.15% (~ 2 Mn out of ~1.35 Bn) online grocery market
  - Anticipated compound annual growth rate (CAGR) of ~68.66% during the 2018-2023 period to reach a value of ~₹1,034.13 Bn by 2023, from its 2018 value of ~₹62.01 Bn.
- Online groceries segment generated $3bln in sales for 2020
- Grew at 65-70% p/a from 2017-2020
  - Fresh share of the market is estimated at 20%, which means ~$600mln market value

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Source: https://www.marketwatch.com/press-release/online-grocery-market-in-india-2020-2023overview-and-scope-future-scope-demands-and-projected-market-2020-10-23 and CRISIL opinion, February 2018

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Online leads to supply chain transition

- Yesterday's supply chain and logistics networks were developed when consumers purchased more processed foods, those with longer shelf lives

- Today, consumers are increasingly more interested in fresh and freshly prepared goods produced and delivered in a sustainable, ethical, environmentally-friendly manner

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Drivers and Challenges for growth in India

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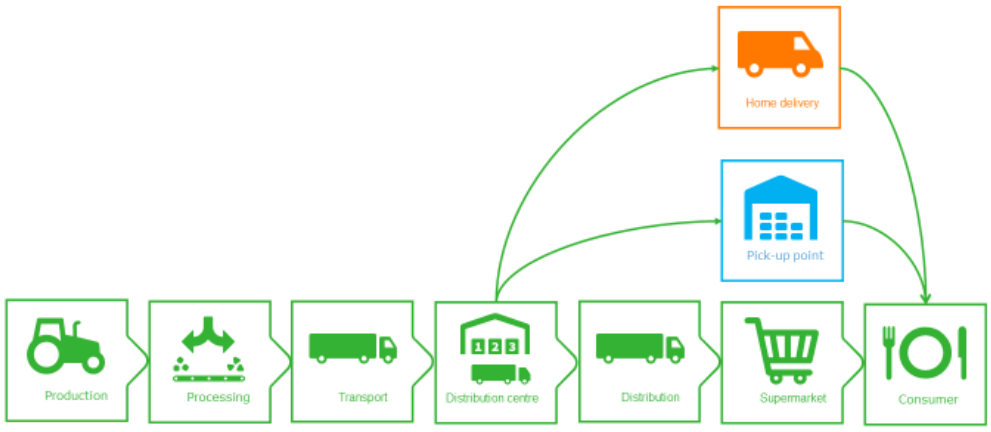
Is it just adding two types of 'outlets'?



Optimal logistical model?

		Pros	Cons	Typical / ideal adopter
	In store Pick-up points	• Small initial investments; • No duplicate stock-keeping; • Low floor space requirements; • Flexible staff planning.	• Double workload for replenishment; • Challenging data synchronisation; • Faster out of stocks; • In store congestion.	Brick-and-mortar retailers
	Stand alone Pick-up points	• Flexible (longer business hours and more locations); • Convenient for customers; • Increases the number of touch-points with consumers.	• High initial investments; • Lower consumer willingness to use compared to home delivery; • Time intensive; • Involvement of more stakeholders.	Brick-and-mortar retailers
	Home delivery	• Preferred by consumers.	• Very high initial investments; • High maintenance costs; • Requires scale of operations.	Brick-and-mortar retailers, Pure online players
	Home delivery (done by a 3rd party)	• Small initial investments; • Flexible – demand driven; • No floor space requirements.	• Complex stock monitoring; • In store congestions; • Dependence on third parties; • Limited process optimisation.	Brick-and-mortar retailers

Source: based on 'The state of online grocery retail in Europe, Syndy, 2015

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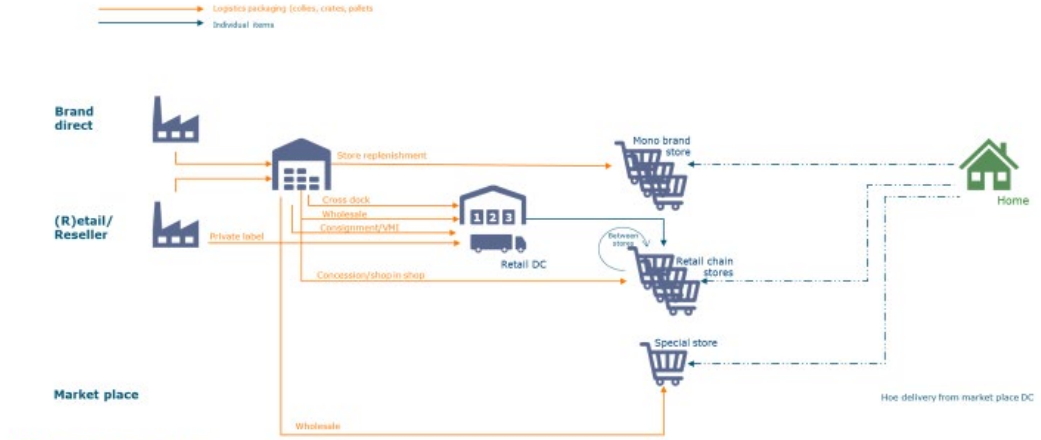
Online: Complexity grows



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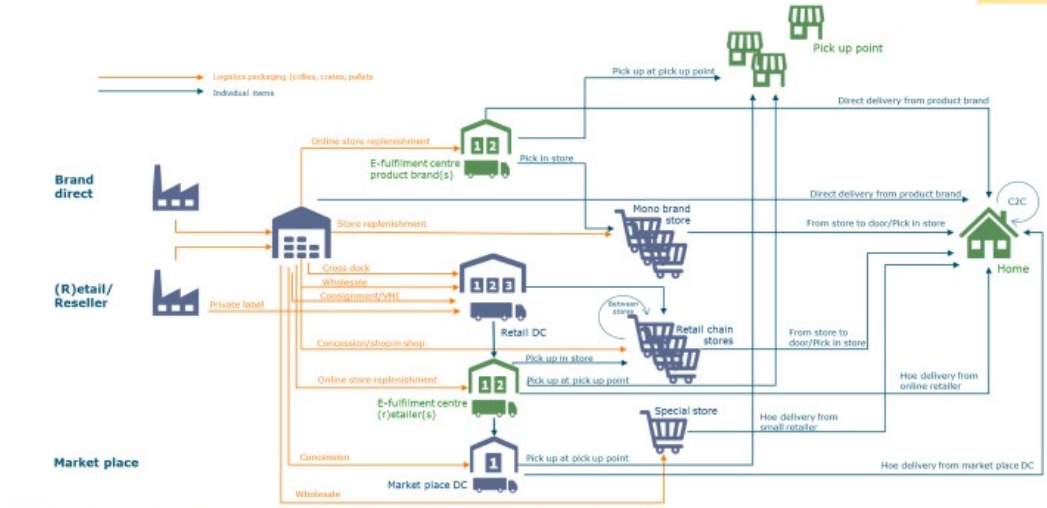
Based on Euro Group Consulting 'Shopping 2020'

Online: Complexity grows



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Based on Euro Group Consulting 'Shopping 2020'

Last Mile most challenging part of the chain

- High percentage of failed delivery *("not@home" / "first-try-right")*
- High percentage returns → *not yet for food, but ...*
- High percentage of (semi) empty vehicles (load factor)
- Mostly carried out by small vans resulting in high costs and carbon footprint per kg.

- Rural vs. Urban
  - = internet access
  - = income distribution
  - = driving distances per drop
  - = 'traditional' vs. 'modern'

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Optimal (logistical) model?

- Consumers prefer Home delivery
- Most important needs of the consumers
  - Food safety
  - Food quality
  - Delivery of all products in one go
  - Real-time information during process
  - Free delivery

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Closing the cooled chain

- Temperature is one of the most decisive factors for the maintenance of product quality
- Temperature is also one of the most decisive factors for ensuring food safety

- The cold chain must be designed from start to finish
  - Maintaining product quality, especially of perishables (handling, packaging, ...)
  - Alternative delivery is difficult or even impossible / undesirable → 'first try delivery'

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Pre-delivery product (quality) check

- 100% reliability (time and order fulfilment)
- Shelf life or Best-Before-Date / Use-by-Date must match the lead time and the time in the week that the consumer wants to consume the product
- Touch, Sight, Smell and Taste for the consumer

- One-stop-shopping: *if you only miss 1 serving of the meal you cannot serve that meal at all*
- Week planning: *if eating the chicken is planned for the end of the week, but the best before date has already expired on Tuesday ...*
- Not 'one size fits all': *do you prefer green or yellow bananas, small or large, 1 kg. is 4 or 5 items, ...*

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Conclusions & Challenges

- Online sales and home delivery of fresh food will grow, also in India
- Supply chain complexity and thus challenges will also grow
- Home delivery of food not only suffers from 'e-commerce issues' but has special challenges
    - Vulnerability
    - Conditioning
    - First try delivery / not@home
    - Quality / Shelf life
- Optimizing & Closing of the cooled supply chain is crucial for food quality & safety
- Optimization of the chain in combination with packaging technology

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Thanks

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The good fresh e-commerce practices

Nov 24, 2020

Dr Xuezhen Guo, Wageningen Food & Bio-based research

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Some facts for E-fresh business

- It is very difficult to make the E-fresh business profitable
- Economics of scale matters:

  supply flow consolidation VS demand flow consolidation

Traditional retail	E-commerce

- Last-mile e-fresh delivery is very costly due to the low value per order
- High delivery costs easily overwhelm the saving from low customer acquisition costs

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Some facts for E-fresh business

- The differentiation of the fresh products are relatively low, so consumers in general do not want to pay a higher price for delivery service.
- Good product quality can lead to a higher price but it needs to compete with the best product quality in the stores because there, consumers can select the product by themselves.
- The competitiveness of the E-fresh business also depends on the maturity of the traditional retail channel.
- For e-fresh business, there is a tradeoff between delivery costs and delivery lead time
- For e-commerce companies, keeping consumers using their website may be more important than making money from the e-fresh section.

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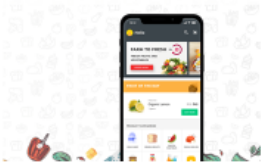
Leverage points in the existing distribution network

- The DailyNinja is a fasting growing Indian E-fresh company
- Indian people like drinking milk and it is very common the milk is delivered to the door in the morning.
- There has been already a big milk delivery network in India.
- This provides the leverage point to combine the delivery of other fresh products with the milk delivery to reduce delivery costs

DailyNinja



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Leverage points in the existing distribution network

- MyEushop is a Dutch e-commerce company to deliver the fresh products to the Chinese community in the Netherlands.
- Its original business was only collecting the infant formulas to be sent to China from the Chinese informal vendors living in the Netherlands.
- By leveraging the e-fresh delivery with their existing infant formulas collection network, MyEushop manages to reduce the delivery costs for the fresh products significantly

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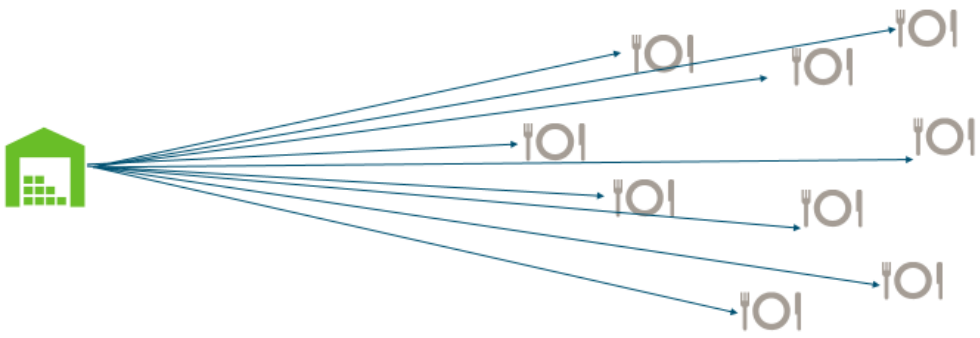
The central warehouse



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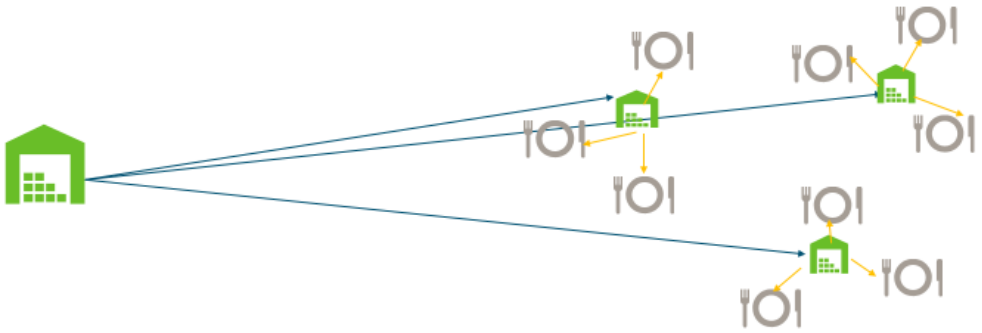
The pre-warehouses



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The pre-warehouses

- **Pros of the pre-warehouses:**
  - Quick response
  - Low outbound delivery costs
  - Low packaging costs and low demand for cold chain
  - Low space costs (compared to delivery from the store)
- **Cons of the pre-warehouses:**
  - More investment costs for pre-warehouses
  - Low SKU numbers
  - High safety stock level (Bullwhip effect)
  - High wastes
  - High complexity for product replenishment

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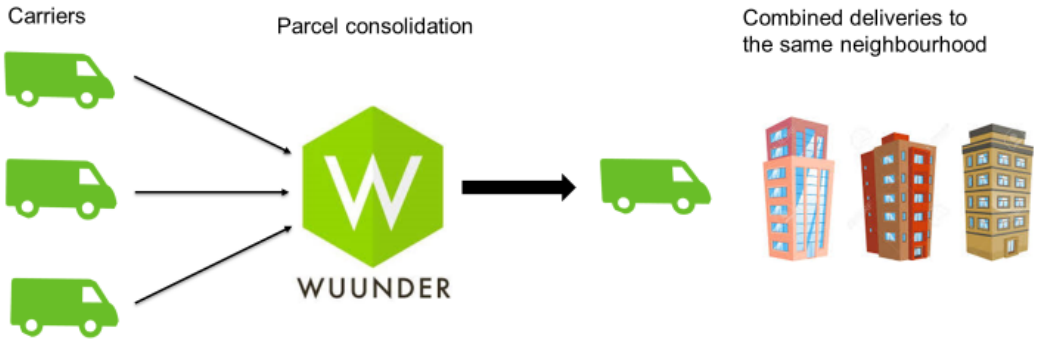
Flow consolidation

'The last-mile consolidation company: WUUNDER in the Netherlands'



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Crowdsourcing

'The Erasmus University Rotterdam pilot research: Crowdsourced B2C delivery in Rotterdam'

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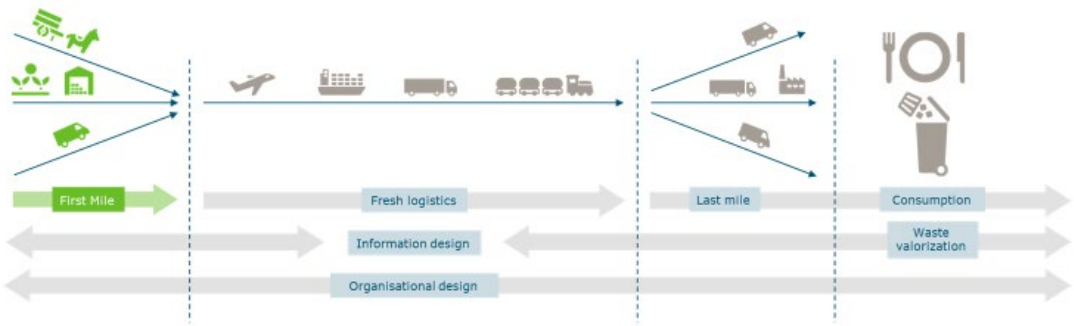
The integrated chain approach:a long-term but most effective solution



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The integrated chain approach: a long-term but most effective solution

- Market-driven supply chain
- Vertical Integration
- Contract farming
- Smallholder farmer organization and community approach
- Vendor-managed inventory
- Chain-wise standard establishment
- Quality control in the whole chain
- Data-driven decision making
- Stock level determination based on demand and shelf life of the products

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Thanks!

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Temperature management in e-commerce

Nov. 2020, Dr. Leo Lukasse

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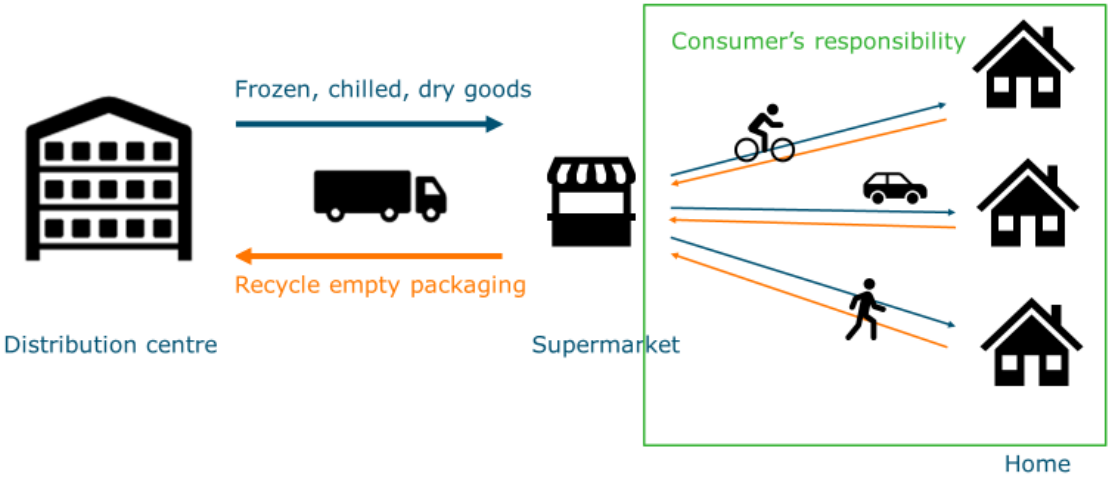
'Traditional' supply chain



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Between DC and supermarket

- Food safety? Laws and guidelines impose temperature requirements
- Food authorities keep control on the fulfilment of requirements

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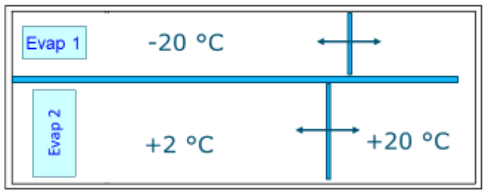
Between DC and supermarket

- Large temperature-controlled multi-temp refrigerated semi-trailer
- Full loads from DC to supermarket
  - At most 2 hours drives
  - No in-between door openings
  - No in-between engine stops



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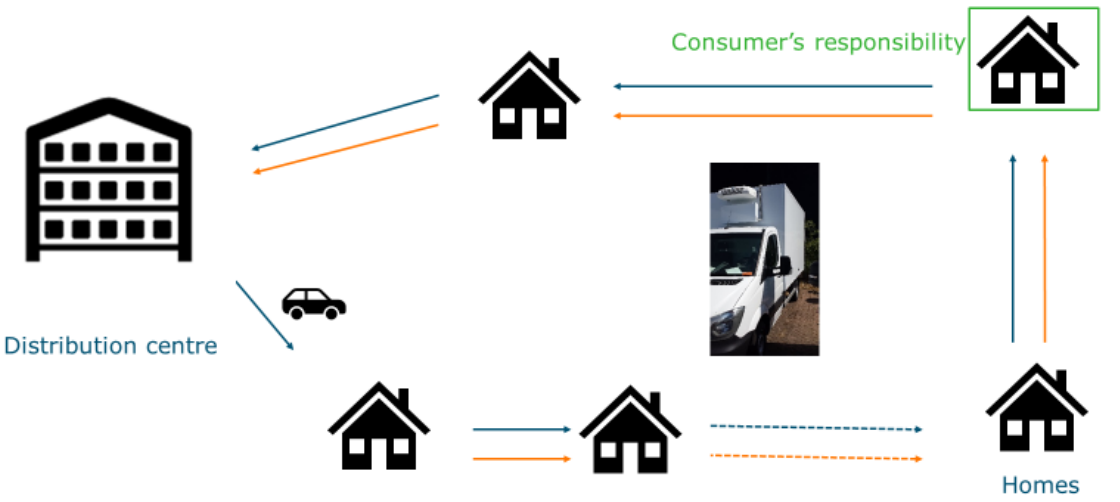
E-commerce for perishables



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E-commerce for temperature-sensitive food

- Numerous stops
- Many small parcels (frozen, chilled, dry)
- Consumer only at home responsible for temperature maintenance
- Van for home delivery MAY be temperature-controlled
- Insulated packaging with cool packs
    - Common: EPS (Expanded Polystyrene)

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E-commerce for temperature-sensitive food

- Temperature management challenging
    - Which cool packs? How many? Where?
    - Required thickness of box walls?

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E-commerce for temperature-sensitive food

- Temperature management challenging
- Cool packs regeneration

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E-commerce for temperature-sensitive food

- Temperature management challenging
- Cool packs regeneration
- EPS (Expanded Polystyrene) waste material

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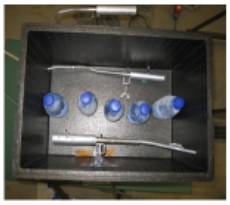
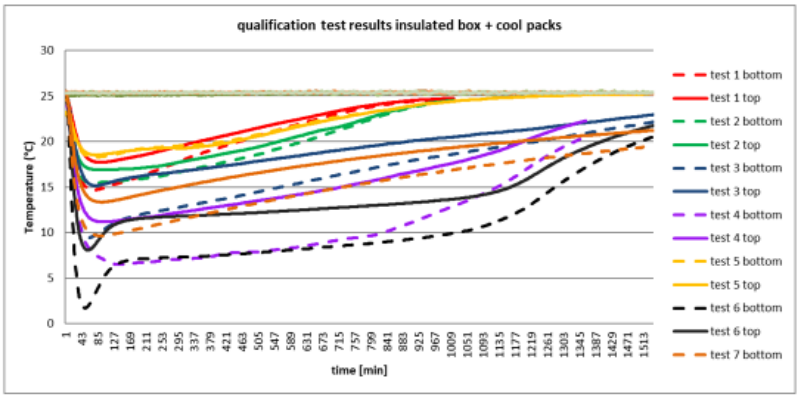
E-commerce for temperature-sensitive food





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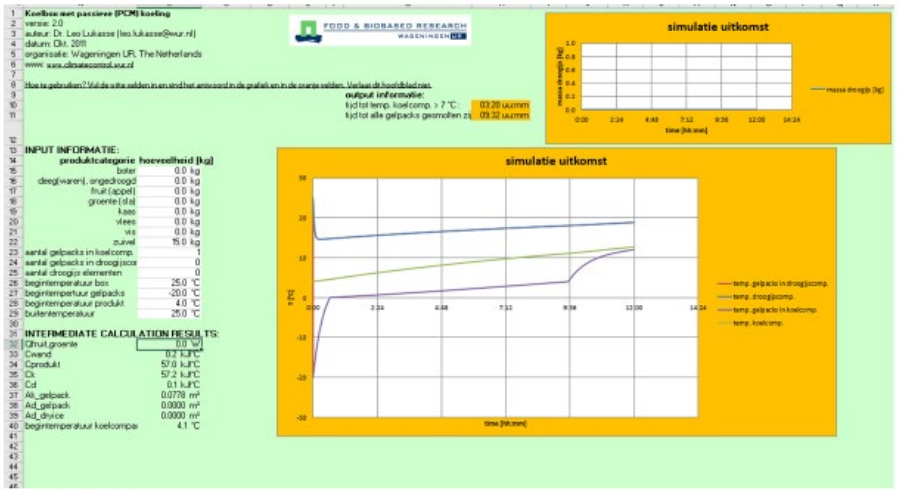
E-commerce for temperature-sensitive food



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E-commerce for temperature-sensitive food

- Many uncertainties in how box + coolpack will be used:
  - Outside temperature
  - Thermal inertia of load
  - Trip duration
- Therefore challenging

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Summary: things to consider

- Temperature management:
  - Thermal simulations
  - Qualification testing
- Cool pack regeneration
- EPS waste material

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Thank you

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2.4 Mentimeter results

1. According to you, what are in general the Top 3 current challenges related to e-commerce of fresh food in INDIA? (Keywords only)

2. According to you, what might become the Top 3 future challenges related to e-commerce of fresh food in INDIA? (Keywords only)

3. What are the Top 3 current challenges related to e-commerce of fresh food for YOUR company? (Keywords only)

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4. What might become the Top 3 future challenges related to e-commerce of fresh food for YOUR company? (Keywords only)

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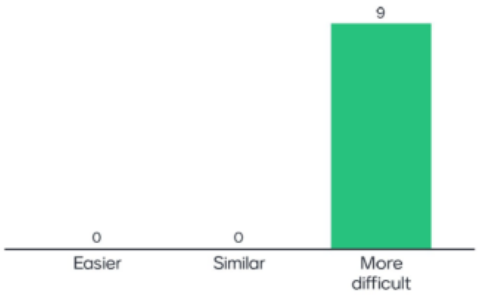
5.Is quality preservation of fresh produce in the e-commerce supply chain easier, similar, or more difficult than in traditional food supply chains?



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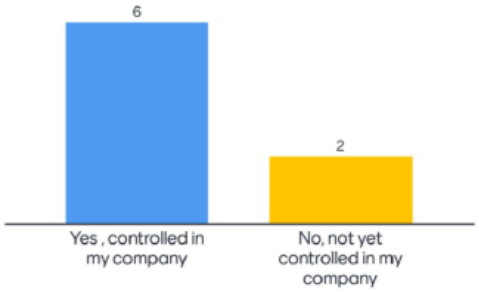
6. Is food quality preservation (or loss and waste) a performance indicator that is controlled within your company?



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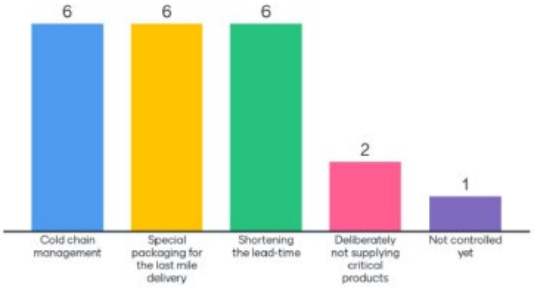
7. How does your company currently safeguard the safety and quality of fresh produce? (Multiple choices possible)



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8. What is your prediction (%) on the growth rates of online ordering of groceries for the coming 5 years in India?

E-commerce will double every year for the next 5 years

200% CAGR

it will increase on a good rate of 20% per year. My company has shown a CAGR of 300%

100-150%

>25%

We predict a 300% - 400% increase in online ordering of groceries in the next 5 years in India

It would grow more than 200% YoY for the next 5 years

20%

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9. Which of the below product categories have the largest growth potential for e-commerce? (Multiple choices possible)

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10. What new services or business models in fresh produce e-commerce do you expect to become relevant in the coming 5 years?

1) Hybrid commerce (using bright stores as dark stores)2) Voice based ordering

Home delivery. Subscription model.

fruits and vegatables seems lucrative

Certified produce with more transparent value chains

Organic produce

Meat industry will have highest impact. F&V will have lesser impact.

Crowdsourced delivery sounds interesting

Residue free food, Long shelf packaging

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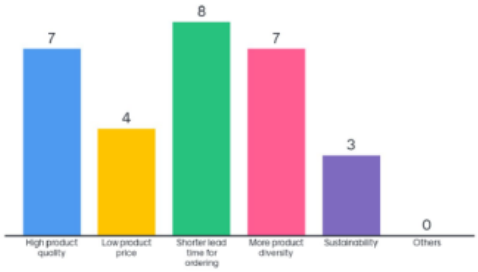
11. What do you think are the most important factors for consumer satisfaction for fresh e-commerce in the coming 5 years? (multiple choices)



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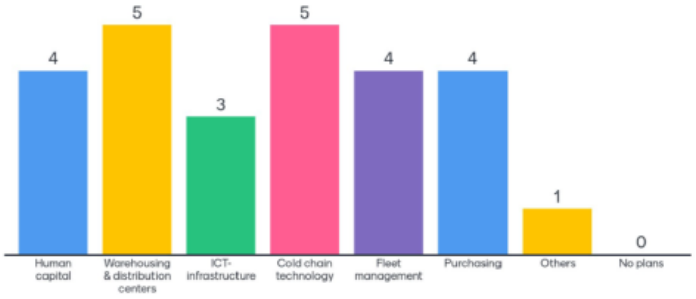
12. In what domains will your company invest upcoming years? (Multiple choices possible)



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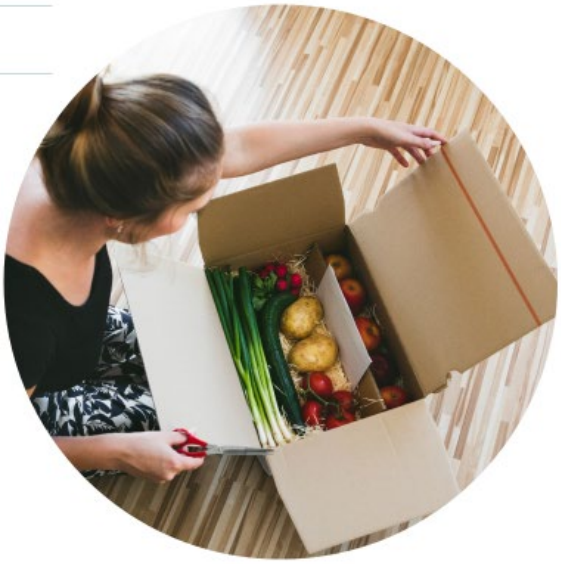

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3 Final remarks

Conducting the workshop fresh 4 e-commerce India has contributed to building a network, gaining insight in the current and future challenges of the sector, revealed the priorities of the participating companies and provided insight in the next steps.

As part of the project, the idea for a Seed Money Project (SMP) was launched. The main focus of an SMP is the forming of a consortium and exploring the possibilities for international activities, between Dutch (SME) companies and local stakeholders. Although the topics discussed in the workshop were considered to be relevant by the participating companies, it was indicated that addressing the challenges are potential unique selling points for the companies. In this light, the companies preferred not to form a consortium at this stage and make the considerations individually.

As highlighted in paragraph 1.1.2, the main priority of the e-commerce companies is increasing their market share in a growing market. It is expected that all investments made, are weighted against this goal. At this point in time, this should be taken into consideration when engaging with e-commerce companies in India.

The workshop revealed different challenges faced by the e-commerce companies. They range from ensuring food safety and quality preservation to sustainability issues such as waste management (packaging), pollution and congested infrastructure. It should be noted that these challenges might need to be addressed as different scales. For example, food quality and safety is expected to be the companies' focus, as this relates to customer retention. One of the solutions therewithin is packaging solutions. On the other hand, challenges such as pollution and infrastructure congestion are typically public concerns, which might require to be addressed from a regulatory perspective. One example can be the promotion of electric vehicles to reduce urban GHG pollution and noise.

The above calls for action for the private sector, public bodies and academia to identify the challenges ahead and ensure that they are addressed while the industry is scaling up.

To explore the potential of nature to improve the quality of life

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Report 2119

The mission of Wageningen University and Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 6,500 employees (5,500 fte) and 12,500 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.