

10 tips to go digital in the fresh fruit and vegetable sector

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Digitalisation is a great way to make your supply of fresh fruit and vegetables more predictable, efficient and transparent as well as traceable and personal. There are many digital technologies, such as in precision agriculture, post-harvest technology and trade finance, that will bring you further as a fresh supplier. And a growing e-commerce channel may create new channels for your market entry. But you must be realistic and choose the options that are most suitable for your situation.

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1. Make a realistic choice among the most common types of digitalisation

Companies in the fresh fruit and vegetable sector use digitalisation to make the daily fresh business more efficient and predictable. Many things can happen with fresh produce throughout the supply chain.

Digital data can be used to:

1. ensure reliable product quality in agriculture, post-harvest and trade;
2. improve the traceability and efficiency from farm to consumer;
3. measure your effort in sustainability;
4. provide an opportunity for suppliers to show more about the origin of their product;
5. get easier access to finance and build credentials with their buyers.

In the fresh trade, you will have to adapt to the efficiency and service level required by your clients and end clients. Your service must be accurate, meaning you must offer reliable and consistent quality, timely delivery and swift solutions for anticipated issues. All this will require more use of data and digital processing in the future. Some of the technology trends have been accelerated by the COVID-19 pandemic and lockdowns.

Figure 1: Different levels of digitalisation



Source: Image by [ICI Business](#)

On a company level, you can improve your efficiency and product quality with precision agriculture, data loggers, resource planning software (ERP) and post-harvest technology. In your cooperation with others, you can also find digital solutions in trade finance or connecting to markets, for example. Eventually, you will be able to use blockchains when you are able to integrate and share data with all the actors in the supply chain for ultimate transparency. For these digital solutions to succeed, connectivity and the participation of stakeholders will be crucial. You can read more about these digital solutions in the tips below.

When going digital, it is important to be realistic in your ambitions and carefully choose what you will invest in. Digitalisation is most obvious in larger supply chains, with frontrunning companies. But there are also digital initiatives to help small farmers and exporters with better access to finance and international markets.

Tips:

Apply the level of digitalisation that is most relevant for your business and the type of clients you serve. When dealing with large retail chains, digitalisation will be a must sooner than in the spot trade.

Follow news on new IT applications in the fresh fruit and vegetable industry on [Freshplaza](#).

Read the [CBI study on Doing business](#) to see what else is needed to do business with European buyers of fresh fruit and vegetables.

2. Explore E-commerce platforms to find new sales channels

E-commerce is growing in the fresh produce sector, although mainly from businesses to consumers (B2C) and on a local level. The COVID-19 pandemic has boosted online sales in Europe. But farmers are also offered online platforms for better market access in producing countries. It provides fresh suppliers with alternative sales channels and new ways of selling.

E-commerce accelerates the need for efficiency, while traceability and product freshness must be maintained. Due to the complex nature of fresh fruit and vegetables, the majority of international traders still rely on their conventional offline relationships.

Table 1: Types and examples of e-commerce initiatives on the European market

Online as primary business model	Online as addition	High service suppliers	E-commerce as a service
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<p>Online grocery suppliers :</p> <p>Mytime (DE)</p> <p>Ocado (UK)</p> <p>Picnic (NL)</p> <p>HelloFresh (UK, int)</p> <p>Bidfood (B2B, Europe)</p>	<p>Conventional grocery stores with online shops:</p> <p>Tesco (UK; supermarket with highest online turnover in Europe)</p> <p>Rewe Online (DE)</p> <p>Bringmeister (Edeka, DE)</p> <p>Albert Heijn (NL)</p>	<p>Specialised fresh companies with online sales:</p> <p>Van Gelder (NL wholesaler)</p> <p>From farm to consumer</p>	<p>Independent platforms:</p> <p>Amazon Fresh</p> <p>Producers Market</p> <p>Lima Link</p>
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Online sales channels in Europe are diversifying

Convenience is a main driver for online sales in Europe, but in this channel you cannot ignore the importance of quality, assortment and price. For fresh fruit and vegetables to be sold successfully online, the seller must be very efficient and guarantee product quality. If (overseas) suppliers want to do business with these online sellers in Europe, they must have good logistics, packaging and traceability for individual sales. For example, the quality of the consumer packaging must be suitable for small deliveries. However, the main product requirements will be the same as for regular channels.

Most online initiatives use an existing distribution network or combine the sales with a network of physical shops (such as a supermarket chain). They depend on regular import channels, where part of the fresh supply is programmed for large buyers and the rest of the products are sold where demand is highest (spot market). E-commerce is part of this structure. The countries with the most online groceries can be found in Northern Europe, such as the United Kingdom and the Netherlands.

There are different e-commerce initiatives. Leading supermarkets have started to expand their online assortment and offer pick-up points and delivery services. The British Tesco is known to be the supermarket with the highest online turnover in Europe. At the same time, new [online supermarket startups](#) are emerging with e-commerce as their primary business, such as Ocado, Mytime and Picnic, challenging the conventional supermarkets. This way, the highly concentrated supermarket landscape is becoming more diverse with new channels.

Specialised wholesalers, such as [Van Gelder](#) in the Netherlands, have started to introduce their own e-commerce platform on which clients can log in and order. These specialised companies guarantee a high service level and a personalised online experience. To do this successfully, they need to be able to rely on their suppliers for on time delivery and guaranteed volumes.

Even on a more local level, small retailers and farms are experimenting with online shops. According to [Freshfel](#), the European Fresh Produce Association, “the German online fruit and vegetable market is mainly shaped by agricultural suppliers selling directly to consumers, while in Spain smaller local ‘Fruteria’ shops have gone online to expand their customer base”. The online offer from farms and small shops mainly relies on local production. This makes them less suitable for imported products.

E-commerce as a service

E-commerce platforms can provide a distribution option for fruit and vegetable companies that normally do not reach their market or the end consumer directly.

Business-to-consumer

Most of the business-to-consumer platforms focus on local market access, often cutting out the middleman. In Europe, e-commerce giants such as Amazon provide a market for local suppliers (only in selected regions). In your own local market, there may be business-to-business (B2B) and business-to-consumer (B2C) platforms that provide online services as well.

Big e-commerce platforms like Amazon have tapped into the fresh business to European consumers with the introduction of [AmazonFresh](#). AmazonFresh started in Europe in 2016 in certain areas in London and expanded to several German cities, Italy and Spain. Their platform competes with established supply chains, but also provides opportunities for other fresh businesses by facilitating their online sales. In Spain, for example, AmazonFresh works together with the supermarket chain Día. In Italy, it works together with U2 Supermercato.

Business-to-business

The development of e-commerce as a service is also taking place at the beginning of the supply chain in producing countries, where farmers are offered digital platforms to sell their produce. Among these platforms are [Lima Links](#) in Zambia, which provides farmers with access to live market prices and connects them to buyers, and [Producers Market](#), which offers an online market place for producers to share their product and their story. [TruTrade Africa](#) uses cloud-based mobile and online applications to provide smallholder farmers with a link to market and fair prices for their produce such as avocado, mangoes and cassava.

A real e-commerce platform for international trade of fresh fruit and vegetables does not really exist. But as a supplier, you can share your offer and potentially get requests from buyers through platforms such as [Tridge](#), [Selina Wamucii](#), [Tradekey](#) and [Alibaba](#). Tridge and Selina Wamucii also provide online market information.

Tips:

Read about [How to implement e-commerce in a food or farm operation](#) and what aspects you should consider in Fruit Growers News.

Follow the latest e-commerce developments in Europe on [Ecommerce News Europe](#) and the situation in different EU countries in the [Freshfel/OECD Report about Online sales of fruit and vegetables in Europe](#).

3. Collect data from precision agriculture and logistics to prevent spoilage

Using data can result in better quality management and prevent spoilage when used during the production of fruit and vegetables or throughout its supply chain. Precision farming is becoming common practice in managing crops. It not only optimises yield and product quality, but also caters to the growing attention for sustainable production.

Data in precision agriculture

Data-driven solutions in agriculture help you optimise crop efficiency. If done well, this will result in better profits and minimal spoilage. Using different data from monitoring your soil, the environment and your crops allows you to make better decisions in crop management. The data can come from a variety of sources such as sensors, drones and satellite images. This is called [precision agriculture](#). With accurate and detailed information, you can take targeted action and apply only the necessary inputs and irrigation. This way, you preserve your resources.

Precision agriculture is an ongoing development in which you can go very far and experiment. Preferably, you would connect all your devices and data to each other. But for small growers, it makes more sense to start with the most crucial sensors to measure the basic conditions of your crop, soil and climate.

Connecting data (IoT)

With the implementation of precision agriculture, you can connect different data sources to a crop management system. But you can also monitor your crop throughout the supply chain, for example in packing houses and logistics. This enhances the Internet of Things (IoT).

The Internet of Things (IoT) means the connection between physical and “smart” devices using the internet to exchange data or to manage your devices. It applies to smartphones and laptops, but also to machines, measurement instruments, sensors and probes used in agriculture, fresh storage and logistics.

See also the [IoT Catalogue](#).

Sensors, data loggers and connectivity in the supply chain give you better control over your product. The generated data can be measured and connected to actions. It will help you maintain a proper cold chain and storage conditions for your product. For example, sensors in storage and shipping containers can measure temperature, ethylene and 1-Methylcyclopropene (1-MCP). For example, the dynamic monitoring of ethylene through an Internet of Things (IoT) module supports users with their decision-making and control strategies (see Figure 2). But the data is also useful in finding the source of a problem when your buyer makes a quality claim. See as an example [how the smart data logger MOST works](#).

Figure 2 shows that, throughout the cold chain, ethylene production can be measured by a sensor and connected to the internet, so that users can monitor it real-time and determine the appropriate control strategy for quality management.

Figure 2: Conceptual framework of ethylene-dynamic-monitoring-enabled multi-strategies control



Source: [MDPI Ethylene Sensor-Enabled Dynamic Monitoring](#) and Multi-Strategies Control for Quality Management of Fruit Cold Chain Logistics

Digital solutions for smallholders

Technological solutions must be tailored to a specific situation. Typical local characteristics play a role, such as farmer size, available inputs, economic circumstances and specific pest issues. But even for smallholders, there are possibilities to use digital technologies to improve production.

The non-profit corporation [Africa Goes Digital](#) has united a number of digital operators throughout the African continent. These technology providers successfully contribute to local solutions, such as [improving premium pineapple production in Ghana through drone and precision agriculture](#). Ghanaian farmers used drone technology to get aerial views and advice based on index maps. This enabled them to be more effective and efficient in managing their crops, improving plant growth and yields. Another technology for small farmers is the real-time soil testing service of [Ujuzi Kilimo](#). Ujuzi Kilimo's mission is to enable data-driven decisions for the world's small-holder farmers by collecting and analysing agricultural data.

Table 2: Examples of precision agriculture technologies, use of data and technology providers

	Crop monitoring	Software	Data loggers
Technologies	<ul style="list-style-type: none"> • Remote sensors to measure drought, temperature and risk of pests; • Visible-near-infrared probing to analyse soil composition; • Drones and satellite images; • Lidar technology to measure erosion. 	<ul style="list-style-type: none"> • Mobile applications and diagnostic software; • Mapping, geographic and analysing software. 	<ul style="list-style-type: none"> • Data loggers to control temperature, humidity and ethylene in logistics.
Examples of suppliers	<p> Plantix (mobile app for crop diagnosis and treatment) SmartFarming (tailored agri-tech knowledge-transfer solutions) AgroCares (crop management) Ujuzi Kilimo (crop management for smallholders) Precision Development (PxD) (non-profit organisation) Farmable (mobile app, crop recording, app) Hectre (mobile apps for orchard management and pre-/post-harvest fruit sizing) Agrinorm (platform for data integration) MOST (data loggers) Swittrace (data loggers) AgroFresh (crop protection, data loggers) Innov8 (crop management) Supplant (crop management) </p>		

Figure 3: Digital service providers on the African continent



Source: [AfricaGoesDigital](#)

Tips:

Identify your main problems in the production of fruit and vegetables (for example, climate or pests) and see if you can start measuring these aspects. Try to collect data from sources at different levels. Combine satellite data with drones and sensors to get a detailed analysis of your field.

Read about the benefits and application of digital technologies in [Big Data for Agriculture](#) and [Drones for Agriculture](#) in the FAO publications of E-Agriculture in Action.

Find data technology suppliers that can help you gather and analyse data, for example via [Africa Goes Digital](#).

4. Use post-harvest technology to improve quality management

Fruit packers and exporters are becoming more and more advanced to comply with the strict quality requirements in Europe. Measuring technology and automation are often used to improve quality and product consistency.

Clients in Europe are becoming more demanding. This increases the need for precise processes and consistent quality. As a supplier, it is important to know what you can deliver and to get the right product to the right customer. A good packing house is key, and there are all kinds of digital improvements you can implement in grading and sorting, packing and labelling and warehousing.

Table 3: Examples of post-harvest technologies

	Grading & sorting	Packing & labelling	Warehousing
Technologies	Visual data and recognition software (camera), laser, near-infrared (NIR) to analyse external and internal quality (brix, maturity, colour, size, defects, bacterial growth, decay); automation in sorting	Automation in packing (automated weighing, stacking, labelling); QR codes; label verification software	Cold chain sensing; controlled atmosphere
Examples of suppliers	Aweta (grading and sorting) Greefa (grading and sorting) Unitec (grading and sorting) Tomra Compacsort (grading and sorting) Consus (label verification systems) Besseling Group (controlled atmosphere) Ilip (smart packaging)		

Advantages of post-harvest technologies

The most obvious advantage of using post-harvest technologies is that you will achieve more precise and consistent product quality. At the same time, it can also be an improvement in efficiency. More and more often, automation and sensors are combined with artificial intelligence and machine learning (self-learning capability of machines). Products with defects are automatically filtered out at an early stage, which prevents claims from buyers at the end of the supply chain. An accurate post-harvest process and tailored quality will help you reach larger, more demanding customers.

Major fresh fruit and vegetable brands can only work on brand recognition with consumers if they have a consistent product; a product that always offers the same consumer experience. For example, the company Driscoll's is one of the market's leading brands in fresh berries and is planning to [implement Near Infrared \(NIR\)](#)

[technology](#). This will enable it to measure quality more effectively, including the Brix value (sugar content), and reward its independent growers that offer consistent berry quality.

Near-infrared spectroscopy is widely applied in agriculture for determining the quality of fruits, vegetables and other agricultural products. It is widely used to quantify the composition of agricultural products because it meets the criteria of being accurate, reliable, rapid, non-destructive and inexpensive.
Source: [Wikipedia](#)

Automation and digital technologies are an important step in efficiency and quality management, but also a big investment. Technology-as-a-service companies, including Microsoft, Google and Amazon Web services, will make digitalisation more accessible for fresh produce suppliers of different sizes. When to invest depends mainly on the costs of manual labour and the type of clients you supply. The COVID pandemic has sped up the use of automation and digital technologies. The lack of available workers has moved many suppliers towards new solutions to reduce their dependence on manual labour. If you are not able to invest in your own sorting and packing, find cooperation with a local packing house that can offer the right post-harvest process for your product and clientele.

Tips:

When outsourcing packing: carefully select your packing house and think about criteria such as food safety certification, level of organisation, efficiency and its willingness to innovate with advanced technologies.

When packing yourself: make sure the basic design of your packing house is right before implementing modern digital technologies. Use the [FAO publication Good Practice in the Design, Management and Operation of a Fresh Produce Packing-House](#) as a guide.

5. Start with digitalising your internal processes

When you digitalise your internal processes, you can work faster and eliminate human error. Especially for a complex organisation, Enterprise Resource Planning (ERP) software is a must. Digitalisation will become even more important when you are building relations in Europe. You can link your systems with those of your buyers and show a professional organisation that can respond fast and accurately.

Enterprise resource planning (ERP) is a system that integrates the management of the main business processes to increase productivity and lower your costs. It often combines various software applications to collect, store, manage and interpret data from many business activities.

The fresh fruit and vegetable sector requires more and more documentation. As a result, business operators are encouraging their suppliers to digitalise the paper trail. However, there are still many public entities in supply countries, such as food safety authorities and customs, that are not yet prepared to provide online documentation.

At the end of the supply chain, the demand for digital processes increases. Especially large retailers, who often work with thousands of products, want to be unburdened by their service providers. One way to do this is by integrating their systems. The closer you operate to the retail sector, the higher the chance that you must adapt to the digital processes of your buyer. This often requires implementation of different software solutions such as ERP.

Selecting ERP software

Selecting ERP software can be difficult. For smaller exporters, the implementation costs can be a hurdle. But once functional, it will likely save your company time and prevent potential expensive mistakes. It is best to orient yourself on the software that fits best with your scale of business. There is specific ERP software for companies that work with a large number of supply farms, such as [eProd](#), a tool developed in Kenya and implemented in several countries in Africa, Central America and Afghanistan. Another solution provider is [Proagrica](#), which shows how to utilise data by integrating ERP into a greater network of data and connecting to other organisations. By complementing your ERP with other data sources, you can improve your supply chain management and customer engagement.

[eProd](#) is an ERP tool for companies that work with a large number of supply farms. Exporters can create farmer profiles, including their credit status, training attendance, field data, supply contracts, GPS location and photos.

[Farmforce](#) offers a mobile platform for sourcing companies to engage with smallholder and medium scale farmers. It extends the traditional ERP to farm level and provides traceability, management information and transparency. It also documents the compliance with sustainability standards such as FairTrade, Rainforest Alliance and Organic certification.

[Auxfin](#) provides eService ecosystems for small holder farmers that combines ERP software, a core banking platform and digital eCoaches. The software facilitates the management of (outgrower) farmer groups. Farmer profiles are stored on the application.

[Proagrica](#) offers ERP and systems integration through connectivity and data-driven support solutions.

[SAP](#) has modular software for business processes including cloud solutions.

[Microsoft Dynamics](#) is a general solution to connect data and processes.

Checklist with recommendations to select ERP software:

Streamline your processes: before orienting yourself on ERP software, make sure your business processes are well organised and documented.

Define your criteria: make a list of your criteria and requirements. What do you want to include - for example, certification management, customs and shipping documents, product documentation and traceability, integration with customer relation management (CRM) or electronic invoicing. Make sure you know all your criteria before comparing ERP software.

Compare: compare different software on how they fit your needs, but also on their complexity, implementation and future-proofness. Think about what your organisation, your products and the market will look like in 3 to 6 years and which functionality you will need.

Integrate: check which systems are used by your main buyers and how you can connect to their systems.

Make the decision yourself: you know your company best. Advisors and specialists can be useful when selecting ERP software, but be aware that they may also have their personal preferences. Make your decision when you are completely sure.

Adjust (only) when needed: there are specific ERP solutions for the fresh sector. If you want to adjust existing software, make sure to use Open Source software. Be aware that scripting comes with high costs and that tailored software is more difficult to maintain.

Back up your files: make sure all your work is backed up, for example with an online cloud storage such as Google Drive, MS OneDrive, iDrive or pCloud.

Tip:

Make sure you document your processes. If you think your company is too small to implement ERP software, at least make sure you document your processes in another way with a practical database and a decent back-up system (for example, online in the [cloud](#)).

6. Connect to digital payment and trade finance technologies

Digitalisation has become common in the financial system. You can expect this to further expand in trading and trade finance. Some of the benefits may still be far away for exporters in developing countries, but there are mobile initiatives that specifically facilitate the trade of smallholders. Connectivity is crucial to use these mobile solutions.

Save time and money with digital trade and finance

There is a common expectation that digital technology will simplify trade finance and transactions, making them faster and more transparent. The digitalisation of trade finance can save you time and costs. It will allow you to share electronic trade documents (such as [bills of lading](#)) with your buyer and freight forwarder without the involvement of a commercial bank. Electronic documents reduce the chance of errors and make funds available faster. If you manage to get a head start in this digital development, you will have a competitive advantage.

[The International Chamber of Commerce \(ICC\) Banking Commission has issued new electronic rules \(eRules\)](#) to advance the digitalisation of trade finance practices, replacing paper with electronic records. A [documentary trade payment \(DTP\)](#) under the ICC eRules will be a fast, low-cost substitute for a commercial bank documentary collection. [Trade Finance Global expects digital trade will become the norm in 2023](#). However, the actual development depends entirely on the level of digitalisation of a supplying country. It involves the cooperation of multiple parties that must be able to process electronic documents, including shipping companies, chambers of commerce, insurers, customs authorities and inspection companies.

Get access to finance by creating a digital profile

On a more local level, there are solutions for small companies to make the business between farmers and collectors easier. Access to finance is one of the biggest challenges for small farmers and exporters. They often lack a credit score and resources to finance agricultural inputs or trade. Digital tools such as TruTrade, Agri-wallet and Farmerline provide farmers with a digital profile and mobile payments. They contribute to a more sustainable and productive agriculture sector.

[TruTrade](#) is one of the online trading and payment platforms that enables small farmers to connect to local, regional and international buyers. It provides digital trading records and gives smallholders credentials to trade. In this way, TruTrade digitalises informal agriculture value chains.

[Agri-wallet](#) is an innovative fintech solution that ensures that all actors in the agri-food supply chain are well financed. Collectors of fruit and vegetables can postpone their mobile payment to farmers, while farmers are well financed through Agri-wallet and can keep buying agricultural inputs. Agri-wallet works with a virtual currency based on blockchain technology. A part of the farmers' income is paid out in blockchain tokens via their mobile phone, which they can spend with affiliated suppliers of farm inputs such as seeds and fertiliser.

[Farmerline](#), active in Ghana, gives farmers a digital identity, improving the access to finance for agricultural inputs. It also provides training and market information.

[Apollo Agriculture](#) is a Kenyan FinTech start-up, which uses satellite data and a machine learning model to make informed credit decisions. Farmers in remote areas can access the affordable credit they need to buy seeds, fertiliser and crop insurance, and increase their yields. They can also use their phones to access voice-based training and make payments.

[DiMuto](#) tags fruit and vegetables with a QR label to document the product as an asset. This gives more control to small and medium growers and packers who can use it as a collateral for trade finance.

Tips:

Make your company bankable by improving your company's credit rating and credentials. No matter if your company is small or big, financiers will grade your credit profile. Learn [what your business credit score means and how to improve it](#), as described by Experian, or build your credentials through new digital applications such as [TruTrade](#).

Use [Trade Finance Global \(TFG\)](#) as a source of information on trade finance and the digital developments that take place. It is the leading trade finance platform.

7. Join blockchain technology to improve traceability and transparency

Digital data technologies will get more advanced. One of the examples is the use of [blockchain](#). In the fresh fruit and vegetable sector, it is still something that is applied mainly by the large corporations, but this may change in the future. It can be used to make the fresh supply chain more transparent and increase traceability.

Blockchain is a digital way to collect data in multiple points and make it available for all stakeholders. The data can be a transaction, a person's identity or a product shipment history. This means that the information is distributed and stored instantaneously across the network, which makes it reliable and verifiable by all parties involved. For blockchain technology, not only your company must be willing to share data and work digitally –all

the stakeholders you interact with must be ready as well. As an individual company, you can try to start on a local level, for example to improve transparency and sustainability.

The main advantage as a supplier is that you will be able to better control your supply chain. By combining digital data of your product with smart labelling and blockchain technology, your supply chain will become transparent and traceable. It will also help improve food safety and reduce food fraud. For example, as soon as a product is labelled, information can be added by the grower, packer, exporter, customs, shipping company, importer and retailer. Every handler of the product will log data such as location and time. But other data can also be added, from sensors and data loggers that are important to safeguard shelf life and product quality, such as temperature.

With a complete traceable history from farm to consumer, you will be able to enter into 'smart contracts'. Transactions will be made automatically when your delivery meets the agreed terms. You will also be able to manage quality claims quickly and make all product handlers accountable for their part in the process. Ultimately, this way of doing business will improve your position with financiers, buyers and end clients.

Reasons for and advantages to using blockchain for fresh fruit and vegetables

Since the COVID-19 pandemic disrupted logistics, traders have become even more motivated to improve the supply chain for their perishable products. In the near future the urge to find solutions in technologies such as blockchain will also increase due to long-term issues such as climate change. In summary, blockchain technology can facilitate several aspects in the fresh trade:

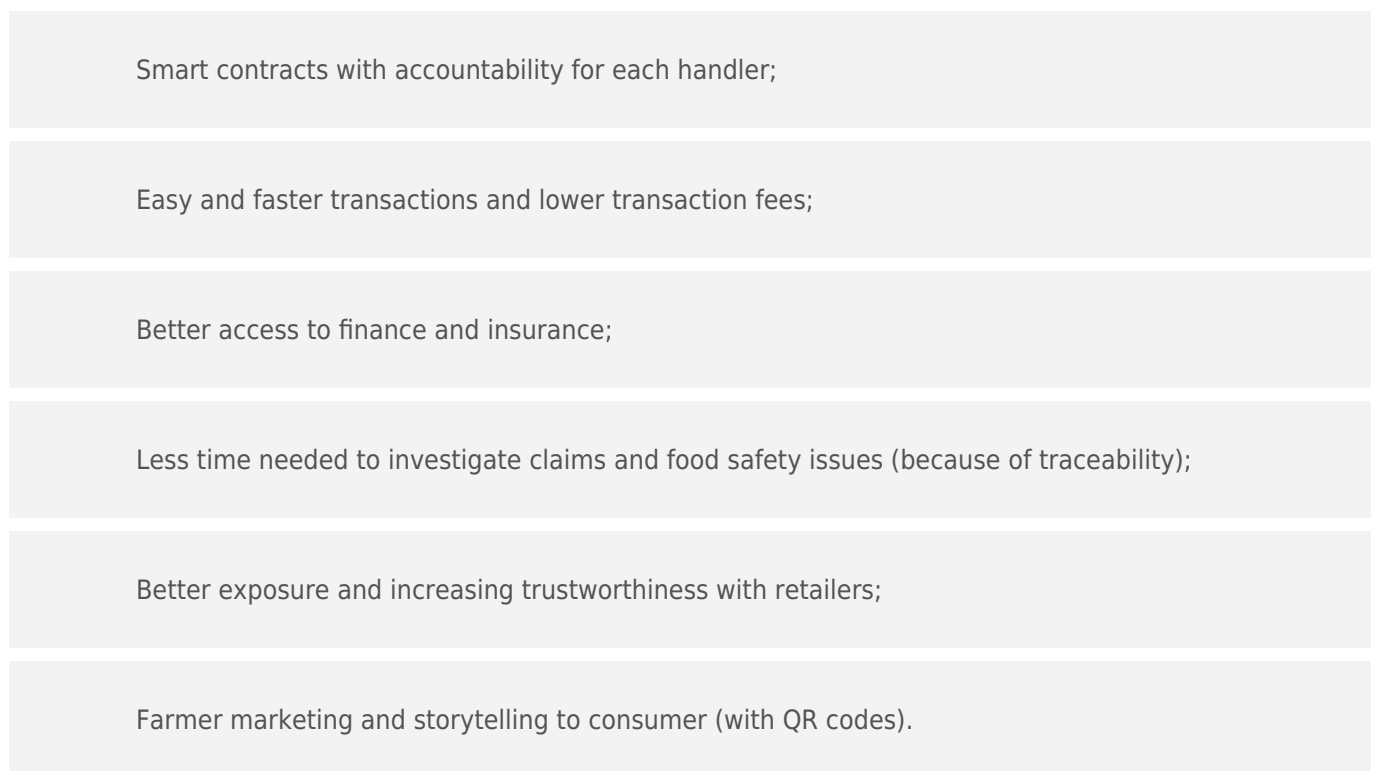


Figure 4: The use of blockchain technology in the fresh fruit and vegetable supply chain



Image created by CBI / [ICI Business](#)

Practical examples of blockchain in the fresh trade

Despite the advantages, blockchain is difficult to implement and does not necessarily result in additional sales. It requires the cooperation of all product handlers. Therefore, blockchain technology is still mainly explored by leading fresh companies and technical solution providers.

An early adopter of blockchain technology is the multinational [Dole](#), the world's largest fruit and vegetable company. Dole uses blockchain to track produce and plans to let customers access the data by scanning a label. Dole works together with Walmart and IBM to implement blockchain product tagging and advanced traceability in all Dole divisions by 2025. [A similar initiative has been taken by the Dutch food retailer PLUS and fruit giant Fyffes](#), using SIM Supply Chain Information Management to gain more insight into their Fairtrade banana supply chain. All bananas have been made traceable from tree to store.

For small companies, there are also options to experiment with blockchain, for example to get easier access to finance or insurance or to facilitate business transactions. For example:

[AgUnity](#) uses blockchain-based technology solutions to build efficient digital supply chains, from farmer to consumer. Their transaction record system for smartphones is based on blockchain. It provides financial inclusion for rural communities and gives farmers a digital identity. This way, it creates an efficient digital supply chain, from farmer to consumer. One of their [projects](#) aims to resolve inefficiencies in transactions and information in the value chain of indigenous vegetables in Kenya.

[AgriLedger](#) helps farmers in developing countries with traceability and credentials such as a digital identity. In Haiti, they have a pilot project using blockchain to help around 600 small farmers with a fair spot price and to help them sell their mangos, avocados and pineapples to developed markets. A QR code provides the end consumer with information about the farmer.

Tips:

Read [What is Blockchain](#) in the CBI study about blockchain in Europe to get a better understanding of the technology.

Get your inspiration for practical applications of blockchain technology, and their opportunities and risks, in [Beyond the blockchain from Agriterro](#), the [Wageningen University article 'Blockchain improves transparency and sustainability'](#) and [Blockchain for Agriculture in the FAO's E-Agriculture in Action](#).

Check and compare different technology providers if you are interested in using blockchain. You can find interesting technology startups in the ['8 blockchain startups disrupting the agricultural industry'](#) in the research blog of StartUs, the [Fanext '8 Global Agri Foodtech Startups reimagining the future of food'](#) and the [EU-Startups article 'Blockchers presents 4 exciting blockchain startups working in food & water'](#).

Learn about 'smart contracts' in IBM's explanation of [What are smart contracts on blockchain?](#)

8. Use digitalisation to measure your environmental footprint

Sustainability is no longer optional in the trade of fresh fruit and vegetables. The European market will require more and more actions on your side as a supplier. Digital technologies can help you measure the environmental footprint and social impact of your company.

Throughout the cultivation and marketing of your product you need agricultural inputs, water, packaging material, logistics and so on. By measuring your environmental impact you can focus on specific improvement points. The [Cool Farm Tool](#) offers a way to quantify greenhouse gas emissions, measure your water footprint and see how well your farm management supports biodiversity. With affordable crop monitoring technology such as [AquaSpy](#) or the [flying sensors of FutureWater](#) you can also improve your environmental footprint and optimise the application of expensive or scarce resources such as nutrients and water.

The social aspects of your value chain are also important. Frontrunners such as fruit importer [Eosta](#) not only look for social certification, but also focus on things such as a living income. Living income or living wage guarantees workers a wage that covers their basic expenses to live. You can use the [IDH Salary Matrix](#) to calculate wage gaps and bring transparency in your supply chains regarding wages.

Tip:

Find synergy in your efforts when implementing digital solutions. When you collect data in your fields and post-harvest to improve efficiency and product quality, use this data at the same time to measure your environmental footprint. For example, measure and communicate how much less pesticides or water you are using thanks to precision agriculture.

9. Digitalise your story with QR codes

Storytelling can be a way to differentiate your company in a competitive market. The best way to share your story is by digital exposure.

When building a (social) fruit brand, [QR codes](#) can be an attractive option to add information to your product. This way you can get your story to the end-consumer as well. If you are a small company, you can try to develop a digital identity together with a trusted partner in Europe that has a network and can put extra effort in branding. Another option is using digital tools to get your story out there, for example through [Farmer Connect](#) or [Storybird](#).

[Farmer Connect](#) uses the mobile app “[Thank my farmer](#)” to build a bridge between farmers, consumers, and everyone else in between. Consumer can scan QR codes on a product and read the story behind it, find out where the product was made, and by whom. It is currently used for the coffee supply chain, but it would be equally suitable for social fruit brands, for example.

[Producers Trust](#) allows producers and brand owners to share their story with consumers via [Storybird](#) and [Producer Stories](#). The organisation collects traceability data in the [StoryBird](#) app, which is designed to help brands tell real, validated stories. Some stories show the entire journey of a product such as the [dried pitahaya from Sol Simple in Nicaragua](#).

Tip:

Get your inspiration in practical applications of blockchain technology, and their opportunities and risks, in [Beyond the blockchain from Agriterra](#), the [Wageningen University article “Blockchain improves transparency and sustainability”](#) and [Blockchain for Agriculture in the FAO’s E-Agriculture in Action](#). The presentation on [Blockchain Technology in Agri-Food: State of Play and Outlook](#) by Wageningen University provides an example of how this works in other agricultural sectors.

10. Use different ways to find digital solutions

Digital technologies can help your company become future proof and solve specific issues in the supply chain. It is important to stay up to date with the developments and decide which technologies best fit your company and situation. When selecting digital solutions, it is best to be critical and get well informed. If needed, ask for help from experts or a business support office or ask about the experiences of your peers.

Find and compare online

Looking online will get you quite far in gathering information, searching the internet for digital solutions and staying informed through online news updates. You can, for example, compare different ERP software online for the fresh food industry on [ERP Focus](#) or [Software Connect](#) or read about new agricultural technologies and tech suppliers on [PrecisionAg](#).

Look at frontrunners in digital agriculture

You can also look at countries that are ahead in technological developments. For example, according to [The Star, a Kenyan news medium](#), 25% of Africa's agri-tech startups are in Kenya. These include companies such as [Dodore](#), with innovative mobile financial solutions such as [Agri-Wallet](#), and [Ujuzi Kilimo](#), a real-time soil testing service that uses sensors and mobile technology to provide precise and actionable information to smallholder farmers.

Increase your knowledge via digital platforms and associations

Specific platforms help you increase your digital knowledge. The social enterprise [M-Shamba](#) provides a digital platform, using interactive voice response services to explain and transfer agricultural technologies to smallholder farmers. But you can also [find technology providers at Africa Goes Digital](#), the pan-African industry association of digital operators.

Visit trade fairs to see the latest digital trends

New digital technologies are often presented at trade fairs. These are excellent places to see new trends and talk directly with the developers of a digital solution. In Germany, [Fruit Logistica](#) usually counts with a number of [exhibitors with digital technologies](#) and events where new technologies are being presented. In Spain, [Fruit Attraction](#) has previously also organised conferences about digitalisation in the agri-food chain.

Since COVID-19, trade fairs have become much more digital as well. [Fruit Attraction](#) launched [LIVE Connect](#), a trade community and social network for fresh fruit and vegetable professionals. [Fruit Logistica](#) has set up a [digital industry platform](#) eight weeks before the 2022 event. The online platform replaces the former Virtual Market Place and will help exhibitors and visitors efficiently prepare their visit and stay in touch year-round.

Get help from organisations

Organisations that have an active role in agricultural development will likely have a role in the digitalisation of farmers and SME exporters. For example, the agri-agency [Agriterra](#) assists agricultural cooperatives in developing countries and recently started a project in digitalisation in cooperation with the [International Fund for Agricultural Development](#) (IFAD). Another initiative is provided by the [GSMA Foundation](#) with resources and support for [GSMA Mobile for Development programmes](#) and innovations with socio-economic impact, for example in agriculture.

Tip:

Read our [Tips for Finding Buyers](#) and [Tips for Organising your Export](#), which can help you further

understand how to do business with European buyers of fresh fruit and vegetables and what it takes to become a successful exporter to Europe.

This study was carried out on behalf of CBI by [ICI Business](#).

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