TITAN

Transparency solutions for transforming the food system

Deliverable 9.6 – Practice Abstracts batch 1

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Executive Summary

Deliverable 9.6 includes a collection of 11 practice abstracts, each addressing innovative approaches and solutions in the realm of sustainable agriculture and food systems. Here's a brief overview of the topics covered in these abstracts:

Miniaturization of analysis for a better control of allergens in the food industry. The use of miniaturized devices for DNA analysis can contribute to a better control along the food value chain. Page 5.

High resolution analysis of multi-strain probiotic products by NGS using innovative molecular markers. The newly developed method brings together fast and standardized approach of NGS metabarcoding with an improved accuracy in distinguishing close related species. Page 7.

Efficient and reliable ESG reporting. Establishing a seamlessly connected supply chain network with third-party verification through Integration of blockchain technology, encompassing the entire value-added process. Page 10.

AI-powered platform to help ingredient and food suppliers to avoid food safety incidents. Tool to Streamline Supplier Assessment & Evaluation with the Application of an AI Solution. Page 12.

Using DSS to reduce agronomic Input and track data. This abstract discusses the application of Decision Support Systems (DSS) to improve the sustainability of agricultural practices by reducing the use of external inputs and enhancing data tracking across the supply chain. Page 15.

A B2B digital marketplace where fair food trade is made easy, fast and transparent. A user-friendly platform that generates market opportunity for farmers and industry buyers. Page 17.

Precision tools for time-efficient operations and food waste reduction. Digital tools to empower businesses to optimize productivity and reduce food waste by addressing the time-sensitive nature of fresh produce to alleviate time-related pressure. Page 19.

Strategic Integration of Digitalisation and Value Chain Analysis in the Seafood Industry. The implementation of digital solutions, such as blockchain, and standardisation of information formats in line with the Global Dialogue on Seafood Traceability (GDST) guidelines. Page 21.

Inventory management which aims to improve efficiency, reduce waste, and enhance sustainability. Page 23.

Revolutionizing Traceability for SMEs. A cutting-edge traceability system employing blockchain technology that provides a cost-efficient, standalone platform tailored to meet the demands of SMEs. Page 25.

Harnessing Digital Tools to Combat Childhood Obesity: Nutritional Chatbot. An AI-based nutritional chatbot that incorporates digital tools, including mobile applications, gamification techniques, and online platforms to engage and educate children in adopting healthier behaviours. Page 27.

These abstracts collectively address a broad spectrum of challenges and opportunities within the agri-food sector, focusing on sustainability, technology adoption, food safety, and circular economy.

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Miniaturization of analysis for a better control of allergens in the food industry

Authors

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Problem

The presence of undeclared allergenic ingredients or the presence of traces of allergens due to unintentional contamination during food processing poses a great health risk to sensitized individuals. Therefore, fast, and reliable analytical methods are required to detect and identify allergenic ingredients in food products.

Solution

The use of miniaturized devices for DNA analysis can contribute to a better control along the food value chain, due to the possibility to perform sophisticated analysis outside the laboratory, moreover, the use of DNA enables the specific detection of problematic ingredients with a high level of specificity and sensitivity.

Benefits

The use of DNA-based miniaturized devices for the detection of allergenic ingredients allows for:

- A highly sensitive detection of traces of allergenic ingredients in the different points of the food value chain.
- Decentralized analysis, enabling to bring the laboratory to the different points of the food value chain providing an on-site analysis.
- Faster implementation of recalls and/or corrective measures in case a positive result is detected in any point of the food value chain.
- A very specific detection of the ingredient(s) responsible for allergenic reactions in sensitized individuals.
- Possibility of the integration of the devices with connectivity and data collection to perform predictive analysis of the productive process.

Practical recommendations

- Identify the main problematic allergenic ingredients in your product to select the targets of analysis and related kits.

- Evaluate possible suppliers and Critical Control Points (CCPs) on the production plant for possible unintentional contamination to establish a good monitoring plan.
- Perform regular controls on both suppliers and Critical Control Points (CCPs).

Further Information

Further readings

Towards on-site detection of gluten-containing cereals with a portable and miniaturized prototype combining isothermal DNA amplification and naked eye detection
https://www.sciencedirect.com/science/article/pii/S0026265X22009432?via%3Dihub

Amplified plasmonic and microfluidic setup for DNA monitoring
https://link.springer.com/article/10.1007/s00604-021-04983-y

Videos

https://www.youtube.com/watch?v=sBJprjwBpZM

Weblinks

https://titanproject.eu/pilots-for-food-safety/

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High resolution analysis of multi-strain probiotic products by NGS using innovative molecular markers

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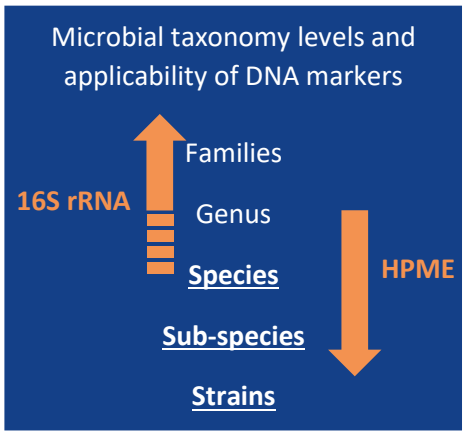
MICROBION srl, Open Innovation Department, Verona, Italy

Problem

Analysis of the microbial composition of multi-strains probiotic products is a challenging task. **NGS metabarcoding** brought great advantages as fast analytical method to understand the microbial communities' composition for research purposes (1). However, its application in industrial settings for quality control and stability check of the microbial composition of probiotics, fermented foods and other products containing microbes, is very limited by the low biodiversity of species used for formulations (2) and by the lack of standard methods that can distinguish strains belonging to same species (3).



Solution

The newly developed method brings together **fast and standardized** approach of NGS metabarcoding with an **improved accuracy in distinguishing close related species, subspecies and strains of the same species** in a blend, when compared with the current standard of 16S rRNA-based NGS metabarcoding. Our method relies on **HPME** markers (4) which are intergenic highly variable sequences flanked by conserved coding sequence for PCR primers design. The amplification, sequencing of HPME markers and matching with a manually curated qualified database, has been validated on mock communities and then successfully applied for the **identification of all species and subspecies in commercial probiotic products**.

Applicability box:
- Microbes-based products
  - Probiotics
  - Starter cultures
  - Biostimulants/Biocontrol
- Fermented foods
  - Inoculated
  - Spontaneus fermentation
- Foods with biotrotective cultures

Benefits

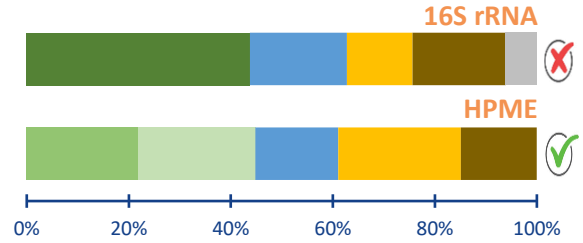
HPME-based metabarcoding analysis allows to quickly detect and identify bacterial species and subspecies in a sample to confirm its microbial composition. According to the presence of signature sequences, it can also discriminate strains belonging to the same species. Moreover, it can be coupled with standard 16S rRNA metabarcoding to reveal unexpected species and combined with flow-cytometry to provide quantification.

Limits of 16S rRNA metabarcoding	Solutions provided by HPME markers
✗ Low taxonomic resolution at genus or specie level	✓ High resolution at subspecies level
✗ Sequences associated to random species	✓ No random association to species
✗ Impossible strains resolution	✓ Possible strain resolution

Case Studies

Application example - Case study on *Bifidobacterium* genus

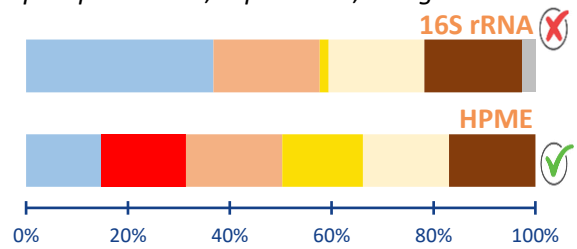
A sample containing five strains belonging to the species *B. animalis* subsp. *lactis*, *B. animalis* subsp. *animalis*, *B. bifidum*, *B. breve* and *B. longum* was analysed through the NGS approach based on 16S rRNA and HPME metabarcoding. **The HPME markers allowed the identification of all the species and subspecies present in the sample**, while standard 16S rRNA metabarcoding analysis was not able to distinguish the two subspecies of *B. animalis*. In addition, with the 16S rRNA a portion of DNA was erroneously associated to bacterial species not present in the sample.



B. animalis | *B. animalis* subsp. *lactis* | *B. animalis* subsp. *animalis* | *B. bifidum* | *B. breve* | *B. longum* | Others

Application example - Case study on *Lactiplantibacillus* genus (former *Lactobacillus* genus)

The two metabarcoding approaches were applied to a sample which includes the species *L. plantarum*, *L. paraplantarum*, *L. pentosus*, *L. argentoratensis*, *L. fabifermentans* and *L. mudanjiangensis*. **The 16S rRNA gene analysis did not identify the presence of *L. pentosus***, and a portion of DNA was associated with other species, which were not present in the sample. The HPME approach, instead, confirms its high resolution power among highly correlated species, identifying correctly all six species present in the sample.



L. plantarum | *L. pentosus* | *L. paraplantarum* | *L. argentoratensis* | *L. fabifermentans* | *L. mudanjiangensis* | Others

References

❶ Srinivas M, *et al.* 2022. Foods.
❷ Mazzantini D, *et al.* 2021. Front. Microbiol.
❸ Dreier M, *et al.* 2022. BMC Microbiol.
❹ Fracchetti F, *et al.* 2018. WIPO WO2018015572A1.

To know more contact info@microbion.it or visit our website www.microbion.it

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Open Food Chain: Efficient and reliable ESG reporting

Author: Blade Brink
Open Food Chain, Amsterdam, The Netherlands

Problem

Food fraud in the olive oil sector is a pressing issue marked by mislabeling and adulteration. Misrepresentation of olive oil quality, often labeling lower-grade oils as extra virgin olive oil (EVOO), erodes consumer trust and harms legitimate producers. Adulteration with cheaper oils, like sunflower or soybean oil, compromises health benefits and flavor. Weak regulations and enforcement exacerbate these problems, enabling fraudulent practices to persist in the supply chain.

Simultaneously, forced labor plagues the shrimp supply chain, particularly in Southeast Asia. This ethical dilemma involves human rights abuses, including forced and child labor. Workers face debt bondage and exploitation by unscrupulous employers, exacerbated by the complex and opaque nature of global supply chains. Efforts to combat forced labor necessitate collaboration among governments, businesses, and advocacy groups to establish and enforce standards, enhance transparency, and ensure accountability throughout the shrimp supply chain. Combating food fraud in olive oil and forced labor in the shrimp industry requires comprehensive reforms, industry collaboration, and heightened consumer awareness to foster a more ethical and sustainable global food system.

Solution

The solution to the challenges within the supply chain hinges on heightened traceability and transparency, a goal that Open Food Chain (OFC) aims to accomplish through the integration of blockchain technology. OFC's strategy involves establishing a seamlessly connected supply chain network with third-party verification, encompassing the entire value-added process in the shrimp supply chain – from fish feed to shrimp farms in Vietnam. For instance, in numerous countries, the labeled "made locally" olive oil far exceeds the actual local production capacity. OFC intends to rectify this by interconnecting the supply chain components, linking the producer, transporter, and final product points to ensure complete traceability for each product. Additionally, the implementation of DNA devices and third-party verification adds an extra layer of security. The DNA sequence of the harvest is recorded before harvesting, and upon reaching the final point of sale, products undergo random testing. A matching DNA sequence with no discrepancies in traceability triggers public third-party verification, confirming the product's authenticity. To address forced labor concerns, OFC will employ key identifiers within the shrimp supply chain. For instance, in the wild-caught supply chain, an alarming indicator is a vessel never returning to dock, a situation indicative of laborers being forced to stay onboard without contact with land. By identifying such key indicators and integrating alert flags in the system, OFC aims to ensure a forced labor-free perspective in the shrimp supply chain.

Benefits

A connected blockchain supply chain offers numerous advantages to organizations at various stages of the production and distribution process. Producers can distinguish themselves by providing unique

attributes to their products and showcasing a commitment to quality through digital records. Processors and distributors benefit from enhanced supply chain insights, becoming central points for traceable products with claims backed by data. Brands can align their products with their values, substantiating responsible sourcing and fair labor practices, thereby building consumer trust, and understanding supply chain risks better. Retailers, through transparent and accountable practices, can establish a trustworthy network of suppliers and respond rapidly to incidents. For NGOs and non-profits, blockchain enables the leverage of unchangeable and traceable data for positive impact, monitoring key performance indicators, collaborating with stakeholders, and empowering consumers through insights into product narratives. Overall, a connected blockchain supply chain fosters transparency, accountability, and efficiency, benefiting all stakeholders in the ecosystem.

Practical recommendations

To address the persistent issues of food fraud in the olive oil sector and forced labor in the shrimp supply chain, Open Food Chain (OFC) proposes practical recommendations centered around the implementation of blockchain technology. OFC plans to establish a connected supply chain network with third-party verification, ensuring complete traceability of products. By incorporating DNA devices and third-party verification, the authenticity of products can be validated through random testing at the final point of sale, providing an additional layer of protection against mislabeling and adulteration in the olive oil sector. Moreover, OFC aims to combat forced labor by identifying key indicators within the shrimp supply chain. Collaboration across the industry, including governments, businesses, and advocacy groups, is essential to establish and enforce standards, enhance transparency, and ensure accountability throughout the supply chain. Consumer education plays a crucial role in promoting awareness about the significance of traceability and transparency, empowering consumers to make informed and ethical purchasing decisions. Additionally, advocating for stronger government regulations and enforcement mechanisms, as well as implementing continuous monitoring and audits, will contribute to an ethical and sustainable global food system. The connected blockchain supply chain proposed by OFC is poised to foster transparency, accountability, and consumer trust, addressing specific challenges in the olive oil and shrimp industries.

Further Information

Further readings

https://edepot.wur.nl/426747

Videos

https://www.youtube.com/watch?v=sBJprjwBpZM

Weblinks

https://openfoodchain.com

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How to Streamline Supplier Assessment & Evaluation with the Application of an AI Solution

Author: Dimitris Alexopoulos
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Problem

When a food safety incident unfolds, and food manufacturers are faced with the economic and reputational impact of such events, they have to look inward to their processes. Central to these are the systems, processes, and protocols in place for assessing the food company's suppliers.
However, keeping track of numerous suppliers from around the world can be a mountainous and extremely time-consuming task that can leave companies scrambling to keep up, and exposed to unforeseen risks. When it comes to assessing and evaluating their suppliers, food manufacturers are bogged down by the sheer amount of data kept in numerous spreadsheets from disparate sources which is difficult to combine and correlate. Add to that the requirement to track and trace the safety and quality of the history of each supplier globally (traceability) which makes the often manual process quite complex.

Solution

Boosting Supplier Assessment and Evaluation with AI

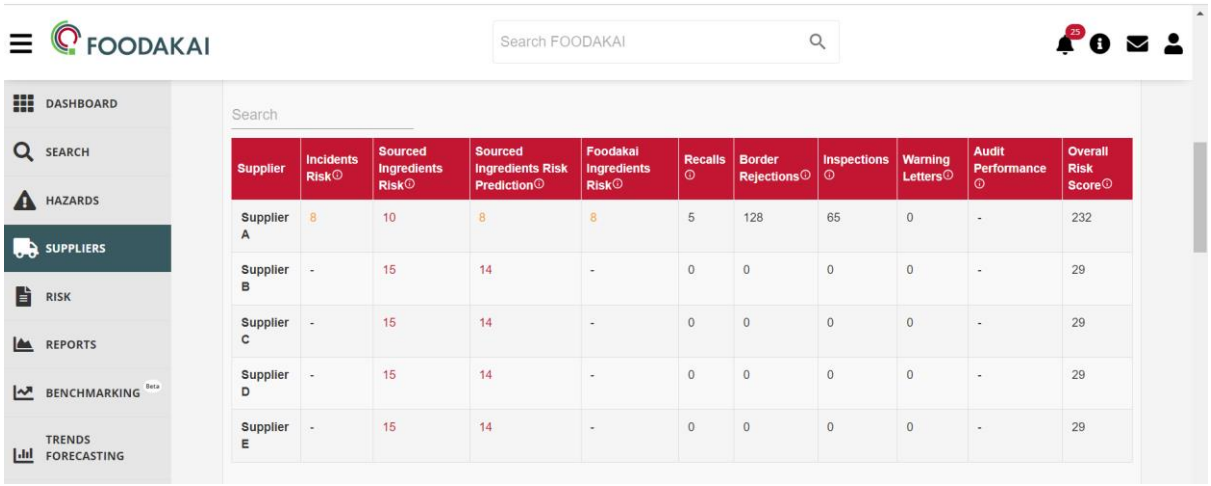
The applications of AI have been previously discussed when it comes to food safety. But how can AI help food manufacturers continuously monitor the food safety performance of all their suppliers to avoid food safety incidents?
FOODAKAI's AI-powered platform enables food and beverage companies to:

- Streamline Supplier Food Safety Assessment & Evaluation
- Discover Vulnerable Food Products & High-Risk Geographic Origin of Ingredients
- Identify Emerging Risks, Formulate Mitigation Strategy & Enhance Sustainability

Benefits

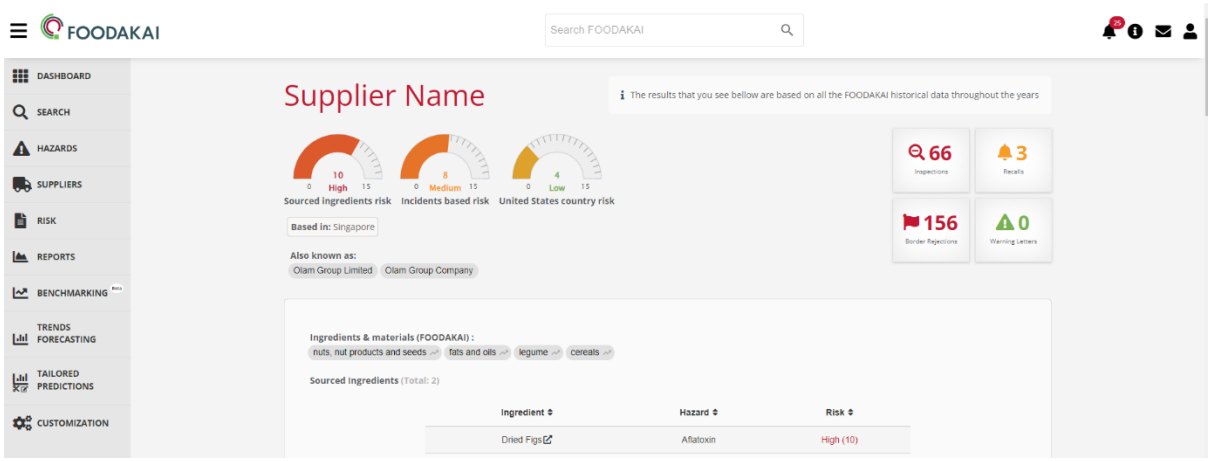
Supplier Food Safety Performance Assessment & Evaluation

Food manufacturers can discover the food safety risk performance and risk score of every single supplier in their supply chain based on the number of incidents they have been involved in, their sourced ingredients, and the country of origin of the supplier. Additionally, with detailed information on the risk performance of supplier's food companies can critically enhance their risk assessment and evaluation processes.



Discover Vulnerable Food Products & High-Risk Geographic Origin of Ingredients

Through Trend Forecasts, food manufacturers can investigate forecasted safety trends in geographical areas of interest for their key ingredients or finished products in correlation to their suppliers. Furthermore, they can have an overview of the countries that are expected to have increased risk for incidents.



Identify Emerging Risks, Formulate Mitigation Strategy & Enhance Sustainability

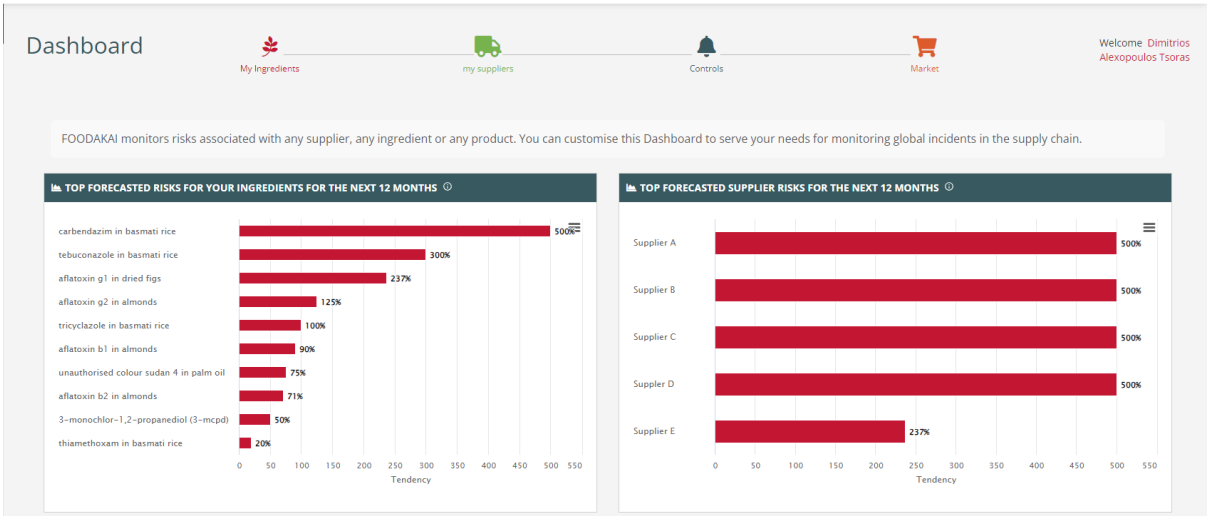
Food companies gain expanded knowledge on what risks and hazards might impact their supply chain so they will be able to take proactive steps to mitigate future risk and safeguard their products to avoid food safety incidents to protect public health by providing consumers with safe food.

Practical recommendations

Enhanced Supplier Risk Assessment & Evaluation

Utilizing FOODAKAI's AI-powered platform, food manufacturers can discover the food safety risk performance and risk score of every single supplier in their supply chain based on the number of incidents they have been involved in, their sourced ingredients, and the country of origin of the supplier.

Additionally, with detailed information on the risk performance of suppliers, food companies can critically enhance their risk assessment and evaluation processes of not only new but also existing suppliers in their supply chain.



Pinpoint Vulnerable Food Products & High-Risk Areas

Through the platform's Suppliers Dashboards, Supplier Profile and Trend Forecasts offerings, food manufacturers can investigate forecasted safety trends in geographical areas of interest for their key ingredients or finished products in correlation to their suppliers.

Furthermore, they can have an overview of the countries that are expected to have increased risk for incidents for their key ingredients which are sourced there or the suppliers that are located in the area. With this data then, risk managers can have an extended overview of potential risk for their existing or new suppliers, evaluate them and take preventive measures.

Know the risks and formulate Mitigation Strategies

Food manufacturers, by accessing the platform's Suppliers Dashboards and Trend Forecasts on top hazards for suppliers that are expected to be on the increase for your key sourced ingredients, can identify early weaknesses and emerging risks in their supply chain. Having and clear view of where risk lies regarding unforeseen risk and their suppliers, they can take proactive steps to mitigate future risk, by creating a comprehensive sampling strategy.

Further Information

https://www.foodakai.com/about/

Weblinks

https://www.foodakai.com/how-to-elevate-supplier-risk-assessment-with-ai/

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How to use DSS to reduce agronomic input and track data

Author: Sofia Maria Lilli

AGRICOLUS

Problem

Nowadays agriculture has to face an increasing number of challenges. One of the most important needs is to move towards more sustainable systems that make more efficient use of available resources and prevent the unnecessary use of external input. Facing these challenges requires complex decision-making processes in which all data can be tracked and used for improving production process management. Moreover, consumers demand healthy and sustainable food, and they want to be able to make informed decisions about the food they purchase.

Solution

4.0 technologies have opened new possibilities for agriculture sustainability.

With the use of a Decision Support System such as Agricolus Platform, it is possible to geolocate the field and visualize data from weather stations. It provides vegetation indices processed from satellite images and forecast models for phenology, irrigation, fertilization, and pests and diseases. The collection of data allows farmers to be driven in their decisions by this data. The platform (based on the data collected from sensors and farmers' inputs) gives different advice to farmers who can make rational decisions. The data collected with this tool can be tracked for the entire supply chain to control the production process.

Benefits

Using a DSS lets farmers make decisions based on the real needs of the crops and their interactions with the environment, which helps them save resources like water, treatments, and fertilisers, prevent the overuse or unnecessary application, and foresee the onset of certain diseases or the attack of pests. The advantages for the farmer are therefore both quantitative and qualitative: on the one hand, producers can save on inputs while also increasing production and yield, and on the other hand, they may produce goods that are of higher quality. Therefore, Agricolus DSS enables the production process to be oriented towards the demand for healthy and sustainable food.

Practical recommendations

The use of Agricolus DSS enables the reduction of inputs and the increase of input efficiency while improving sustainability and, at the same, it allows useful data to be tracked for the entire supply chain. Achieving these goals requires:

- Draw fields directly on the map and enter all the information about the field.
- register and consult your crop planning to plan the next season efficiently.
- Consult professional weather forecasts and connect a weather station to get geolocated data in real-time;
- consult vegetation indexes processed from satellite images to monitor the crop and based on this data, create prescription maps to customize the optimal nitrogen doses for each field, import them into machinery for variable rate fertilization.
- consult forecasting models to assess phenological stage, irrigation and nutritional requirements and the occurrence of pests and diseases to take timely action.
- choose when to carry out treatments and then drive decisions based on the data collected.
- do crop scouting to monitor the presence of diseases, insects, and damage in the fields;
- register all crop operations, and machinery, and organize activities in the fields with co-workers;
- create and modify the lots and track data to create the product history.

Further Information

Further readings

https://www.agricolus.com/en/blog/

Videos

https://www.youtube.com/watch?v=6_ZOFydADZQ

Weblinks

https://www.agricolus.com/en/

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A B2B digital marketplace where fair food trade is made easy, fast and transparent

Authors Filipe Núncio and Tiago Pessoa
Affiliation Agri MP (Agri Marketplace)

Problem

Agri Marketplace has tackled two main problems in the farmers and agroindustry:

1. Farmers have difficulties to access buyers worldwide, hence reduced sales or lower prices, and
2. Food processing industries have limited access to farmers, in an excessively intermediated supply chain, hence limited suppliers' choice, shortages of specific supplies, and lack of traceability.

Solution

A B2B digital marketplace to address these two main issues, and trade food crops in an easy, fast, and transparent way.

- In the traditional business model, when farmers and cooperatives sell to the agro-industry, they must go through a series of steps, namely: find the buyer, negotiate the contract, sign an agreement, send samples, manage logistics, quality inspection and receive their payment.
- Agri Marketplace has created a cloud software platform that manages these processes digitally.

How?

- The Agri Marketplace solution handles digital sample management, negotiation, and contract formalization (electronic signing), and can provide services like strategic sourcing, logistics, quality inspections, and secure payments.

Benefits

- A user-friendly platform that generates market opportunity for farmers and industry buyers.
- Unlimited access to a global market from anywhere, at any time.
- Transparent and reliable market information, deal creation, and negotiation.
- Integrated and secure platform payment processes.
- Tailored product quality verification and logistic services.
- A market with only verified buyers and sellers.
- Customer support and insight.

Practical recommendations

- Encourage users to become familiar with the platform's features (e.g. digital contract signing, sample management, and negotiation tools).
- Engage only with verified buyers and sellers on the platform to ensure credibility and reduce risks associated with unverified transactions.
- Stay updated with any new features or services introduced on the platform.

Further Information

Videos

Explanation complete video: https://youtu.be/7XBd36XQtaY

Institucional Video: https://youtu.be/gxVRDtNyhXw

Weblinks

www.agrimp.com

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Precision tools for time-efficient operations and food waste reduction

Georgi Macaron
Affiliation: Consentio

Problem

Time inefficiencies and the pressing concern of food waste significantly impact the profitability and sustainability of the fresh produce sector. It is crucial to highlight that a portion of food losses is also due to human errors and disputes between clients/suppliers (attributed as "pressing"). The need for rapid order handling and digitalization of this sector helps the challenges, emphasizing on the urgency for effective solutions.

Solution

Consentio's innovative digital tools empower businesses by providing a comprehensive solution to optimize productivity and reduce food waste. Addressing the time-sensitive nature of fresh produce, our tools are tailored to alleviate time-related pressures, allowing clients to navigate the unique challenges they face.

Benefits

Enhanced Productivity: Consentio's tools streamline tasks, ensuring optimal time utilization crucial for the time-sensitive nature of fresh produce. This includes simplifying specific tasks such as order reading with Magic Orders and real-time margin calculation with Turbo Margins.

Reduced Waste: A dual impact on waste, Consentio's tools aid in prioritizing and managing time effectively, minimizing the likelihood of errors, and directly contributing to a reduction in food waste. This is a paramount concern in a business where time is a formidable adversary.

Stress Reduction: Consentio's structured time management tools alleviate stress associated with time pressures and operational inefficiencies. We deploy artificial intelligence to assist daily operations, exemplified by the Intelligence Assistant, which provides real-time alerts to watch orders. Therefore, fostering a more composed environment for handling time-sensitive tasks in a seamless and not complex way.

Integration: Consentio's tools seamlessly incorporate sustainable practices and time-efficient fresh produce operations. Featuring effective order management, record-keeping, and transaction updates, our platform enhances communication with customers, optimizing sales strategies. Moreover, it automates order imports from/to users' ERPs, streamlining operations for increased efficiency.

All-in-One Commerce Solution: Serving as the comprehensive platform for all fruit and vegetable trading needs, Consentio centralizes every aspect of the produce trade into an easy-to-use interface. Adaptable to various requirements, the platform keeps users connected with clients anytime, anywhere, and on any device, seamlessly managing all commercial transactions.

Practical recommendations

Intuitive Tools: Utilize Consentio's intuitive tools, including the chat system, workspaces, and the Consentio University. This comprehensive approach offers insights into operational efficiency, creating transparency, and fostering waste reduction awareness and time-saving.

Strategic Task Management for Time Efficiency: Leverage Consentio's versatile platform to categorize tasks, strategically prioritizing activities based on urgency and importance. Access more data through the platform to enhance waste reduction awareness and optimize time usage.

Smart Goal Breakdown: Within Consentio's ecosystem, break down larger objectives into achievable tasks. The platform's features, including the chat system, workspaces, and other personalizations contribute to stress reduction and error-free task completion (as order processes are digitalized), impacting waste reduction efforts.

Continuous Operational Enhancement: Regularly review and adapt operational strategies within Consentio's dynamic environment. The platform's tools, combined with the Consentio University, ensure ongoing improvement, promoting overall efficiency, creating awareness in waste, and fostering continuous improvement throughout the supply chain.

Further Information

Further readings

In the fast-paced world of fresh produce, effective time management is critical, particularly given the unique challenges posed by the perishable nature of products. This practice abstract delves into a targeted suite of tools by Consentio, crafted not only to optimize productivity but also to play a pivotal role in reducing food waste—an even more pressing concern in the realm of fresh produce, where time is a significant obstacle due to the limited shelf life of goods.

Weblinks

https://www.consentio.co/

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Strategic Integration of Digitalisation and Value Chain Analysis in the Seafood Industry

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Overview

The seafood industry is a dynamic and complex sector that spans the globe. It is facing significant challenges that require urgent attention. One of the biggest challenges is related to transparency, as it is often difficult to trace the origin of seafood products from catch to consumer. Regulatory compliance is another issue that the industry must contend with. The European Union has made it clear that social, environmental, and supply chain control issues must be addressed to ensure sustainability and accountability. To meet these challenges, the industry needs a strategic response that encompasses the adoption of digital technologies like blockchain and the analysis of value chains. By doing so, the industry can ensure that it meets international standards and market expectations while also promoting transparency and accountability.

Problem

The industry faces challenges related to slow and unreliable information exchange due to outdated data handling methods, which can result in traceability and accuracy issues. In addition, the need for transparency in sustainability and ethical practices, coupled with complex international regulations, poses a multifaceted challenge. The intricate supply chains involving diverse actors and complex logistics, particularly in aquaculture, further complicate these issues.

Solution

Implementing digital solutions, such as blockchain, and standardising information formats in line with the Global Dialogue on Seafood Traceability (GDST) guidelines are crucial steps. These steps should be preceded by in-depth value chain analyses to understand and document each stage of the supply chain. This sequential approach ensures that the digital technologies and standardised data formats are effectively tailored to the unique complexities of the seafood industry.

Benefits

- Enhanced traceability and transparency, building consumer trust and meeting regulatory demands.
- Streamlined compliance with diverse international legislations, simplifying administrative tasks.
- Increased operational efficiency through improved data management and decision-making processes.
- Access to new market segments focused on sustainable and ethical practices.
- Improved understanding of supply chain complexities, leading to better sustainability and economic viability.

- Strengthened industry reputation and market access through adherence to international standards.

Practical recommendations

- Conduct regular value chain analyses to guide the integration of digital technologies and to adapt to global market changes.
- Invest in and adopt blockchain and other digital solutions for more efficient information exchange.
- Implement the GDST standardised information format for consistent and uniform compliance.
- Train industry personnel in digital tools, GDST standards, and value chain dynamics for effective application.
- Establish collaborations with technology experts, regulatory bodies, and other industry partners to ensure alignment with the latest digital and regulatory developments.
- Educate stakeholders, including consumers, about the importance of digitalisation, transparency, social requirements, and sustainability in the seafood sector.
- Foster partnerships for technology transfer and capacity building between various scale actors within the industry.

Further Information

Further readings

Improved traceability in seafood supply chains is achievable by minimizing vulnerable nodes in processing and distribution networks C.R. Hopkins, S.I. Roberts, A.J. Caveen, C. Graham, N.M. Burns - https://www.sciencedirect.com/science/article/pii/S0308597X23004438

FAO – "Selecting value chains for sustainable food value chain development: Guidelines" De Walker, C., DeMatteis, L., Lienert, A. - https://www.fao.org/3/cb7623en/cb7623en.pdf

FAO - Guidance document: Advancing end-to-end traceability - https://www.fao.org/3/cc5484en/cc5484en.pdf

EUMOFA TALK (Webinar) "Digitalisation of the fisheries sector and full traceability of fishery and aquaculture products: achievements and remaining challenges" https://youtu.be/YHAB9P3xens?si=KJIZqnkXhWOSI_Qv

GDST Website - https://traceability-dialogue.org

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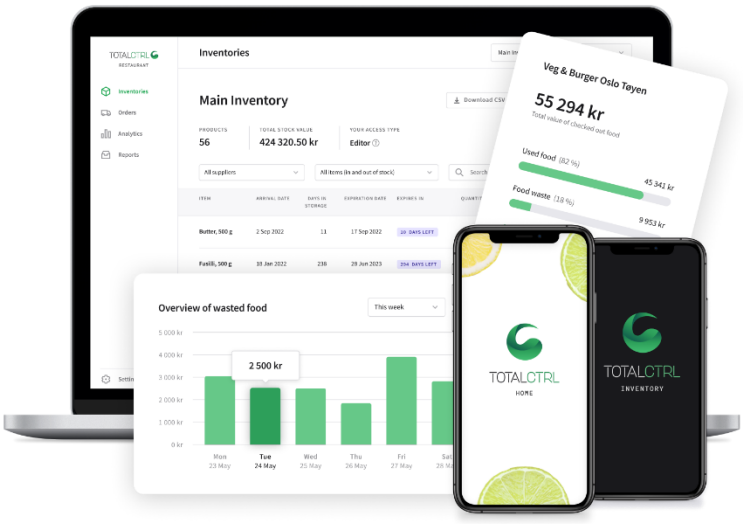
Innovative Food Inventory Management for Reducing Waste and Enhancing Sustainability

Problem

A significant challenge within the food industry and retail sector is the management of perishable goods to minimize waste and optimize shelf life. Traditional inventory systems often fail to accurately predict demand, leading to overstocking and, subsequently, increased food waste. This not only has a direct economic impact on businesses but also contributes significantly to environmental degradation. Effective management of food inventory is crucial for sustainability, reducing waste, and ensuring the efficient use of resources.

Solution



TotalCtrl introduces a revolutionary food inventory management system designed to tackle the issue of food waste through the utilization of advanced data analytics and real-time tracking. The platform enables businesses to achieve precise control over their food inventory, significantly reducing waste by optimizing stock levels and improving the accuracy of demand forecasting. By integrating with existing supply chain systems, TotalCtrl provides actionable insights that allow for the timely redistribution of surplus food, extending its shelf life and reducing the environmental impact.

Benefits

- Enhance inventory accuracy and reduce food waste through real-time tracking and predictive analytics.
- Contribute to environmental sustainability by minimizing the carbon footprint associated with food waste.
- Improve economic viability by optimizing purchasing decisions and reducing unnecessary expenditure on surplus stock.

Proven results

- 35% reduction in food waste after one month of using the solution.
- 80% time-reduction on managing inventory in operations.

Practical recommendations

Implementing TotalCtrl's food inventory management system can significantly contribute to the sustainability of food chains by optimizing inventory levels, reducing waste, and supporting efficient resource use. Businesses can leverage the platform to not only achieve economic benefits but also to fulfill their social and environmental responsibilities. TotalCtrl offers a scalable solution suitable for businesses within the hospitality sector looking to enhance their operational efficiency and sustainability practices.

Further Information

For more insights into how TotalCtrl is revolutionizing food inventory management and contributing to sustainability, visit the TotalCtrl website and explore case studies demonstrating the impact of the platform on businesses and the environment.

Videos

E-learning course: Food waste & sustainability course

Introduction video: An introduction to TotalCtrl

Weblinks

www.TotalCtrl.com

TotalCtrl's YouTube Channel

About this practice abstract and TITAN

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QualityChain – Revolutionizing Traceability for SMEs

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Problem

In the agri-food sector, the assurance of product authenticity, safety, and sustainability is paramount. However, small and medium-sized enterprises (SMEs) face formidable obstacles in achieving a high degree of transparency within their supply chains due to financial constraints, technical complexities, and regulatory burdens. These challenges are particularly pronounced when it comes to products that are sensitive to quality variations and require strict control, such as olive oil, wine, and wheat. The lack of a reliable and accessible traceability system impedes SMEs from verifying the origin and handling of their products, which is crucial not only for consumer trust but also for adhering to stringent food safety standards.

Solution

QualityChain addresses these issues by offering a cutting-edge traceability system that employs blockchain technology as its backbone. This solution is tailored to meet the demands of SMEs, providing a cost-efficient, standalone platform that does not necessitate extensive IT infrastructure or expertise. The system offers a user-centric interface that simplifies the complex processes of tracking, recording, and verifying product data across the entire supply chain. By creating an immutable and transparent record of all transactions and product movements, QualityChain ensures the authenticity and integrity of the data, which is critical in a market that is increasingly driven by the need for transparency and ethical business practices.

Benefits

The benefits of implementing QualityChain are multifaceted. Firstly, it enhances the traceability of food products, enabling consumers to track the journey of their purchased goods from origin to point of sale. This transparency fosters consumer trust and loyalty, as they can verify the authenticity and quality of the products they consume. For producers and distributors, the system offers a way to demonstrate compliance with regulatory requirements, potentially reducing the risk and costs associated with product recalls and reputational damage. Furthermore, this increased level of detail in product information allows SMEs to differentiate their products in the marketplace, often enabling them to command a higher price for goods that are proven to be of superior quality or sustainably sourced. Making a recap:

- Enhanced transparency of the supply chain, reinforcing consumer trust.
- Immutable record of product history, reducing the risk of fraud.
- Streamlined compliance with regulatory standards.

- Empowerment of producers to share detailed product narratives with consumers, enriching the consumer experience and potentially commanding premium pricing.

Practical recommendations

For successful implementation, SMEs should conduct a thorough assessment of their current supply chain operations and identify specific areas where blockchain traceability could bring the most benefit. Engaging with QualityChain experts can help tailor the system to their particular needs. Staff training is crucial to ensure that all users are comfortable with the new system and understand its capabilities. Moreover, SMEs should plan for ongoing support and system updates to keep pace with the evolving landscape of supply chain management and technology.

Environmental Impact

Beyond the operational advantages, QualityChain's system contributes significantly to environmental sustainability. It promotes accountability and encourages best practices in agricultural production and distribution. By enabling more accurate tracking of products, the system helps in reducing waste and improving the efficiency of resource use. It also allows for the optimization of logistics, leading to a reduction in carbon emissions associated with transportation. The traceability system can support SMEs in demonstrating their commitment to environmental stewardship, which is not only ethically sound but also aligns with the growing consumer demand for environmentally responsible products.

Weblinks

qualitychain.ch

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Harnessing Digital Tools to Combat Childhood Obesity: Nutritional Chatbot

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Iotic Solutions, S.L. (AI Talentum)

Problem

Childhood obesity presents a global multifaceted challenge, since causes impact on health and well-being of children: however, some diseases like cardiovascular ones, diabetes, musculoskeletal disorders, and specific cancers, might not be manifested until adulthood. Yet, childhood obesity remains preventable.

Solution

Digital tools, including mobile applications, gamification techniques, and online platforms, have emerged as innovative solutions to engage and educate children in adopting healthier behaviours. Based on that, an AI-based nutritional chatbot aimed to children aged 10-12 years is being developed. The chatbot will contribute to providing educational content of interest and trustable information regarding food system with topics related to food nutrition, food science and food sustainability. For that, the digital tool is being created using a friendly and funny conversational style, with bits of humour and adapted to the cognitive stage of this age range.

Benefits

1. Education and guidance: Providing accurate, age-appropriate nutritional and sustainability information conversationally.
2. Behavioral reinforcement: Regular interactions to reinforce positive attitude, encouraging healthier and sustainable choices.
3. Continuous support: Offering guidance, meal reminders and consistent assistance in cultivating healthier habits.
4. Accessibility and affordability: Easily accessible via smartphones or computers, ensuring cost-effectiveness and wide availability.
5. Empowerment and autonomy: Encouraging children's autonomy in food choices fosters their active participation in keeping a good health.

Practical recommendations

Creating an effective nutritional chatbot for children necessitates a strategic approach to deliver accurate information, engage users effectively and promote healthy habits. Practical recommendations include:

1. Collaboration with experts: Partner with nutritionists, dietitians, pediatricians, and psychologists for evidence-based and accurate content aligned with childhood nutrition.

2. User-centric design: Prioritize an intuitive, conversational, and engaging design, especially for children.
3. Personalization and learning: Continuously refine suggestions through user interactions and machine learning.
4. Comprehensive database: Develop a robust repository of information and behavioural tips.
5. Interactive elements: Incorporate quizzes or challenges for engaging learning experiences.
6. Privacy measures: Adhere strictly to data privacy regulations, especially concerning children's information.
7. Accessibility and multilingualism: Ensure accessibility across diverse devices, platforms, and cultures.
8. Continuous improvement: Regularly gathering user feedback for updates aligned with the latest guidelines and preferences.
9. Educational resources: Provide supplemental links to reputable sources for extended learning.

Further Information

Videos

The first TITAN project video – TITAN Project

Weblinks

Pilots for health – TITAN Project

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