PROFILEPRINT

Breaking new ground in food quality assessment: ProfilePrint's AI-powered solutions for the food industry

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Industry challenges in market pressures

Today's traders and food manufacturers face mounting pressures from multiple directions. Supply chain vulnerabilities, from natural disasters to geopolitical tensions, directly impact production continuity and costs. Key ingredients, like coffee, cocoa, and dairy, have seen dramatic price increases while inflation continues to drive up operational costs. New regulations like the European Deforestation Regulation (EUDR) add further compliance considerations. These challenges demand more resilient operations and innovative approaches to cost management.

The need for innovation

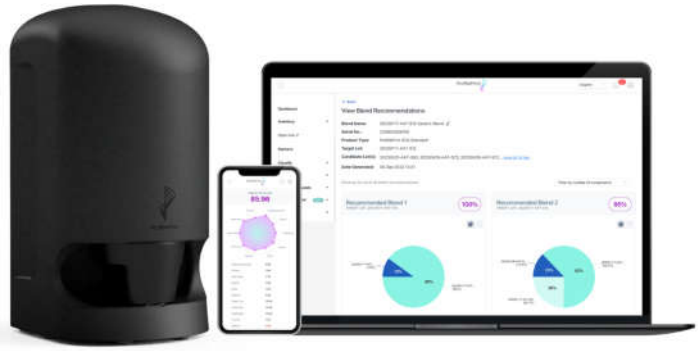
Traditional quality assessment methods are becoming bottlenecks in modern operations. Conventional evaluation techniques, like cupping in the coffee sector, are often slow and labour-intensive.

Additionally, the subjective nature of manual sensory evaluations, which lack objective data, can result in inconsistencies and errors. While lab testing and analytical tools offer precision, they tend to be costly and resource-heavy, and their data often fails to capture the subjective nuances essential for driving effective business strategies.

Improved food quality assessment processes are essential for navigating these challenging times. A system that facilitates swift quality assessment, along with data-driven insights, enables food companies to make well-informed choices about sourcing and ingredient blending, ultimately leading to cost reduction and better resource usage.

Based in Singapore with a global footprint, ProfilePrint, an Identity-as-a-Service (IDaaS) technology company, is modernising the food industry's approach to ingredient analysis using its patented digital fingerprint technology. Combining a sensor-based analyser and a cloud-based artificial intelligence (AI) platform, ProfilePrint captures unique digital fingerprints of ingredients, unlocking a wealth of data that transcends traditional quality assessments.

This versatile information, processed through ProfilePrint's AI-driven platform, enables a multitude of applications within the food industry, from aligning quality standards between diverse stakeholders and efficiently sourcing alternatives to rapidly predicting quality in food quality control and streamlining product development. In an increasingly complex environment, ProfilePrint aims to empower food businesses to make informed decisions and maintain competitiveness in a dynamic market.



ProfilePrint's Version 5.0 Analyser, "Orca", and AI platform

ProfilePrint's latest breakthrough: "Fingerprints" to "Palmprints"

ProfilePrint's sensor-based analyser employs NIR spectroscopy, a technique well-established within the food industry. However, its unique integration of spectroscopy with easy-to-use AI tools on its Ingredient Quality Platform provides a distinct advantage, facilitating a more comprehensive analysis of food ingredients that can be used by anyone regardless of technical abilities.

ProfilePrint's fifth-generation analyser, "Orca", represents a breakthrough for the food industry. By extending its wavelength range to 1700nm, twice that of its predecessor, Orca captures significantly more data, moving from "fingerprints" to "palmprints." This richer dataset empowers ProfilePrint's AI to provide deeper analysis and opens the door for evaluating complex food ingredients, including roasted coffee, modified starches, non-dairy creamers, and others.

In a demonstration of Orca's analytical power, ProfilePrint quantified the Arabica percentage in roasted and ground coffee blends. The NIR-II wavelength range (1100-1700nm) proved superior to the previous VISNIR range (400-1100nm), yielding an AI model with less than five percent mean absolute error.

Furthermore, the model exhibited robust performance across a diverse dataset of roasted Arabica and Robusta coffees, encompassing various origins and processing methods. While this study compared NIR-II and VISNIR, Orca's true strength lies in its versatility. It can "mix and match" wavelengths across its broad range to optimise models tailored to specific applications.

Orca's application on roasted and ground coffee beans

Orca has demonstrated its potential in enhancing food quality assessment, offering substantial gains in speed and efficiency. A prime example is its successful application in analysing commercial ketchup.

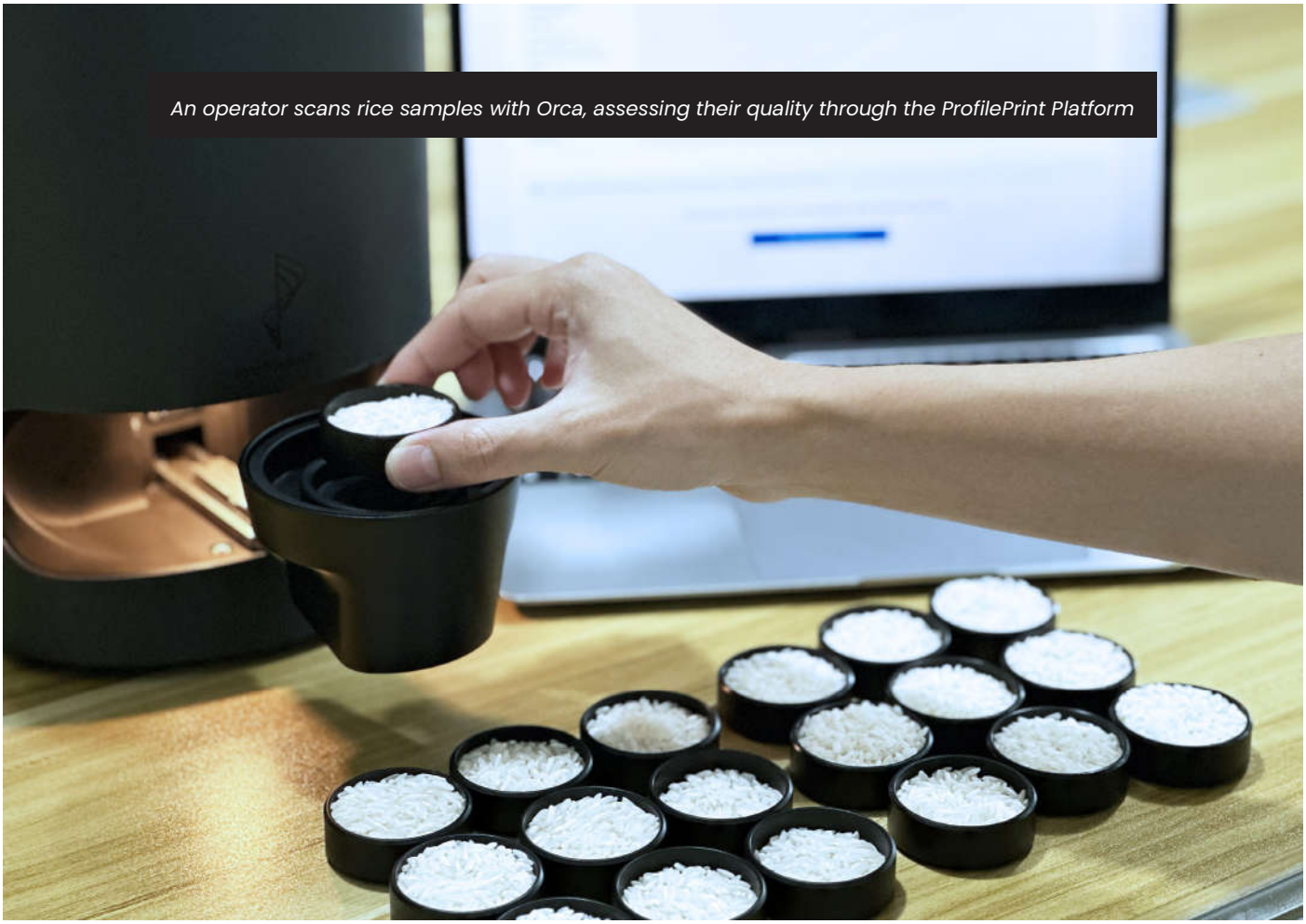
Orca can rapidly and non-destructively scan ketchup samples, generating data used to build predictive models for key quality parameters. These models can predict characteristics such as carbohydrate content, consistency (viscosity), and shelf life (days to expiry).

Furthermore, Orca's measurements have proven more consistent than traditional manual methods, such as using consistometers for rheological measurements. Such consistency, combined with its ability to analyse multiple parameters simultaneously, positions Orca for broader applications beyond standard quality control.

The speed of analysis is also remarkable: each scan takes only 10 seconds, and with AI-powered predictions, a complete sample analysis takes just a few minutes. This allows for substantial time saving when used as a rapid screening tool compared to traditional, often laborious, quality assessment procedures.

Future development plans include expanding Orca's analytical capabilities to encompass complex food ingredients like sauces, as well as specialised food and nutraceutical ingredients such as gelatin and collagen.

Orca's potential ingredient applications



An operator scans rice samples with Orca, assessing their quality through the ProfilePrint Platform

Enhancing manufacturing efficiency and cost control

ProfilePrint's technology represents a significant advancement in food quality assessment, offering comprehensive benefits across the entire supply chain. The solution streamlines quality control processes by providing rapid, objective analysis that complements traditional evaluation methods. Instead of relying solely on time-consuming manual evaluations by sensory panels, ProfilePrint acts as a rapid screening tool, significantly boosting productivity.

By leveraging AI-powered models, ProfilePrint provides deeper insights into key ingredient quality parameters. The process is simple: operators use ProfilePrint's analysers to scan ingredients and generate predictions. This method is quick, minimally disruptive to the sample, and easy to execute within minutes.

While ProfilePrint provides valuable data and predictions, human expertise remains crucial. Food quality controllers retain final decision-making power and can focus their attention on ingredients requiring further investigation beyond the AI's initial assessment.

Besides the immediate benefits of quality assessment, ProfilePrint's AI capabilities support organisations' sourcing strategies, which is particularly crucial in today's volatile global supply chain.

During supply chain disruptions or price volatility, the solution can quickly evaluate and recommend alternative ingredients, providing objective data to support sourcing decisions. This allows buyers to explore alternative, lower-cost ingredient sources.

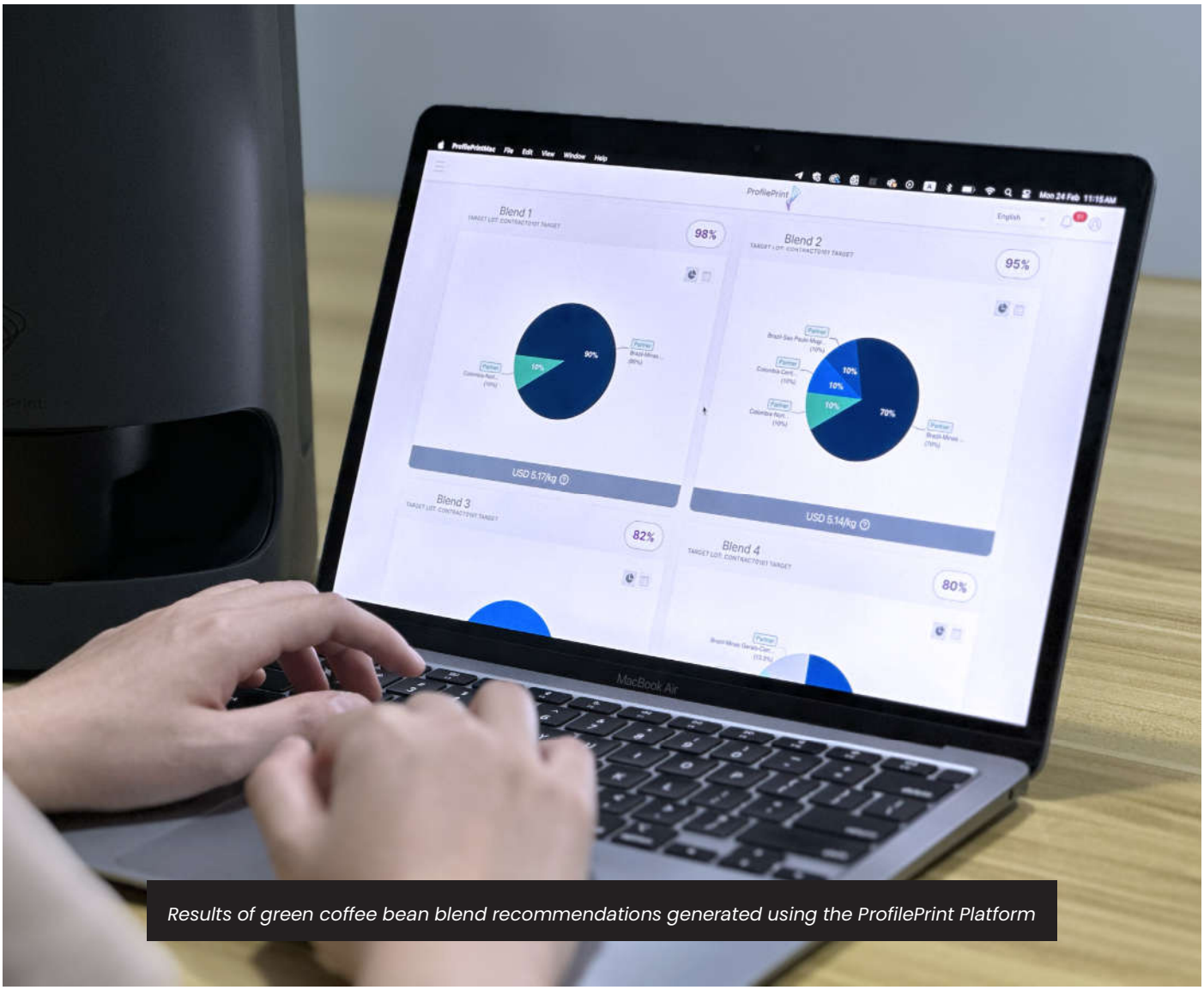
Furthermore, ProfilePrint's solutions accelerate blend development for single-ingredient products by providing AI-powered blend recommendations. Leveraging the unique digital fingerprint of each ingredient, the system analyzes existing inventory and costs to suggest optimal blends that match a desired target. This significantly reduces product development time and enables experts to quickly identify and utilise substitute components, mitigating supply chain disruptions and maximising value.

Shaping the future of food quality assessment to buy, manufacture, and sell better

ProfilePrint's technology marks a fundamental shift in how the food industry approaches quality control, sourcing, and even product development. By providing objective, data-driven insights, the technology enables organisations to make more informed decisions while improving operational efficiency. Its ability to deliver rapid, accurate analysis while reducing costs positions it as a crucial tool for organisations navigating today's challenging market environment.

The technology's impact extends beyond individual organisations to enhance efficiency across the entire supply chain. By establishing a common, quantitative language for quality assessment, ProfilePrint facilitates clearer communication between buyers and sellers. Suppliers can definitively demonstrate their products' quality characteristics, while buyers can quickly verify these claims, leading to more efficient transactions and stronger business relationships.

As the food industry evolves, ProfilePrint's commitment to innovation ensures its technology will continue to address emerging challenges. The recent introduction of the Orca analyser, with its extended wavelength capabilities, demonstrates this commitment to advancing quality assessment technology. These ongoing developments promise to deliver even greater value to organisations throughout the food supply chain, supporting their efforts to maintain quality while optimising operations in an increasingly complex market environment.



Results of green coffee bean blend recommendations generated using the ProfilePrint Platform