Enhancing Food Quality and Safety Testing Programs with Computer Vision and iVeris®

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Ensuring the quality and safety of food and their ingredients requires a significant amount of testing using multiple methods. Traditional methods include morphological, microscopic, chemical, microbiological, genetic, and other analytical technologies such as NIR, FTIR, and HPTLC. Each of these methods requires trained experts, a laboratory and in all but morphological require expensive equipment, chemicals, and typically take hours to days to perform.

The time, expense, and expertise required to do thorough food quality and safety testing leads to many foods and ingredients being inadequately tested or not tested at all. Food ingredients often include natural products such as herbs, spices, meat, and fish that may involve long and complex supply chains and geographic distance from the source to the manufacturer and ultimately a lab for testing. This leads to both accidental contamination and intentional adulteration and substitution, as well as natural degradation as time passes.

Technologies that can be deployed along a supply chain from the source to the lab are essential to ensure the food safety and quality. This would require fast, easy, and affordable solutions. The patented BriteScan® iVeris® testing device solves the problems of traditional testing by providing a scientifically valid solution that can be deployed anywhere and used by anyone. It works by simply pressing a button to take an image of the food or ingredient and is analyzed by the cloud-based Computer Vision software, with results viewable in real-time, anywhere in the world.

The iVeris takes testing out of the lab. But it can also be done in the lab in combination with traditional testing methods. It can easily substitute morphological methods performed by taxonomists by *immortalizing and infinitely scaling their expert knowledge.* Experts are required to develop the reference image databases that are used to train iVeris. That's where the labs come in. Reference materials of foods and ingredients that are tested using other independent methods that labs already have on hand can then easily be imaged and entered into the database. As images are added it becomes increasingly smart, reliable, and accurate. Over time it could be used to replace or augment a wide variety of tests- for attributes not typically tested using morphology such as freshness, chemical composition, and flavor- as they often co-occur with physical differences detectable by the Computer Vision software.

Contract testing labs or in-house labs have an opportunity to scale their testing logarithmically as they now have the ability to push their testing outwards- to the farmers, distributers, and importers. They can charge other parties for use of their databases, thus providing a passive income stream and reaching new customers they wouldn't otherwise be able to. These customers may then bring new business for other types of tests offered by contract labs. In-house labs at manufacturers could for the first time ever turn their lab into a profit center, with iVeris database use revenue offsetting their own testing costs or more.

The iVeris is poised to greatly disrupt and enhance the current food testing paradigm. Now there are no excuses to not do testing, no more skip lot testing, no more waiting around for samples to arrive at the lab or for a days-long procedure to finish. It puts the responsibility for testing at every point along the lifeline of a product. This will in turn greatly enhance the quality and safety of products in the long run.