



**BUREAU
VERITAS**

FOOD GENOMICS

Genomics studies the genes in an organism and their interrelationships in order to determine their combined self-influence. In food studies, genomics was originally used to identify a single ingredient, and has since evolved to identify multiple ingredients in one step.

COMBATING FOOD FRAUD

Food fraud involves the deliberate misrepresentation of food products for financial gain. It can include substitution with inferior ingredients, mixing additives to pass it off as a pure product, making false claims or misleading statements and mislabelling. It often misleads consumers into paying a higher price for inferior products and can sometimes lead to health risks.

Food fraud has become an emerging global issue, and genomics is shaping up to have a profound impact. Genomics can provide insights into food fraud using **Next Generation Sequencing (NGS)** technology, thereby assisting organizations with developing policies for food security.

GENOMICS TECHNOLOGY

The NGS platform reduces the time and cost of DNA sequencing, revolutionizing both the study and application of genomics and molecular biology. NGS-based tests have ultra-low detection limits, higher specificity and increased sensitivity, which provide accurate results from just a single test.

A single test reveals all potential threats by sequencing millions of genes in parallel, in the same operation. These sequences are matched with a known database to confirm their identities, and can be used to develop the database over time. There are two types of Next Generation Sequencing:

- **Targeted NGS or barcoding** – enables companies to carry out food ingredient identification, pathogen and allergen detection, and to strengthen food safety procedures.
- **Whole Genome Sequencing (WGS)** – uses a non-targeted technique where the whole genome of the sample is sequenced. The data generated provides information that can be used for epidemiological studies, movement of pathogens across the industry, to strengthen the supply chain management and to develop a robust food safety culture.



**BUREAU
VERITAS**

FOOD GENOMICS

HOW CAN BUREAU VERITAS HELP YOU?

You can work with us to decrease food fraud across North America by using genomics as a discovery tool and to ratify your food safety program. It can also be an effective tool for food traceability when integrated into supply chain management, to ensure that end consumers get what they paid for. Genomics further assists in creating sustainable agriculture, seafood farming and livestock management, having a greater impact on lowering the carbon footprint.



Food authentication is based on NGS and references a DNA sequence database to identify the ingredient in the sample. Our range of food authentication testing services includes food component detection, ingredient declaration, mislabelling detection and confirmation of cross-contamination.



Microbiome analysis provides a discovery tool that develops a fingerprint of the organisms being tested. With microbiome analysis, you can develop data to solve issues over sample abuse and contamination, as well as establish the shelf life of the sample. Food manufacturers can benefit from this analysis when developing new products, and food companies can use it to enhance the quality of existing products.



Pathogen typing generates information to address food safety challenges, such as pathogen contamination, using targeted NGS and WGS. This analysis allows you to identify pathogens and their distribution across a region, confirm outbreak strains, identify the source of contamination in a plant or processing unit, and understand the movement of the pathogen.

ABOUT US

Bureau Veritas is a North American provider of testing, auditing, certification and training services to the food and agriculture industries. Our work ensures the safety and quality of our customers' food from farm to fork, enabling them to meet regulatory compliance and sustainability objectives. Founded in 1828, Bureau Veritas is the global leader in testing, inspection and certification services with 78,000 employees in 1,500 locations worldwide.