

## **Analysis techniques**

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Because genetic modifications are carried out in the DNA, it is necessary to use analytical methods to detect these changes.

### **DNA-based**

Currently, the most widely used technique for this purpose is the Polymerase Chain Reaction (PCR), which allows the detection, identification and quantification of DNA sequences associated with Genetically Modified Organisms (GMOs) through the selective amplification of DNA segments present in a sample.

This technique allows detecting even the presence of a single DNA sequence in a sample, as it is highly sensitive and specific. All the methodologies used in the Molecular Analysis and New Technologies Department are previously validated to ensure the reliability of the results.

### **Protein-based**

The protein method uses antibodies specific to the protein of interest. The ELISA (*Enzyme-Linked Immuno Sorbent Assay*) technique detects or measures the amount of protein of interest in a sample. It uses an antibody to bind the specific protein, a second antibody to amplify the detection (optional phase) and an antibody conjugate with an enzyme, the product of which generates a color reaction, which is easy to observe and quantify by comparison with a standard curve of the protein of interest.

The ELISA technique is less sensitive than PCR and can only be used on samples that are not damaged by climatic conditions, since proteins denature easily.

Therefore, the result obtained by protein determination is only presumptive; a DNA test must be performed to confirm the result.

### **Whole Genome Sequencing**

Whole Genome Sequencing (WGS) allows characterization of bacteria of agrifood interest with a degree of resolution unsurpassed by any other methodology at the moment, while allowing comparisons with sequences from other laboratories anywhere in the world. This "universal language" character is particularly useful in the context of sanitary alerts associated with outbreaks, situations of great relevance for the commercialization of products from the Mexican countryside.