NANOSENSORS IN FOOD QUALITY CONTROL

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1 Objectives

To determinate if **nanosensors** could **be used in food quality control**, and also if they could improve the efficiency, sensibility and detection time of the analytics parameters of any quality control.

To describe possibles applications of nanosensors and the products that are currently available to own.

2 Nanosensor

A nanosensor is a biological, chemical, or physical device that share the same basic mechanism of action: **selective binding of an analyte**, signal generation from the **interaction of the nanosensor with the bioelement**, and **generation of a signal** that we will later process.

3 Applied research

Detection of pathogens: **Nanocantilever** for E. Coli. (Sozer N., et al 2009)

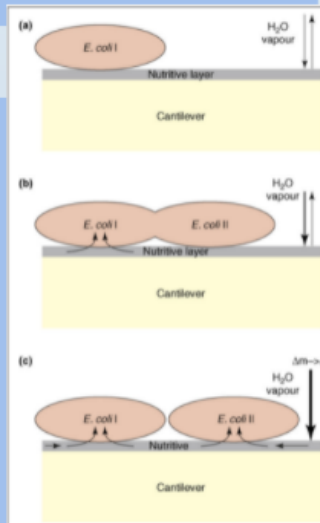Based on the detection of mass increase due to bacterial growth. Single UFC.

Detection of **Ochratoxin A** with gold nanoparticles. (Kanan P., et al 2020)

OTA absence
AuNP dimers-oligonucleotides
Solution color doesn't change.

OTA presence
AuNP dimers / oligonucleotides
Solution turns from blue to red.

Fraud detection: **Melamine** with gold nanoparticles. Colorimetry. Red turns to **blue.** (Su H., et al 2011)

AuNP-MPS + MPS-melamine → Complex that aggregates more **AuNP.**

Source: (Sozer N., et al 2009)

4 Applications

9453 nanoparticles products → 362 Food industry → 12 Food sensors

NANODETECT: UE project to develop nanosensors prototypes to detect:

- Listeria monocytogenes
- Fraud, drug, antibiotic
- Mycotoxins

Companies involved

Granja Rinya

AquaDx: portable device to detect toxics chemicals in potable water, available to purchase for any consumer.

Source: AQUADX – WATER QUALITY SENSOR

5 Conclusions

Nanosensors can be applied in food quality control, providing great benefits while carrying out these controls.

- **Shorter detection time** than current methods
- They **do not require** highly qualified personnel
- Can work in **real time**

If there are scientific evidences that nanosensors work, why isn't food industry currently using them?

Conventional analysis has given us **guarantees** that they work **properly and reliable**.

To make r**esearch agreements with industries,** and to bet on applied research.