

# “Assessment of chemical residues in animal-based food, a quality control approach”

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## Background:

Food safety is a major concern due to the presence of pesticide and antibiotic residues in animal-derived foods. These contaminants pose risks to human health, including toxicity and antimicrobial resistance. Therefore, Rapid and reliable detection methods are essential for ensuring food quality and consumer protection.

## Objective

To assess chemical residues (pesticides and antibiotics animal-derived food (honey, eggs, poultry) using nuclear-based techniques, combined with physicochemical and regulatory evaluation.

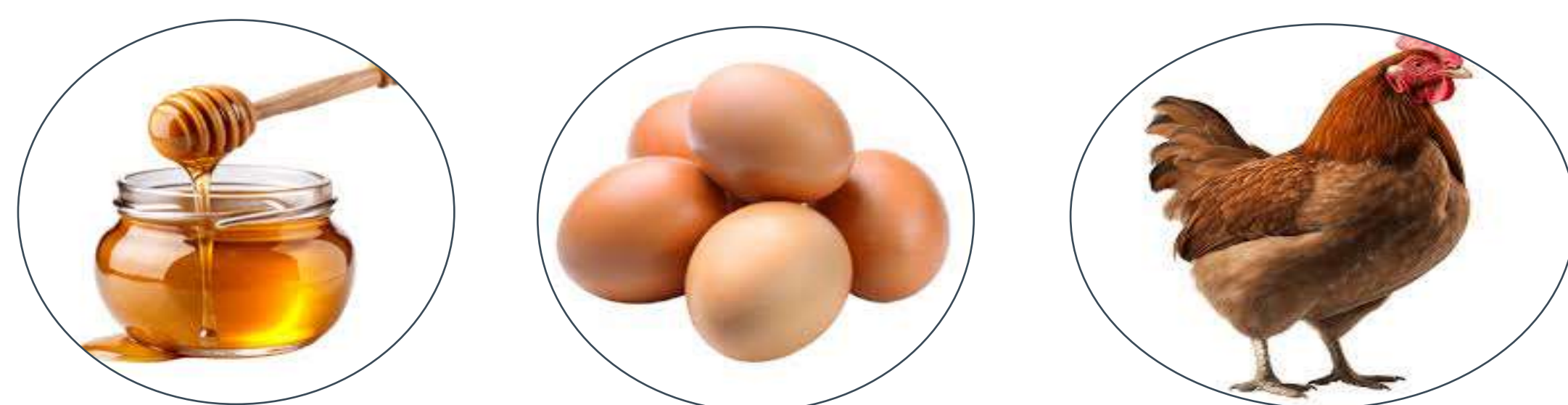
## Materials/Methods:

### Sampling:

52 Honey samples were collected from different departments of Algeria to ensure geographic representativeness. The samples were obtained from the Technical Institute for Livestock (ITELV) and beekeepers



### Samples:



## 1. Pesticide and antibiotic screening:

This study used a nuclear technique called radio receptor assay from charm II system. The analyses focused on the detection of antibiotic residues (Tetracyclines, Chloramphenicol) and pesticide residues, specifically organophosphates (OP) and carbamates (CM).



Figure: Radio Receptor Assay par Charm science INC

## 2. Physical and chemical analysis:

**Pfund Scale Analysis:** the color was determined on the Pfund scale (mm Pfund) by converting the absorbance values of the diluted honey samples using White's equation (1984)



**Polyphenol Content:** To evaluate antioxidant properties The total phenolic compound content (TPC) of honey was determined using the Folin-Ciocalteu spectrophotometric method (FC method)

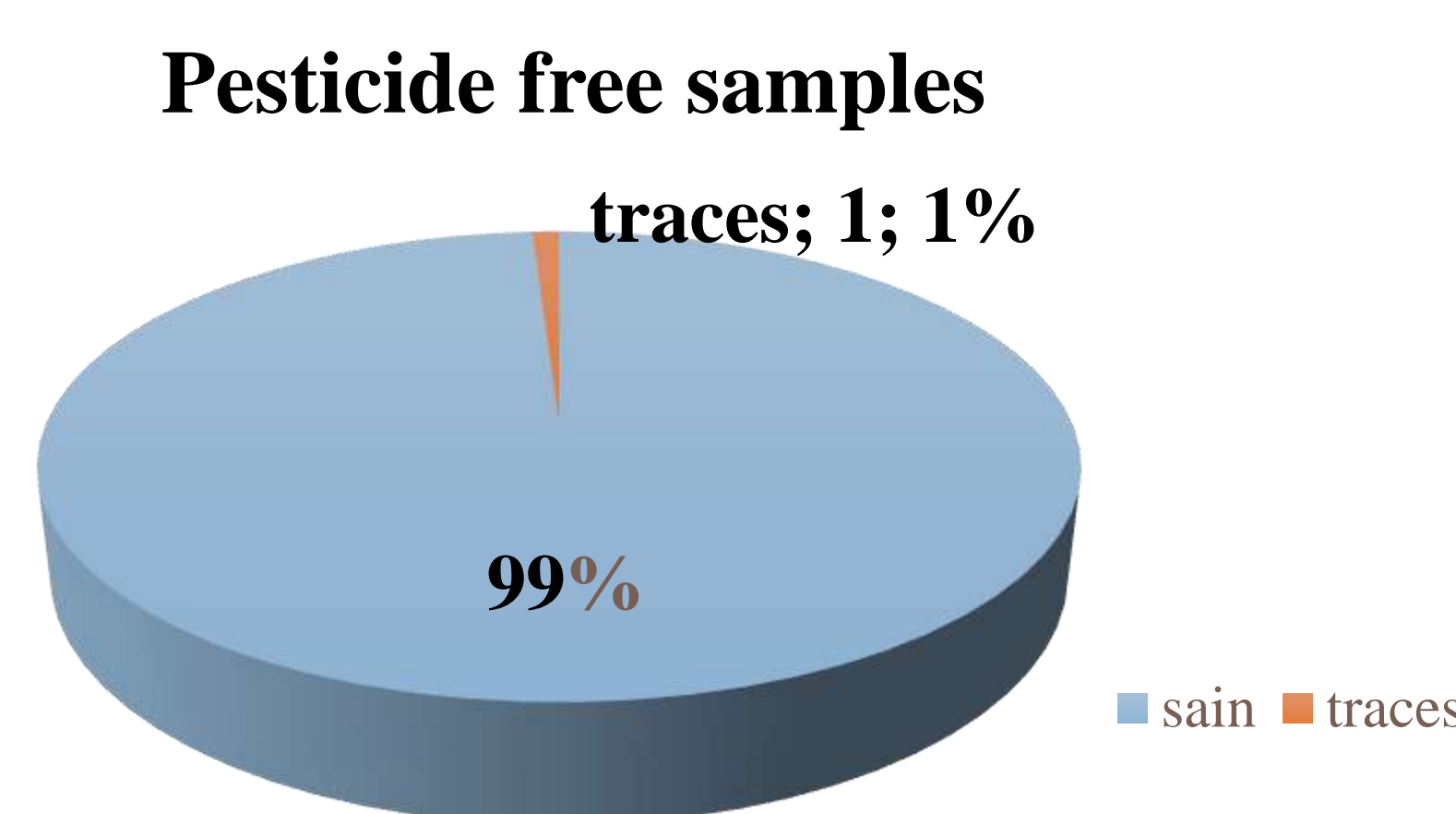
Other analyses were performed such as: water content, free acidity, conductivity



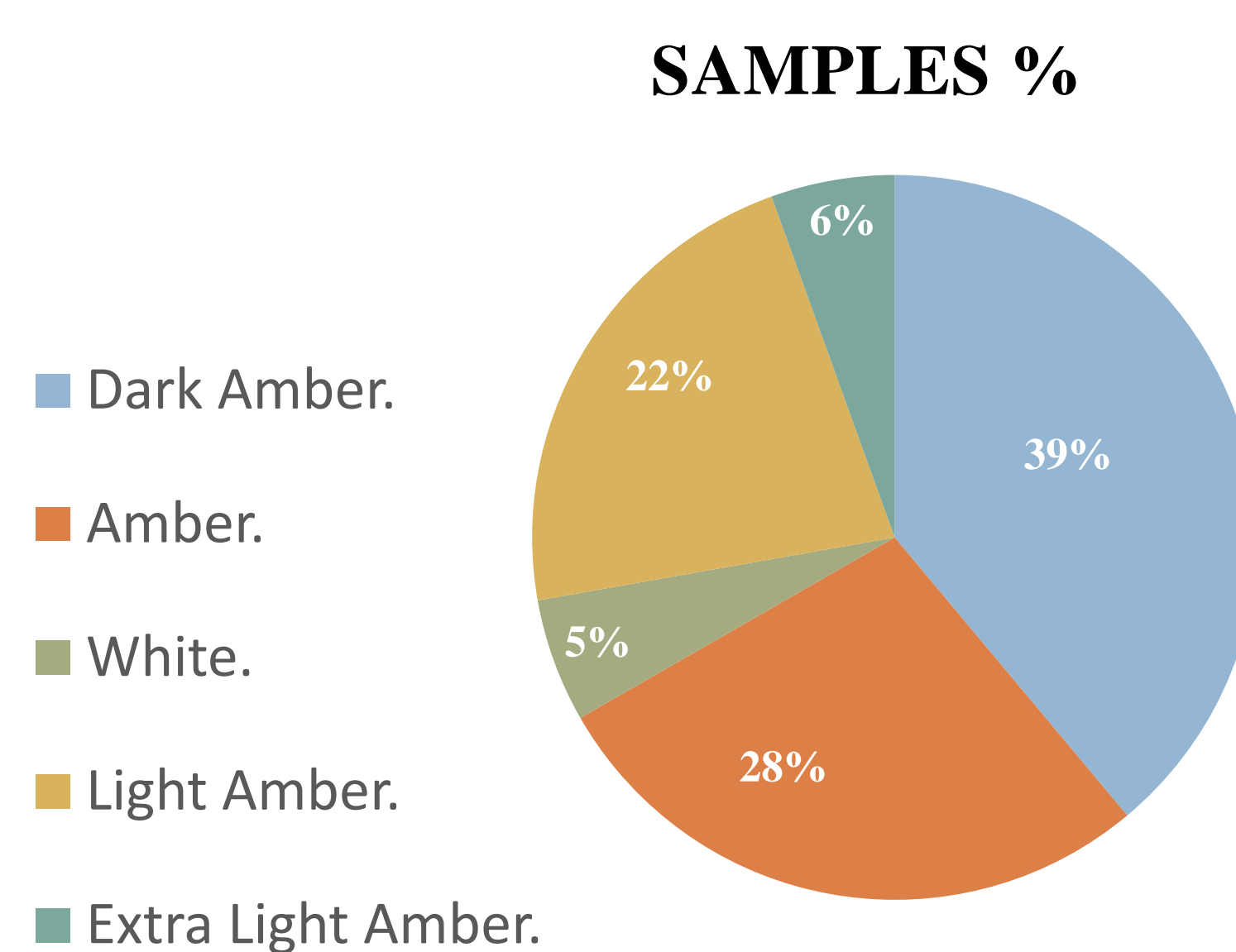
## Results:

### Residues analysis results:

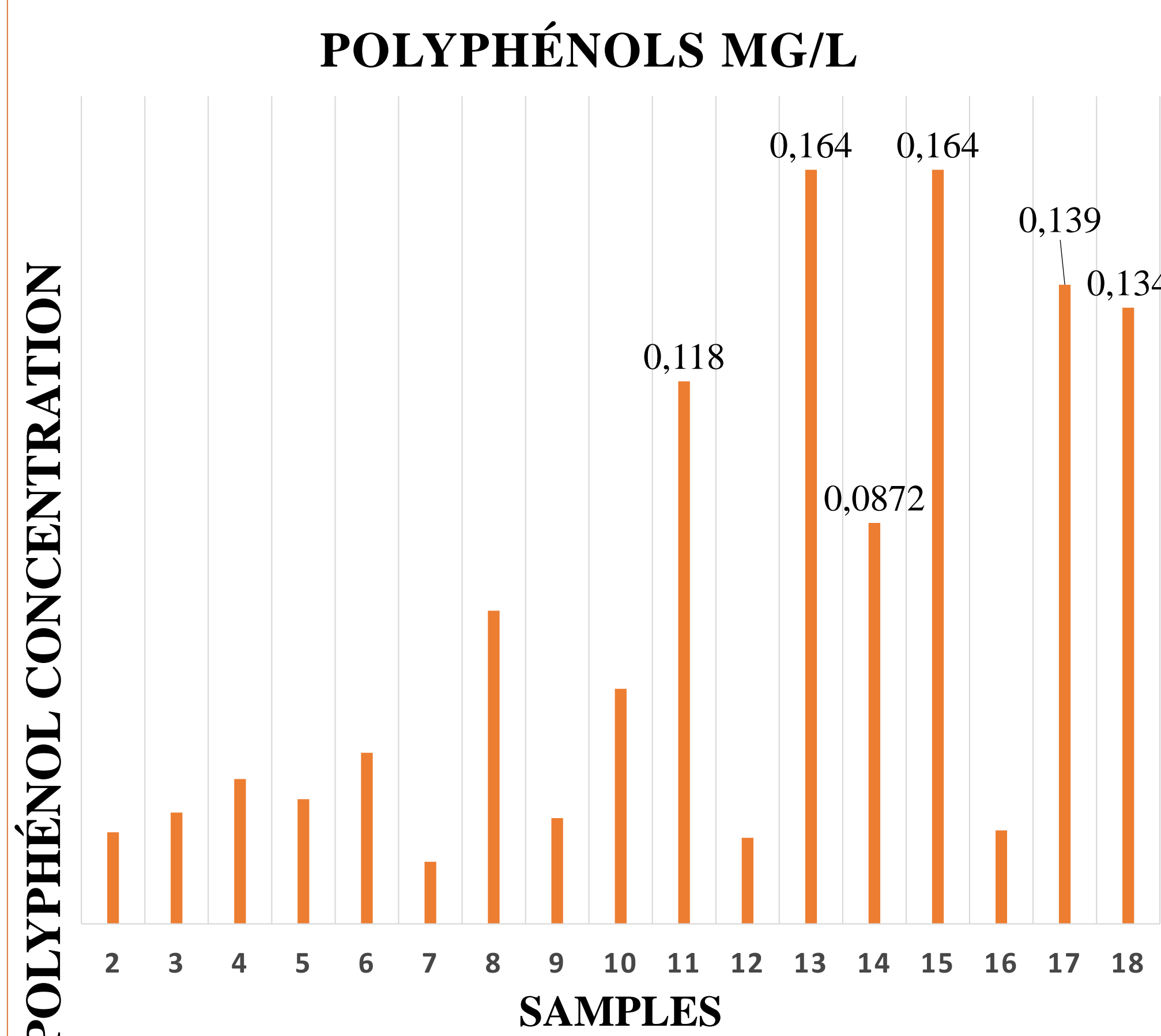
Results showed that a significant amount of the analyzed Honey samples were free from detectable pesticide residues. Testing on egg and poultry samples is still in progress.



### Physical and chemical Analysis results: Pfund:



### Polyphenol Content:



## Regulatory framework:

Aspect	International (Codex Alimentarius)	European Union	Algeria
Reference	Codex MRLs (CXLs)	Regulation (EC)	Alignment avec international standards
Définition MRL	Maximum residue limit (mg/kg)	Legal limit based on scientific assessment	Inspired by Codex / UE
Principe	Based on GAP (Good Agricultural Practice)	Scientifique approach + EFSA	Contrôle national
Objectif	Food safety+ international trade	Protection of consumer health	Snational surveillance

## Conclusion:

The use of nuclear-based techniques RRA Charm II system provides a rapid and sensitive tool for monitoring Food safety.

The absence of pesticide residues reflects good product quality and effective beekeeping practices promoted by the ITELV. This also highlights the importance of collaboration between research institutions, ITELV, and universities in ensuring safe, high-quality products for both national and international markets.

The physicochemical characteristics highlight their nutritional and commercial value.

This work was carried out within the framework of the regional African project RAF 5091 and the AFOSAN DZ network. <https://afosan.org/>

## References

- Commission du Codex Alimentarius (FAO/OMS)
- Organisation mondiale de la Santé (OMS)
- Vanessa B. Paula et al (2024)
- B. Paula et al (2024)