

## APPLICATION OF ADVANCED OXIDATION TECHNOLOGIES FOR THE TREATMENT OF SPECIFIC CONTAMINANTS IN FOOD INDUSTRY WATERS

### ET3-OXICLEAN

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### BACKGROUND

#### Region of Murcia

Severe water shortage  
Important agricultural production  
High food industry activity  
High demand for water

Reusing water for agricultural irrigation, or recirculating water in the food processing and packaging industry, can reduce water stress and improve water efficiency.

However, wastewater generated by food packaging or processing industries can be considered point sources of contamination by post-harvest phytosanitary compounds, and the water used in recirculation processes can be loaded with these same compounds, potentially compromising the quality of the final product.

Ensure microbiological quality and the elimination of chemical contaminants (phytosanitary) present in the waters ( **compliance with REGULATION (EU) 2020/741** ).

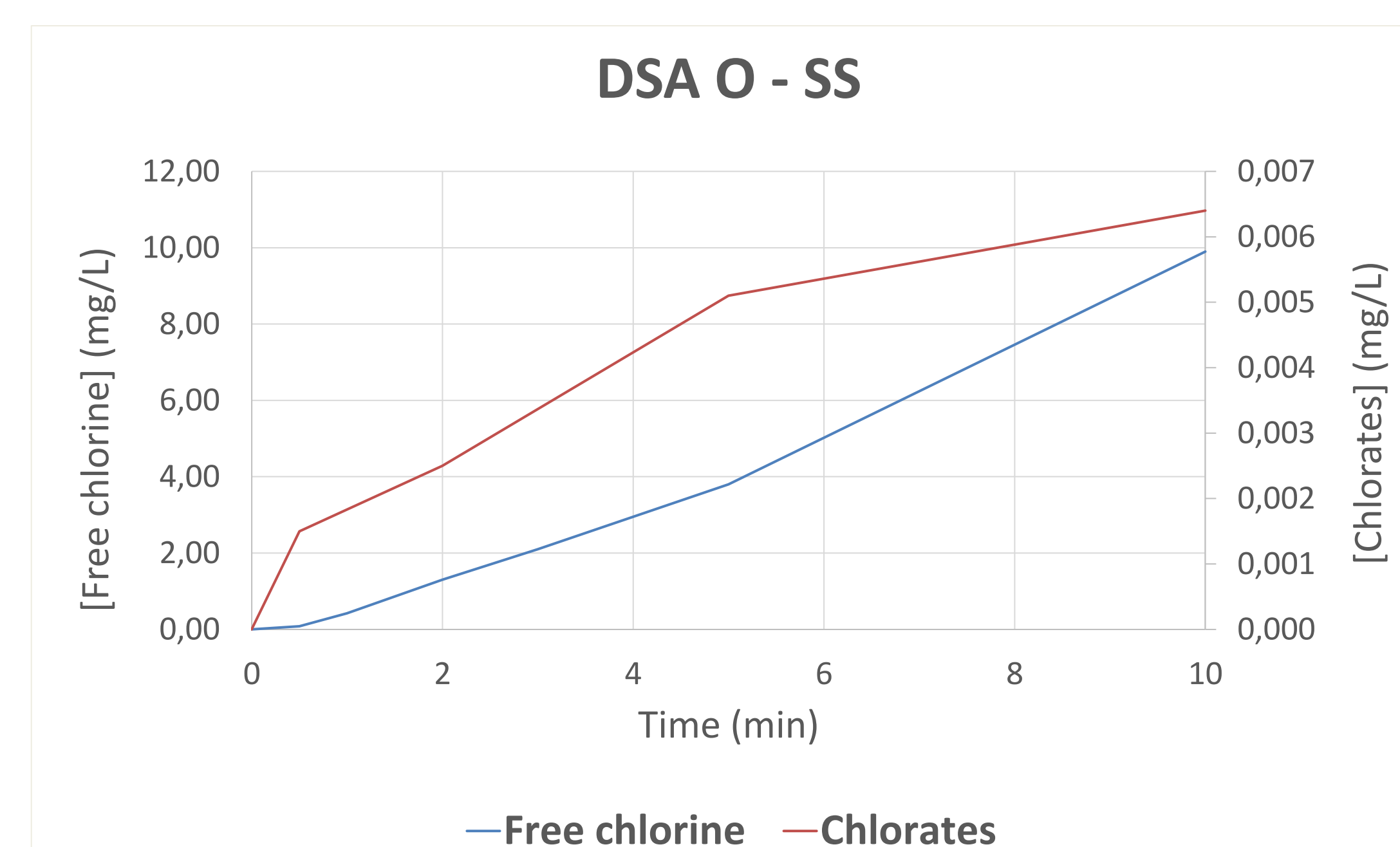
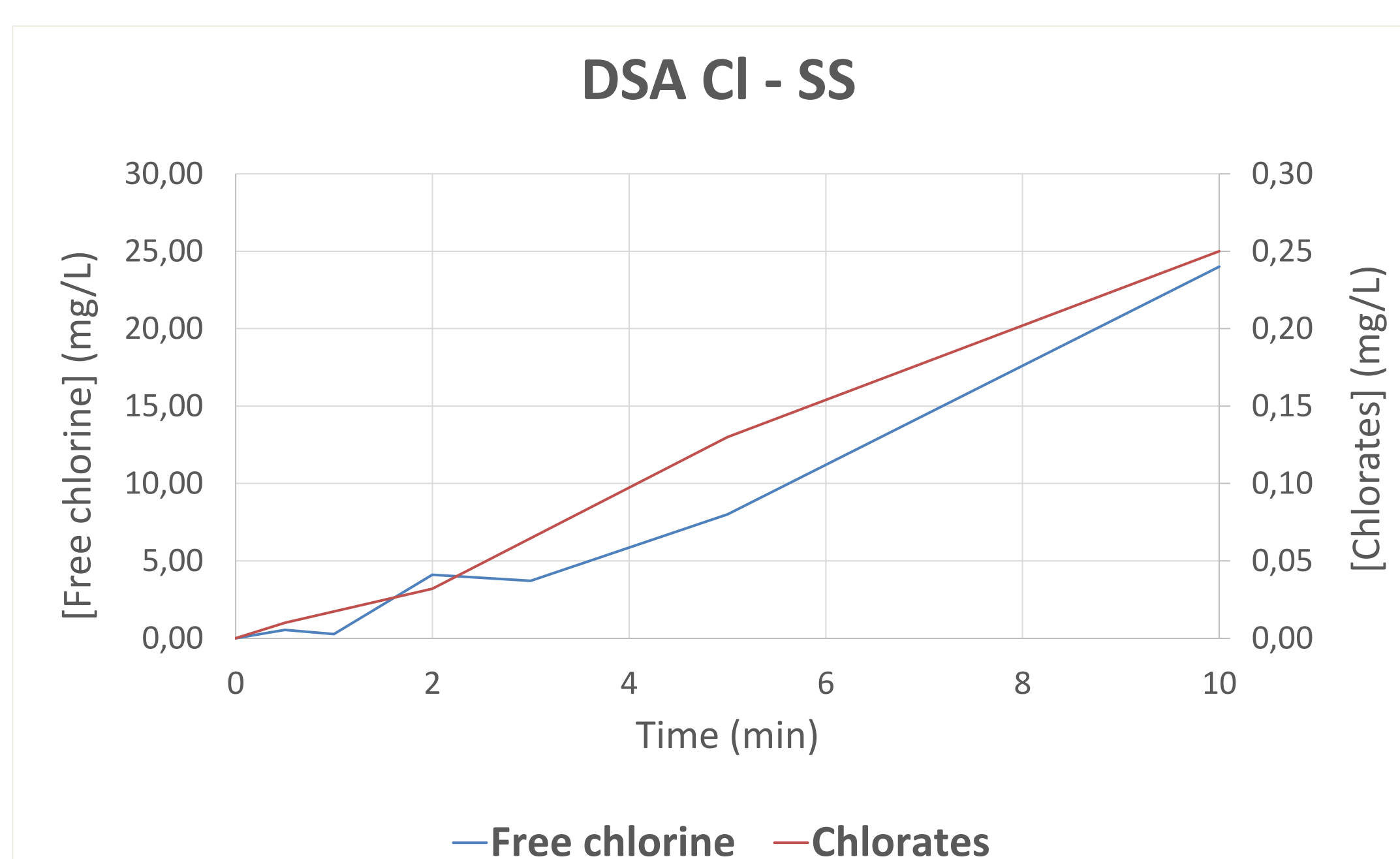
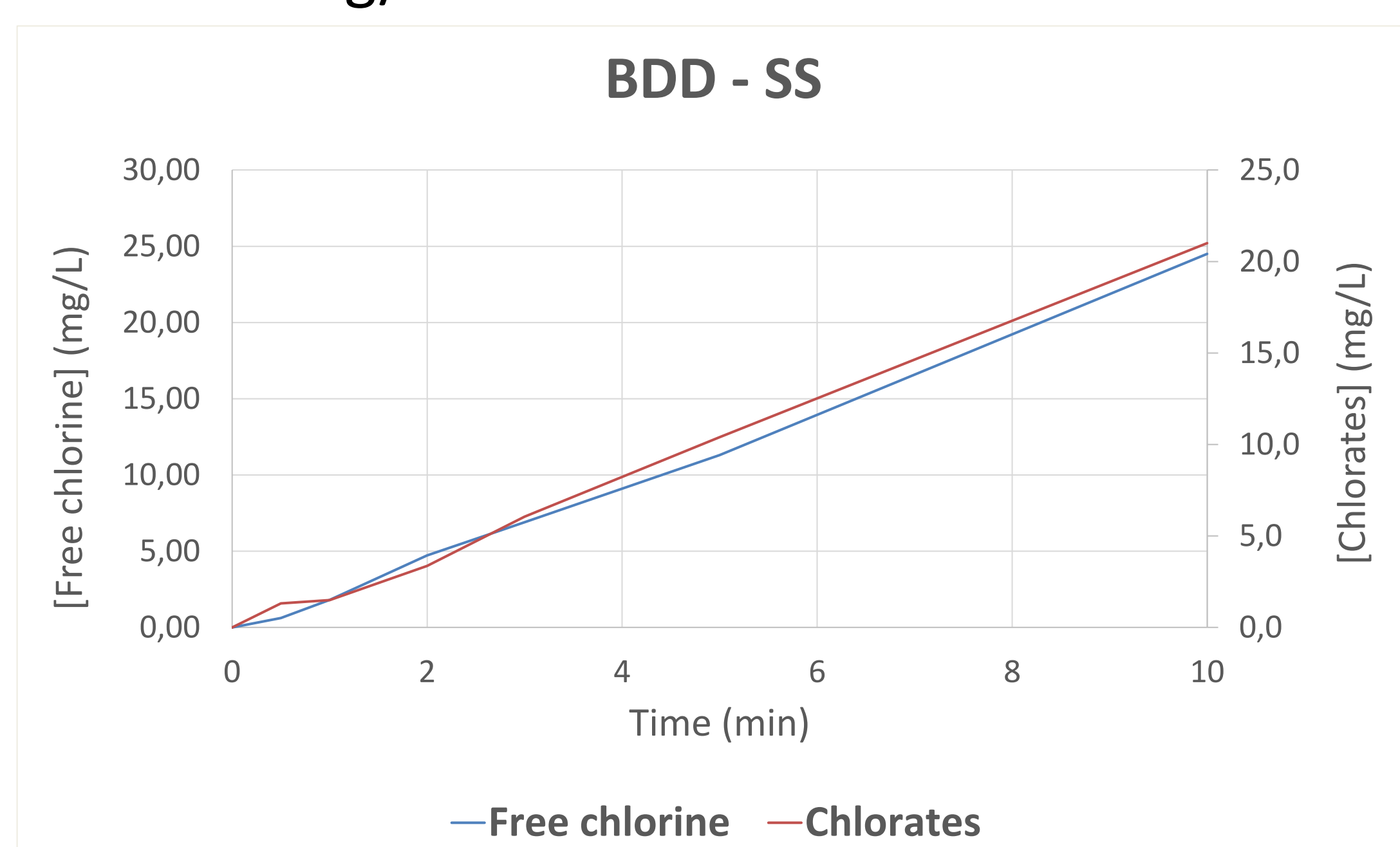
Eliminate specific water contaminants from the food industry production process that can compromise the final quality of the commercial product

Treatment of these waters using advanced oxidation technologies :

- PHOTOCATALYSIS
- ELECTRO-OXIDATION

### RESULTS

- **Compounds of phytosanitary origin** have been detected in wastewater and water used in the recirculation phases after several cycles.
- **Evaluation of the removal capacity of phytosanitary compounds by electro-oxidation and photocatalysis with real waters**
- Evaluation of the **disinfection capacity of electro-oxidation and photocatalysis with real waters** to determine the effectiveness of this technology in eliminating pathogenic indicators (*Escherichia coli* and *Clostridium perfringens* spores )
- Evaluation of the formation of disinfection by-products during disinfection using electro-oxidation :
  - Tests at different chloride concentrations (from 150 to 1000 mg/L)
  - Tests with different combinations of electrodes
  - Determination of chlorine and chlorates at different times
  - 300 mg/L of chlorides:



### CONCLUSIONS

- Electro-oxidation achieves a **reduction of more than 90% of the concentration of phytosanitary compounds** with certain combinations of electrodes.
- Likewise, electro-oxidation has been able to achieve **complete disinfection** with certain combinations of electrodes in less than 5 minutes of treatment.
- During the electro-oxidation treatment, chlorine (which can cause the oxidation of phytosanitary compounds and microorganisms) and chlorates are generated, although the **formation of chlorates can be minimized** as much as possible with certain electrode combinations (such as DSA O).

### ACKNOWLEDGEMENTS

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