Araújo, A. C., Noir, L., & Silva, C. L. M. (2023). *Exploring the potential of solar cooking: impact of parabolic and box models on broccoli quality*. Abstract from 37th EFFoST International Conference 2023: Sustainable Food and Industry 4.0: Towards the 2030 Agenda , Valencia, Spain.

Aim: Solar cooking, and associated equipment, take advantage of a large amount of free energy directly offered by the sun. Solar cookers do not need high ambient air temperatures but simply solar radiation, enabling them to play a huge role in sustainability by reducing greenhouse gas emissions, consumption of non-renewable energy and resource depletion. Yet knowledge gaps still exist on solar cooking technical, sustainability, and food nutritional quality impacts. This study aimed to evaluate the impact of solar cooking on the nutritional quality of a food product. Two different solar cookers, a quick (parabolic) and a slower (box) models were considered. Methods: Broccoli (Brassica oleracea L. ssp. Italica) was selected as the primary vegetable for this study due to its recognized nutritional value and abundance of bioactive compounds such as antioxidants, phenolics, and vitamins. Broccoli florets were cooked using two types of solar cookers, parabolic and box, and compared to traditional cooking methods. The time-temperature of the processes was recorded. The physic-chemical properties of the initial and final products were evaluated, including total antioxidant activity, phenolic compounds, carotenoids, chlorophylls, colour, texture, and volatile compounds. A sensory evaluation was also implemented using a trained panel. Available isothermal thermal degradation kinetic data of broccoli quality parameters was used to predict experimental quality retentions after solar cooking. Results: The study concluded that there were no significant differences in the quality of broccoli cooked using either traditional or parabolic solar cooking methods. The integration of the isothermal kinetics for dynamic conditions effectively predicted the quality of solar-cooked broccoli, suggesting the potential use of these models to enhance the utilization and acceptance of environmentally friendly food processing technologies.