



Sous Vide Technique. Sustainable thermal process in the food industry

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Abstract: The sous vide processing technique (from the French „sous vide” („under vacuum”), expresses the principle of the method)) represents a modern method of controlled heat treatment, widely used in gastronomy, with applications in the food industry for maintaining the sensory and nutritional qualities of products. The process primarily involves vacuum packaging, followed by gentle thermal treatment, monitored at moderate, constant temperatures (recommended within the range of 50÷90°C, using thermostated baths with water as the heating medium) and for a duration adapted to the matrix of the food material (red/white meat, vegetables, fruits, eggs), conditioned by physicochemical properties, thickness, and the targeted level of microbiological safety. Understanding them contributes to the uniformity of the process, with minimal loss of water, volatile substances, and microbiological safety. By limiting contact with oxygen and using temperatures below the boiling point, significant reduction of fat oxidation, protein denaturation, and degradation of heat-sensitive vitamins is ensured. Research in the field supports that sous vide processing contributes to the improvement/intensification of the texture, tenderness, and juiciness of products by precise control of internal temperature and maintaining the structural integrity of tissues. Microbiologically, by carefully adhering to and monitoring the process parameters (vacuum/temperature/time), sous vide processing helps reduce common pathogenic flora (e.g., *Listeria monocytogenes*, *Salmonella* spp.). Therefore, the following advantages can be stated: 1. uniformity of processing; 2. extension of shelf life by inhibiting the growth of aerobic microorganisms; 3. the possibility of standardizing recipes and the reproducibility of results through digital control of process parameters (Fig. 1) [1,2].

Keywords: sous vide technique, process parameters, quality indicators, reproducibility of results.

• Conclusions

From a technological perspective, the translation and implementation of sous vide processing on an industrial scale require specialized equipment—vacuum sealers, thermostatic processing units, and HACCP monitoring systems—as well as personnel trained in the application of food safety protocols.

• Reference

1. Baldwin, D. E., 2012, Sous Vide Cooking: A Review. International Journal of Gastronomy and Food Science, 1(1), p. 15–30.
2. Aviles, m. V. Et al., 2020, Impact of Sous Vide Cooking on Nutritional Quality of Meat, Nutri Food Sci. Int. J., 10(3).



FIG. 1. Sous Vide Technique: Principles and Benefits for a Green Food Industry

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