

## Limiting Factors on Probiotic Table Olive Production

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### Abstract

Table olive is thought as promising probiotic food by using probiotic starter cultures which contains nutritional or health advantages but there are factors that limit its use for this aim. Appropriate strain selection, salt concentration of brine, production hygiene, fermentation temperature, sugar content of olive, phenolic content of olive packaging system, storing time storing temperature and sensory acceptance of consumer are some of them. This review is aimed to present shortly these limiting factors for probiotic table olive (PTO) production.

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### Introduction

Several researches have emphasized the role of table olives as adequate carriers for delivering probiotic bacteria to humans [1,2]. Functional starter cultures contribute to microbial safety and offer organoleptic, technological, nutritional or health advantages of table olives [3]. But industry still do not have PTO production because of some limiting factors and scarcity on delivering research results to industrial applications. So that this review is aimed to summarize these limiting factors.

### Limiting factors on PTO production

Today, pure starter cultures of lactic acid bacteria are available in the market and used in several vegetable fermentations [4] but their use in table olive processing is still limited despite the benefits they provide [3] the selection of specific strains displays important difficulties [5] Olive matrix has an important role in the probiotic development and efficacy [6]. Due to the peculiar characteristics of table olives [7], the use of an adapted starter culture could result essential for its implantation [8]. So that probiotic LAB strains were previously isolated and characterized from olive microbiota should be advised [9].

Apart from the microbiological aspects of table olive fermentation, olive tree varieties could present different behaviors during brining because of the different fruit dimensions and physicochemical characteristics that would in turn affect the microbiota responsible for olive fermentation and influence the sensory profile of the final product [10]. The conditions during the fermentation process may be inhibitory for the growth of the selected strains natural black olive fermentation is taking place into brine containing 8–10% (w/v) NaCl,

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concentrations which could be an inhibitory factor for growth for several starters [5,11]. Temperature was one of the effective factors for fermentation but in most companies, the temperature control of the process is not applied because it is expensive [12]. The ability of starters to grow in high salt levels could induce not only which will grow during the fermentation, but also the dominant species as well as the interactions among them [5]. It is important to verify the presence of the inoculated probiotic starter culture in adequate numbers at the end of the fermentation process [13,11].

Presence of the probiotics in the brine does not assure its intake of olive [8]. Effective packaging systems should be determined to deliver the health benefits, probiotic foods need to contain an adequate amount of live bacteria (at least  $10^6$ – $10^7$  colony forming units/g) with maintaining of overall quality of table olive [14,15]. The imposition of the probiotic strain on olives has been demonstrated to be highly dependent on its characteristics, circumstance that confirms the importance of the matrix and a proper starter [8]. Higher sensory scores were reported for PTO at 20° than at 4°C and 6 month than 12 month [3]. Comparative response of consumers against the table olive and PTO has been scarcely researched [8].

## Conclusion

Processing of PTO should be advised to industry with results of adaptation researches and solving decision of limiting factor. Commercially available probiotic starter culture, controlled fermentation conditions and hygienic production had vital importance for PTO production. Process lines, production parameters, package selections and storing conditions and time should be well defined for industrial production of PTO.

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