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Table of Contents

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Effect of food matrix on antimicrobial activity upon food spoilage Lactic Acid Bacteria

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Abstract

Lactic acid bacteria (LAB) have been used in foodstuffs due to the desirable effects on the organoleptic and functional characteristics; however they can also cause food spoilage by producing off-flavours, carbon dioxide and textural changes. In such circumstances, their intrinsic high resistance to acidic conditions and antimicrobials poses a problem to the food industry. So it is important to select amongst the food additives those that assure LAB inhibition in acid and complex food matrices assuring safety and quality preservation. In this work we describe the antimicrobial efficiency of sodium diacetate in two prototypes of mayonnaise and ketchup. To that end both matrices (ketchup and mayonnaise) formulated with the selected antimicrobial agent were inoculated with a LAB isolated from previously spoiled sauces and the capability to reduce their initial viable cell numbers was evaluated.

The results obtained showed that the inclusion of this antimicrobial into both matrices was not completely successful. While in the ketchup prototype revealed high antimicrobial activity reducing, in 24 h, LAB viable counts by 5.37 log CFU/g, in the mayonnaise only 1 log CFU/g reduction was observed in the same time frame. A probable cause for this discrepancy is the higher fat content of mayonnaise that may be blocking the antimicrobial activity.

In conclusion the results obtained show the need to adapt the antimicrobial solution to different complex matrices, since several interactions between food matrix and antimicrobial components may occur.

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