Diversity of staphylococcal species in pork and beef Kitoza

A. RATSIMBA1, D. RAKOTO1, V. JEANNODA1, E. ARNAUD2, G. LOISEAU3, J. P. CHACORNAC4, S. LEROY4, R. TALON4

1 UT, University of Tananarive, Madagascar, 2 UMR QualiSud, CIRAD, Department PERSYST, Montpellier, France
3 UMR QualiSud Montpellier SupAgro, France; 4 INRA - UR454 Microbiologie, Saint-Genès Champanelle, France

Introduction

Kitoza is a traditional product from Madagascar manufactured either with strips of pork or beef meat. It is an artisanal product manufactured in rural and urban regions. The first step of the process is salting with coarse salt mixed with spices and then either a drying or smoking step is carried out. The microbiological analyses of these products revealed the presence of bacteria with potential technological interest. Among them, a high level of presumed coagulase negative staphylococci (CNS) was found (5 to 7 log CFU/g). These bacteria seemed well adapted to the two processes drying or smoking. The aim of this work was to identify the CNS species in Kitoza manufactured according the two processes: drying or smoking from pork or beef meat. This accurate identification represented the first step for the potential development of specific starters for Kitoza.

Methodology

Samples from pork or beef and drying or smoking processes representative of the diversity of the products have been analysed. From these samples, 811 isolates of presumed CNS were isolated from Mannitol Salt agar. For the identification two approaches have been applied. First the isolates were identified by PCR multiplex which allowed identifying the isolates belonging to the Staphylococcus genus and the three species S. epidermidis, S. saprophyticus and S. xylosus (Corbière Morot-Bizot et al. 2004 J. Appl. Microbiol. 97: 1087). Secondly the isolates were identified by a “staph array” targeting sod gene for the identification of 36 CNS species potentially found in food from animal origin (Giammarinaro et al. 2005 J. Clin. Microbiol. 43: 3673).

Inventory of the species in beef and pork Kitoza

406 Staphylococcus isolates were identified from the pork Kitoza with 210 from smoked and 196 from dried products. The comparison between the dried and smoked samples revealed that S. kloosii and S. epidermidis were absent in the dried samples while S. sciuri was not found in the smoked ones. S. saprophyticus represented the major species (75%) with S. xylosus the second one (17%) in the dried products. In the smoked products, 5 species (S. saprophyticus, S. xylosus, S. equorum, S. succinus, S. epidermidis) with almost similar population were identified.

Impact of the process on the CNS species in pork Kitoza

405 Staphylococcus isolates were identified from the beef Kitoza with 211 from smoked and 194 from dried products. The comparison of the dried and smoked samples revealed that S. saprophyticus was dominant in both processes: 73% and 79% for dried and smoked beef, respectively. S. xylosus represented 10% of the CNS population in the two processes. But while S. kloosii represented 10% of the population in the dried beef, it was minor in the smoked beef. It was the opposite for S. sciuri and S. vitulinus higher in the smoked than in the dried samples. Furthermore, S. warneri was only detected in the smoked beef samples.

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