Fermented meats are the result of an age-old preservation method, with a long-standing culinary tradition and gastronomic value. Traditional fermented sausages, which are most often produced by spontaneous fermentation, are habitually perceived as superior products, mainly due to their unique sensory properties obtained during fermentation. Contemporary variants are usually produced on an industrial scale with the use of starter cultures to ensure safe and uniform products. Besides lactic acid bacteria and optional moulds, coagulase-negative staphylococci (CNS) form one of the main microbial groups involved in the process. Generally, they contribute to the development of colour and flavour.

Although certain CNS are already routinely applied as starter cultures in the production of fermented meats, as is particularly the case for selected strains of Staphylococcus carnosus and Staphylococcus xylosus, there seems to be margin for further development. The present study had the mission to explore to which degree the group of CNS holds potential for meat fermentation improvement, based on the use of both conventional and non-conventional starter cultures. In parallel, the purpose was to demonstrate whether such CNS cultures are able to persist during diverse types of production processes, especially with respect to the intensity of acidification.

It turned out that CNS form a heterogenic group both in terms of metabolic capacity and competitiveness. In vitro assessments showed inter- and even intraspecies variability regarding amino acid conversions, indicating that further consideration is needed, especially when developing new starter culture formulations. Candidate strains should also be able to overrule the background microbiota and maintain themselves during processing. The present study indicated that both the intensity of acidification and the fermentation temperature strongly affected the competitiveness of specific species whether added as starter cultures or not. Also, safety issues may emerge, as pathogenic bacteria could develop under specific combinations of pH and temperature.

Taken together, the success of a promising CNS starter culture is not always guaranteed and should be carefully assessed, especially in relation to the processing conditions.