

Volatile organic compounds and Photobacterium phosphoreum associated with spoilage of modified-atmosphere-packaged raw pork - DTU Orbit (08/11/2017)

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Accumulation of volatile organic compounds was monitored in association with sensory quality, bacterial concentrations and culture-independent microbial community analyses in raw pork loin and pork collar during storage under high-oxygen modified atmosphere at +4°C. Of the 48 volatile compounds detected in the pork samples, the levels of acetoin, diacetyl and 3-methyl-1-butanol had the highest correlations with the sensory scores and bacterial concentrations. These compounds accumulated in all of the four monitored lots of non-sterile pork but not in the sterilized pork during chilled storage. According to the culture-dependent and culture-independent characterization of bacterial communities, Brochothrix thermosphacta, lactic acid bacteria (Carnobacterium, Lactobacillus, Lactococcus, Leuconostoc, Weissella) and Photobacterium spp. predominated in pork samples. Photobacterium spp., typically not associated with spoilage of meat, were detected also in 8 of the 11 retail packages of pork investigated subsequently. Eleven isolates from the pork samples were shown to belong to Photobacterium phosphoreum by phenotypic tests and sequencing of the 16S rRNA and gyrB gene fragments. Off-odors in pork samples with high proportion of Photobacterium spp. were associated with accumulation of acetoin, diacetyl and 3-methyl-1-butanol in meat, but these compounds did not explain all the off-odors reported in sensory analyses.

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