

Title Ozone and carbon dioxide modified atmosphere storage on pathogens of catfish fillets
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Abstract

Fresh catfish fillets account for over 50 percent of total fresh catfish sales. Catfish fillets, which are kept on ice at refrigeration temperature, have a short shelf-life of 5-10 d. To extend shelf-life of the fillets, modified atmosphere storage (MAS) (100% carbon dioxide, ozone, and atmospheric air) was studied. Even though 100% carbon dioxide and ozone could extend shelf-life by more than 100% and 60%, respectively, safety of the fillets must be investigated. Growth of *Listeria monocytogenes* and *Salmonella typhimurium* as affected by atmospheric conditions (100% carbon dioxide, ozone, and atmospheric air) and storage time were investigated. Pathogens (each one separately) were grown and inoculated (inoculum size of 10⁴ cfu/g of catfish fillet) on raw, untreated catfish, rubbed, and placed in polyethylene bags. The bags were placed in hermetically sealed containers, the air evacuated (except for aerobic environment), and back flushed with each of the gases respectively. The containers with fish were held at 4 °C and sampled every 4 d. When sampled, the boxes were flushed with the gases again. Pathogen was slightly suppressed by 100% carbon dioxide and ozone after 4 d storage. However, no significant decrease in any of the pathogens was noted. Even though ozone is a powerful oxidizing agent and carbon dioxide can suppress several genera of bacteria (bacteriostatic), rough surface and composition of the fillets may protect the bacteria from contact with the gases. Additional methods such as irradiation or chemical treatment may be required to reduce initial load in catfish fillets and increase MAS effectiveness.