

Minimising protein oxidation in retail-packed minced beef using three-gas MA-packaging - DTU Orbit (08/11/2017)

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Minced beef is usually packed in high oxygen modified atmosphere packaging (MAP) with a gas mixture consisting of 70-80% oxygen (O₂) and 20-30% carbon dioxide (CO₂). Unfortunately, this results in rubbery and less juicy beef patties with a more rancid flavour compared with fresh or nonoxygen packed beef. To establish whether three-gas MAP (O₂, CO₂ and N₂), instead of two-gas MAP (O₂ and CO₂), would affect sensory attributes, shelf life, protein and lipid oxidation, minced beef was packed in MAP with either 40%, 50% or 80% O₂ and 20% or 40% CO₂ with N₂ as filler gas. When comparing traditional MA-packaging (80% O₂ + 20% CO₂) with a low oxygen packaging atmosphere (40% O₂ + 20% CO₂ + 40% N₂), the latter is seen to increase the meat oxidative stability during storage but decrease acceptability and shelf life. In contrast, high oxygen MAP (80% and 50% O₂) results in more oxidation but a longer shelf life. However, this was not sensorially detectable in the first five days of storage. To maintain shelf life, packaging in 50% O₂ + 40% CO₂ + 10% N₂ or 80% O₂ + 20% CO₂ is preferable, although this gas mixture will not prevent lipid or protein oxidation in the meat.

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