

MICROBIOLOGICAL SECURITY OF APPLES STORED AT MODIFIED ATMOSPHERE

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INTRODUCTION: It is substantial to maintain the quality of fruits during storage, including their microbiological security. Fruit microbiological security depends on several factors: cleanness of premises, extent of air pollution of storage chambers which could be one of the reasons of pollution and the following quality decrease. Many microorganism species are aerobic and their growth is inhibited in controlled atmosphere with low oxygen concentration. Therefore it is possible to reduce the development of some microorganism species.

MATERIALS AND METHODS: The investigation was carried out to find relationships among gas compositions and development of microorganism species during storage. Air quality of storage chambers and microbiological cleanness of apple cultivars 'Gita', 'Saltanat', 'Auksis', 'Korichnoe Novoe', 'Orlik' fruit surface were studied. As a result different microscopic fungi genus as *Botrytis*, *Alternaria*, *Aspergillus*, *Penicillium* were identified on the apple surface before storage not depending on cultivar. *Penicillium italicum* was the dominant species and from genus *Cladosporium* - *Cladosporium macrocarpum*; from bacteria species - *Pseudomonas fluorescens*, *Bacillus cereus* and from yeasts - *Candida curvata*, *Candida fomata*, *Pichia etchellsii*, *Pichia carsonii*.

RESULTS: Microorganisms as *Penicillium italicum*, *Bacillus cereus*, *Pseudomonas fluorescens*, *Candida curvata*, *Pichia etchellsii*, *Candida fomata* were found after apple storage in the controlled modified atmosphere chamber ULO1 (Ultra Low Oxygen) with the content of: O₂ 1%, CO₂ 2% and N₂ 97%. However, only *Penicillium spp*, *Bacillus spp*, *Candida curvata*, *Candida fomata* developed in the chamber ULO2 with O₂ 1.5%, CO₂ 2.5% and N₂ 96%, while several microorganisms: *Botrytis*, *Penicillium*, *Penicillium italicum*, *Pseudomonas fluorescens*, *Bacillus cereus*, *Candida curvata*, *Candida fomata*, *Pichia etchellsii*, *Pichia carsonii* developed in the common cooling chamber with O₂ 20.96%, CO₂ 0.03% and N₂ 78.06%.

CONCLUSIONS: The investigation proved that fewer microorganisms were found in the chamber ULO2, testifying that this content of gases inhibits the growth of microorganisms. Apples stored with this composition of modified atmosphere can be used for food safely, even if they are not washed well. More microorganisms developed on apples stored in the common cooling chamber. It is important to record that bacteria *Bacillus cereus* which developed after storage exudes toxins and cause bacterial toxicopathy in humans.