

Abstract

Over the last decade the shipments of fresh fruit under controlled atmosphere conditions have gained in importance. The shippers worldwide use of controlled atmosphere (CA) to maintain the condition of their fruit during long distance sea transports. Notably the use of CA is beneficial for commercial exports of a.o. Ecuadorian bananas, Mexican Avocado's and New Zealand apples to Europe. Inspired by this success exporters of other products worldwide have been experimenting with the CA use for their container shipments of mango, kiwifruit etc. These experiments had a varying success. In case of bad arrivals of fruits, surveys at destination are carried out. Shippers or receivers, who want to claim against the ship's owner/carrier or the owner of the CA container, must proof that the CA equipment was not functioning according to the instructions given. Surveyors acting on behalf of shippers or receivers or their insurers/underwriters have the obligation to carry out fact finding in order to assess the cause of the damage. The datalogs of the CA systems are not disclosed to parties interested in the cargo, in order not to jeopardize the interests of the ship's owner/carrier or the owner of the CA containers. Incorrect levels of oxygen and carbon dioxide may result in anaerobic respiration. Fruits will start to produce ethanol as a result of the anaerobic respiration process. After some time the ethanol levels may be built up to levels in the fruit's tissue that may lead to permanent damage and the fruits will develop visible damage such as rind breakdown. However rind breakdown can be the result of other causes as well such as pathogens or low temperature etc. Upon arrival at destination the cause of the deviations in condition of the fruit carried under CA conditions are difficult to assess without detailed information about the fruit's history. A method was developed to assess whether the deviation condition of the fruit carried under CA conditions was the result of incorrect gas levels in transit. Randomly chosen samples out of shipments of fruits carried under CA are tested for the presence of Ethanol. Results of these tests have shown that fruits suffering from a deviation condition a.o. rind breakdown level may contain 0.2% to 0.4% Ethanol. This method is also applied for normal refrigerated shipments (no CA) which have been deprived from fresh air supply in transit due to the closure of the fresh air supply with similar results. Since the introduction of the methods multiple claims against carriers have been settled in a satisfactory way.