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STUDY OF APPLE FRUIT RESPIRATION UNDER SPECIAL CONDITION

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Understanding the changes in fresh-cut apples that are caused by their respiration rate is crucial for maximizing their nutritional content, optimizing storage conditions, prolonging shelf life, and reducing postharvest losses. The primary objective of this thesis was to assess the respiration rate, potential gas changes measurement, and test procedures used to manage the atmospheric composition of fresh-cut 'Idared' apple fruits during postharvest storage. This study aims is to make a substantial contribution to reducing food waste in the supply chain, in line with broader sustainable development goals. Five apples of the cultivar *Malus domestica* Borkh. cv. 'Idared' were meticulously chosen and sliced into approximately 1 cm thick slices. The sliced apples were subsequently separated into three experimental samples, weighing 75.34 g, 74.81 g, and 75.47 g, and were manually packaged beside an oxygen gas checker. The packages were then sealed using a Multivac T200 oxygen sealing machine and subsequently microperforated using a laser perforator machine. The samples were thereafter placed in refrigerated storage for a duration of 7 days at a consistent temperature of 5^{o}C. Data on the oxygen level, recorded by the oxygen checker and captured by a GoPro camera mounted in the storage area, were collected at estimated intervals of 30 minutes throughout the study duration. The collected data was subjected to analysis using Microsoft Excel to generate graphical trend lines and statistical measures used in interpreting the results. The results showed a consistent rise in oxygen concentration over the study duration. Notably, there were significant and rapid increases in oxygen levels on Day 0 and Day 1 across all samples however, between Day 5 and Day 7, the rate of increase slowed down, and some samples did not exhibit any oxygen generation on Day 6 and 7. The findings of this study revealed a notable correlation between

time and respiration rate, suggesting a strong linear connection between the two variables, as supported by high R^2 coefficients seen in the samples. These findings have significant implications for practical application, namely in terms of improving packing methods for fresh-cut fruits to extend their shelf life and preserve the quality of the product.