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Effects of Short Term High Carbon Dioxide Treatment on Tomato Ripening

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**Abstract:** Tomato ( *Lycopersicon esculentum* Mill.) fruits (Cv Criterium) were harvested at the mature green stage and stored at 13°C in controlled atmosphere (CA) conditions for 1, 3 and 5 days. The CA conditions were 5, 10, 20, 40 and 60% CO<sub>2</sub> all with 5.5% O<sub>2</sub> plus air as control. The tomatoes were then stored at 20°C in air until they were fully ripe. At that time colour, firmness, titratable acidity, total soluble solids (TSS) and days to ripening were measured. Fruit exposed to CO<sub>2</sub> for 5 days subsequently ripened more slowly than those exposed only one day. The controlled atmosphere stored fruit took 11 to 12 days to ripen compared to only 8 days for fruits stored in air. The ripening time of the fruits exposed to 60% CO<sub>2</sub> for only one day was 18 days without CO<sub>2</sub> injury, whereas it was 14 and 15 days for fruits exposed 20% CO<sub>2</sub> for 5 days or fruits exposed to 40% CO<sub>2</sub> either for 1 or 3 days. Fruits treated with 5, 10, and 20% CO<sub>2</sub> did not show any harmful effects on colour development and fruit softening. Treatments with 40 and 60% CO<sub>2</sub> for 1 day also did not cause any harmful effects on colour development while there was only a slightly inhibition of colour development after 3 days and completely inhibited it by 5 days exposure. There was also considerable CO<sub>2</sub> injury on tomatoes exposed to 40% to 60% CO<sub>2</sub> for 5 days. Fruits exposed to 40% and 60% CO<sub>2</sub> for 1 to 5 days were found to be softer than the fruits from other treatments. It was observed that titratable acidity and TSS values of fruits stored in CA for 1 and 3 days were similar to each others. But both acidity and TSS values of 40 and 60% CO<sub>2</sub> treated tomatoes for 5 days were found to be lower than the 5, 10 and 20% CO<sub>2</sub> exposed fruits.

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