

Abstract

In efforts to extend shelf life of fresh-packed stored blueberries and to eliminate *Escherichia coli* 0157:117 and *Salmonella* on the fruit, the use of three gases was examined on Rabbiteye blueberries cv 'Tifblue'. Two experiments were conducted to compare the effectiveness of gases on postharvest fruit quality, shelf life and control of *E. coli* O157:H7 and *Salmonella* infection on blueberries. The first experiment studied the effects of gases on fruit quality and shelf life of 'Tifblue' blueberries. Fruits were placed in clamshell containers, then loaded into SLX ® containers and fumigated with 15.5% O₃ , 193 PPM SO₂ , 18.8% CO₂ , and normal air. Fruit were then stored at 2° C and 95% relative humidity, and sampled periodically for a period of 48 days. The second experiment studied the effectiveness of the above listed gases in inhibiting *E. coli* O157:H7 and *Salmonella* in stored blueberries. In this experiment, blueberries were inoculated with bacterial cell suspensions, packaged, fumigated and stored as described in first experiment. At timed storage intervals, berry samples were removed from each treatment and microbial load was determined. Results indicated that fruit decay was greater on berries stored in normal air compared to other treatments. In all gas treatments, change in weight loss did not differ with the time. Acidity decreased during storage, particularly for the samples stored in SO₂. Firmness was increased when berries were stored under O₃ gas. Berries treated with SO₂ had higher anthocyanin and antioxidant content. However, blueberries stored under SO₂ and O₃ showed higher levels of phenolic content. Berries stored under SO₂ had higher hue values, 'a' values and chroma, than the other treatments. The control and O₃ -treated berries had higher 'L' and less 'b' values. Sensory evaluations showed that blueberries stored in O₃ had more acceptable qualities than did berries kept under other storage conditions. Treatment with O₃ and SO₂ resulted in greater reduction in populations of *E. coli* O157:H7, *Salmonella*, and yeast and mold growth. Ozone and SO₂ may, therefore, be considered useful gases under modified atmosphere packaging (MAP) to extend shelf life and inhibit growth of pathogenic bacteria on blueberries.