

Effect of ozone on the quality of fresh-cut green beans (*Phaseolus vulgaris* L.) and bell peppers (*Capsicum annuum* L.)

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Ozone is recognized as a strong oxidant and potent disinfecting agent. Ozone has several applications in the food industry, such as food surface disinfection, sanitation of food plant equipment and reuse of wastewater. Ozone acts at cell level, oxidizing sulfhydryl groups and amino acids of enzymes, peptides and proteins to shorter peptides. Another proposed mechanism involves oxidation of polyunsaturated fatty acids to peroxides (Victorin, 1992).

Several studies demonstrated that ozone treatments increase shelf life of fruits and vegetables (Rice *et al.*, 1982). This fact may be explained by the antimicrobial effect of ozone and also by its potential action at enzymatic level. Enzyme activity is responsible for quality decay of foods. One of the most effective processes for enzyme inactivation is blanching, which has as the main disadvantage, the degradation of sensorial attributes of foods. Ozone may be used as an alternative non-thermal process.

The objective of this work was to study the effect of ozone on the quality of fresh-cut green beans (*Phaseolus vulgaris*, L.) and green and red bell peppers (*Capsicum annuum*, L.). The quality factors analysed were enzyme (peroxidase) activity, colour and texture for green beans, and colour, texture and pH for bell peppers.

Experiments were carried out using pilot equipment. An ozone generator (SPO3, OZ5) was interconnected to a container (158 L) filled with tap water. Ozone was continuously incorporated in water at 15 °C and its content indirectly measured by potential difference. Green beans and bell peppers were cut in small portions (2x1 cm for green beans; 4x10 cm for bell peppers). Samples were immersed in ozonated and non-ozonated water baths and removed after different times, till a maximum of 180 minutes. Data from both treatments were compared by analysis of variance.

For green beans, results showed that ozone treatment did not affect the colour, but significantly influenced texture (firmness) and peroxidase inactivation (at 7% significance level). After 40 minutes enzyme activity was reduced approximately 20%. This inactivation was verified for the rest of the sampling times.

Ozone treatment only affected the pH and texture (fracturability) of red bell peppers (at 1% significance level). The other quality factors were not significantly influenced by ozone.

References

- RICE, R.G.; FARGUHAR, J.W.; BOLLYKY, L.J. 1982. Review of the applications of ozone for increasing storage times of perishable foods. *Ozone Science and Engineering*, 4: 147-163.
VICTORIN, K. 1992. Review of the genotoxicity of ozone. *Mutation Research*, 277: 221-238.