Plasma activated water (PAW) has shown promising results as a surface decontamination technique. The aim of this research was to: i) Isolate the effect of pH in PAW for inactivation of Enterobacter aerogenes using buffer systems and (ii) to understand the effect of surface roughness for microbial inactivation efficacy of PAW in fruit system. PAW was generated by exposing water to air plasma, which resulted in a pH drop from 6.5 to 3.1. To isolate the effect of pH, a citrate-phosphate buffer at pH 3.1 was introduced. In the model system, a microbial reduction of ~2 log CFU/ml was achieved with PAW, while no reduction was observed for the buffer system. This confirmed that the inactivation was due to reactive species in the PAW, and not pH. Moreover, plasma activated buffer (PAB) gave a higher microbial reduction of ~5 log CFU/ml. Surface roughness for grape tomatoes (2.54±0.62 µm) and limes (8.80±1.11 µm) was characterized using CLSM. In fruit systems, PAW and PAB achieved ~4 log CFU/fruit microbial reduction. However, no significant difference was observed in microbial inactivation efficacy of PAW and PAB for either a given fruit system or within fruits with different roughness values.

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