

Title pH reduction and vegetable tissue structure changes of zucchini slices during pulsed vacuum acidification

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Abstract

A pulsed vacuum acidification treatment (PVA) applied to zucchini slices and the related response of vegetable tissues, were studied. Results showed that in comparison with a traditional acidifying–dipping at atmospheric pressure, PVA may improve the pH reduction as a consequence of the increase of acid solution-vegetable tissues contact area. Nevertheless, the low porosity fraction of fresh zucchini, the variability of the vegetable tissue structure and its mechanical properties did not allow to increase the acidification rate by increasing the vacuum level of 200 mbar. In particular, the study of structural changes showed that the liquid volume changes occurred without significant total volume variation due to the rigidity of vegetable tissues. Probably, this aspect reduced the deformation–relaxation phenomena which have great effect on liquid impregnation at both 200 mbar and 400 mbar. In addition, due to the low viscosity of acid solution it was hypothesize a great filling also at 400 mbar reducing the effect of the increase of vacuum pressure.