# vacuum impregnation to modify health-promoting properties of fresh-cut apple cv. Granny Smith (wedges, each *ca.* 10 g)

| Raw Material | Composition of Vacuum Impregnation Solutions | Process Parameters | Effect |
|---|---|---|---|
| fresh-cut apple cv. Granny Smith (wedges, each *ca.* 10 g) | 50% (*v*/*v*) Mexican or 50% (*v*/*v*) Argentinean honeys, distilled water (control sample) | *p*1 70 kPa<br>*t*1 10 min<br>*t*2 10 min | less acceptable in terms of sensory qualities than their fresh-cut counterparts, total polyphenol content and antioxidant activity values in vacuum impregnated products were lower than in fresh-cut samples |

## Flow Chart

fresh-cut apple cv. Granny Smith (wedges, each *ca.* 10 g) Introduced into Vacuum Chamber

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Hydrodynamic Mechanism (HDM) Vacuum Chamber at = 70 KPA Time 1(t1) = 10 minutes

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50% (*v*/*v*) Mexican or 50% (*v*/*v*) Argentinean honeys, distilled water (control sample)

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Deformation Relaxation Phenomenon(DRP) Vacuum Chamber at atmospheric pressure Time 2(t2)= 10 minutes

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Result : less acceptable in terms of sensory qualities than their fresh-cut counterparts, total polyphenol content and antioxidant activity values in vacuum impregnated products were lower than in fresh-cut samples

## Vacuum Impregnation Setup




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**Result:**

Less acceptable in terms of sensory qualities than their fresh-cut counterparts, total polyphenol content and antioxidant activity values in vacuum impregnated products were lower than in fresh-cut samples. This procedure may cause an increase in the content of polyphenolic compounds in apple tissue, mainly anthocyanins, thus modifying fruit color as well as vitamin C content, since black currant is agood source of this compound. The authors investigated the effect of extract concentration, the level of pressure and the duration of its application on both mass transfer and nutritive value of apple cubes by applying the response surface method. In the process of vacuum impregnation they used high fructose corn syrup with extract content of 50° Brix and a black currant concentrate mixed in the following proportions [%]: 90/10, 85/15, 80/20 and pressure within the range of 40–80 kPa in time ranging from 15 to 45 min. Higher pressure and longer duration resulted in a greater uptake of extract compounds, but not a high black currant content. A higher antioxidant activity was obtained using medium and high concentrations of black currant concentrate, while the highest content of vitamin C was recorded at a medium content of black currant in the impregnating solution. Optimal parameters of vacuum impregnation were specified based on the analyses, promoting the introduction of such amounts of black currant concentrate, which significantly enhanced the nutritive value of produced apple cubes. Roβle et al. (2011) applied vacuum impregnation of fresh-cut apple wedges in order to enrich them with honey, additionally applying an addition of browning inhibitors and subjecting the enriched fruit to osmotic dehydration

**Burhani Hardware And Fittings**

**110 General Patters Road. Chennai -2 .** www.burhanihardware.org, sales@burhanihardware.org

**044-45116252 +919677296252**