EFFECT OF THE HIGH HYDROSTATIC PRESSURE ON THE QUALITY AND SHELF-LIFE OF FRESH-CUT POTATO

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In spite of fresh-cut potato's (FCP) convenience particularly in faster meal preparation, its short shelf-life is a challenge to producers, especially when chemical preservatives are avoided. Peeled and sliced potato is very susceptible to browning, microbiological growth and losing quality traits in general. Therefore, a lot of different techniques are investigated where also high hydrostatic pressure (HHP) preoccupies scientists. During HHP treatment the material is instantaneously and evenly compressed by pressure regardless to shape and size, hence at ambient temperature could be effective to enzyme or microbial inactivation1, but could also alter other some quality or sensory parameters.

OBJECTIVE
- the influence of HHP treatment (400 MPa/3, 5 and 10 minutes) in the sodium ascorbate solution on the quality and sensory properties and microbial stability of FCP.
- stability of the best evaluated samples during 15 days storage in vacuum packaging at 6 °C.

MATERIALS & METHODS

PREPARATION
- Washing, peeling, slicing of potato cv. Birgít harvested in Slavonia region (Croatia) in 2019
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- Packaging in plastic jars in 2 % sodium ascorbate solution
- HHP treatment 400 MPa/3 (control), 5, and 10 minutes
- Drained slices vacuum packaged in PE/PA bags
- Storage for 8, 11 and 15 days at 6 °C
- Boiling: in distilled water at 100 °C/15 min
- Frying: in sunflower oil at 180 °C/5 min

TREATMENT
- Color (Lightness -L*) by colorimeter (Spectrophotometer CM-3500D, Konica Minolta, Japan)
- Sensory evaluation: by 5 trained panellists, Quantitative Descriptive Analysis (scale 1 to 9).
- Color of raw and boiled, an intensity of browning (0 = absent to 5-complete browning).
- Characteristic color of fried potato (0 = absent to 5 = very pronounced).

RESULTS & DISCUSSION

HHP TREATMENT
- Treatment did not significantly affect on firmness (F), but it did on lightness (L*), where slices treated 5 and 10 min were brighter.

HHP TREATMENT AND STORAGE
- Same samples showed certain mechanical damage, where during their frying the oil spattered strongly, and they were sensory lower graded. Consequently, stability of untreated samples (control) and only ones treated 3 min was examined during storage at 6 °C (after 8, 11 and 15 days). F and L* followed the same pattern as in the first experimental part. Although AMB was reduced by the treatment, it increased during storage but slower in comparison with untreated ones, and on the 15th day it was under the limit set by the Regulations.

CONCLUSION

Regarding sensory properties, only untreated samples were acceptable till the 8th day of storage. In spite of the excellent results for aerobic mesophilic bacteria count in HHP treated samples (400 MPa/3 min) in sodium ascorbate, such treated potato slices showed poor sensory properties. Future research of the HHP treatment application without using water during HHP for the fresh-cut potato (slices) intended to be used for example to be used to avoid water diffusion into the tissue which disables frying.

REFERENCES