

Non-thermal treatments impact on safety and quality aspects of refrigerated strawberry (*Fragaria ananassa*)



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Introduction

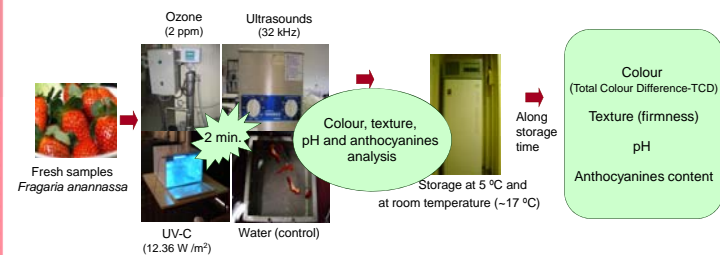
Thermal treatments, when conveniently applied, are efficient in reducing microbial load of fruits and vegetables. However, the negative impact of heat, especially at food texture level, makes non-thermal treatments promising technologies as minimal food processes.

Objectives

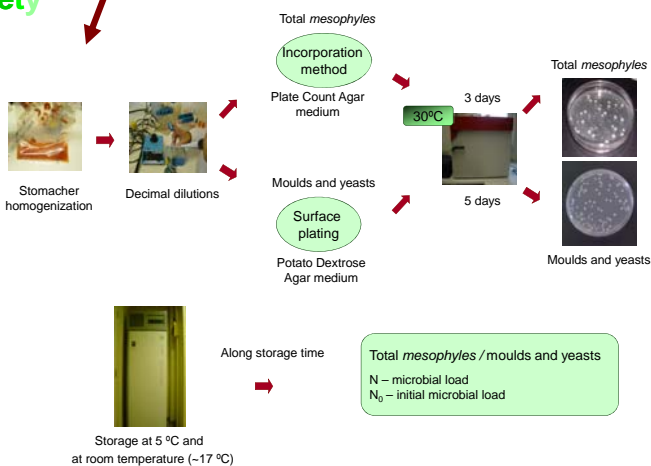
The objective of this work was to study the effect of some innovative technologies (ozone (O₃) in aqueous solution, ultraviolet light (UV) and ultrasounds (US)) on safety (evaluated by total mesophyls and yeasts and moulds enumerations – autoctone flora) and some quality features (pH, colour, anthocyanines and texture) of strawberries, throughout 13 days of storage at 5°C and at room temperature.

Experimental description

Treatments and Quality



Safety



Acknowledgments

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Results and Discussion

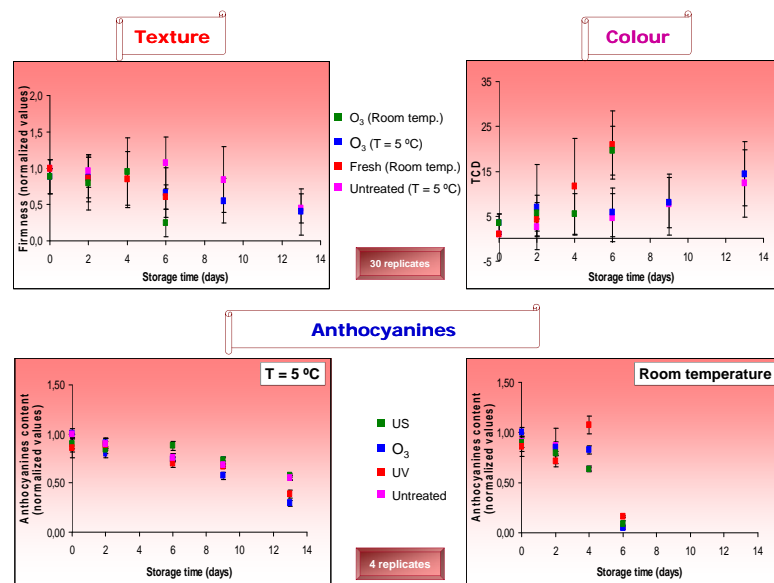
Quality

In terms of texture (analysed through firmness), colour and pH (results not presented) of strawberries, no significant differences were observed between all treatments analysed.

However, a temperature effect on colour was evident when samples were stored at room temperature. Differences in colour were also more significant as storage time increases. Results of the ozone treatment are shown below, and are representative of all studied treatments.

In relation to anthocyanines content, storage temperature had the major impact. When samples were stored at room temperature, a great decrease of anthocyanines content was observed. In such situation, the treatment effect was not significant.

When samples were stored at 5°C, anthocyanines degraded throughout storage in a slower rate than the one observed at room temperature. Ultrasounds treatment was the best treatment to apply, since a better retention was observed.

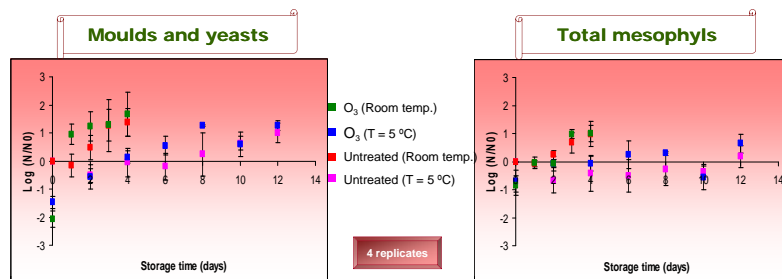


Safety

In terms of microbial reduction (i.e. mesophyls and yeasts and moulds), all treatments were equivalent. Results of the ozone treatment are shown below, and are representative of all treatments studied.

Total mesophyls and yeasts and moulds content in strawberries increased along storage. The increase was more evident at room temperature.

At the end of storage at room temperature (4 days), it was observed an increase of approximately 2 log-cycles and 1 log-cycle for the yeasts and moulds and total mesophyls, respectively. At 5°C, and at the end of 12 days of storage, it was observed an increase of approximately 1 log-cycle for moulds and yeasts. In the case of total mesophyls, the value was slightly lower.



Conclusions

At quality level, the treatments did not have a significant impact. An exception was observed for anthocyanines content, stored at refrigerated temperatures. In such situation, US treatment lead to an increased retention of anthocyanines content.

At microbiological level, the treatments did not have a significant impact. Storage temperature had the great influence on microbial growth.