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Impact of ozonization on quality parameters, nutritional aspects and inactivation of *Listeria innocua* in beans

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Introduction

Beans are one of the most consumed legumes, due to their high content of proteins, complex carbohydrates, fibers, vitamins and also antioxidant substances, such as polyphenols. Antioxidants are substances that can slow down or inhibit oxidative damage by playing a role in preventing chronic diseases. However, the bean quality can be affected by microbial contamination or the methods used to avoid it. Ozone (O₃) is a gas with high oxidizing potential, considered a “green chemical process” and recognized as GRAS (Generally Recognized As Safe). It can be used for microbial inactivation in different agricultural products, as well as for mycotoxins degradation in grains and derivate. However, it can also negatively impact the product quality due to oxidative processes.

Objective

The objective of this study was to evaluate the effect of processing beans with ozone on their phenolic compounds and antioxidant capacity, as well as their impact on the physical properties (water activity, color) and inactivation of *Listeria innocua*, as a target microorganism.

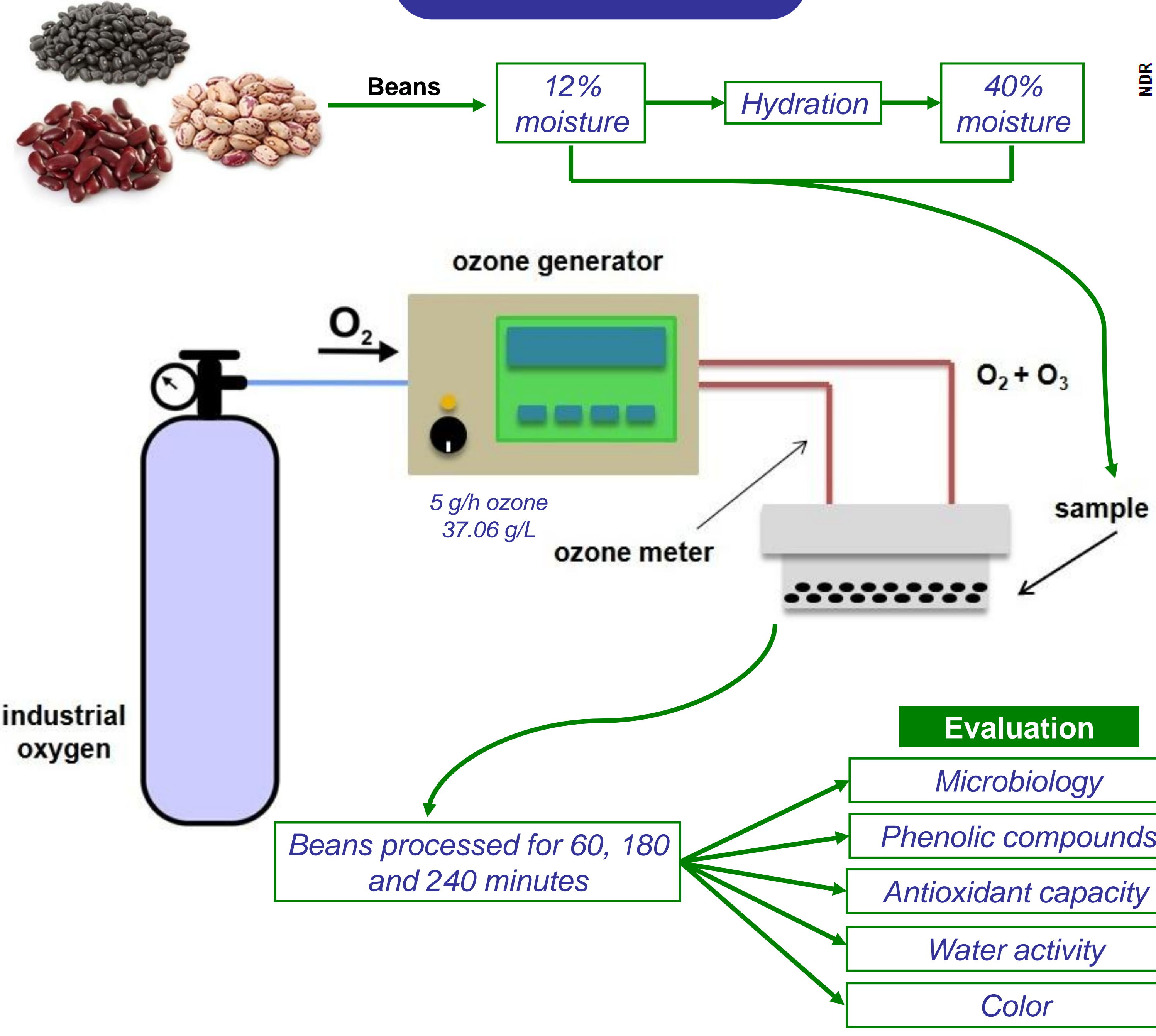
Results and Discussion

Black beans
Red beans
Catarino beans

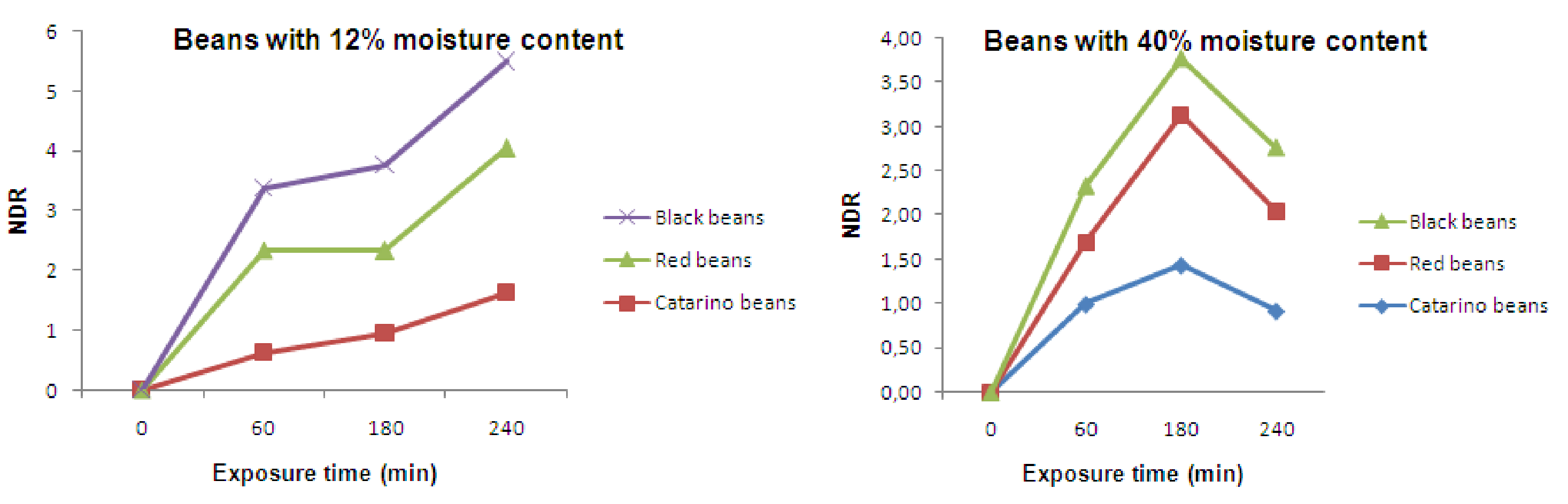
Water activity
Color
Antioxidant capacity $\lambda = 734 \text{ nm}$
Phenolic compound $\lambda = 750 \text{ nm}$

The ozone processing did not affect ($p \leq 0.05$) the total phenolic content, antioxidant capacity, and color of the beans. The catarino bean was affected in the phenolic content when moistened.

Material and Methods



Effect of ozone processing on the catarino, red and black beans



Inactivation of *Listeria innocua* in ozonized beans

Conclusions

Therefore, the present study demonstrated that the ozonation can reduce the microbiology content in beans, without impact on its nutritional quality

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