



Polyphenols-tannins complexes in chicken meat: evalution of their impact on lipid oxidation, colour, cooking yield and sensory profile

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INTRODUCTION

During the last decades, over 300 million tonnes of **meat products** have been consumed and demanded worldwide each year¹. However, meat and meat products are extremely susceptible to **lipid oxidation**, causing meat quality deterioration. Indeed, this process leads to loss of nutrients, **unpleasant colour changing**, rancidity, off-flavour and off-odour formation, gas production, **sensory alteration**, texture deterioration, and **toxic compounds** formation, responsible for human health problems². To counteract this phenomenon, research is focused on the use of **natural green alternatives** to synthetic antioxidant compounds, with possible beneficial effects on the human body. In this context, the enrichment of chicken patties with **polyphenols** and **tannins**, which present *in vivo* and *in vitro*³ very effective antioxidant, antimicrobial, cardioprotective, and anti-inflammatory activities, can be a good strategy to **increase meat shelf life** and protect its **quality**.

MATERIALS AND METHODS

Chicken patties receipt:

95.5% (w/w) of chicken thigh meat

3% (w/w) of deionized water

1.5% (w/w) of salt

+ % of extracts

C - : patty with no extracts

C + : patty with synthetic ascorbic acid 0.1% (w/w)

PT1: patty with polyphenols-tannins blend 0.02% (w/w)

PT2: patty with polyphenols-tannins blend 0.02% (w/w)

RE: patty with rosemary extract 0.2% (w/w)

ANALYSES:

TBARS⁴

Colour

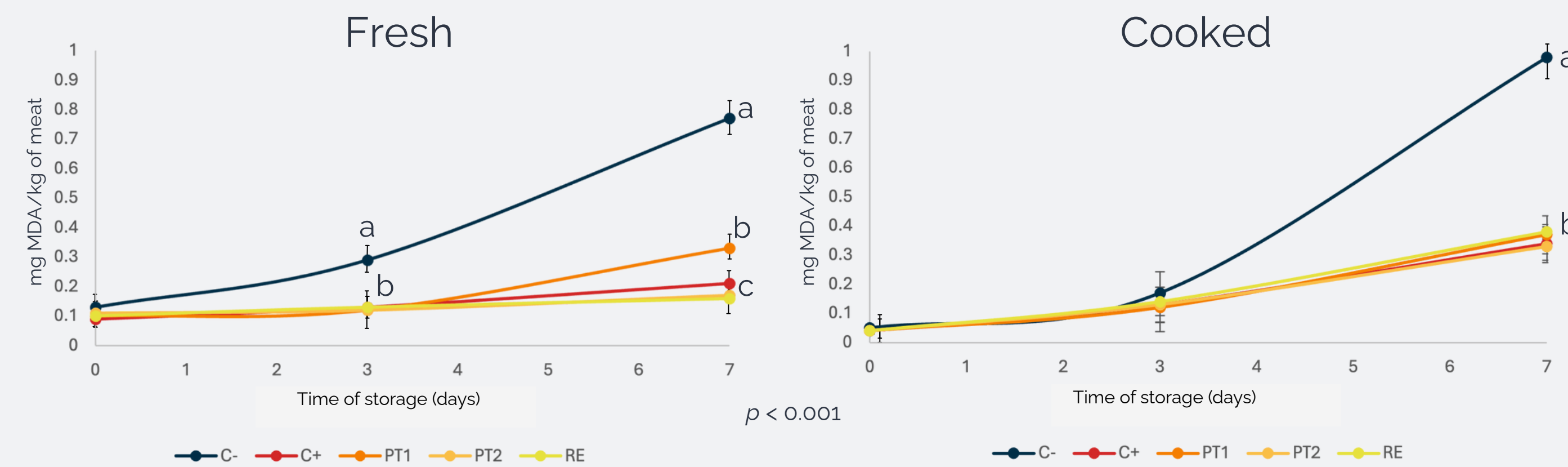
Cooking yield

Sensory analysis

5 different samples of chicken patties were obtained by manually mixing the ingredients, then formed (n=3) and placed in a polyethylene terephthalate (PET) container with a poly-coated (PE paper) paper foil. Patties were stored at 4°C in darkness for 7 days of storage and analyzed after 4 hours (Day 0), 3 days and at the end of the experiment.

RESULTS

TBARS

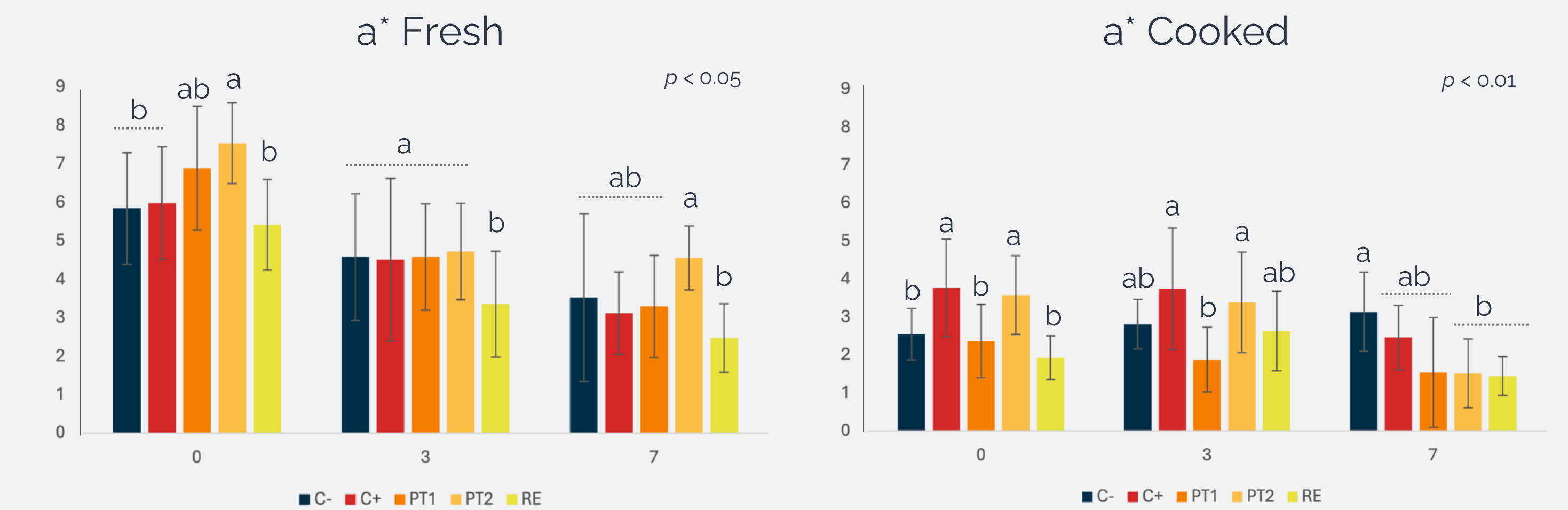


◆ All the tested compounds exerted an effective antioxidant activity counteracting lipid oxidation, **reducing** secondary **oxidation products** both in fresh and cooked meat during their entire storage period.

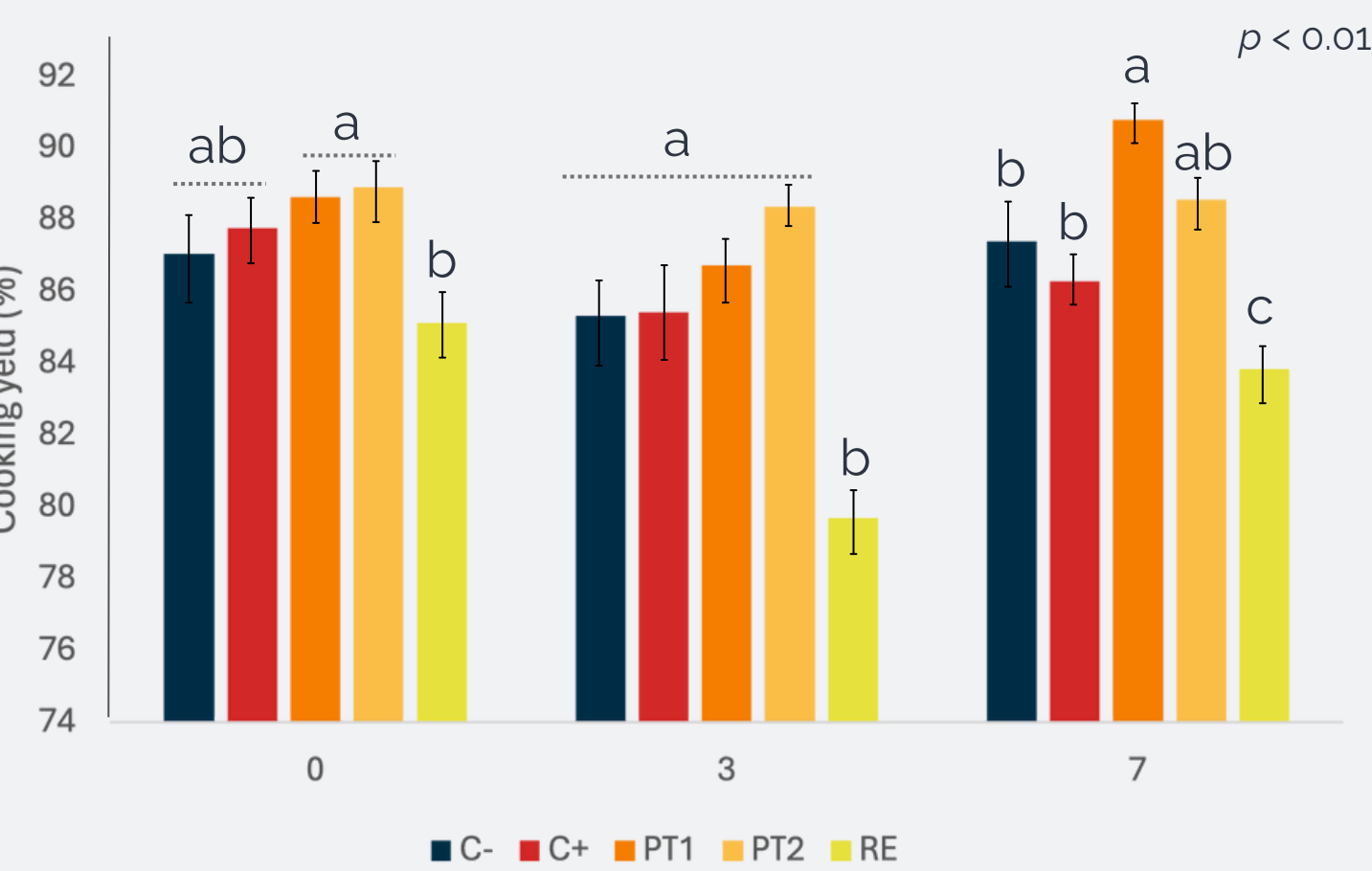
◆ Both **polyphenols-tannins blends** exhibited **higher antioxidant activity** than synthetic ascorbic acid and rosemary extract, as they showed similar TBARS content at a concentration of 0.02% (w/w), compared to 0.1% and 0.2% (w/w) of the other two, respectively.

COLOUR

The **L*** and **b*** values were **not influenced** by the addition of any extract, suggesting that lightness and yellowness were not sensitive to the treatments. In contrast, the **a*** value was better **preserved** by **polyphenols-tannins blends** and **ascorbic acid** during the refrigeration period. Again, after cooking, PT2 and **ascorbic acid** were able to protect the colour. This indicates that these antioxidants helped **protect** the small fraction of **myoglobin** from oxidation, thereby maintaining the characteristic colour of chicken meat.



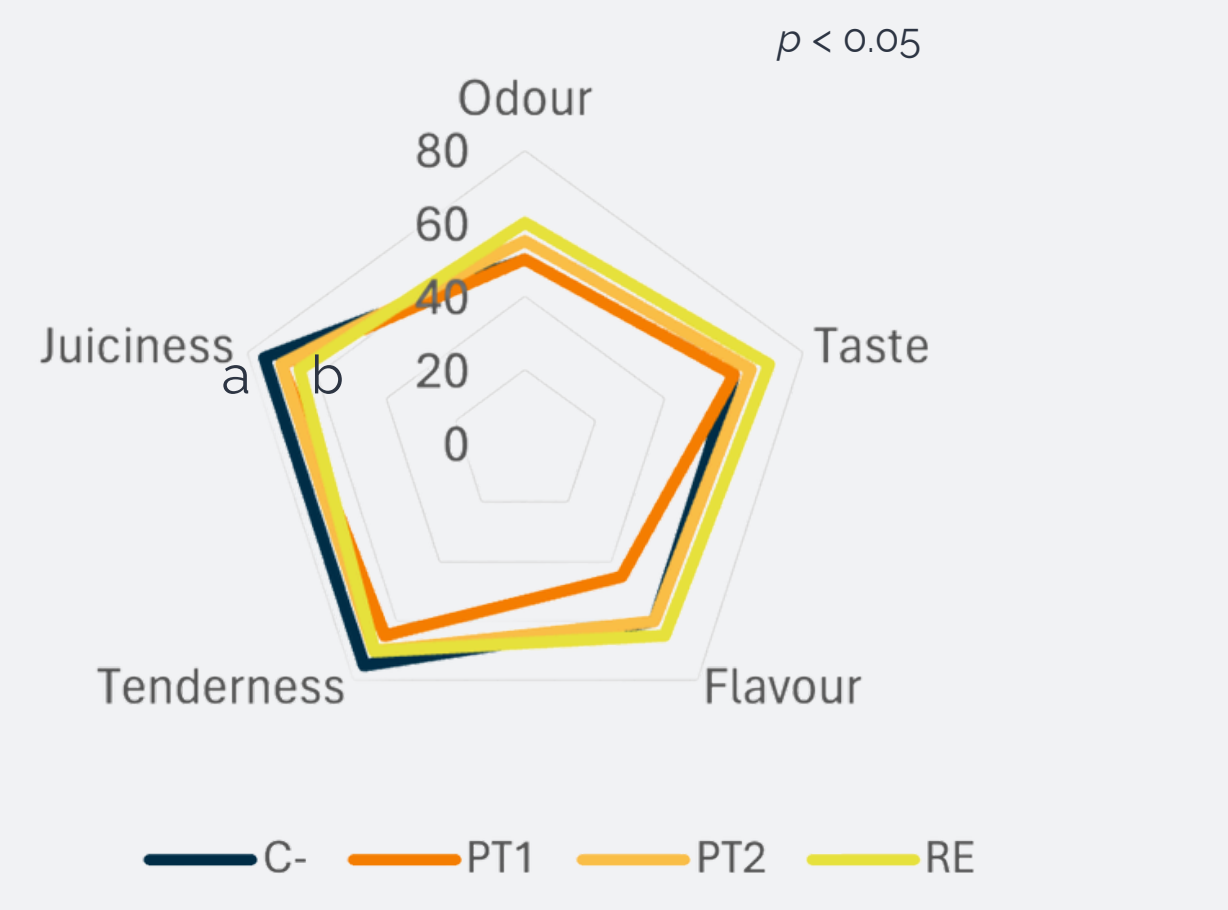
COOKING YIELD



The presence of both polyphenols-tannins blends (PT1 and PT2) and ascorbic acid did **not affect** the **cooking yield**. Conversely, RE determined an increase in the water loss of chicken patties. The same trend was observed for the entire storage period of chicken patties.

SENSORY ANALYSIS

In the sensory analysis, panelists evaluated the samples enriched with natural compounds as less juicy than the control, but **more palatable** due to the presence of **aromatic/herbaceous notes**, which enhanced the flavorfulness of the patties. Moreover, panelists considered the **tenderness** and **juiciness** levels of all samples to be **acceptable**.



CONCLUSIONS

- ◆ All the tested compounds exhibited very **effective antioxidant activity**, both in fresh and in cooked chicken patties, presenting the best results in samples enriched with polyphenols-tannins blends.
- ◆ Polyphenols-tannins blends and ascorbic acid provided better **a* colour protection** with respect to RE during the entire storage period and after patties were cooked.
- ◆ The presence of natural compounds determined **higher palatability** of chicken patties with respect to the control, without any enrichment.

REFERENCES

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