

# Effect of Carqueixa (*Pterospartum tridentatum*) antioxidant extract on the quality and sensorial characteristics of pork burger

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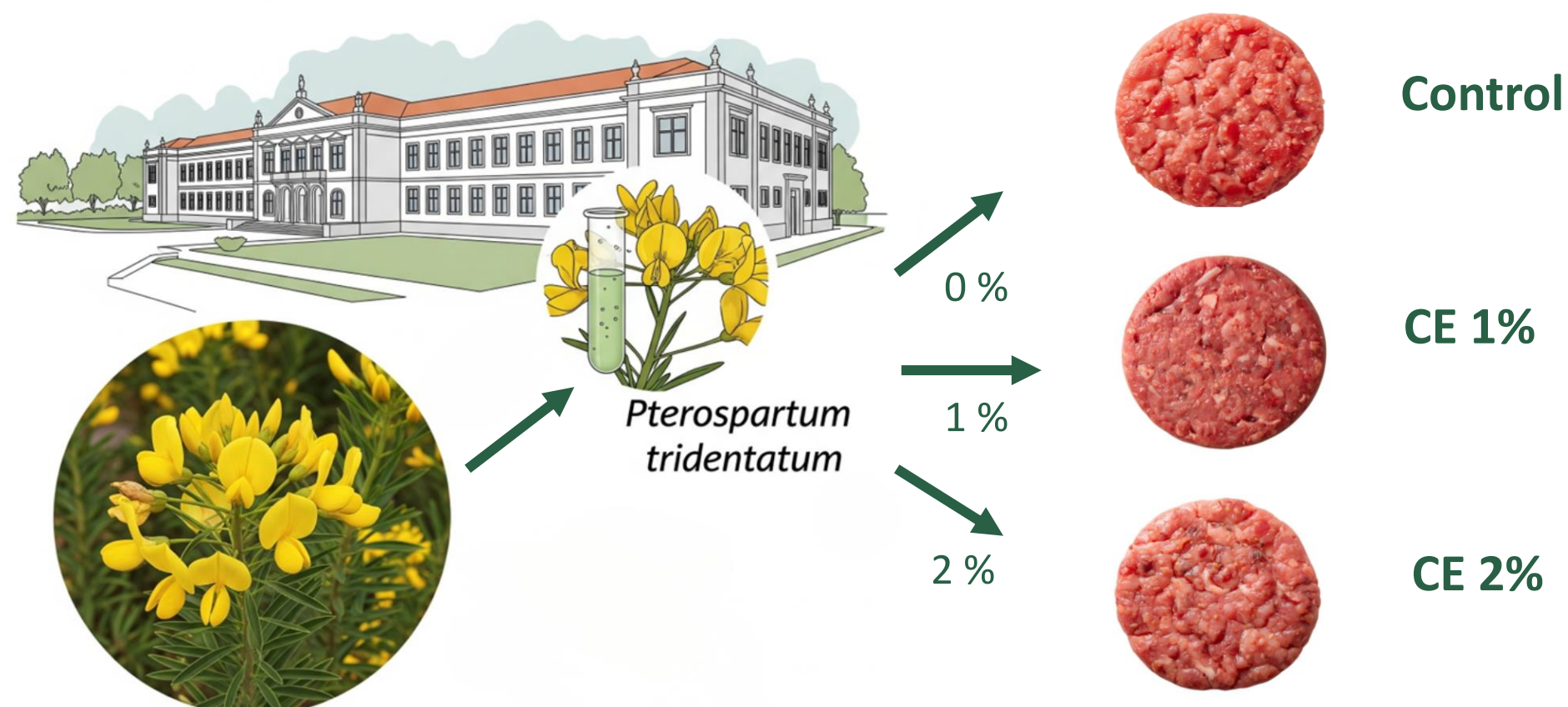
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## INTRODUCTION & AIM

Carqueixa (*Pterospartum tridentatum* L. Willk.) is a Mediterranean leguminous plant rich in bioactive compounds, particularly phenolics, which are associated with notable antioxidant properties and traditional medicinal uses. Due to increasing consumer demand for natural additives and industry interest in replacing synthetic antioxidants, carqueixa has emerged as a promising functional ingredient in food products. **This study investigates the impact of carqueixa extracts on the physicochemical, technological, and sensory attributes of pork burgers.**

## METHOD

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Traditional formulation composed of 100% meat (50:50:18:1.5:0.2 of lean meat, backfat, water, sodium chloride, and white pepper, respectively). This mixture was divided into three equal portions and supplemented with carqueixa at concentrations of 0%, 1% and 2%.

Determinations carried out:

Chemical composition  
Physico-chemical properties  
Cooking characteristics  
Lipid oxidation  
Sensory attributes

Samples added with carqueixa (at any concentration) showed an **increased in cooking yield** compare with control sample. ↑

Burgers with 1% carqueixa showed **reduced lipid oxidation** in both raw (28%) and cooked (8%). ↓

Improved stability during cooking, **favorable textural** modifications.

## RESULTS & DISCUSSION

**Table 1.** Proximate composition of pork burger (raw and cooked) formulated with different levels of carqueixa (CE).

|              | Raw burgers              |                          |                          | Cooked burgers           |                          |                          |
|--------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|              | Control                  | CE 1%                    | CE 2%                    | Control                  | CE 1%                    | CE 2%                    |
| Moisture (%) | 50.15±1.23 <sup>aA</sup> | 49.32±1.03 <sup>aA</sup> | 49.02±0.25 <sup>aA</sup> | 36.23±0.98 <sup>aB</sup> | 35.12±0.82 <sup>aB</sup> | 34.31±1.10 <sup>aB</sup> |
| Fat (%)      | 27.60±0.79 <sup>aA</sup> | 30.43±1.34 <sup>aA</sup> | 30.40±3.19 <sup>aA</sup> | 37.38±0.82 <sup>aB</sup> | 39.38±0.64 <sup>bB</sup> | 41.78±0.46 <sup>cB</sup> |
| Proteins (%) | 18.94±0.12 <sup>aA</sup> | 17.26±0.00 <sup>bA</sup> | 16.93±0.14 <sup>cA</sup> | 28.81±0.27 <sup>aB</sup> | 27.05±0.59 <sup>bB</sup> | 26.84±0.28 <sup>cB</sup> |
| Ash (%)      | 1.76±0.09 <sup>aA</sup>  | 1.90±0.05 <sup>bA</sup>  | 2.24±0.13 <sup>bA</sup>  | 2.30±0.03 <sup>aB</sup>  | 2.41±0.05 <sup>bB</sup>  | 2.51±0.05 <sup>cB</sup>  |

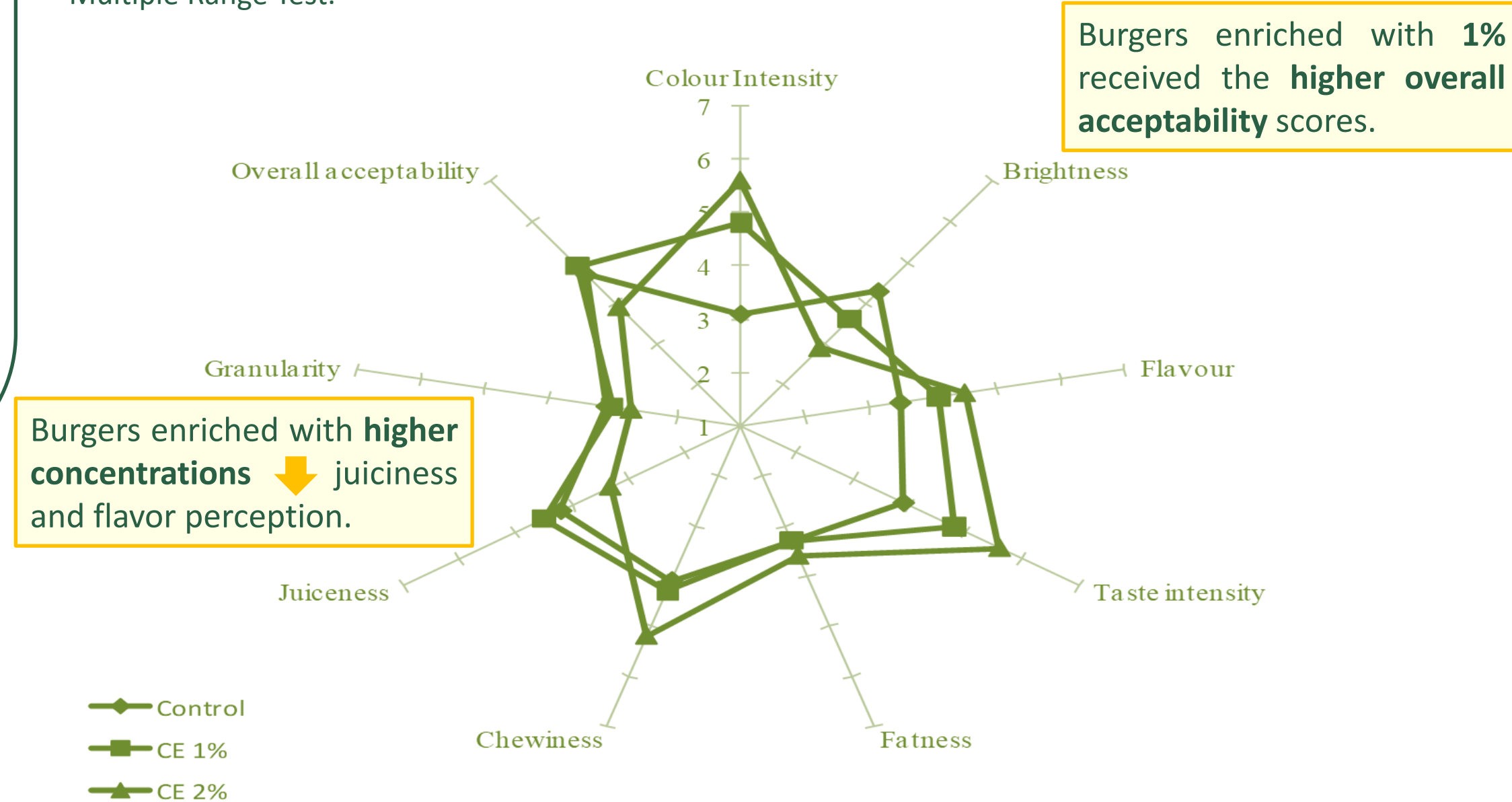
For each group (raw or cooked) values followed by the same small letter within the same row are not significantly different ( $p > 0.05$ ) according to Tukey's Multiple Range Test. For the same formula, means with different capital letters for raw or cooked burgers are not significantly different ( $p > 0.05$ ) according to Tukey's Multiple Range Test.

Favorable textural modifications, including ↑ **increased hardness and chewiness** in raw and cooked samples.

**Table 2.** Physico-chemical properties of pork burgers (raw and cooked) formulated with different levels of carqueixa (CE).

|                 | Raw burgers               |                           |                           | Cooked burgers            |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                 | Control                   | CE 1%                     | CE 2%                     | Control                   | CE 1%                     | CE 2%                     |
| pH              | 5.77±0.03 <sup>aA</sup>   | 5.74±0.02 <sup>aA</sup>   | 5.73±0.01 <sup>aA</sup>   | 6.11±0.01 <sup>aB</sup>   | 6.06±0.01 <sup>bB</sup>   | 6.03±0.01 <sup>cB</sup>   |
| Water activity  | 0.965±0.001 <sup>aA</sup> | 0.961±0.000 <sup>bA</sup> | 0.960±0.001 <sup>bA</sup> | 0.966±0.001 <sup>aA</sup> | 0.960±0.001 <sup>bA</sup> | 0.961±0.001 <sup>bA</sup> |
| Lightness (L*)  | 39.98±1.61 <sup>aA</sup>  | 43.00±0.67 <sup>bA</sup>  | 44.10±1.07 <sup>bA</sup>  | 46.96±1.09 <sup>aB</sup>  | 49.17±1.23 <sup>bB</sup>  | 50.05±1.32 <sup>bB</sup>  |
| Redness (a*)    | 8.81±0.16 <sup>aA</sup>   | 7.08±0.47 <sup>bA</sup>   | 4.38±0.65 <sup>cA</sup>   | 6.25±0.84 <sup>aB</sup>   | 3.54±0.78 <sup>bB</sup>   | 3.23±0.58 <sup>bB</sup>   |
| Yellowness (b*) | 19.07±1.01 <sup>aA</sup>  | 21.14±0.42 <sup>bA</sup>  | 23.16±0.65 <sup>cA</sup>  | 20.62±0.53 <sup>aA</sup>  | 21.41±1.39 <sup>aA</sup>  | 22.66±1.32 <sup>aA</sup>  |
| Chroma (C*)     | 20.18±0.75 <sup>aA</sup>  | 22.38±0.16 <sup>bA</sup>  | 23.59±0.83 <sup>cA</sup>  | 21.55±0.63 <sup>aA</sup>  | 21.71±0.42 <sup>aA</sup>  | 22.90±0.32 <sup>aA</sup>  |
| Hue (h*)        | 64.75±5.72 <sup>aA</sup>  | 72.10±4.65 <sup>abA</sup> | 79.66±2.72 <sup>bA</sup>  | 73.18±1.72 <sup>aB</sup>  | 80.62±1.90 <sup>bB</sup>  | 81.88±1.48 <sup>bB</sup>  |

For each group (raw or cooked) values followed by the same small letter within the same row are not significantly different ( $p > 0.05$ ) according to Tukey's Multiple Range Test. For the same formula, means with different capital letters for raw or cooked burgers are not significantly different ( $p > 0.05$ ) according to Tukey's Multiple Range Test.



**Figure 1.** Sensory analysis of pork burgers formulated with different levels of carqueixa (Control, 1 and 2%).

## CONCLUSION

These results suggest that carqueixa extract, especially at 1% concentration, is a promising natural additive for meat product formulations, as it improves oxidative stability and sensory quality, while responding to consumer demand for clean-label ingredients.