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Effect of atmospheric pin-to-plate cold plasma treatment on structural modification and cooking quality of split red lentil (*Lens culinaris*)

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Abstract

Improving the cooking efficiency and nutritional quality of legumes using non-thermal technologies remains a key challenge in food processing. The present study investigated the impact of atmospheric cold plasma (ACP) on modifications induced in split red lentils at different voltages (170, 200 and 230 V) and varied treatment time (5, 10 and 15 min). ACP treatment reduced the cooking time by 31.22% without significantly affecting the physicochemical characteristics of the lentils. Rate constants for hydration from Peleg's equation [1] fitting revealed enhanced water uptake rate and better hydration [2] extent by the treated lentil kernels. Although the ACP treatment negatively affected the total phenolic content and antioxidant capacity which dropped by a maximum of 12.47% and 4.89%, respectively but the maximum phytic acid content reduction obtained was 57.21% [3]. Further insights from electron microscopy revealed structural changes providing support to the improved cooking quality.

References

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