

## **Use of Plasma Activated Water for the functionalization of chick-pea flour**

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The market of plant-based ingredients, in particular proteins sources, has increased constantly in the last years. There are various driving forces behind this dietary shift, including sustainability, health, and ethical considerations. Various products, as vegetable, cereals, pulses, fungi, have been exploited and are under current investigation for extracting proteins, but also starches and other ingredients. Beside the nutritional values, these ingredients possess also various techno-functional properties such as thickening and gelling ability, emulsifying, foaming, water holding and fat absorption, that are crucial for the formulation of foods, in particular for the formulation of meat and dairy analogues. In order to meet market demand, there is a need to have plant-based protein and ingredients that rival or have improved quality and functionality compared to the traditional animal protein ingredients they may replace.

Traditionally, ingredients are modified through chemical modification, however, to increase the sustainability of the ingredients, different alternatives have been investigated.

Plasma Activated Water (PAW), obtained by exposing water to cold plasma discharges, has emerged recently as a potential alternative for structural modification of ingredients aimed at their functionalization.

In the present research PAW, obtained through a corona discharge at 15kv, has been applied, for a 20 min exposure time to chickpeas flour to assess the modifications in the functionality. Specifically, technological properties such as emulsifying, gelling, water binding and foaming ability were measured in the flour after PAW treatment.

Results showed significant changes in the techno-functionality of the chickpea flour, due mainly to structural modification induced by the highly reactive species in PAW, confirming its potential as novel, green and uniform alternative treatment method to modify the properties of food ingredients.