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# OPTIMIZING THE DEVELOPMENT OF AN ANTHYPERTENSIVE WHEY HYDROLYSATE IN SEMI-PILOT SCALE

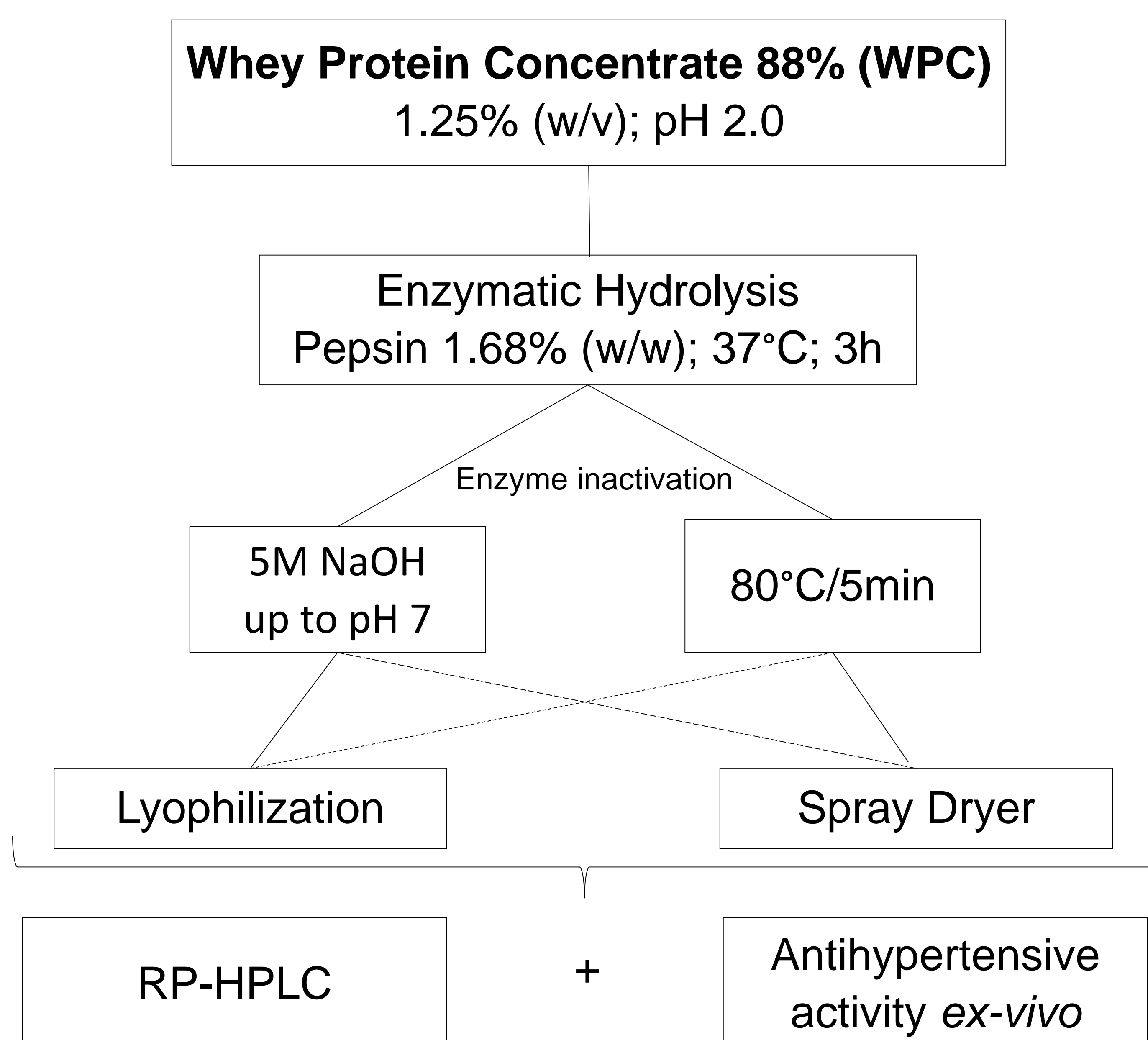
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## INTRODUCTION

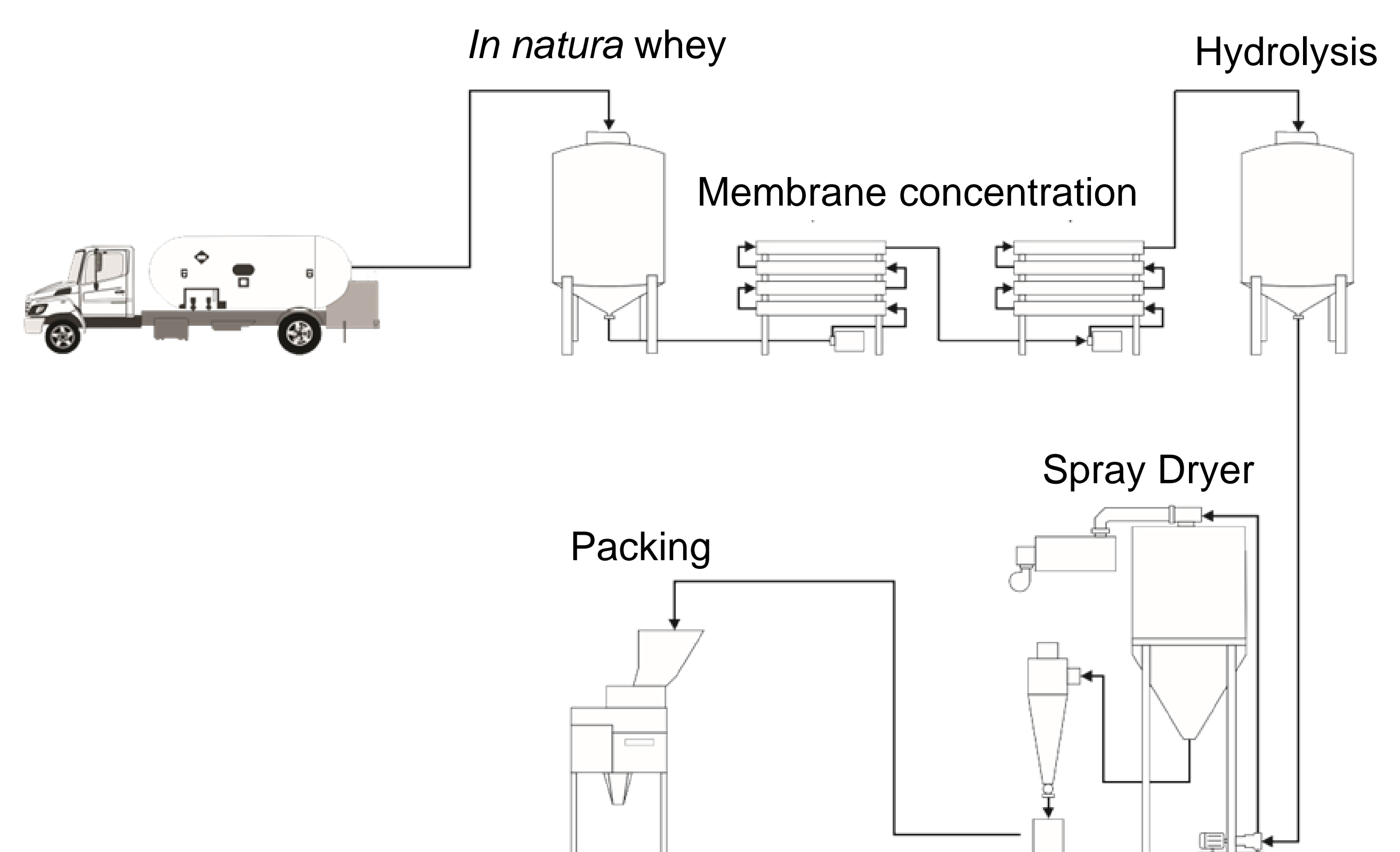
- Large quantities of whey are generated annually by the cheesemaking industries and concerns about the environment have made them seek new alternatives for their effluents;
- Whey proteins and peptides are one of these byproducts which is recognized for reducing risk factors of numerous diseases, including hypertension;
- Despite the need of better use of this agroindustrial residue and the high prevalence of hypertension worldwide, whey based-products that are able to modulate blood pressure are very scarce in food and nutraceutical markets, emphasizing the need of more research regarding this theme. The development of new products requires several stages in which scaling-up the production is comprised.
- The present study proposed to optimize the process of development of a new antihypertensive whey hydrolysate in semi-pilot scale, assessing the influence of drying technologies and enzyme inactivation conditions on its biofunctionality.

## MATERIALS AND METHODS

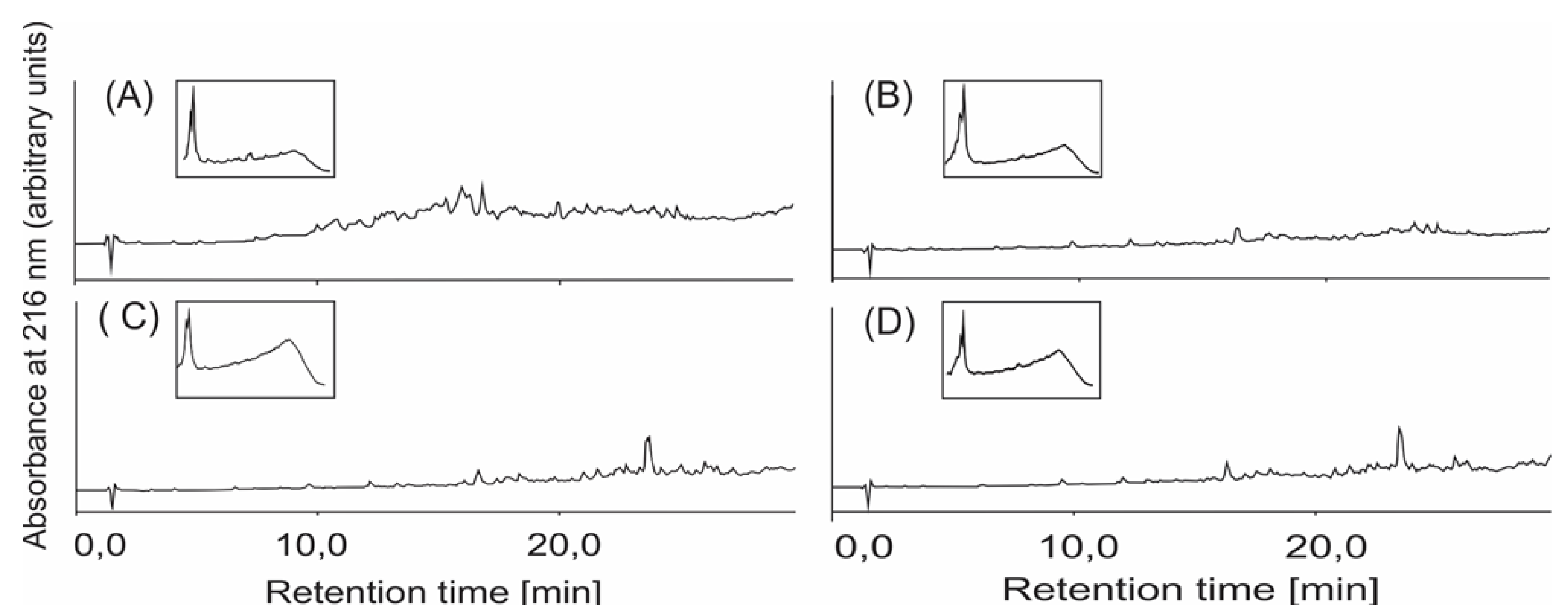


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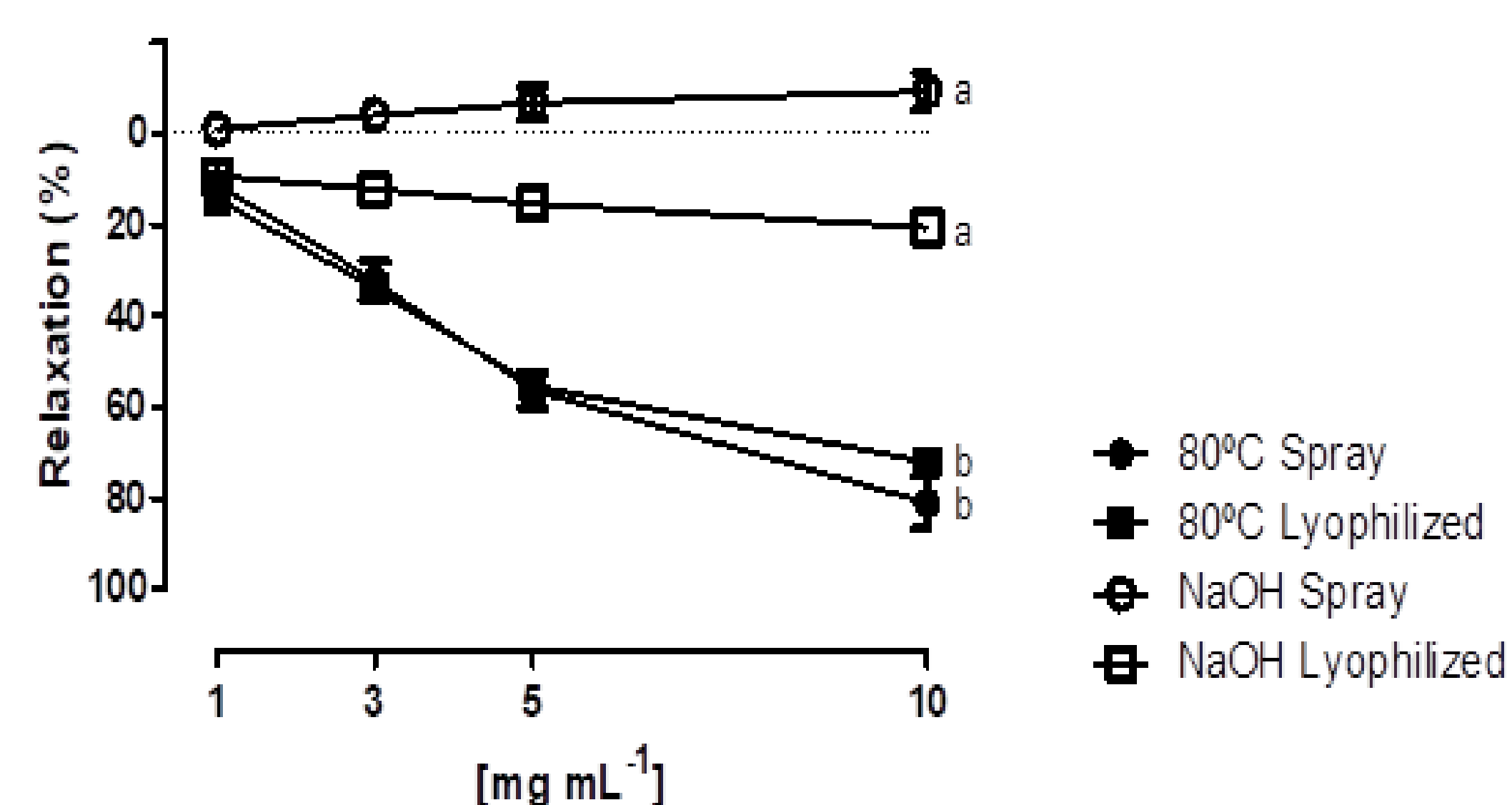
## RESULTS



**Figure 1:** Design of an industrial plant for whey protein hydrolysate production.



**Figure 2:** Peptide profiles of whey hydrolysates. (A) chemically inactivated and freeze-dried; (B) chemically inactivated and spray-dried; (C) thermally inactivated and freeze-dried; (D) thermally inactivated and spray-dried. Upper windows show  $\beta$ -lactoglobulin.



**Figure 3:** Vascular relaxations induced by cumulative concentration of 1, 3, 5, 10 mg.mL<sup>-1</sup> of whey hydrolysates. Letters a and b indicate significant difference ( $p < 0.05$ ).

## CONCLUSIONS

The present study revealed that the spray-dry technology was effective in maintaining the antihypertensive potential of the hydrolysate, besides being more affordable to food industries. Moreover, the enzyme inactivation seemed to be an important step in the process for the obtainment of a biofunctional ingredient, since thermally inactivated samples achieved vascular relaxations above 70%. In this manner, thermic inactivation of the enzyme and spray-drying the hydrolyzed solution were the best alternatives for the development of antihypertensive whey hydrolysate in a semi-pilot scale.