Effect of high isostatic pressure on the modification of the techno-functional properties of protein isolate from quinoa (Chenopodium Quinoa Willd) with pH variation

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Quinoa is being widely used as a source of alternative proteins, standing out worldwide as a superfood and, above all, for the quality of its proteins. Vegetable proteins, such as quinoa, have important physical and functional properties for the processing, storage and consumption of food, but their native form may have reduced functionality if compared to animal proteins and, therefore, their use may be more limited. Therefore, methods such as high isostatic pressure (HIP) and pH adjustment are being used to modify proteins technofunctionality. The potential of API combined with pH adjustment in modifying the structure and techno-functional properties of quinoa protein isolate (QPI) was evaluated. IPQ dispersions (5%; w/v) were processed at HIP (260 and 540 Mpa) with different pH values (3.5 and 10.50), for 10 min at 25°C and the control was performed using samples no processing. Pressurization combined with pH adjustment promoted a significant increase ($P<0.05$) in the water absorption capacity of QPI dispersions (3.00 g/g), with greater absorption at pH 3.50 (4.40 g /g). The oil absorption capacity (2.40 g/g) increased compared to the control, with maximum absorption at 260 MPa and pH 3.50 (3.53 g/g). There was a significant increase of 23% in the foaming capacity of the dispersions (32.50 g/g), with the maximum formation observed at 540 MPa and pH 10.50 (40.00 g/g). The foam stability of the QPI dispersions at 10, 30 and 60 min (28.75, 28.75 and 22.50 g/g), were significantly increased at 540 MPa and pH 10.50 to 37.50, 32, 50 and 32.50 respectively. Although the emulsifying capacity has been significantly reduced, it is still possible to indicate that QPI is a promising food ingredient for use in food formulation and pH adjustment combined with HIP processing are able to provide changes in proteins techno-functionality.