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# Food-grade pickering emulsion stabilized by protein-based particles obtained from a lupin variety (AluProt-CGNA®) as a system for encapsulating astaxanthin

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**Numerous studies have shown that astaxanthin has a number of benefits for human health. Unfortunately, the use of astaxanthin oleoresin as food ingredient is limited owing to its poor water solubility in aqueous matrices and susceptibility to degradation through the development of oxidation reactions, which may be promoted during thermal treatment or storage. Encapsulation technology may be a way of solving these problems. Among encapsulation methods Pickering emulsion (O/W) could be an alternative for protecting this appreciate molecule. Therefore, the aim of this study was to investigate the encapsulation of astaxanthin using a food-grade Pickering emulsion system to enhance its stability during spray-drying. Astaxanthin was microencapsulated in a Pickering emulsion and then subjected to a spray-drying process. The emulsions were stabilized by protein-based particles obtained from the protein-rich lupin variety AluProt-CGNA® (LPIA). The Pickering emulsion stability, microstructure, physicochemical properties and astaxanthin concentration after spray-drying process were investigated. First of all, the results showed that lupin protein aggregate particles (LP-APs), obtained from LPIA, exhibit great potential to perform as stabilizers for Pickering emulsions. The formed emulsions were highly stable against creaming upon storage over 14 days, especially at high concentrations (>3%, w/v). On the other hand, the stability of the astaxanthin in the microcapsules was evaluated under storage conditions at 25 and 45 °C for 4 weeks measuring the loss of concentration of this carotenoid. The results indicated that spray-drying can be applied to prepare stable astaxanthin emulsions into powders with good oxidative stability. The success of this study could help to expand the use of astaxanthin as a functional ingredient, overcoming problems related to dosage and manipulation, low solubility and oxidative stability.**

## Biography

Cesar Burgos-Diaz is a Group Leader and Researcher at Agri-aquaculture Nutritional Genomic Center, CGNA, Temuco-Chile. He is a Specialist in Food Science and Technology. He is currently leading a research project on "Microencapsulation of astaxanthin in a new food-grade Pickering emulsion system for increasing its protection and stability". He has also participated and the results of his works have been presented in different scientific conferences linked to his area in Spain, Italy, Ecuador, France, United States and Chile.

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