ENCAPSULATION OF ASTAXANTHIN SUPERCritical EXTRACT FROM
*Haematococcus pluvialis* BY FREEZE AND SPRAY DRYING

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Astaxanthin (AX) obtained from the microalga *Haematococcus pluvialis* represents a valuable choice for the growing demand of natural bioactive compounds. The extraction from the microalga allows the acquisition of higher bioavailability but decreases AX stability due to oxidation and/or isomerisation during storage. Encapsulation (E) could provide a physical barrier between the active compound and the environment, avoiding oxygen diffusion and oxidation of the active ingredient, extending the application of carotenoids to a wide range of foods. Spray drying (SD) and freeze drying (FD) are common technologies of encapsulation but, there is scarce information about AX encapsulation by both methodologies, so the objective of this work was to evaluate the effect of the encapsulation methodology on AX encapsulation efficiency (EE) and AX recovery (AR). CO₂-supercritical astaxanthin extract was encapsulated by SD and FD using modified starch (Capsul) and employing AX extract/encapsulating agent ratios from 1:1 to 1:3. Microparticles (MP) were characterised by determining AX EE (%), AR (%), water activity (a_w), particle size and morphology. Results indicated a higher EE for SD (84.9-98.5 %) respect to FD (74.3-86.1 %). An opposite effect was observed for AR where FD achieved the higher recoveries (69.4-86.0 %) than SD (48.4-76.5 %), suggesting that the emulsion stability and/or inlet temperature affect the retention of AX during spray drying process. The results indicated that SD and FD microparticles could protect AX throughout storage and could be applied for nutraceutical and food industry.

Acknowledgment: The authors are grateful for research grants from Conicyt.