Large-scale production of high-content lutein extracts from *S. almeriensis*.

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The carotenoid lutein has gathered increasing attention on the grounds of a sound body of evidence that shows how an adequate intake of this product might help to prevent or ameliorate the effects of degenerative human diseases, such as age-related macular degeneration (AMD). The present work describes the development of a lutein production process using an overproducing strain of microalgae, *Scenedesmus almeriensis* (CCAP 276/24). This biomass is particularly adequate for lutein production due to its high content compared to traditional sources. Microalgal biomass can be an advantageous source of lutein compared to current supplies with regard to the development of an extraction process because microalgae can be grown under tightly controlled conditions in closed photobioreactors to render a uniform, homogeneous high quality biomass at a constant rate and independently season, moreover taking into account that when grown under the proper culture conditions lutein my account for up to a 70% of the total carotenoid content of *S. almeriensis*, rendering a carotenoid extract with an unprecedented concentration in lutein without further purification.

A complete manufacturing process for the production of 25 million doses of lutein per year, from strain isolation to soft gelatine capsule, has been developed. The present work describes the main steps of that process starting by a 32.000 L culture facility and followed by cell disruption, biomass saponification, solvent extraction, solvent removal, resuspension of lutein in olive oil and deodorization steps. The result of the process is a lutein-enriched extract suspended in olive oil, suitable for human consumption.

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