

GENERATION OF GnIH HORMONE/PLURONIC F-127 SYSTEMS BY SUPERCRITICAL ANTISOLVENT PROCESS

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Abstract

GnIH seems to represent a pleiotropic neuropeptide exerting not only inhibitory effects on reproduction, but it is also related to stress and growth. Research has been carried out to develop encapsulation technologies for GnIH, which permit their dietary incorporation into the feed. In this work, microparticles of GnIH were generated using supercritical antisolvent process (SAS) and subsequently the process of encapsulation of the compound with a biodegradable polymer, Pluronic F-127, was studied. The use of supercritical fluids and particularly SAS process to prepare microparticles removes the problems of the conventional techniques such as thermal degradation, excessive use of solvent, residual solvent concentration, and principally the challenge of controlling particle size throughout processing. In this preliminary work, the influence of the pressure and ratio hormone/polymer on the particle size, morphology, and elemental composition of these particles have been investigated. Most of the experiments led to successful precipitation of a white powder of particles in the micrometer range. The initial morphology of the GnIH was modified, resulting in a generally spherical particle form. The smallest particle size (0.16 μm) and the highest amount of precipitated GnIH in composites was obtained using 100 bar and 1/9 ratio, which were considered the best conditions in this preliminary study.