

Acetylated starch and inulin as encapsulating agents of gallic acid and their release behaviour in a hydrophilic system

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Gallic acid (GA) was encapsulated with native starch (NS), native inulin (NIn), acetylated starch (AS) or acetylated inulin (AIn) (two substitution degrees each) by spray-drying, and a 2² statistical factorial design was used to evaluate each system. GA microparticles, produced under optimal conditions, were characterised by determining the GA encapsulation efficiency (ME) and their release profile in water. The inclusion of an acetyl group in the starch molecule improved the GA-ME. However, the opposite effect was observed for acetylated inulin. The release profile was fitted to First-order, Peppas and Higuchi models, and it was consistent with a non-Fickian diffusion (anomalous diffusion). No statistical differences were identified between the GA release rate constants for the GA-starch systems, whereas the acetylated inulin microparticles showed significantly lower GA release rate constants. The GA release pattern was fast for all systems studied (<9 h), suggesting that the micropa