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1 **Release of polyphenols from starch-chitosan based films containing**  
2 **thyme extract**

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7

8 **Abstract**

9 The release kinetics of thyme extract polyphenols (TE) from chitosan (CH), pea starch  
10 (S) and CH:S blend films in different solvents was evaluated, as well as their antioxidant  
11 activity in each release media. Pure starch films showed the fastest delivery rate and  
12 the highest delivery ratio of polyphenols, although the corresponding release media  
13 exhibited the lowest antioxidant capacity. TE provided CH based films with remarkable  
14 antioxidant activity, despite the lower polyphenol release obtained in all solvents, due to  
15 the strong polyphenols-chitosan interactions. The maximum amount of polyphenols  
16 delivered was found in the acetic acid solution, due to the high solubility of CH. The  
17 incorporation of tannic acid (TA) into CH films promoted cross-linking effect, which  
18 delays the TE release rate in water and ethanol aqueous solutions, except for CH:S:TA  
19 films. Thus, the polarity of the solvents and the polyphenols-matrix interactions  
20 markedly affected the polyphenol release and the antioxidant activity of the films.

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22 **Keywords:** starch, chitosan, thyme, tannic acid, antioxidant activity, kinetics.

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