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# Retarding strawberry fruit senesce with edible coatings - industrial application

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The objectives of this work were to study the ability of starch, carrageenan and chitosan based coatings to extend the shelf life of strawberry fruit (*Fragaria ananassa*). The work has been divided in a first stage, where the coatings and the strawberries were characterized in terms of their physical properties (superficial properties, wettability, oxygen permeability), and in a second stage, where the coatings were applied to the fruits both in the lab and in the field and their effects on relevant quality parameters were assessed. The superficial tension of the strawberry was 28.94 mN/m, and its polar and dispersive component was 22.99 mN/m and 5.95 mN/m, respectively. The critical superficial tension of the strawberry was 18.84 mN/m, obtained from a Zisman plot. The wettability of the coatings (starch, carrageenan and chitosan) was optimized with compositions of, respectively: 2 % of starch and 2 % of sorbitol; 0.3 % of carrageenan, 0.75 % of glicerol and 0.02 % of Tween 80; 1 % of chitosan and 0.1 % of Tween 80. The oxygen permeability of carrageenan films was inferior to the one obtained with starch films. The application effects of these coatings to fresh strawberries was assessed by controlling parameters such as content in colour evolution, firmness, mass variation, soluble solids and microbiological growth during a period of 6 days. No significant differences were found between the chromaticity coordinates. The minimum loss of firmness was obtained in strawberries coated with carrageenan and calcium chloride. The minimum loss of mass was obtained for fruits with chitosan and carrageenan coatings both with calcium chloride. Relatively to the content in soluble solids the coating of chitosan and calcium chloride presented the lower variation in relation to the content of soluble solids of non treated fruits. The addition of 1 % di-hydrated calcium chloride to the studied coatings was also considered, and this was shown to decrease the microbial growth rate on the fruits. The minimum rate of microbial growth was obtained for strawberries coated with chitosan and calcium chloride. The industrial application of calcium enriched carrageenan coating with on fresh strawberries has resulted in the loss of firmness of the fruit when compared to non-coated fruits.