

Title Influence of atmosphere composition on quality attributes of ready-to- cook fresh-cut vegetable soup  
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### **Abstract**

The demand of different kind of products which can meet different customer requirements is increasing, and not only for simple cold dishes, but also for more complex formulations. Various types of vegetable soups are already present on the fresh-cut market, with more or less simple mix of vegetables, due to the shelf-life limits of some species. In this work different atmosphere compositions were tested in order to extend the shelf-life of a fresh-cut, ready-to-cook soup of vegetables and legumes, usually present in the gastronomic tradition of various Italian regions. The soup was composed of parsley, beet, spinach, zucchini, pumpkin, carrot, celery, tomato, savoy cabbage, leek, onion, and re-hydrated peas and 'Borlotti' beans. Samples of the vegetable mix in 250 g trays were stored for 10 days at 5°C and 90% RH, in a continuous flow of 4 different atmospheres: air, air + 20%CO<sub>2</sub>, 3% O<sub>2</sub> in nitrogen, and 3% O<sub>2</sub> + 20% CO<sub>2</sub> in nitrogen. Initially and after 4 and 10 days quality attributes were evaluated on 3 replicate trays, including overall appearance and color for all species, and firmness for pumpkin, zucchini, celery, carrots, 'Borlotti' beans, peas and tomatoes. Pumpkin and zucchini resulted the species limiting the marketability of the mix, due to the loss of structure, translucency and, in the case of zucchini, to the browning of the seeds. Atmosphere with 3% O<sub>2</sub> + 20% CO<sub>2</sub> allowed 10 days of shelf life, with most of the species scoring above the limit of marketability. This mix was also effective in reducing yellowing of fresh-cut spinach, parsley and beet, and in generally was beneficial for all the species. The treatments in air, and in 3% O<sub>2</sub>, resulted the worst in term of quality of the product, while intermediate results were obtained using 20% of CO<sub>2</sub> in air.