Bringing the concept of healthy to flatbreads through vegetables

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INTRODUCTION: Flatbreads are worldwide one of the oldest-consumed bread. Traditionally, it is prepared from a flattened dough made of flour, water, yeast, and salt, which could be leavened or not, and subjected to a very short baking. Nowadays, the food trend for innovation through novel ingredients has also reached flatbreads (FB). The healthy pattern of vegetables is well-known, owing their high content in bioactive compounds (fiber, minerals, and phenolics). However, scarce information is available about their use as food ingredients for improving the nutritional profile of traditional foods. OBJECTIVE: The aim of this study was to develop innovative and healthy flatbreads exploring the inclusion of different vegetables. Vegetable powders from different sources were screened as bakery ingredients for making gluten FB (single and double layer). METHODS: Vegetable powders evaluated were from fatty fruits (black and green olives), citric fruits (lemons and orange peel), berry fruits (tomato), roots (beetroot and carrot), bulbs (onion), inflorescence (artichoke), green leaves (spinach and chard) and cabbages (kale and pak choi). Proximate composition of the powders was determined. The basic recipe consisted of wheat flour type 85 (100%), water (52.5%), salt (1.5%), dry yeast (1%) and vegetable powder (2%). Fresh flatbreads were evaluated regarding color, texture and sensory properties. RESULTS: There were statistically significant differences in the physicochemical properties (ash, fat, nitrogen content, color, and particle size) of powders. Powders from green leaves and cabbages contained higher amount of minerals (11.88-22.70%), proteins (4.02-5.23%), and insoluble dietary fiber. Flatbreads showed differences according to the vegetable powder added, particularly in their appearance. Regarding texture of double layer FB, leaves and artichoke powders increased the extensibility, and particularly spinach significantly increased the tear force. Conversely, those powders increased the hardness of single layer FB, which was only reduced with tomato powder. CONCLUSIONS: Vegetable powders could offer an alternative for innovation in bakery. They could be used as natural and healthy ingredients, modifying flavor, texture, or the nutritional profile of gluten flatbreads.