

Legume beverages from chickpea and lupin, as new milk alternatives/ **Food, environment and sustainability: New alternatives to milk from legumes/ Pulse beverages: new milk alternatives**

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Nowadays, milk consumption has been declining and there is a high demand for non-dairy beverages other than soy. Different reasons are driving consumer choices, from health and intolerance problems to ethic grounds, centered on the GMO and CO₂ footprint issues. Adding to that, the promotion of pulses to produce food is highly recommended worldwide for sustainable food production as 68th UN assembly declared 2016 the year of pulses. The information associated with pulses consumption is very positive, therefore consumer's preference for pulses is increasing. However, market offers are mainly cereal and nut-based beverages, which are essentially poor in protein (less than 1.5% against the 3.5% in milk) and are not true milk replacers in that sense. Therefore, legume-based beverage became a fast-growing segment for its low-fat source of protein (20-40%), fiber, vitamins, minerals and bioactives.

In this work, new beverages from different pulses (pea, chickpea and lupin) were developed using technologies enabling the incorporation of a high level of seed components, with low or no discharge of by-products. A mild heat treatment was chosen, to minimize extensive protein denaturation in beverages. The pulse-based beverages were typical non-Newtonian fluids, displaying a pronounced shear-thinning behavior, similarly to current non-dairy alternative beverages. In this respect, the sprouted chickpea beverage, without the cooking water, presents the most pronounced shear-thinning behavior of all formulations.

Therefore, this work contributes to pave the way for the development of novel pulse-based beverages as viable alternatives for cow milk. Nevertheless, further optimizations must be performed in future works, such as considering the use of enzymes, to refine the beverage mouthfeel, and the addition of natural flavors, for an improved and pleasant sensorial perception.

Keywords

Non-dairy beverages, pulses, protein, flow behavior.

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