



Abstract

# Adaptation of the INFOGEST Digestion for the Elderly Population to Assess Sterol Bioaccessibility in a Plant Sterol-Enriched Wholemeal Rye Bread <sup>†</sup>

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**Abstract:** The fortification of foods with cholesterol-lowering agents such as plant sterols (PS) is allowed in Europe and could be of interest to the elderly since aging may lead to higher cardiovascular risk. To date, no studies have analyzed how the gastrointestinal conditions of the elderly affect PS bioaccessibility. Thus, this study evaluates the impact of adapting the standardized INFOGEST 2.0 method for adult to elderly physiological conditions on the bioaccessibility (BA) of PS-enriched wholemeal rye bread. For this purpose, changes in gastric or gastric and intestinal phase conditions (enzyme activity, pH, digestion time, or agitation) were made. Compared to adults, only when gastric and intestinal phase conditions were modified, the BA (%) decreased for individual (10.9–20.5 vs. 19.5–36.3) and total PSs ( $11.4 \pm 1.7$  vs.  $20.5 \pm 1.0$ ), demonstrating that this reduction is due to intestinal phase modifications. However, the order of BA was not modified under any of the conditions tested, following the increasing rank:  $\beta$ -sitosterol, campesterol,  $\Delta 7$ -stigmasterol, sitostanol,  $\Delta 5,24$ , stigmastadienol,  $\Delta 5$ -avenasterol,  $\Delta 7$ avenasterol, stigmasterol, and campestanol. This complex matrix, very rich in fiber, such as wholemeal rye bread, may be responsible for the enzymatic reduction affecting PS solubility in the adapted digestion elderly model.

**Keywords:** elderly; simulated digestion; cereal; enrichment



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