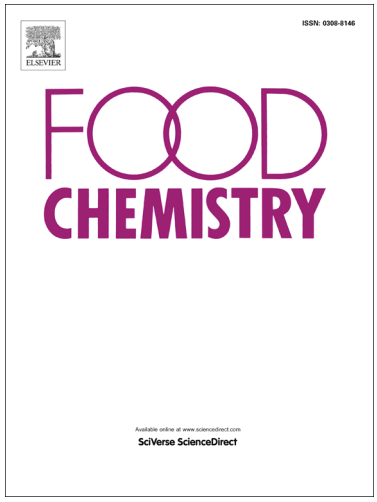

Iron-catalysed chemistry in the gastrointestinal tract: Mechanisms, kinetics and consequences. A review

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PII: S0308-8146(18)30978-6
DOI: https://doi.org/10.1016/j.foodchem.2018.06.018
Reference: FOCH 22979

To appear in: *Food Chemistry*

Received Date: 20 February 2018
Revised Date: 28 May 2018
Accepted Date: 4 June 2018

Please cite this article as: Bechaux, J., de La Pomélie, D., Théron, L., Santé-Lhoutellier, V., Gatellier, P., Iron-catalysed chemistry in the gastrointestinal tract: Mechanisms, kinetics and consequences. A review, *Food Chemistry* (2018), doi: https://doi.org/10.1016/j.foodchem.2018.06.018

Iron-catalysed chemistry in the gastrointestinal tract: Mechanisms, kinetics and consequences. A review

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Abstract

Chemical changes that occur during the storage and processing of food can affect its nutritional content. During digestion, the exposure of food to considerable variations of pH and high oxygen and peroxide concentrations also participates in the deterioration of nutrients, with a negative impact on the nutritional value of the diet and harmful consequences for human health. Iron plays a key role in gastrointestinal chemistry. Haem iron, which exists only in meat, and non-haem iron, present in most foods, are catalysts of most of the reactions implicated in the deterioration of nutrients. Disintegration of food matrix due to mechanical forces and enzymatic hydrolysis favour this endogenous process. This paper provides a review of what is known in the literature concerning the mechanisms and kinetics of endogenous reactions catalysed by iron. The main consequences on nutrient bioavailability are reported and protective strategies against the deleterious effect of iron are discussed.

Keywords: Antioxidants; digestion; haem iron; iron; nitrosation; oxidation