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Metrological aspects in nanoencapsulation studies of saffron (*Crocus sativus* L.) bioactive antioxidants

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Saffron, which is comprised of the dried stigmas of the pistil of the *Crocus sativus*, L., is the most expensive spice of the world per weight unit. This plant material is recognized as the unique edible source of certain bioactive apocarotenoids for which in vivo antioxidant properties have been reported. Among them, crocins, red-orange natural colorants, and their parent molecule crocetin prevail in bioactivity significance.

The material is coming from the cultivated, sterile crocus plant, which presents limited natural variability in its chemical composition. Differences in the content of bioactive compounds is mainly influenced by epigenetic phenomena, agricultural and mainly processing practices.

Recently, literature on nanoencapsulation of saffron bioactive compounds is accumulating. In the published studies there are certain metrological aspects that are not always considered carefully. These aspects are related to the authenticity and quality control of the starting material as well as the method applied for the extraction, identification and quantification of the target compounds throughout the encapsulation process, release, stability, bioavailability and bioactivity studies (1).

The presentation gives examples for fit for the purpose procedures, which, if adopted as a standardized protocol, then repeatable and meaningful data will be obtained. Quantitative chromatographic or spectrophotometric procedures for the determination of the target compounds are highlighted. Authenticity control and quality of saffron samples and verification of the concentrations of compounds in commercial preparations labeled as 'crocin' are prerequisites in any experimental design setup.

Keywords: saffron bioactive compounds analysis, crocins, crocetin, nanoencapsulation, metrology

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