

## qNMR および HPLC による機能性表示食品中の 機能性関与成分ルテインの定量

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### Quantitative analysis of lutein in Foods with Function Claims by quantitative NMR and high-performance liquid chromatography

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#### Abstract

A new system of functional foods, which was instituted by Consumer Affairs Agency, Government of Japan, has been put into effect in April 2015. In this system, foods containing functional substances, whose functions for the human body are demonstrated scientifically, are defined as “Foods with Function Claims”, and are allowed to be sold with the information about their functions. Since the amount of functional substances affects the quality and safety of these functional foods, the manufacturers are obliged to submit the accurate amount of functional substances in the foods with the analytical method. High performance liquid chromatography (HPLC) is usually adopted as the analytical method for the determination of functional substances because of its high selectivity and quantitative capability.

Lutein, one of natural carotenoids, is reported to have effect to prevent human macula from damages causing by light, so that lutein-containing Foods with Function Claims are sold with claiming the promotion of eye health. However, the reference material of lutein is not available in the reagent markets so that its accurate amount is difficult to be determined by HPLC and might result in leading to reduce the quality and safety of the Foods with Function Claims. In order to solve this problem, the contents of lutein in Foods with Function Claims determined by HPLC and <sup>1</sup>H qNMR methods were compared. As the result, the amount determined by HPLC tended to be larger than that by <sup>1</sup>H qNMR. One reason for this was that the absolute purity of lutein reagent was lower than the purity, which was calculated using already-known absorption coefficient of lutein. For more accurate calculation of purity of lutein reagent, the absorption coefficient of lutein was also determined by <sup>1</sup>H qNMR method, revealing that absorption coefficient of lutein was 2591, which was larger than known value.

**Keywords** : ルテイン、機能性表示食品、比吸光係数  $E_{1\text{cm}}^{1\%}$ 、絶対定量、定量 NMR

lutein, Foods with Function Claims, absorption coefficient, absolute quantitation, quantitative NMR (qNMR)

#### I 緒言

機能性表示食品とは、事業者の責任において、科学的根拠に基づいて機能性を表示した食品であり、販売前に安全

性および機能性の根拠に関する情報などが消費者庁長官へ届け出されたものである。例えば、機能性表示食品として、ルテインを機能性関与成分とするものがある。ルテインはパセリやホウレンソウなどの緑黄色野菜や卵黄に多く含まれる