DEUTSCHE GESELLSCHAFT FÜR QUALITÄTSFORSCHUNG
(PFLANZLICHE NAHRUNGSMITTEL) e.V.

50. Vortragstagung, 14./15.März 2016
Julius Kühn-Institut, Berlin

# Market, trends and applications of phytoextracts produced by supercritical $CO_2$

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## Introduction

NATECO$_2$ installed the first industrial plant for $CO_2$ extraction already over four decades ago. In the meantime a great variety of natural substances are refined using supercritical (sc) $CO_2$ in tons scale as well as numerous R&D trials have been conducted. But next to the classical extraction process also new applications and trends for critical fluids appear on the market to gain high-valuable phytoextracts.

## Market figures

Actually approx. 170 companies are engaged in sc$CO_2$ processes and the global market is increasing. The preferred fields of application can be found in the food & beverage, cosmetic and pharmaceutical industries. Thus for the sc$CO_2$-extraction of plant materials a growth rate of over 25 % from 2013 to 2018 is predicted, whereas alternative extraction technologies show significant lower rates.

## Trends and applications

Due to ongoing globalization, purification procedures gain more and more importance and the reduction of pesticides or odors by sc$CO_2$ is of increasing interest. Additionally individual customer requirements are rising and therefore product diversity, supplementary certifications and services are essential. Consequently tailor-made solutions can be generated by using new technologies and coupling their respective capabilities adapted to product or process requirements.

Accordingly the application of ultra-high pressure of around 1000 bar enables the economic extraction of up till now challenging plant ingredients. Thus antioxidants like the carotenoid luteine from calendula, anti-inflammatory triterpenes from barks or even anti-cancerogenic polyphenols from hops become extractable. Also continues rectifications or the creation of well defined powders are economically realizable by using novel critical fluid technologies.

## Conclusion

Detailed market figures and data based on actual studies and internal long-lasting industrial experience of using supercritical fluids will be presented in the respective lecture. Furthermore innovative technologies related to sc$CO_2$, their field of application and first results will be demonstrated.