

# A New Automated On-line QuEChERS-HPLC Direct Injection Clean-up for Fatty Matrices

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## Introduction and Background

In many cases difficult to analyse matrices, in particular fatty matrices, were analysed without using QuEChERS. For fatty matrices additional steps are required in order to apply the QuEChERS methodology (e.g. freezing out).

The new QuEChERS automation concept by LCTech is based on the second clean-up step applying a non-dispersive approach in specifically adapted cartridges containing a proprietary sorbent. The cartridges are dedicated for fatty matrices and do not require additional steps or filters. Furthermore, as a novelty the eluted extract is on-line injected onto the LC-MS/MS. Because of the high matrix-retention capacities of the cartridge in combination with the non-dispersive approach, a minimised ion suppression with high recoveries and low standard deviations is observed. The new methodology is successfully applied to fatty matrices like butter or avocado and gave excellent results.

On this poster, the automation concept of the FREESTYLE SPE-HPLC-Direct Injection system designed by LCTech GmbH is presented, as well as the results for the matrix mentioned above.

## Material and Methods

### Animal Matrix (Butter)

- Weigh 5 g sample in a 50 mL centrifuge tube
- Add 10 mL of acetonitrile
- Add 5 mL of water
- Shake vigorously for 1 min, shake occasionally
- Allow to stand for 10 min
- Add buffer mix
- Shake vigorously for 1 min
- Centrifuge 5 min at 500 rpm, 4 °C

*No freezing out!*



## Material and Methods

### Herbal Matrix (Avocado)

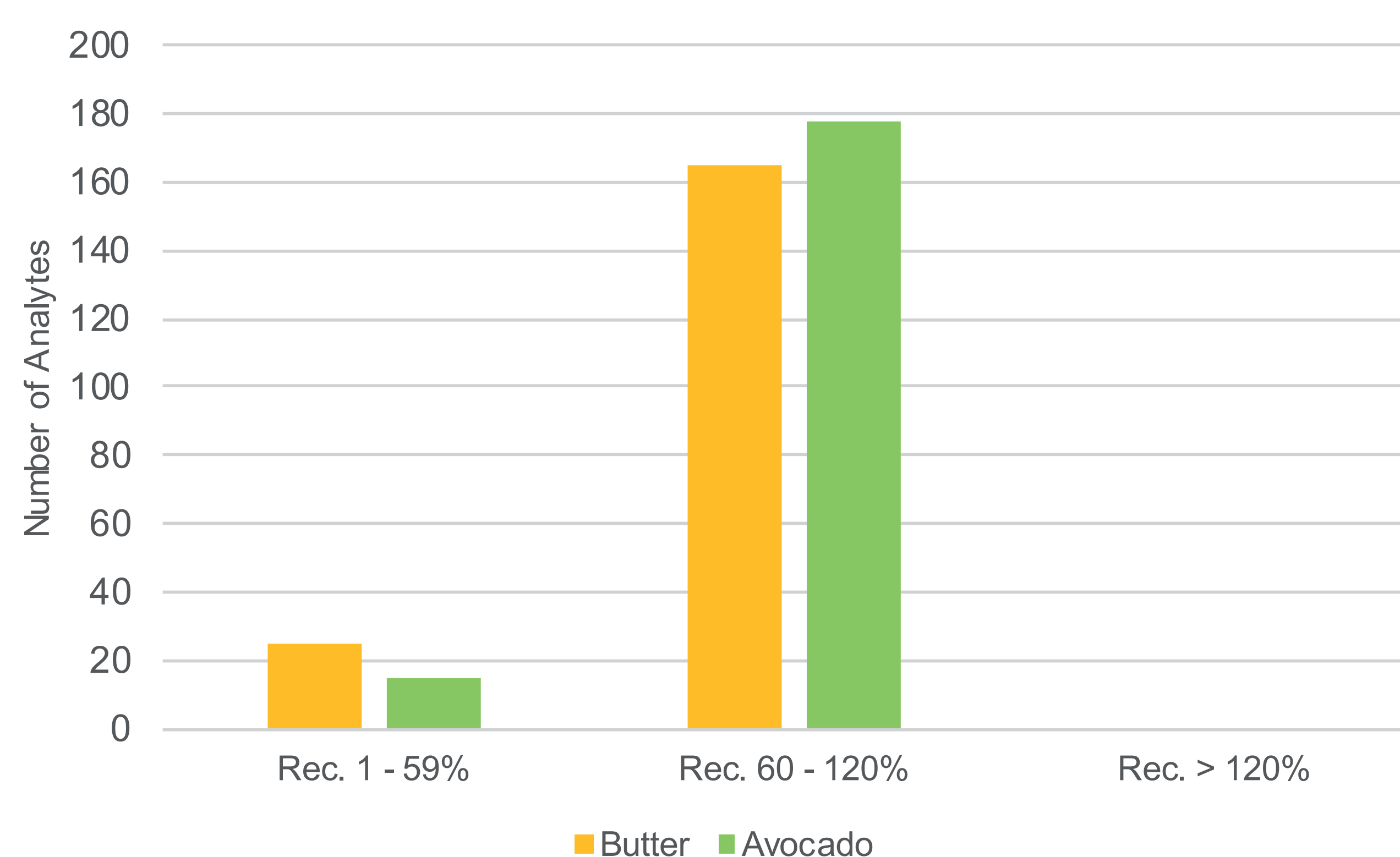
- Weigh 10 g sample into a 50 mL centrifuge tube
- Add 10 mL of acetonitrile with standard
- Shake vigorously for 1 min
- Allow to stand for 10 min
- Add buffer mix
- Shake vigorously for 1 min
- Centrifuge 5 min at 500 rpm, 4 °C

*No freezing out!*



- ✓ No conditioning
- ✓ No eluting
- ✓ No further dilution of results
- ✓ No extra filters needed

*Just load 2 mL raw extract!*



**FREESTYLE™**

Total runtime on FREESTYLE with Direct-Injection: **9 min**



*Matrix reduction  
Avocado: 95 %;  
Butter: 99 %*

**Left:** Extract after addition of Mix I, **Middle:** Extract after dispersive SPE clean-up, **Right:** Extract after non-dispersive automated clean-up via FREESTYLE and Pesticide III QuEChERS column

## Conclusions

A novel approach for a QuEChERS clean-up of fatty matrices of plant or animal origin is presented. The main characteristics of the new cartridges are the straightforward and easy to use protocol with just one simple loading step. Furthermore, an ultimately high matrix reduction of > 95 % combined with good analyte recoveries was obtained. As the FREESTYLE instrument can perfectly automate the cartridges and a connection to any HPLC-MS/MS system is possible, the setup opens new perspectives to routine analytical laboratories.