

Determination of mineral oil hydrocarbons within the first German total diet study (BfR MEAL Study)



BfR
MEAL Study
What's in your food

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(meals for exposure assessment and
analytics in foods)



Criteria of a Total Diet Study



critterion 1

- representative for the (German) population
- covers 90 % of the German diet
- includes highly contaminated foods, although they are consumed rarely (< 10 %)



critterion 2

- foods are prepared as consumed



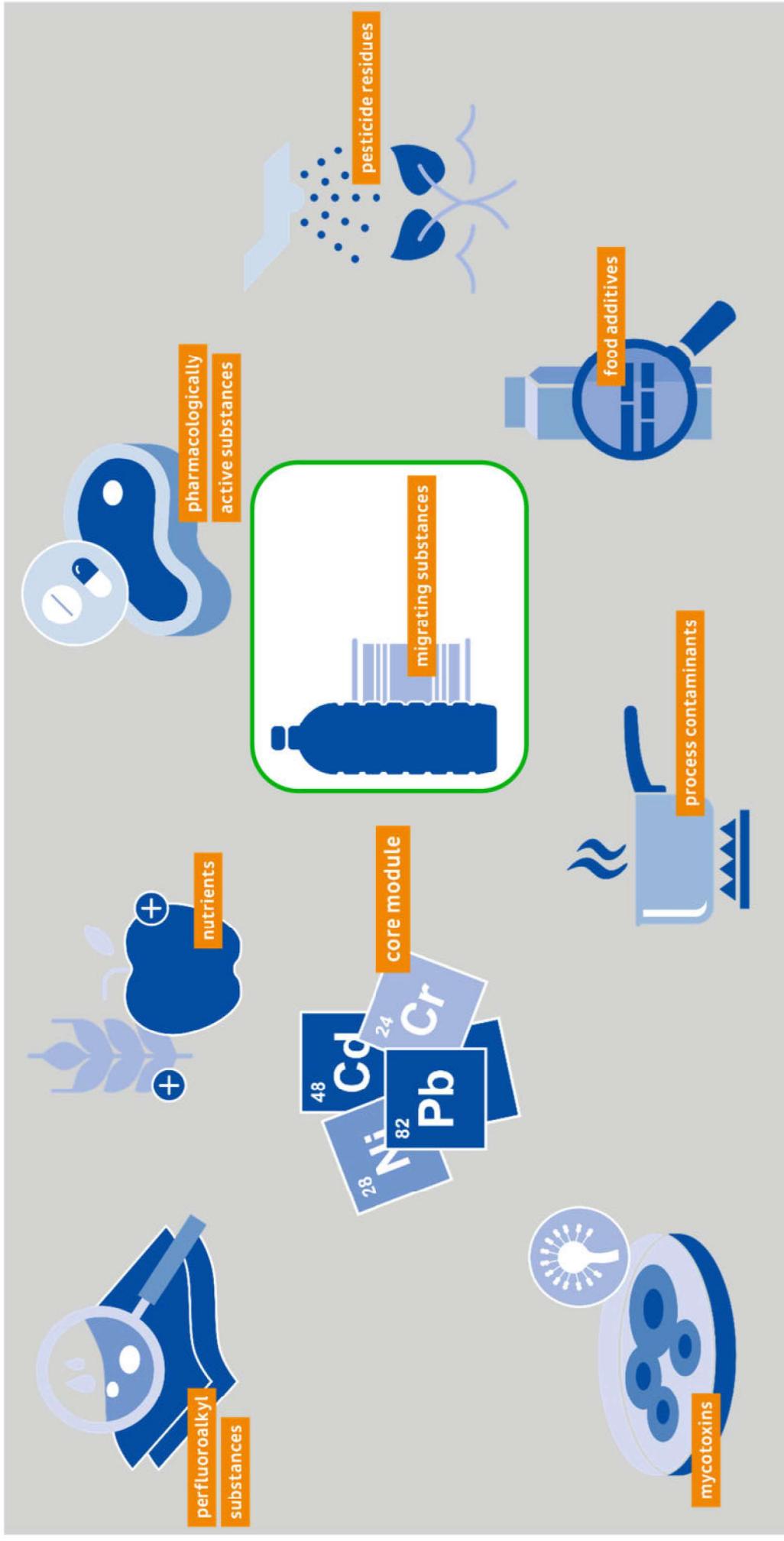
critterion 3

- similar foods are pooled together to one sample to reduce the number of samples

Modular structure of the BfR MEAL Study



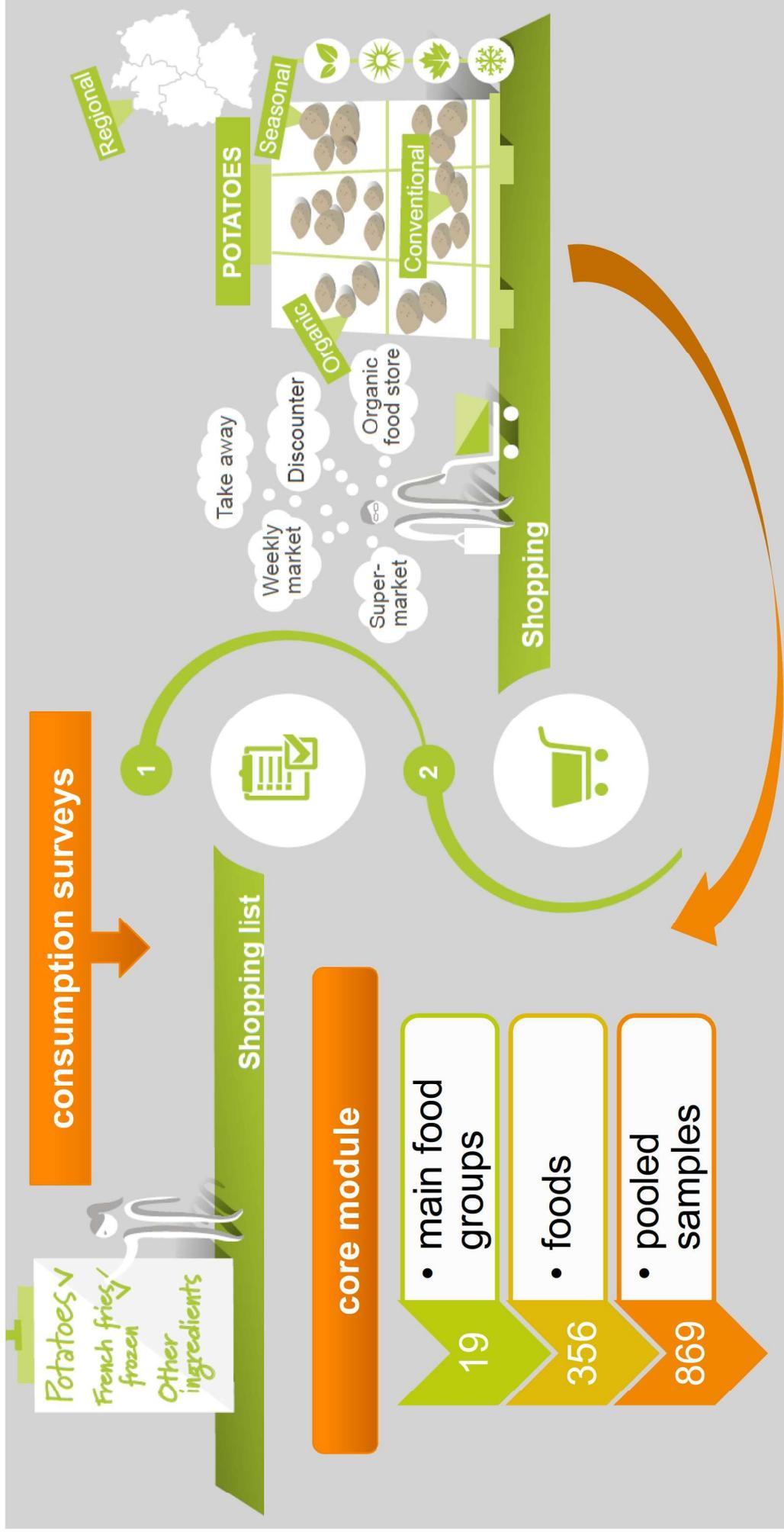
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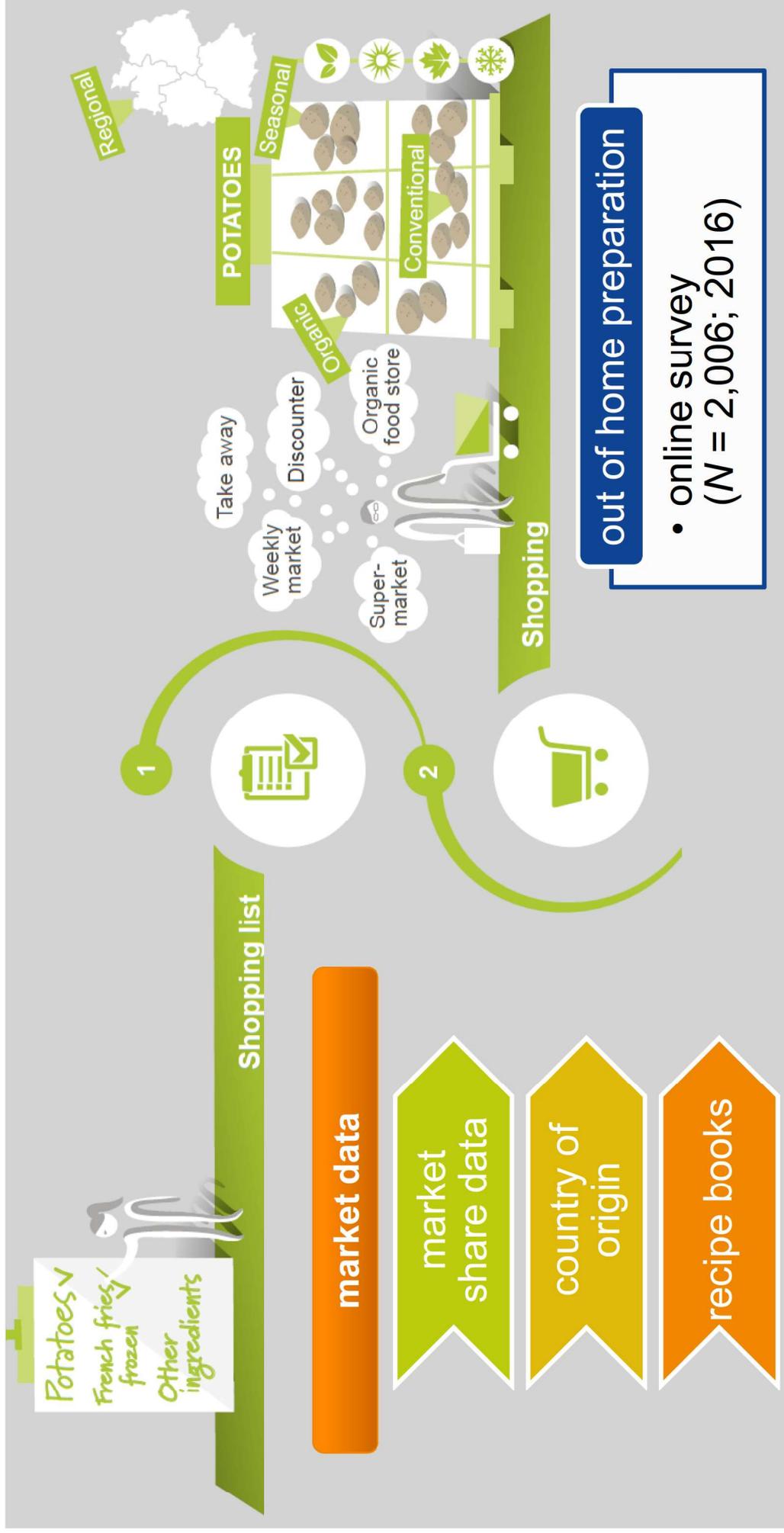
Selection of foods



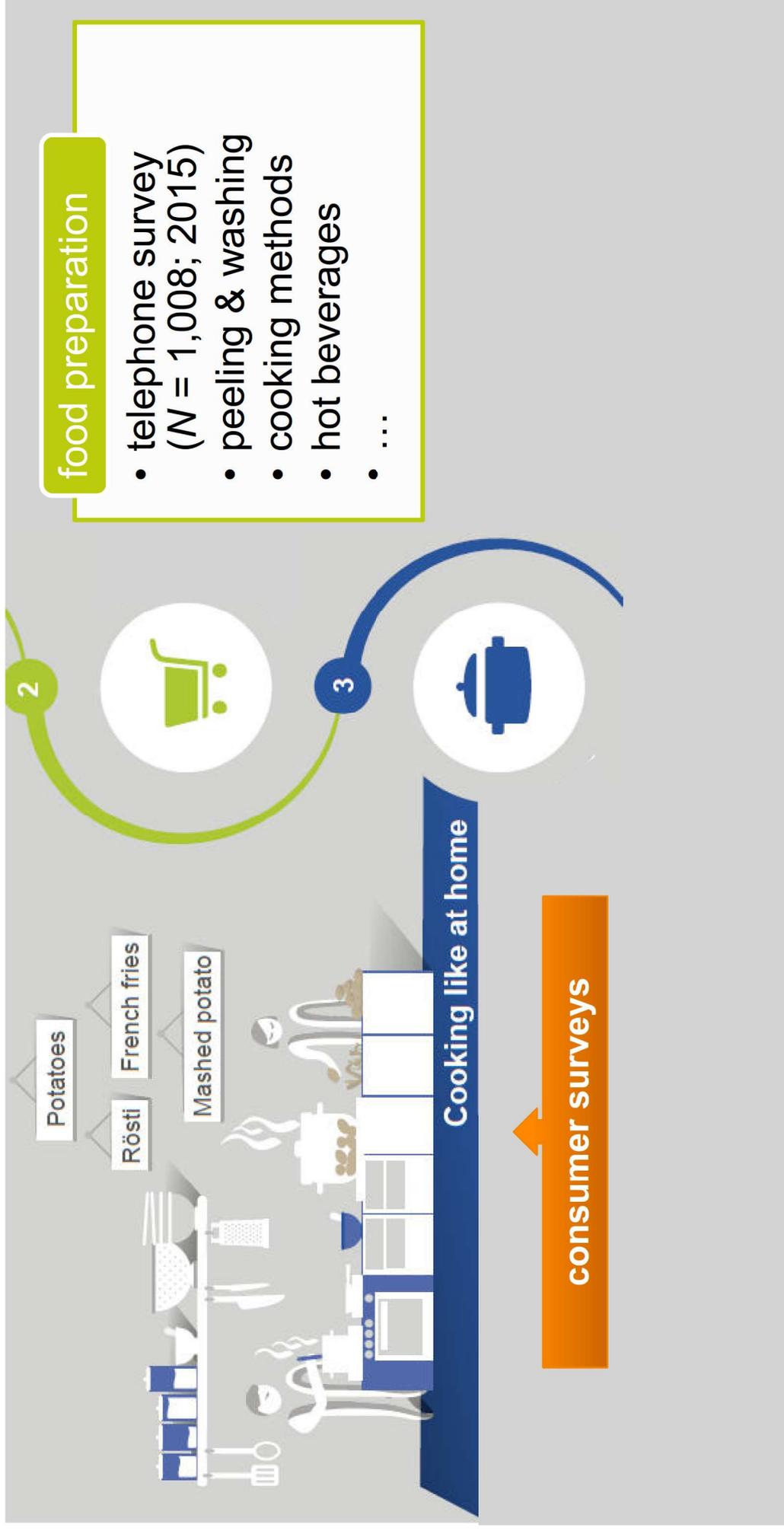
Selection of foods



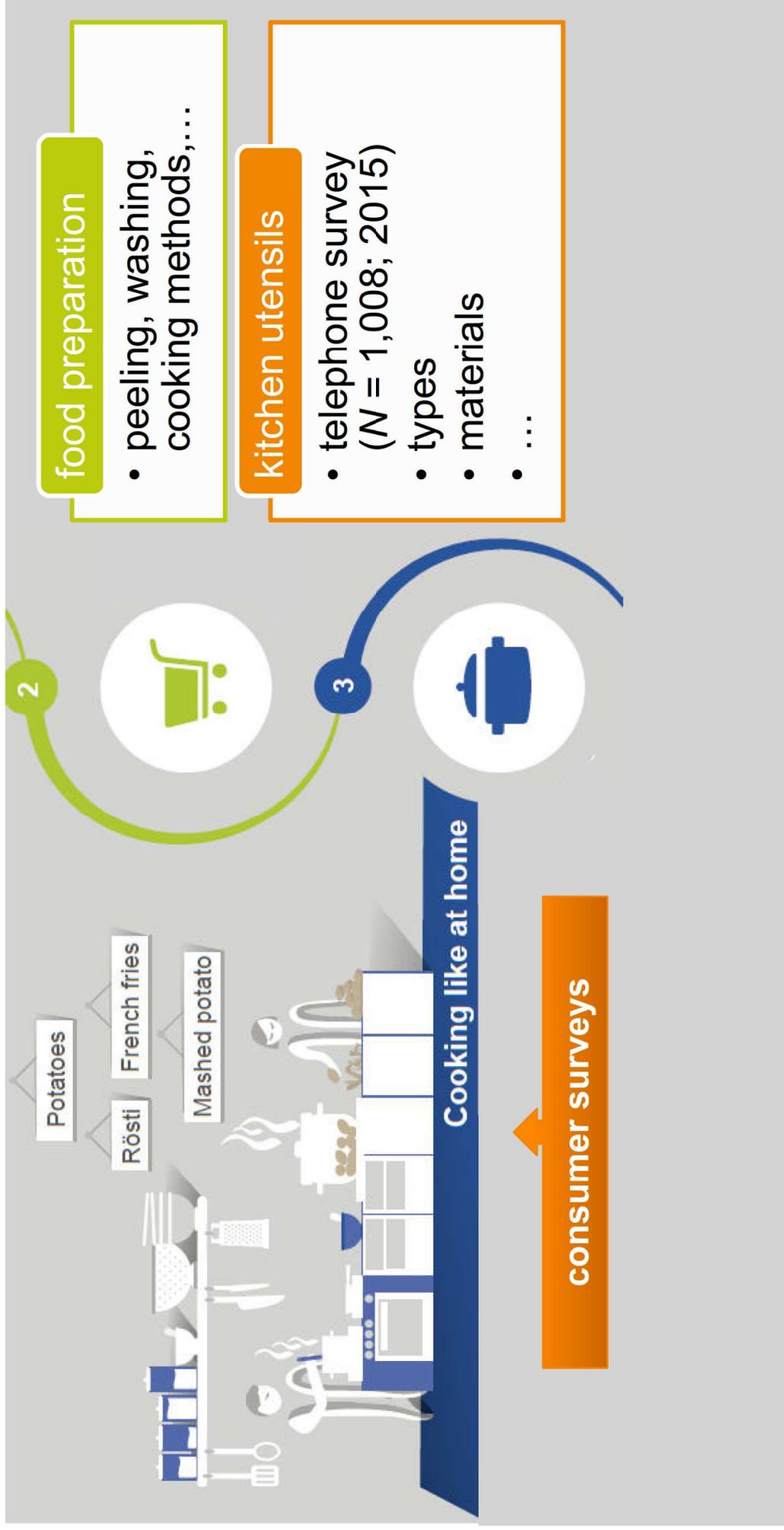
Selection of foods



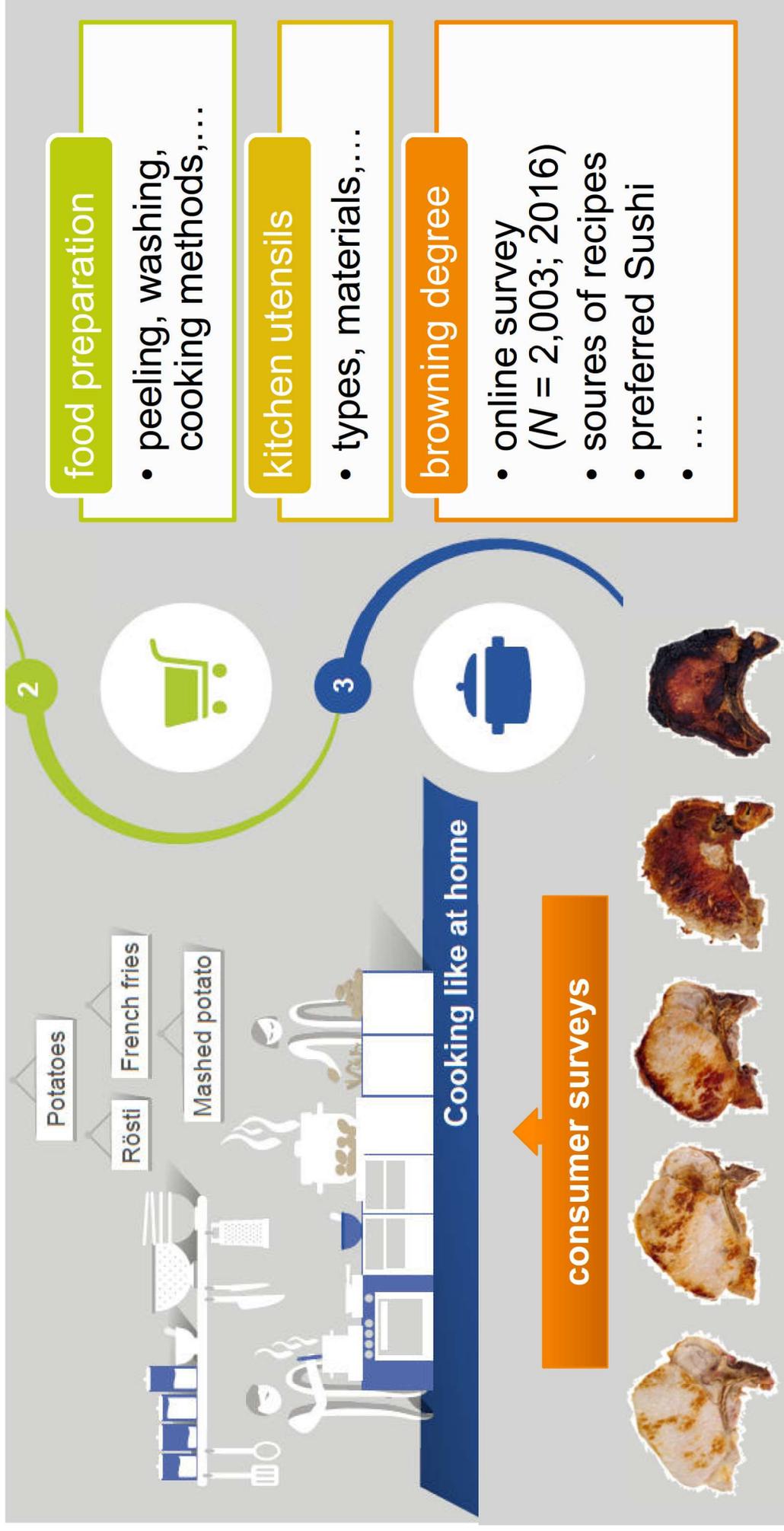
Preparation & processing



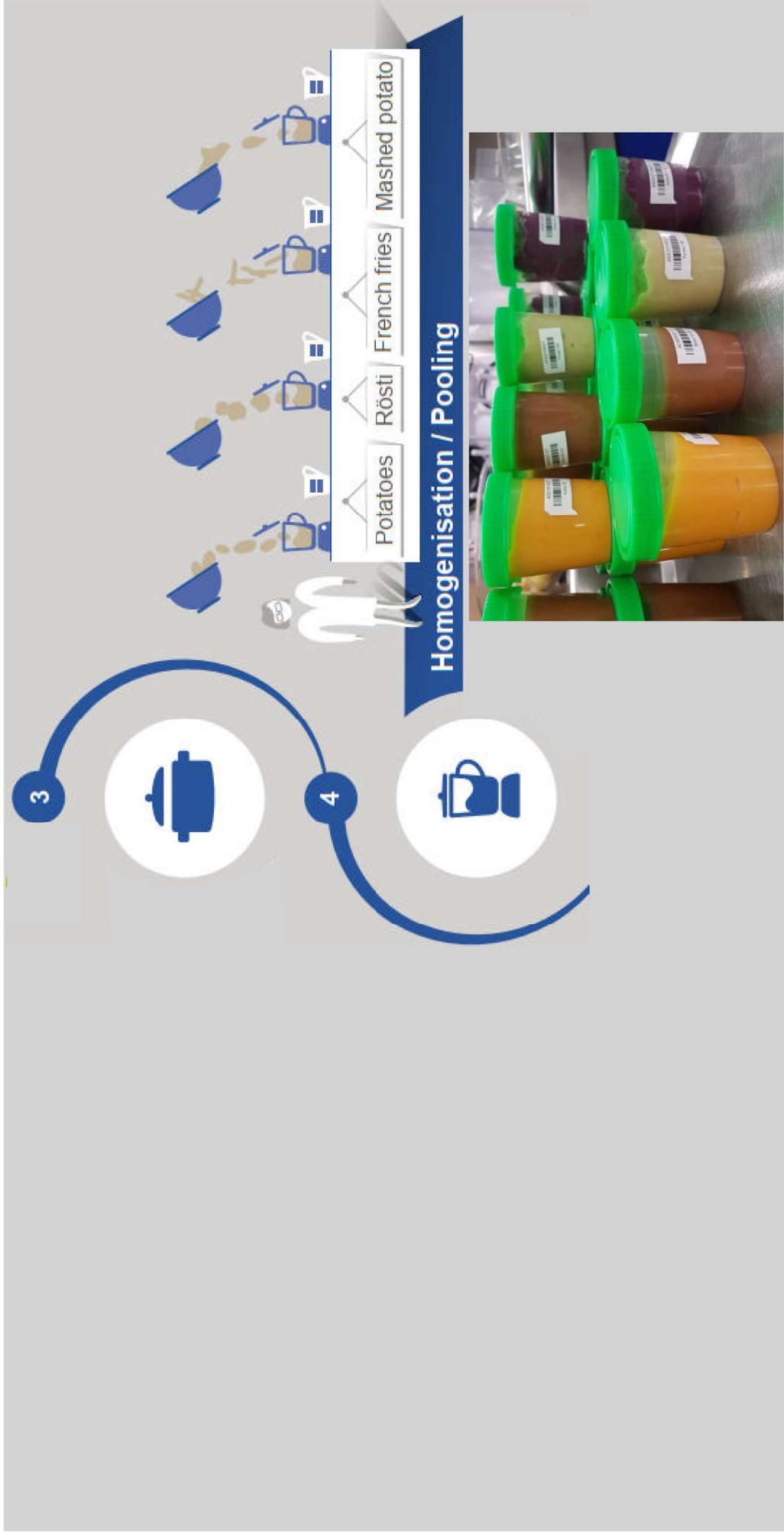
Preparation & processing



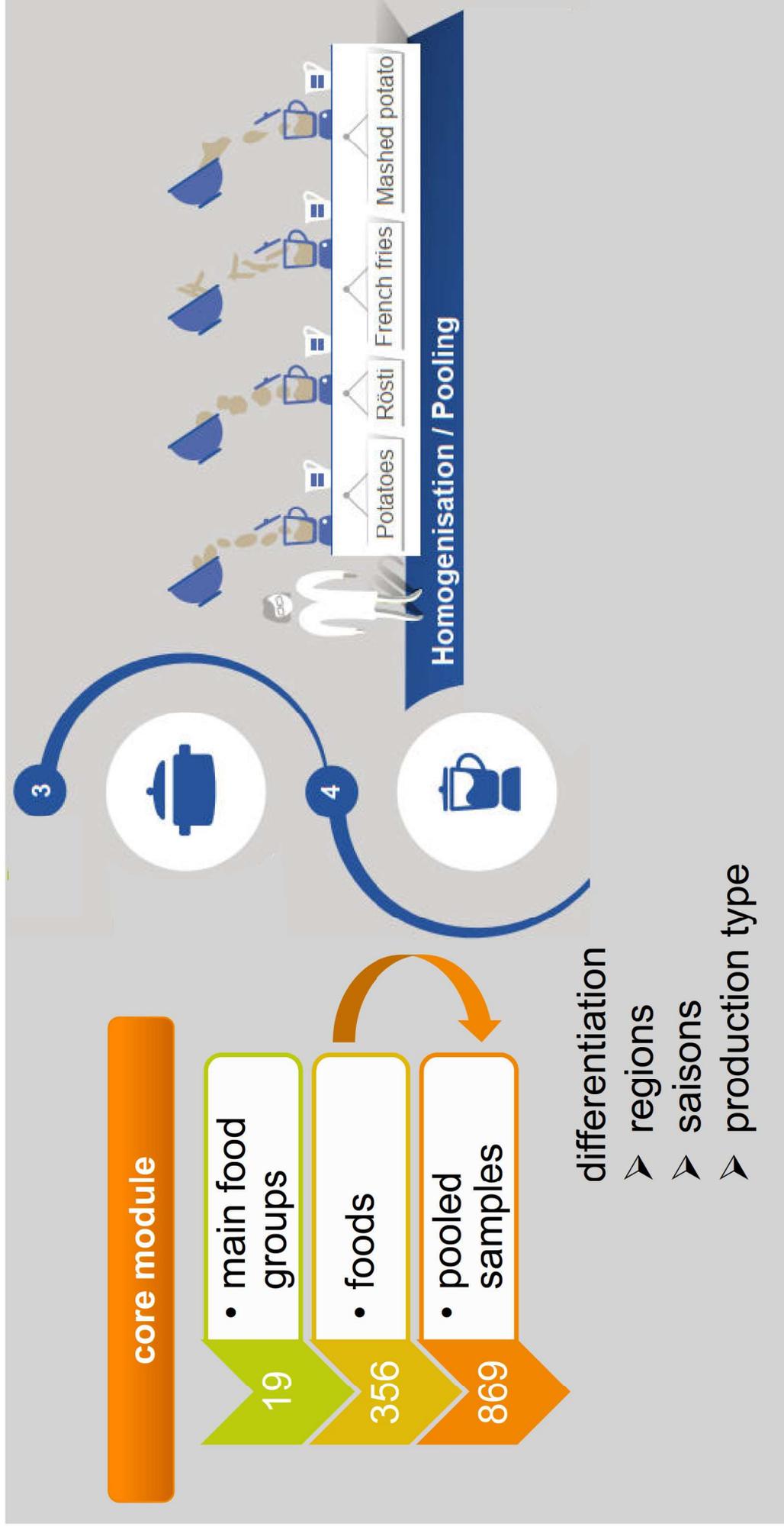
Preparation & processing



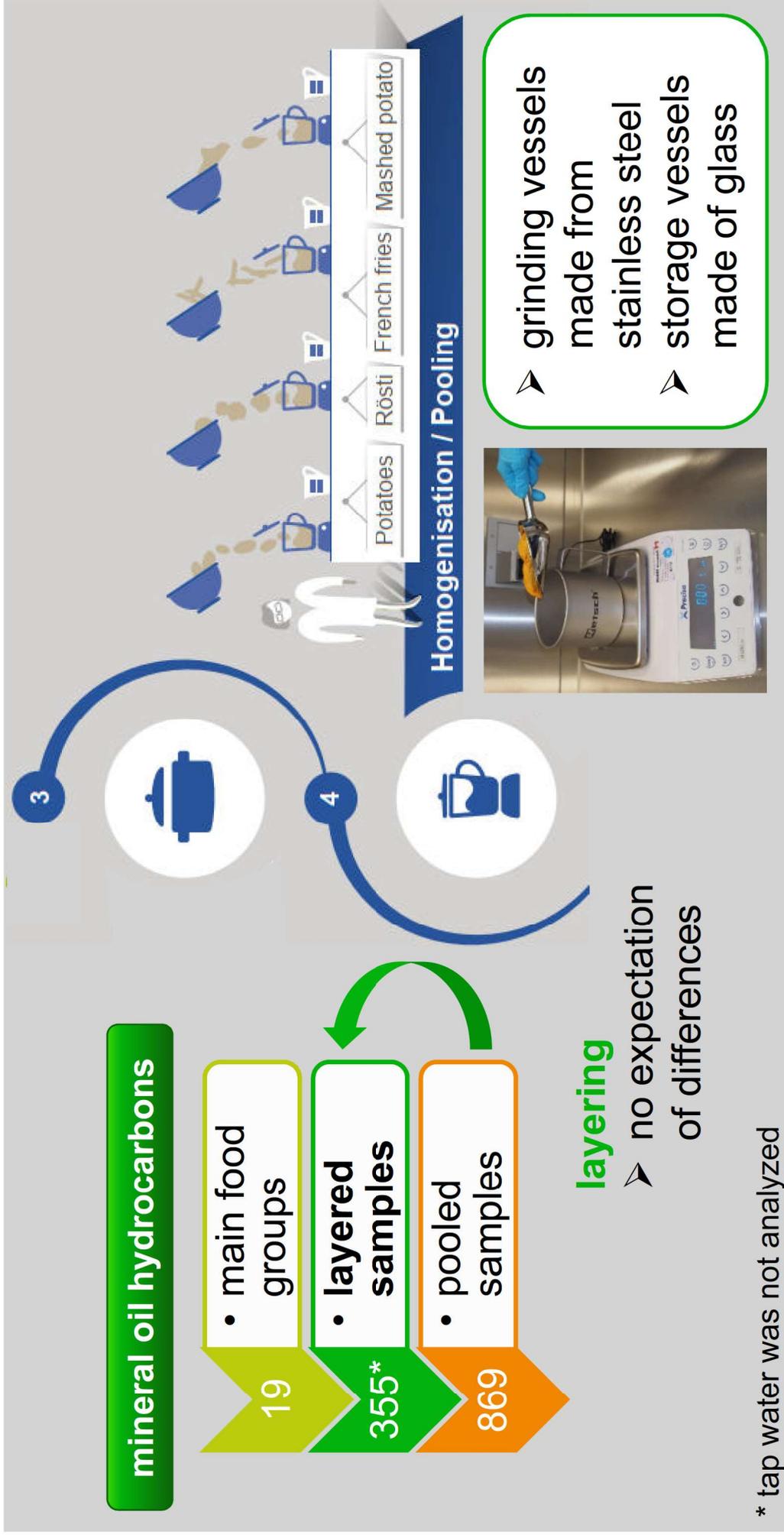
Pooling & homogenization

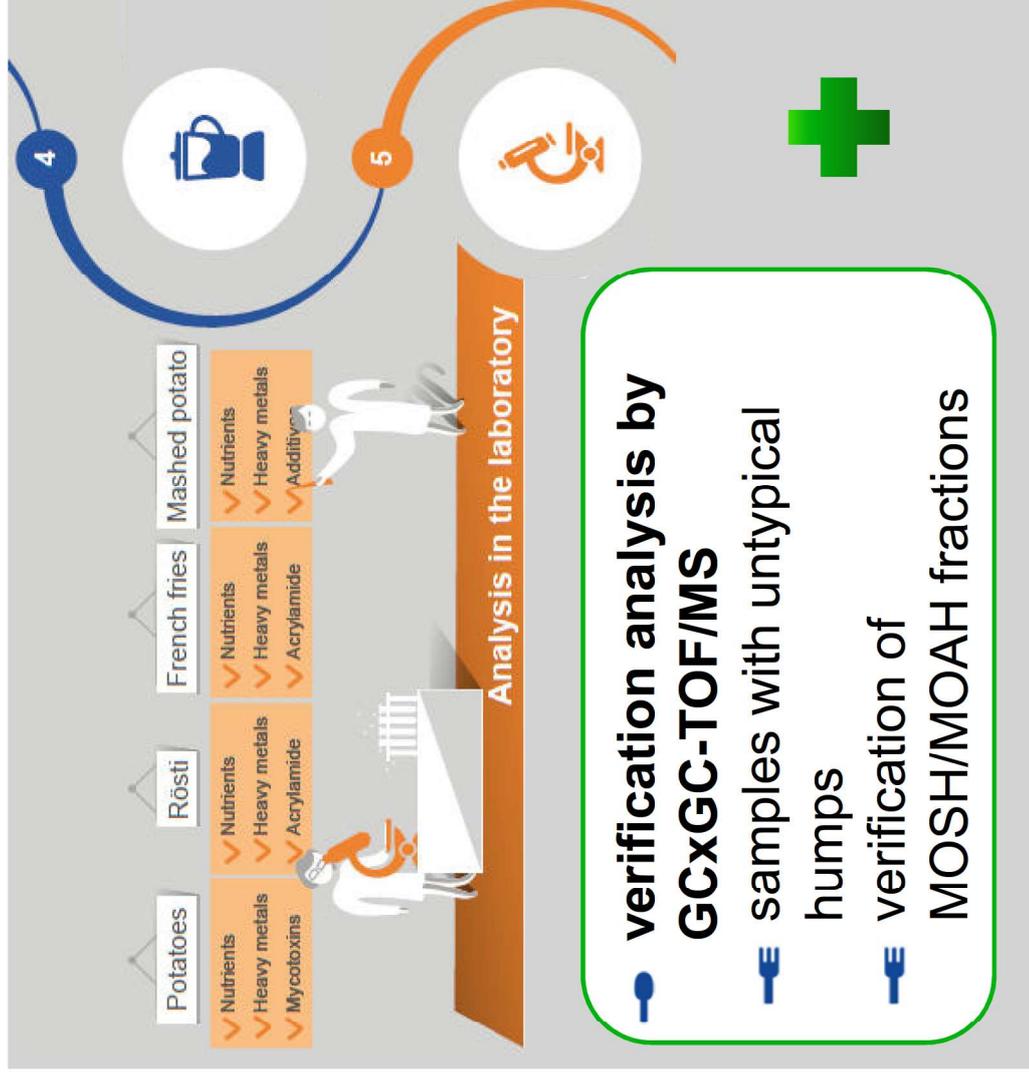


Pooling & homogenization



Pooling & homogenization





quantification via online-LC-GC/FID (accredited contract laboratory)

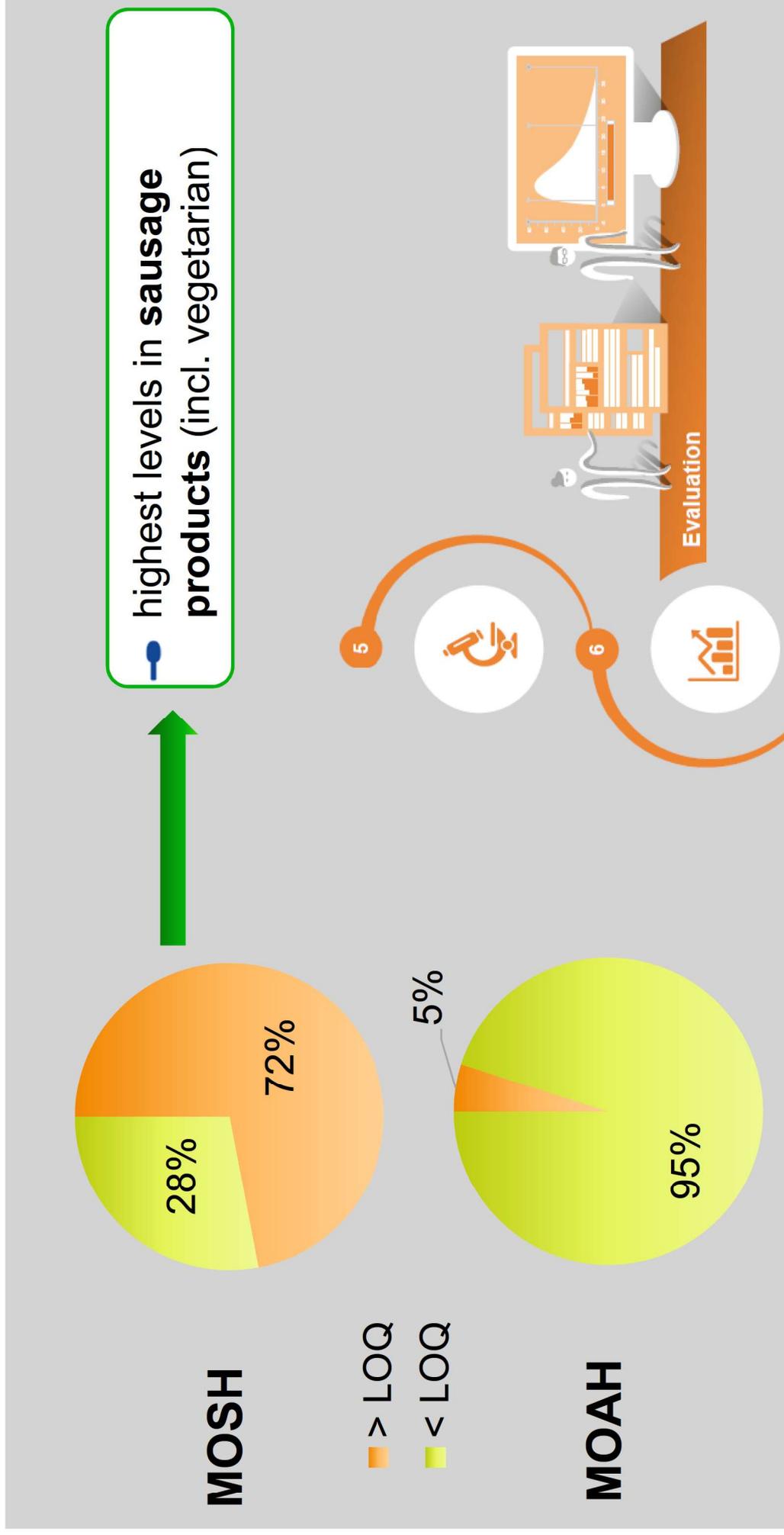
- LOQ
- food < 4% fat: 0.2 mg/kg
- food up to 20% fat: 0.5 mg/kg
- food > 40% fat: 1.0 mg/kg

- | | |
|-------------|-------------|
| MOSH | MOAH |
| ≥ C10 ≤ C16 | ≥ C10 ≤ C35 |
| > C16 ≤ C20 | > C16 ≤ C25 |
| > C20 ≤ C25 | > C25 ≤ C35 |
| > C25 ≤ C35 | > C35 ≤ C50 |
| > C20 ≤ C40 | |
| > C35 ≤ C50 | |

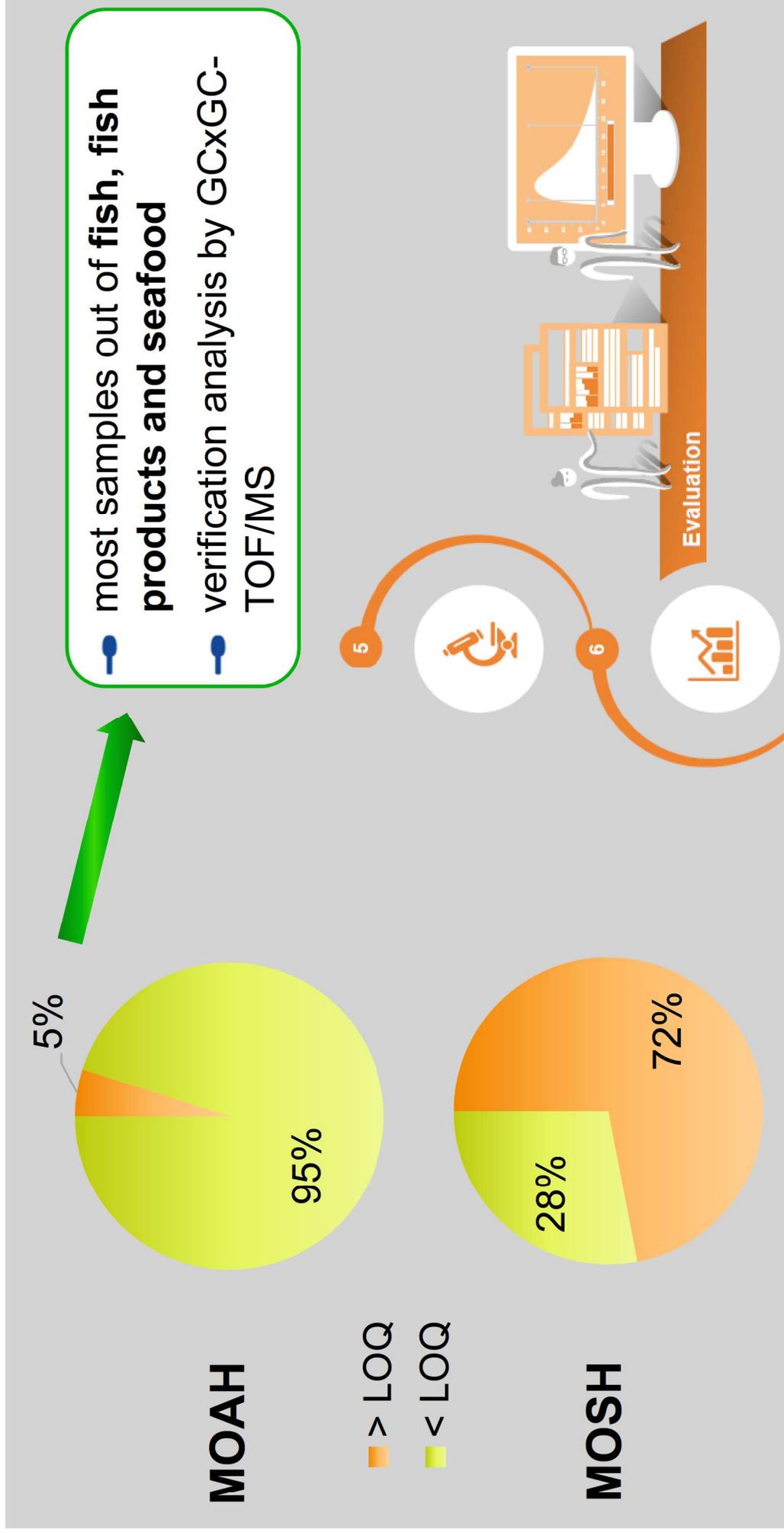
verification analysis by GCxGC-TOF/MS

- samples with untypical humps
- verification of MOSH/MOAH fractions

Evaluation



Evaluation



Further steps

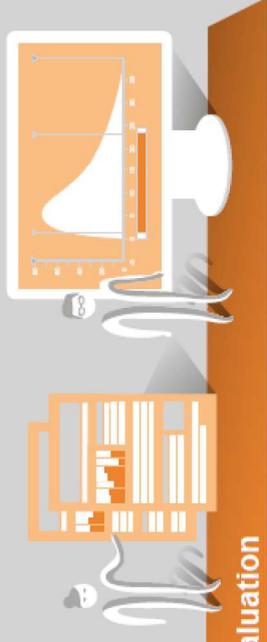
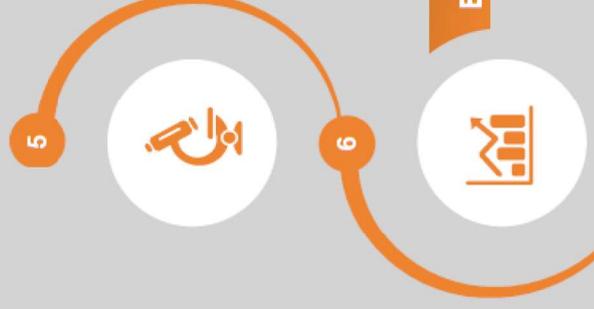


- plausibility checks

- further fractions in accordance to the JRC guidance

- MOSH:
 - > C35 - ≤ C40
 - > C40 - ≤ C50
 - ≥ C10 - ≤ C50
- MOAH:
 - ≥ C10 - ≤ C16
 - ≥ C10 - ≤ C50

- exposure assessment



Evaluation

Conclusion



- Investigation of MOSH/MOAH in foods most consumed by the German population
 - presence of MOSH in more than half of the foods
 - quantifiable levels of MOAH only in a few foods
- generation of mean levels of representative pooled samples
 - Low LOQs
 - Additional verification of fractions by GCxGC-TOF/MS
- preparation for exposure assessment
 - fractions according to JRC Guidance
 - reduction of uncertainties



improving of consumer health protection



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Thank you for your attention!

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