

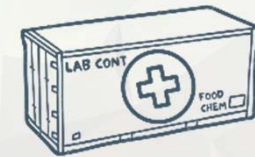
UNTERSTÜTZUNG



ZENTRALES INSTITUT DES SANITÄTSDIENSTES DER BUNDESWEHR MÜNCHEN

FOOD DEFENSE – SAMPLING WORLDWIDE

Probenahme weltweit



SanOA e.V. Jahrestagung - 04.07.2026
OStAp Dr. Nicole Meier



BUNDESWEHR

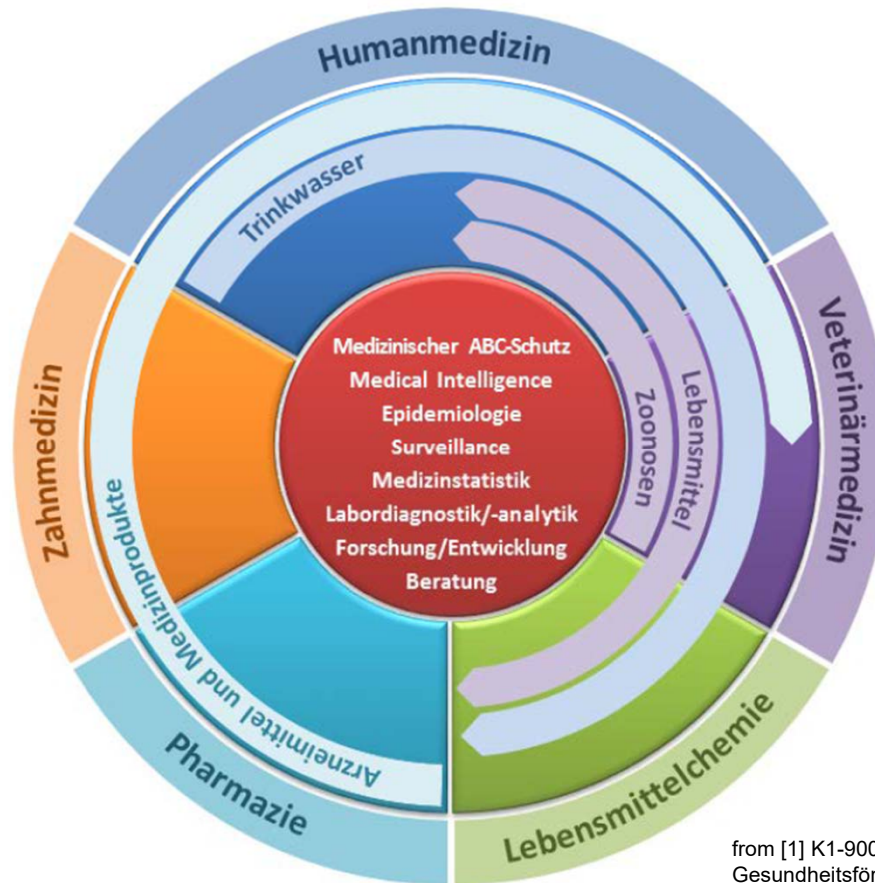
FOOD DEFENSE – SAMPLING WORLDWIDE

Workshop schedule

- Introduction (15 min) 
- Food defense lecture (45 min)
- Sampling techniques presentation (30 min)
- On-site CBRN-analysis and presentation of mobile food chemistry lab (60 min)

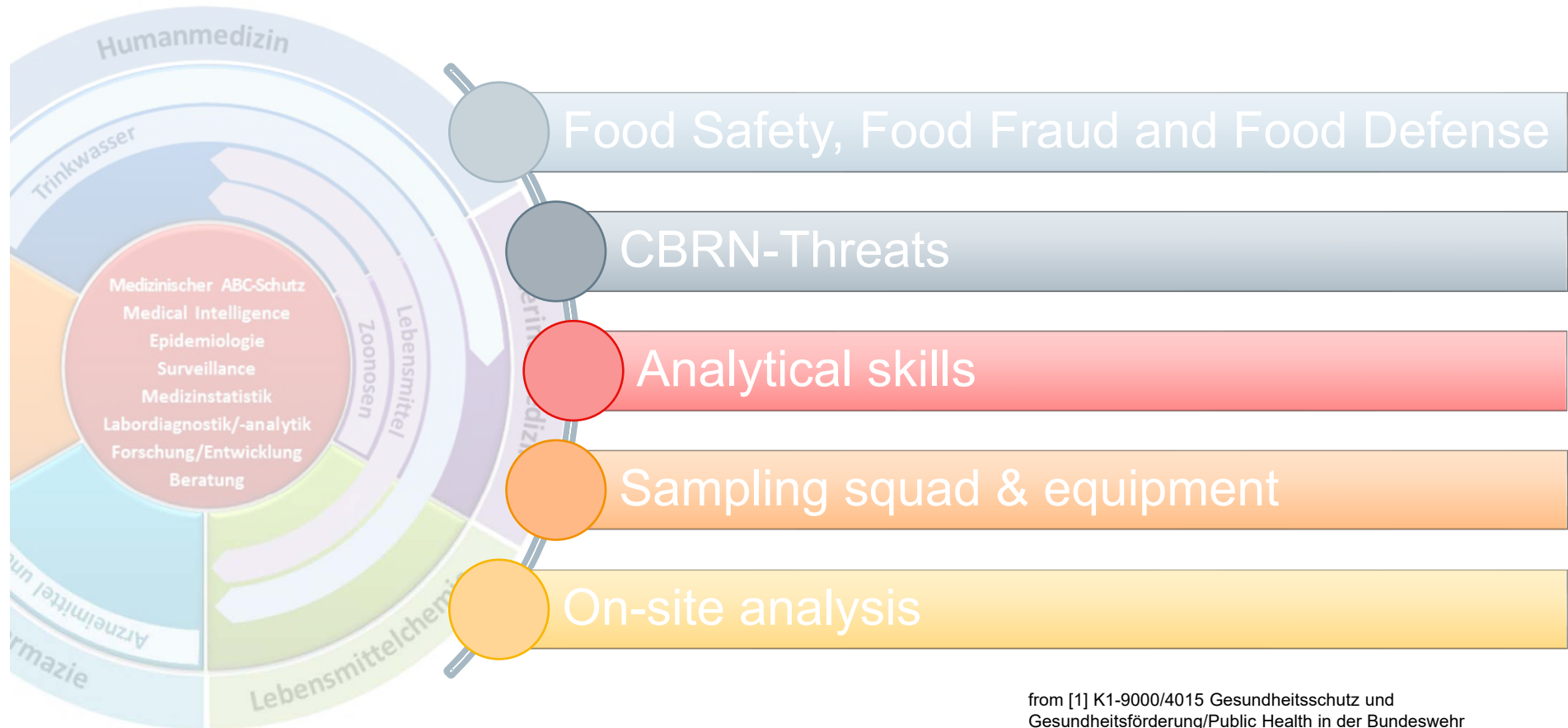
FOOD DEFENSE – SAMPLING WORLDWIDE

One-Health



from [1] K1-9000/4015 Gesundheitsschutz und Gesundheitsförderung/Public Health in der Bundeswehr

FOOD DEFENSE – SAMPLING WORLDWIDE

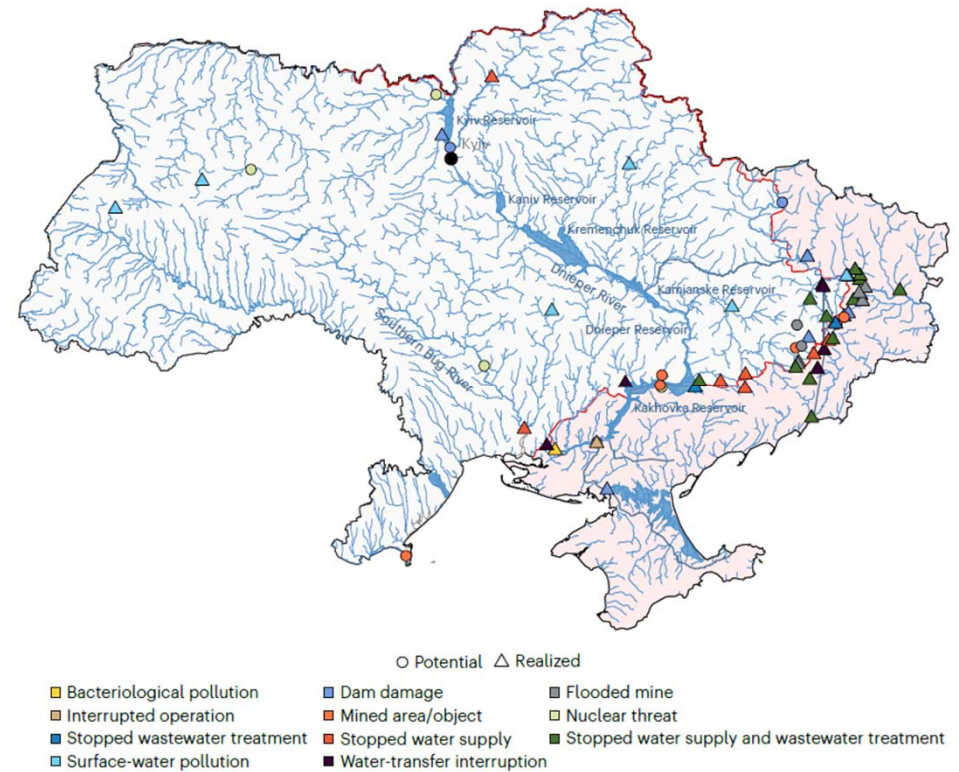


from [1] K1-9000/4015 Gesundheitsschutz und
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FOOD DEFENSE – SAMPLING WORLDWIDE

RUS/UKR-Conflict

- Military activities have a significant **effect on freshwater resources** and infrastructure in Ukraine
- **Chemical contamination** of air, water and soil
- Environmental impacts **threaten human health**



[2] Shumilova, Oleksandra, et al. "Impact of the Russia–Ukraine armed conflict on water resources and water infrastructure." *Nature Sustainability* 6.5 (2023): 578-586.

FOOD DEFENSE – SAMPLING WORLDWIDE



[3] <https://commercial.allianz.com/news-and-insights/expert-risk-articles/shipping-safety-22-ukraine-war.html>



[4] <https://www.ipg-journal.de/rubriken/wirtschaft-und-oekologie/artikel/klimakiller-krieg-6066/>



[5] <https://www.mdr.de/politik/ukraine-krieg-russlands-angriffe-vergiften-europas-kornkammer-was-sind-die-folgen-7F2HIGZ47FHYJBVQ3CFJFJRPPE.html>



RUS/UKR-Conflict



Contamination of
soil and water

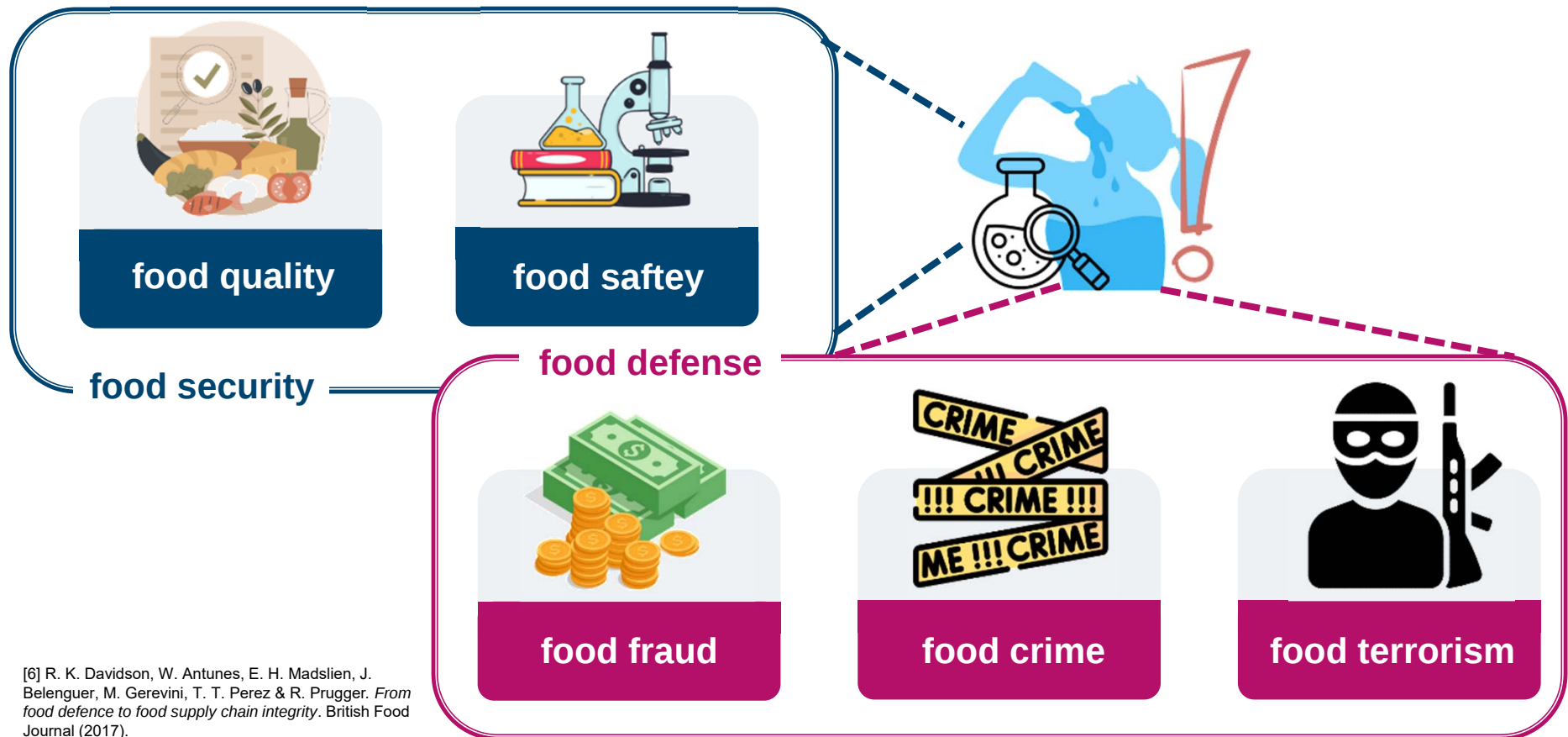


Influence on water and food
safety



Effect on military operations

FOOD SAFETY, FOOD FRAUD AND FOOD DEFENSE



[6] R. K. Davidson, W. Antunes, E. H. Madslien, J. Belenguer, M. Gerevini, T. T. Perez & R. Prugger. *From food defence to food supply chain integrity*. British Food Journal (2017).

FOOD SAFETY, FOOD FRAUD AND FOOD DEFENSE

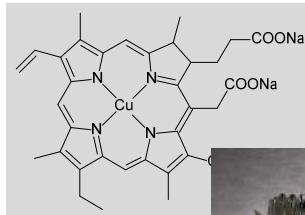
More Mislabeled Oil and Dangerous Colored Olives Seized in Italian Raids

By Ylenia Granitto
Feb. 4, 2016 11:34 UTC



Italian authorities blocked the sale of more than 2,000 tons of olive oil falsely labeled as Italian during an operation codenamed "Mamma Mia."

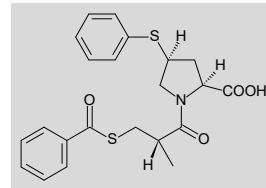
The fraud ring, with an estimated illicit turnover of **€13 million** (\$14.5 million), involved false documentation attesting the Italian origin of extra virgin olive oil that was, in fact, Spanish and Greek.



E 141



food fraud



Zofenopril



Kinder Surprise: Italian kid finds pill instead of toy in egg

The Italian food police (Nas) have launched a probe into how a child came to find a Zofenopril tablet inside a Kinder Surprise egg.

Published: 2 February 2016 08:11 CET



food crime



Rajneeshee Bioterror Attack

BY LEENA OH / DECEMBER 20, 2017



Salmonella typhimurium

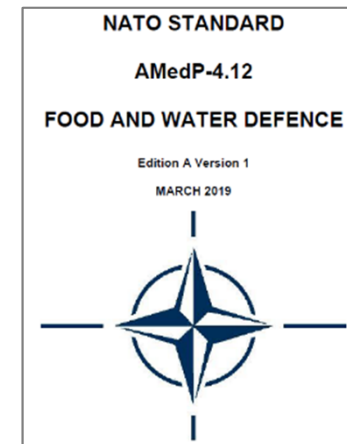
food terrorism

- [7] Y. Granitto. *More mislabeled oil and dangerous colored olives seized in Italian raids*. Olive Oil Times (2016). URL: www.oliveoiltimes.com/olive-oil-business/europe/more-mislabeled-oil-and-dangerous-colored-olives-seized-in-italian-raids
- [8] *Kinder surprise: Italian kid finds pill instead of toy in egg*. The Local (2016). URL: www.thelocal.it/20160202/kinder-surprise-italian-kid-finds-pill-instead-of-toy-in-egg
- [9] L. Oh. *Rajneeshee bioterror attack*. Homeland Security Digital Library (2017). URL: www.hsdl.org/c/tl/rajneeshee-bioterror-attack
- [10] W. Carus. *Bioterrorism and biocrimes: The illicit use of biological agents since 1900*. National Defense University, Center for Counterproliferation Research, Washington, DC (2001). URL: www.fas.org/irp/threat/cbw/carus.pdf
- [11] G. R. Dalziel. *Food defence incidents 1950-2008: A chronology and analysis of incidents involving the malicious contamination of the food supply chain*. Centre of Excellence for National Security (2001).
- [12] A. Amine, K. S. Saloua, M. Mouadh, E. M. Alya & L. Ahmed. *The absence of the "GATC-binding protein SeqA" affects DNA replication in Salmonella enterica serovar typhimurium*. DNA Replication and Related Cellular Processes (2011).

FOOD SAFETY, FOOD FRAUD AND FOOD DEFENSE



International Organization for Standardization
ISO 22000
„Food safety management systems“



Standardization Agreement (STANAG) 2556
Allied Medical Publication(AMedP)-4.12
„Food and Water Defence“

[13] ISO 22000:2018(en) Food safety management systems — Requirements for any organization in the food chain

[14] North Atlantic Treaty Organization (NATO). *Encyclopedia of NATO Topics. Standardization*. URL: www.nato.int/cps/en/natohq/topics_69269.htm

FOOD SAFETY, FOOD FRAUD UND FOOD DEFENCE



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www.pixabay.com

CBRN-THREATS



Chemical

- Pesticides (insecticides, herbicides, rodenticides)
- CWA (GB, VX, alkylants, ricin)
- Heavy metals (mercury, thallium, arsenic)
- Solvents (acetone)
- ...



Biological

- *Ascaris suum*
- *Shigella dysenteriae*
- Hepatitis-viruses
- *Salmonella typhimurium*
- *Salmonella typhi*
- ...



Radio-Nuclear

- Phosphorus-32 (^{32}P)
- Iodine-125 (^{125}I)
- Polonium-210 (^{210}Po)
- ...

Food Safety

- limited number of (known) pathogens & compounds
- predominantly process-related
- **unintentional** contamination

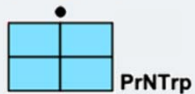
Food Defence

- unlimited number of potential contaminants
- dependent on resources & know-how of the perpetrators
- **intentional** contamination

ANALYTICAL SKILLS

Level 1:

Mobile sampling squad

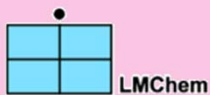


- On-site testing of water and food at the sampling point
- Information about usability or treatability of drinking water available on location
- Highly mobile deployment



Level 2:

Mobile food chemistry lab (LabCont)



- Capabilities for testing and assessing drinking water and food with regard to C(B)RN-contaminations and sabotage toxins
- Requirements: Electricity, water, space for LabCont and type-II tent, time (quantitative results after 24-48 h)



Level 3:

ZInstSanBw

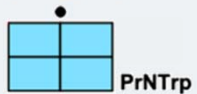
- Comprehensive analytics across the entire scope of services
- Reach back-analysis



SAMPLING TEAM & EQUIPMENT

Level 1:

Mobile
sampling squad



1 x San(St)Offz Ap
1 x San(St)Offz Vet
1 x SanFw ChemTAss
1 x SanFw VetMedTAss

Responsibilities:

- sampling
- on-site analysis



SAMPLING TEAM & EQUIPMENT

Level 1:

Mobile
sampling squad

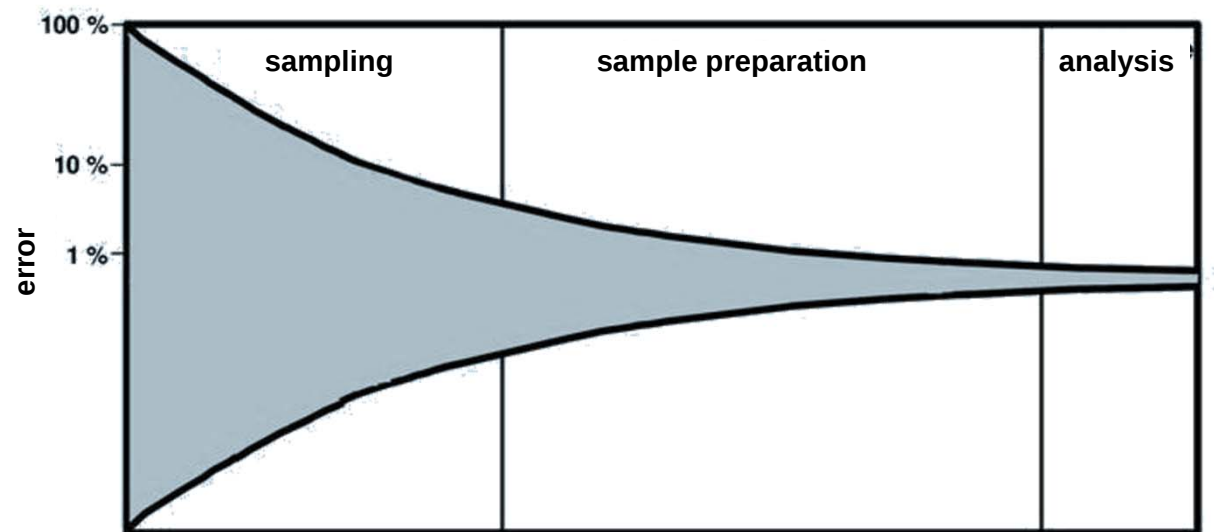


PrNTrp

Responsibilities:

- sampling
- on-site analysis

Why is the correct sampling important?



SAMPLING TEAM & EQUIPMENT

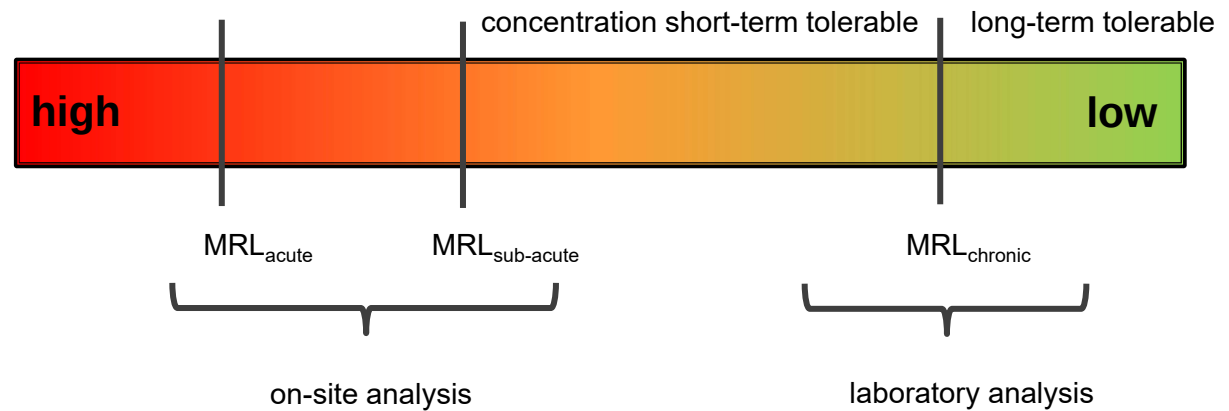
Level 1:

Mobile
sampling squad



PrNTrp

Is the food/drinking water safe to consume?
Does the consumption pose a health risk?



Responsibilities:

- sampling
- on-site analysis

Maximum residue levels (MRL) according to AMedP 4.9

ON-SITE ANALYSIS

Level 1:

Mobile
sampling squad



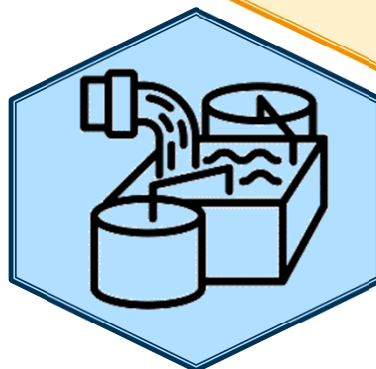
PrNTrp

water analysis



indicator parameter

(e.g. conductivity, turbidity, pH, temperature, nitrate, iron, ...)



technical parameter

(e.g., free and total chlorine, calcium, magnesium, ...)



health-related parameter

(e.g. cyanide, arsenic, CWA, alkyants, pesticides, nitrite, heavy metals, radionuclides, ...)

ON-SITE ANALYSIS

Level 1:

Mobile
sampling squad



PrNTrp

water analysis

time-dependent measurement:

- conductivity, turbidity, pH, temperature, iron
- free and total chlorine

acute health risks:



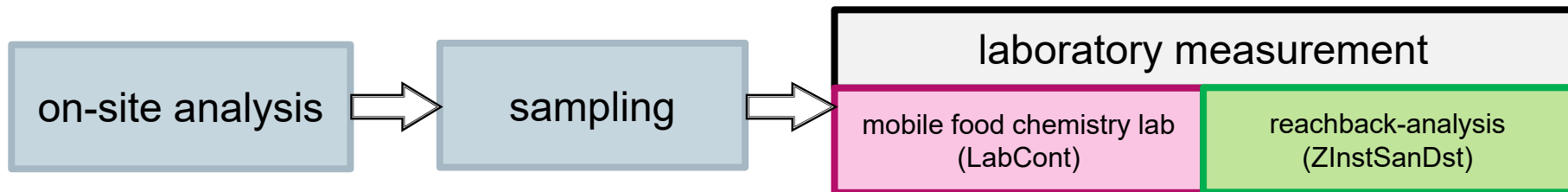
- radionuclides, cyanide, arsenic, CWA, alkyants, ricin

food defense

on-site
analysis



FOOD DEFENSE – SAMPLING WORLDWIDE



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