

FEDERAL INSTITUTE FOR RISK ASSESSMENT



Risiken erkennen – Gesundheit schützen

Federal Institute for Risk Assessment – Contribution to safe food-fair food 2

Alexandra Fetsch


Dr. Alexandra Fetsch: Who am I ?



- 1997-2003: study veterinary medicine, FU Berlin
- 2004-2007: PhD student, Institute of Virology
- 2005-2006: de facto specialist for food microbiology/hygiene, LALLF, Rostock
- since May 2006: scientist at BfR, Berlin, Dept. Biological Safety
- since Oct. 2008: head of NRL for coagulase positive staphylococci incl. *S. aureus*
- since Oct. 2011: Master student Science marketing, TU Berlin
- Main area of professional interest: Microbiology, Risk assessment, Food hygiene, Risk communication

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Federal Institute for Risk Assessment




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- established on 1 November 2002
- as a body under public law
- in the area of responsibility of the Federal Ministry of Food, Agriculture and Consumer Protection

independent

- in its scientific assessments and
- in its research

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Locations



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The Federal Institute has locations in

Berlin-Jungfernheide and 

Berlin-Marienfelde 


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Main areas of work




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- Microbiological and substance-chemical safety and assessment of foods
- Safety and assessment of substances (chemicals, plant protection products, biocides) and selected products (commodities, cosmetics, tobacco products, textiles and food packaging)
- Risk communication
- Research




Furthermore

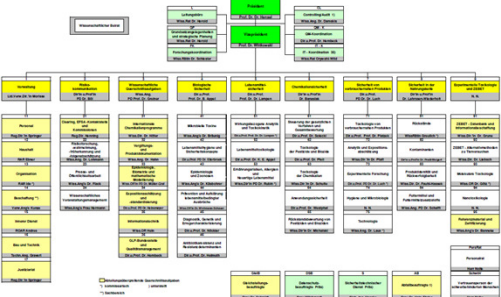
- Elaboration of alternatives to animal experiments in which the safety of substances can be determined


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Organisation chart



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Department 4 Biological Safety

41 Coordination Microbial toxins	→	NRL Staph incl. <i>S.aureus</i> NRL <i>E. coli</i>
42 Food Hygiene and Food Safety Concepts	→	NRL <i>Campylobacter</i> NRL <i>L. listeria</i> viral shellfish contaminants food technology
43 Epidemiology and Zoonoses	→	NRL - antibiotic resistance monitoring of zoonosis
44 Prevention and Investigation of Food Borne Outbreaks	→	BELA data base on outbreaks
45 Diagnostics, Genetics and Characterisation of Pathogens	→	NRL <i>Trichinella</i> bact. shellfish contaminants Consultation for <i>Yersinia</i> S3 Laboratory
46 Antibiotic Resistance and Resistance Determinants	→	NRL <i>Salmonella</i> lab antibiotic resistance array-based methods

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BfR and safe food-fair food 2: particular interest – potential contribution

- International collaboration
- strengthen networking
- Zoonotic pathogens in Africa
- responsibilities, delivery/trading networks of different food chains in Africa
- Milk food chain in Tanzania

- Provide expertise in the field of risk assessment, microbiology, (detection/typing) methodology, risk communication
- Regional training courses (No. 2-3 in 3 years)
- Laboratory training on zoonotic pathogens at BfR

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Thank you very much for your attention

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Dept. Biological Safety: main resources

Personal

permanent staff: 80 (30 scientists)
project staff: 20 (15 scientists)

Laboratories

biosafety level: 1-3
GMO level: 1-2

Animal house, animal farm

small laboratory animals (mice, rats, guinea pigs)
food animals (pigs, sheep, goat, cattle)

Slaughter house and food technology

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Main tasks for the NRL

- confirmatory testing, typing of pathogens
- development and validation of methods
- epidemiological investigation
- strain collection, production of reference material
- ring trials for proficiency testing
- trainings for routine laboratories
- risk assessment on foodborne pathogens and resistance
- national and international cooperation, research projects
- scientific boards (DIN, EFSA, OECD, FAO/WHO, CEN...)
- annual reporting and publication

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Risk analysis Framework

Application of Risk Analysis to Food Standards issues, a Joint FAO/WHO Expert Consultation, Geneva, Switzerland, 13-17 March 1995

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NRL *Salmonella*

Key aspects

- Monitoring and control of salmonellosis (Dir. EU No. 2003/99/EG, Reg. EU No. 2160/2003, AVV Zoonoses)

Research

- Salmonella* infections in animal and man (FBI-ZOO, BMBF)
- fast detection of *Salmonella* with MALDI-TOF (PROINNO II, BMWi)
- tracing of *Salmonella* in food and feedstuff (BIOTRACER, 6th EU RFP)
- molecular typing of *Salmonella* isolates from foodborne outbreaks, data bank collection (PulseNet Europe, 6th EU RFP)



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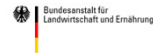
NRL *Campylobacter*

Key aspects

- Coordination of the national monitoring programme on prevalence of *Campylobacter* along the food chain

Research

- usage of bacteriophages for the reduction of *Campylobacter* in chicken (CAMPYQUANT, BMELV)
- investigations on bactericide effects of marinades against *Campylobacter* in food



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NRL *E. coli* incl. VTEC

Key aspects

- monitoring on the prevalence of VTEC in food
- investigations on the natural reservoir of VTEC

Research

- evaluation of detection methods for human pathogenic VTEC; methods for the isolation of VTEC from food
- fast methods for the typing of VTEC from food (investigation of infection chains)
- cooperating within the network on pathogenic *E. coli* (PEN, 6th EU RFP)



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NRL coagulase-positive *Staphylococcus* spp.

Key aspects

- monitoring on prevalence of MRSA in the food chain
- qualitative and quantitative detection of staphylococci in food matrices
- characterization of enterotoxins in food

Research

- development and validation of methods for quantitative detection of MRSA in food (EH, BMELV)
- validation of a method for the selective detection of MRSA in minced meat and raw milk
- evaluation of the toxin production of coagulase-positive staphylococci and MRSA in raw sausage



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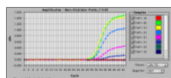
NRL *Listeria monocytogenes*

Key aspects

- monitoring on prevalence of *Listeria* in ready-to-eat products (fish, cheese)
- advancement of molecular methods for the detection and typing of *L. monocytogenes*

Research

- development of a real time-PCR for detection of *L. monocytogenes* (*prfA*, *mpl*) for the official examination of food (§64 LFGB)



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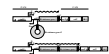
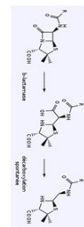
NRL Antibiotic Resistance

Key aspects

- national resistance monitoring on *Salmonella*, *Campylobacter*, VTEC, MRSA and commensal bacteria (*E. coli*, *Enterococcus*)
- genotypic characterisation of resistant pathogens (ESBL's, fluorquinolon-, aminoglycoside resistance)

Research

- standardisation of resistance determination (MIC) in *Staphylococcus* spp.
- risk profiles for the development of resistance (ESBLs)
- detection of resistance genes by PCR
- studies on transmission of resistance genes
- development of resistance in disinfectants (Triclosan)



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NRL Viruses and Bacteria in Molluscs

Key aspects

- coordination of laboratories for the routine analysis of pathogens in molluscs

Research

- validation of molecular methods for virus detection in molluscs (Norovirus, HAV, HEV, Rotavirus)
- experiments on virus persistence in molluscs
- use of MALDI-TOF for fast identification of *Vibrio* isolates
- development of molecular methods for detection of toxins from *Vibrio* spp.
- optimization and validation of a real-time PCR for quantitative detection of pathogenic *Vibrio* in molluscs



NRL *Trichinella*

Key aspects

- accreditation of national laboratories performing routine *Trichinella* inspection; organisation of national ring trials for proficiency testing
- monitoring on *Trichinella* prevalence in wildlife (fox, raccoon dog)

Research

- development and validation of ELISA for *Trichinella* detection in pigs (PROINNO II, BMWi)
- use of inactivated *Trichinella* for proficiency testing



Laboratory examination at NRL per year

direct detection from organs or food

- no. of isolates: > 2500
- no. of DNA-, RNA-tests: > 4000

typing

- no. of phenotypic tests (incl. resistance): > 8500
- no. of molecular tests (incl. resistance): > 4500

indirect detection from serum or meat juice

- no. of antibody tests: > 1500

