Problembewusstsein AB – Resistenz aus vet. med. Sicht

Univ. Prof. Tzt. Dr. Josef Köfer

Einfluss von AB – Resistenzen, Gemeinsame Herausforderung für Veterinär- und Humanmedizin

28. März 2017, Steiermarkhof, Graz

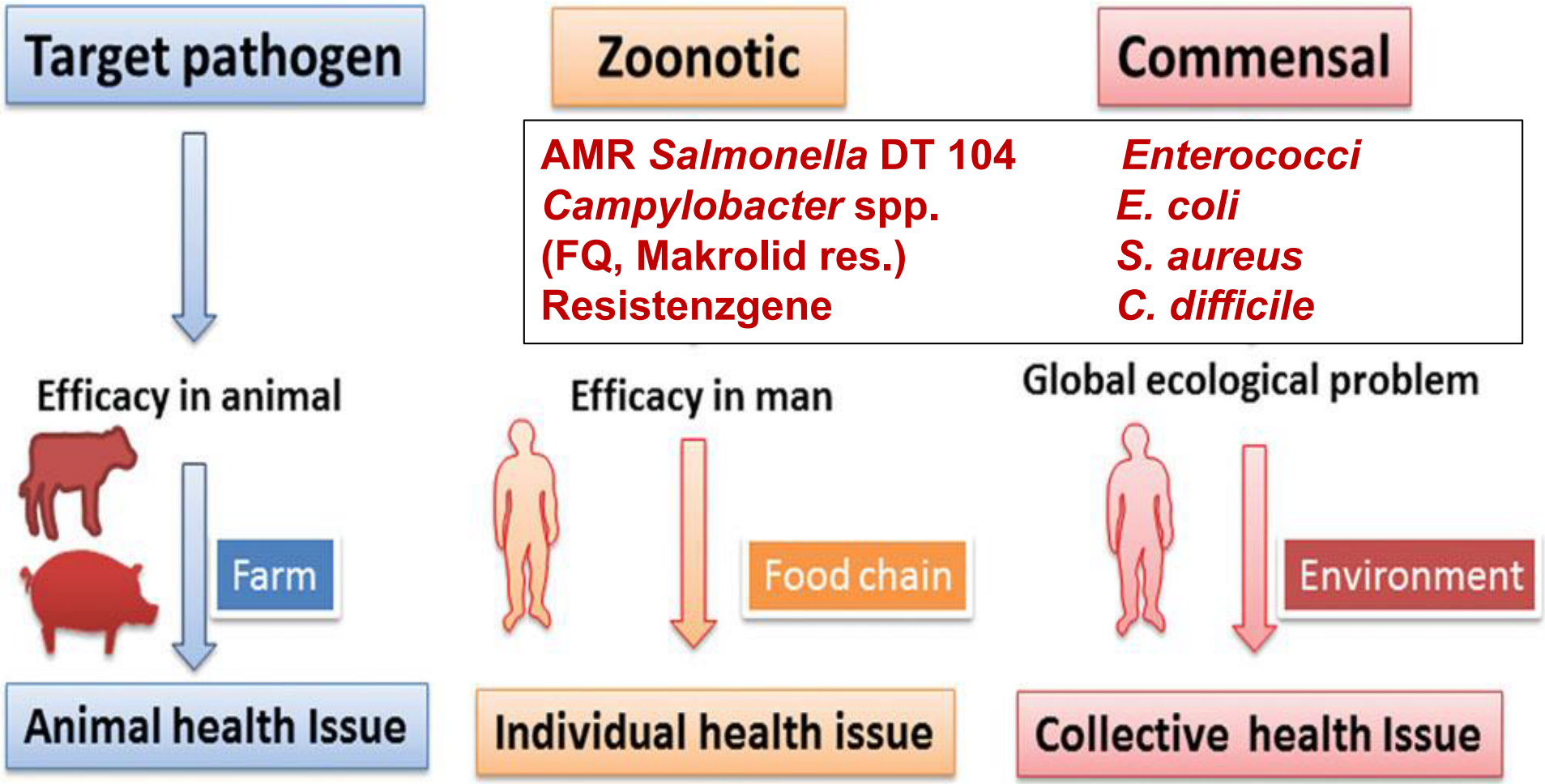
Institut für Öffentliches Veterinärwesen
Veterinärmedizinische Universität Wien

vetmeduni vienna

Inhalt

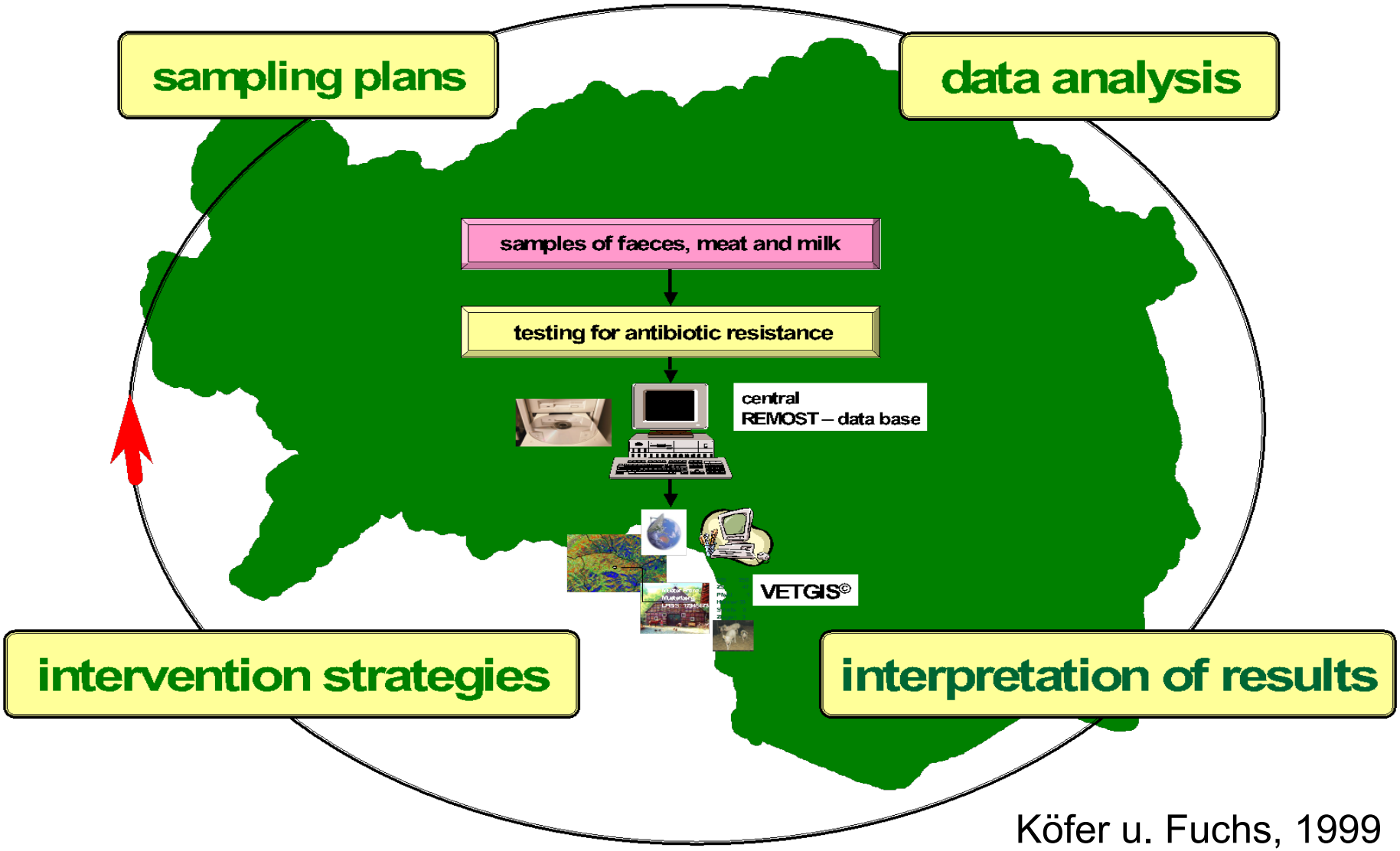
- Material, Methoden, Begriffe
- Glycopeptide/Streptogramine
- Gefahren aus dem Stall ?
  MRSA, ESBL
- Antibiotikamengenströme
- Ausblick

AB – Einsatz / Konsequenzen



Quelle: Toutain P.L. et al., 2016

Integrated Monitoring and Control Systems in Food Production

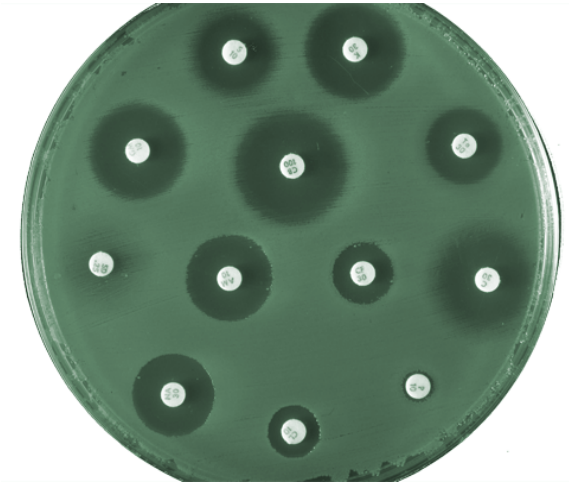


Köfer u. Fuchs, 1999

Resistenzbestimmung

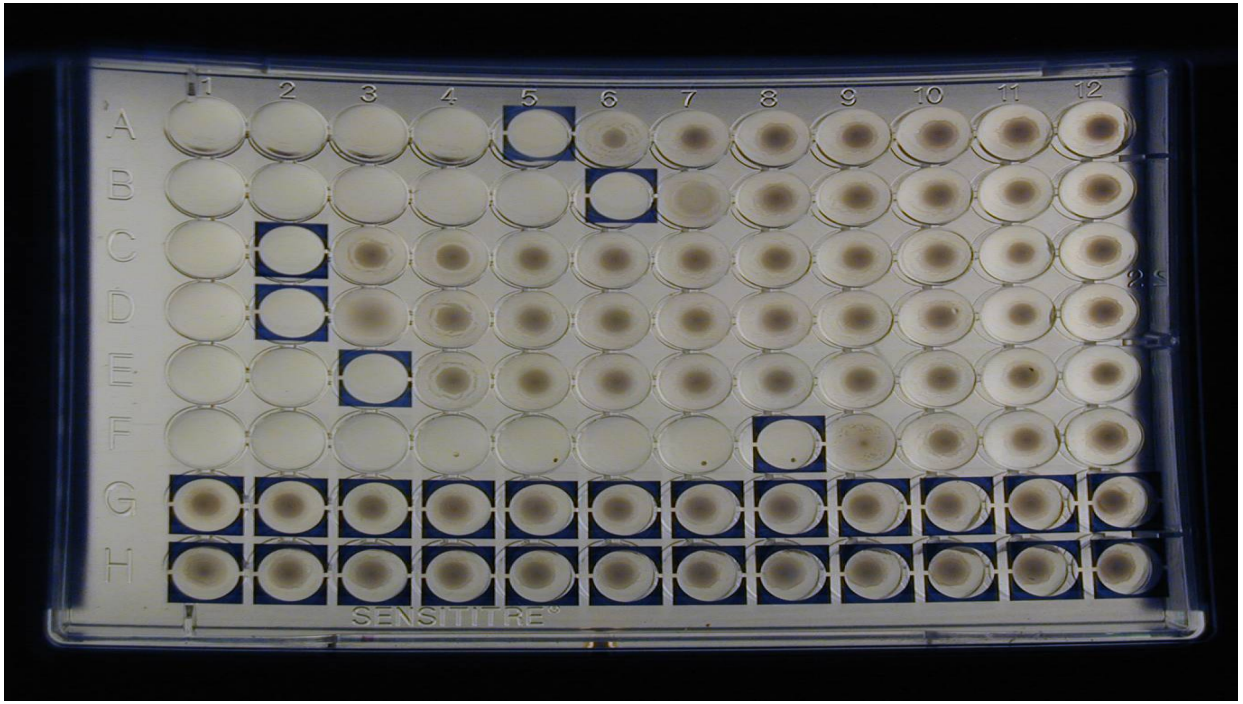
Plattendiskverfahren

semiquantitativ



Sensititre - MHK

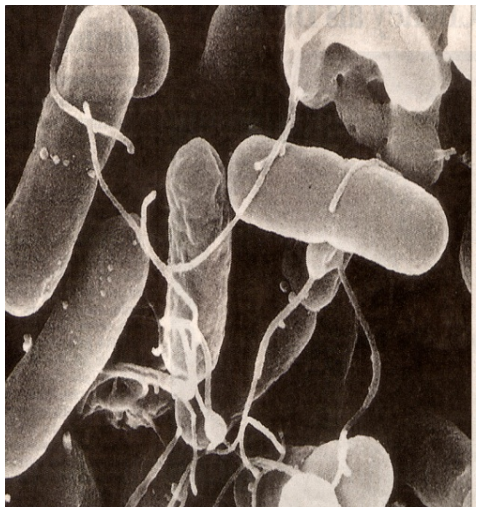
quantitativ

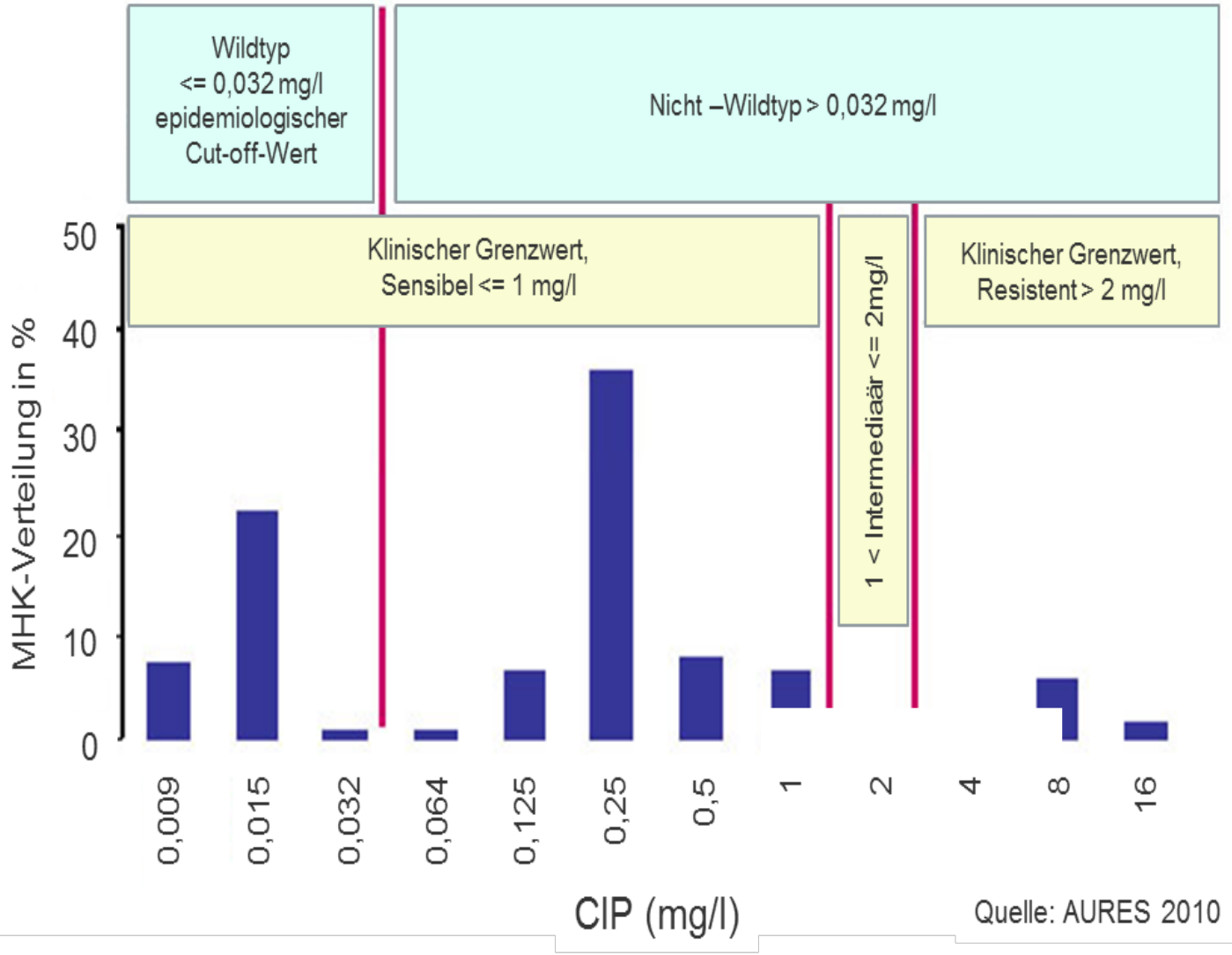


2015 repräsentative Stichproben von Schlachtschweinen untersucht: Indikator – *E. coli, Salmonella* spp., *E. coli* (AmpC, ESBL, Carbapenemasen) sowie frisches Schweine- und Rindfleisch

Klinischer Grenzwert nach CLSI und epidemiologischer Cut-off Wert nach EUCAST

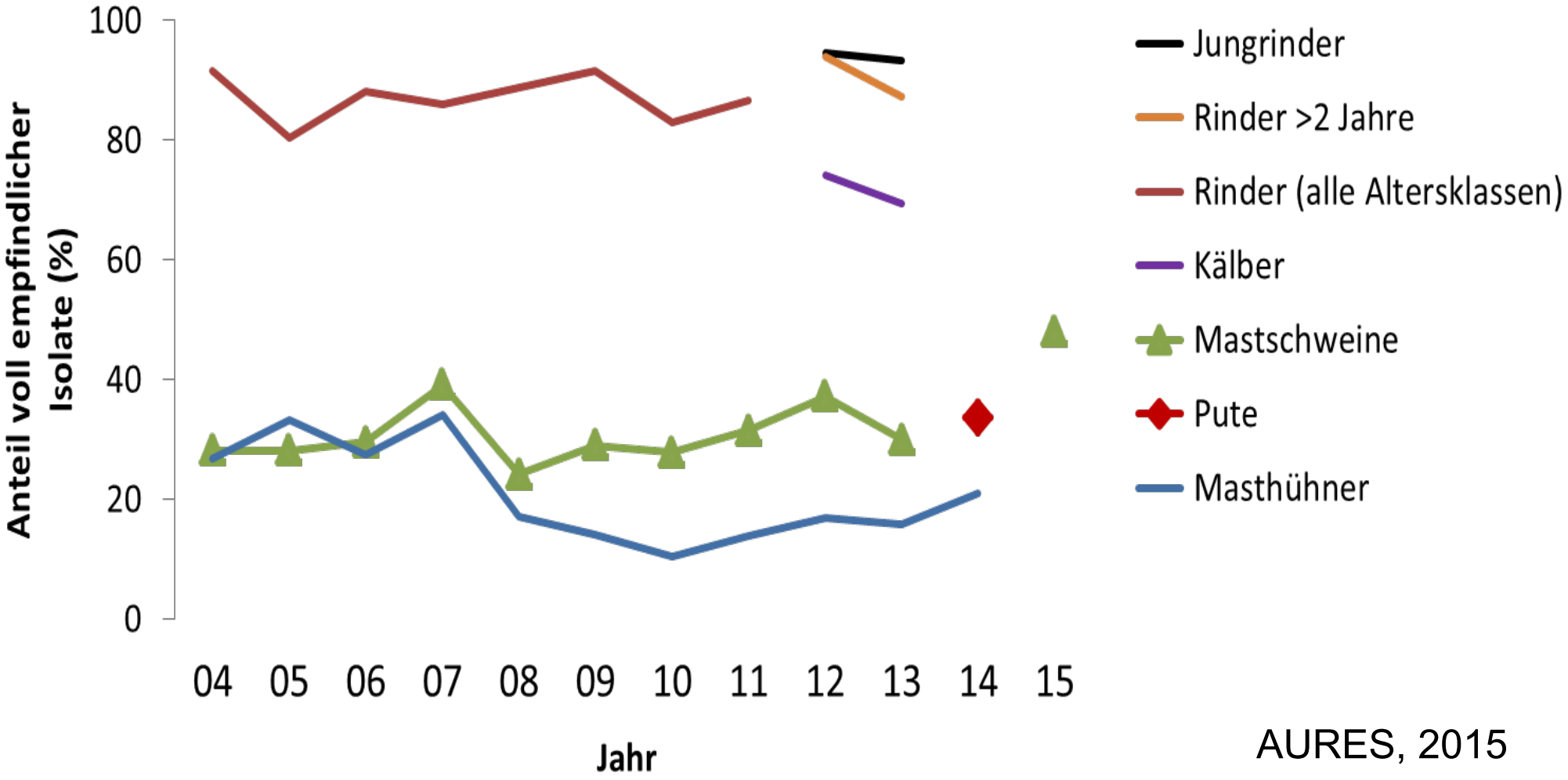
E. coli





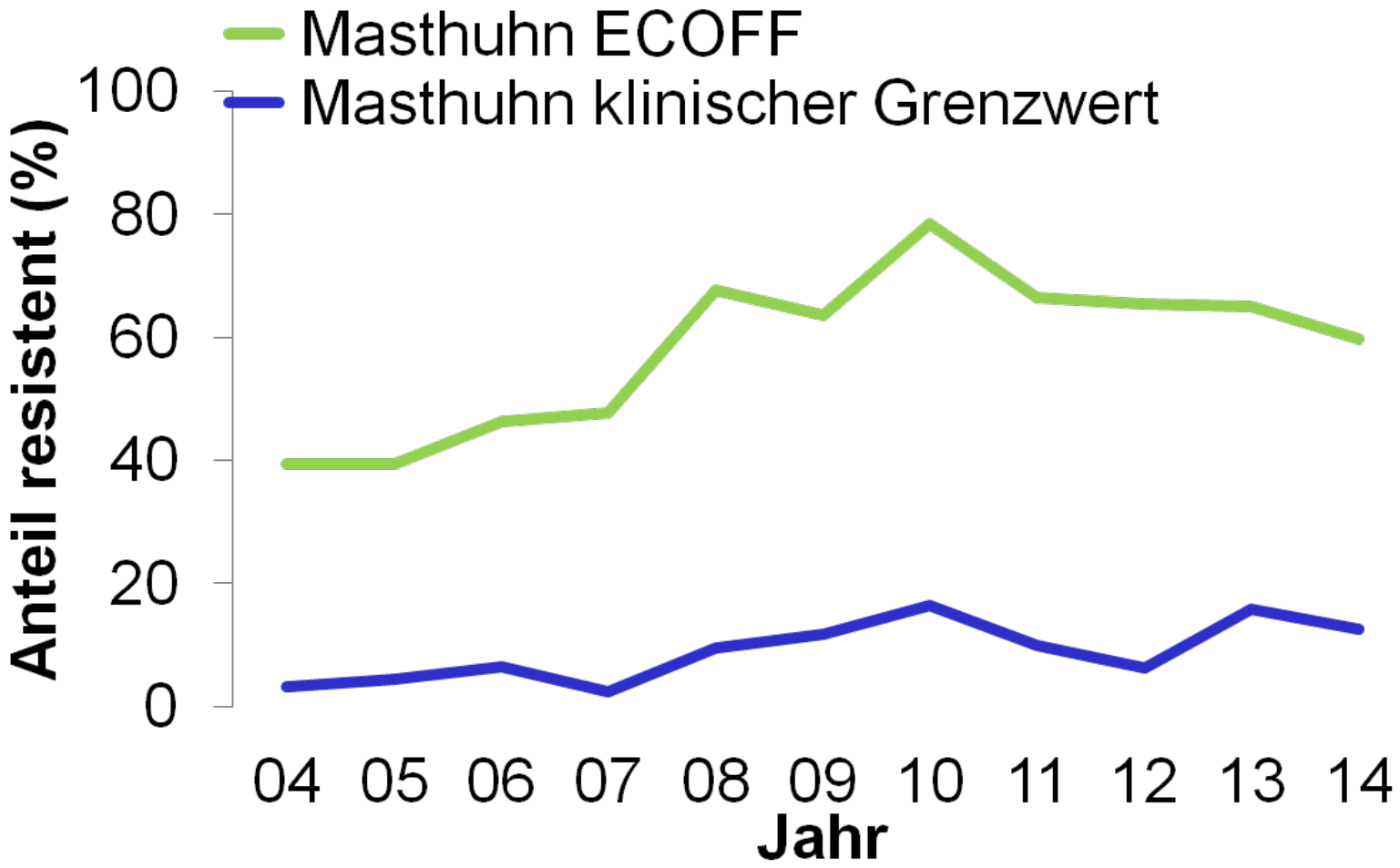
Quelle: AURES 2010

Anteil voll empfindlicher Isolate von kommensalen *E. coli* aus verschiedenen Nutztieren, 2004–2015



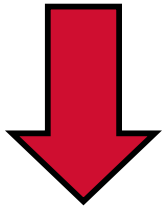
AURES, 2015

Anteil resistenter Isolate von kommensalen *E. coli* aus Masthühnern, 2004–2015, beurteilt nach ECOFF bzw. CLSI



EU – Council Resolution 1999

„A strategy against the microbial threat“

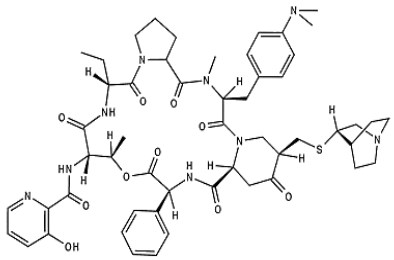


multidisciplinary and cross sectoral strategies to control AB resistance

One health strategy !!!

Enterokokken - Resistenz

Quinupristin

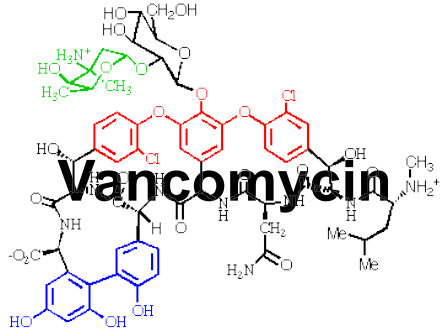


Dalfopristin

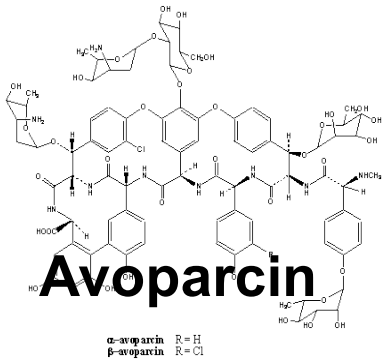
Virginiamycin

Streptogramines

Glycopeptides



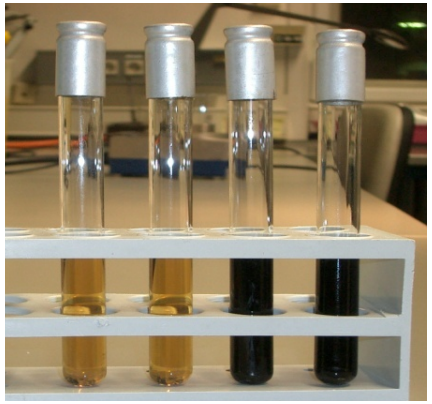
Vancomycin

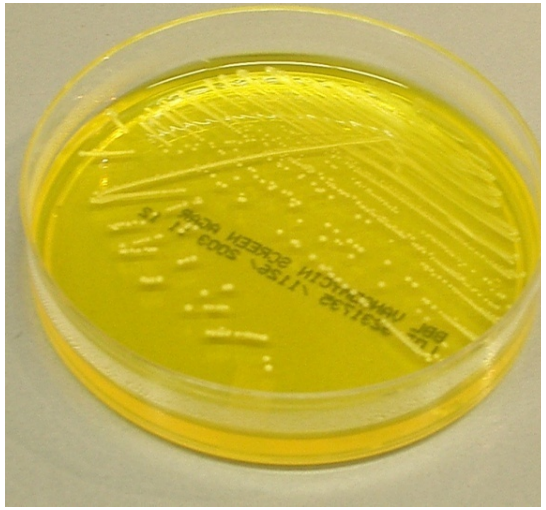


Avoparcin

α-avoparcin R = H
β-avoparcin R = Cl

Resistances of *Enterococci* to Vancomycin in livestock production





	cattle	pig	broiler
analysed faecal samples	208	206	205
faecal samples containing vancomycin-resistant enterococci	46 (22.1%)	48 (23.3%)	158 (77.1%)
faecal samples containing *vanA* (*E. faecium*)	1 (0.5%)	0	86 (42.0%)
faecal samples containing *vanC1*	9 (4.3%)	27 (13.1%)	71 (34.6%)
faecal samples containing *vanC2/3*	37 (17.8%)	22 (10.7%)	4 (2.0%)

Quelle: GORKIEWICZ et al., 2004

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Diagnostic Microbiology and Infectious Disease 53 (2005) 17–21

DIAGNOSTIC MICROBIOLOGY AND INFECTIOUS DISEASE

www.elsevier.com/locate/diagmicrobio

Identification of Glycopeptide-resistant enterococci by VITEK 2 system and conventional and real-time polymerase chain reaction☆

Alexandra Eisner[a], Gregor Gorkiewicz[a], Gebhard Feierl[a], Eva Leitner[a], Josef Köfer[b], Harald H. Kessler[a,*], Egon Marth[a]

[a]*Institute of Hygiene, Medical University of Graz A-8010, Austria*
[b]*Department of Veterinary Administration in Styria, Graz A-8010, Austria*

Received 24 February 2005; accepted 13 April 2005

Abstract

Glycopeptide-resistant enterococci (GRE) are important causes of nosocomia… Europe. Rapid detection of GRE is essential for the implementation of appropriate control mea… this study, we compared the reliability of 3 different methods, VITEK 2 automated system (bi… olymerase chain reaction (m-PCR) protocol, and a real-time PCR protocol performed on the Light… of GRE in the routine microbiology laboratory. Species identification and glycopeptide resistance… ococcal isolates with different glycopeptide resistance phenotypes. With the VITEK 2 system, 39%… to species level. Resistance to vancomycin was detected in all isolates; however, discrepancies occur… resistance. The PCR protocols proved to be suitable for detecting clinically relevant GRE; 90% … ntified with the conventional m-PCR and 100% of *vanA* and *vanB* isolates with the real-time PCR … d rapidity make the real-time PCR assays superior tools for identification of GRE in clinical sample… to detect *vanC*.

APPLIED AND ENVIRONMENTAL MICROBIOLOGY, Oct. 2005, p. 6407–6409 Vol. 71, No. 10
0099-2240/05/$08.00+0 doi:10.1128/AEM.71.10.6407–6409.2005

High Prevalence of VanA-Type Vancomycin-Resistant Enterococci in Austrian Poultry

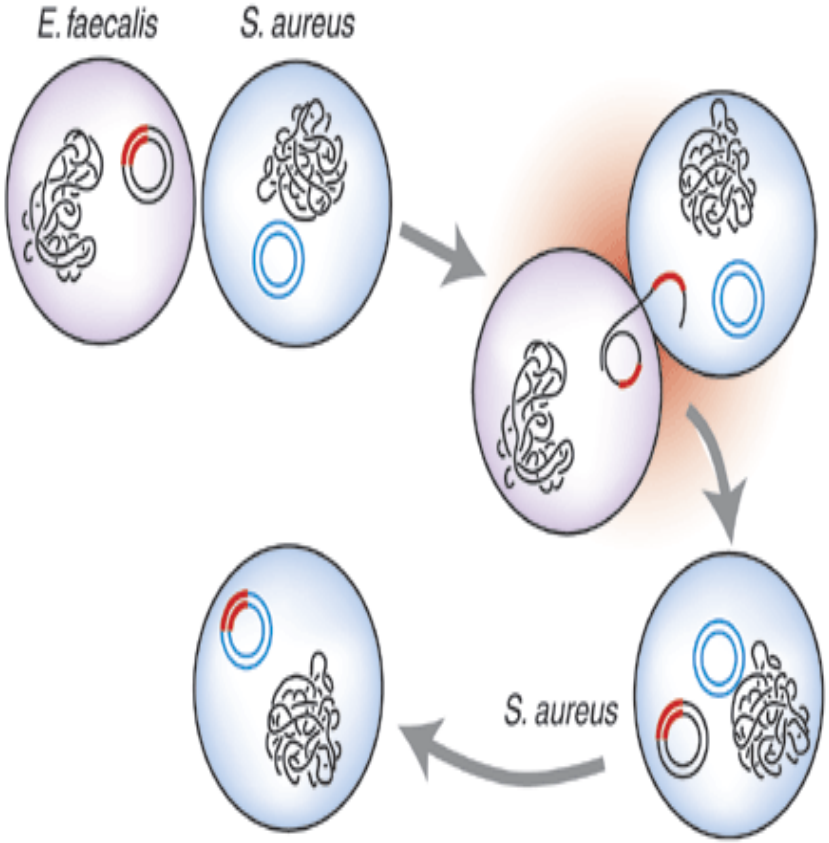
Alexandra Eisner,[1]* Gebhard Feierl,[1] Gregor Gorkiewicz,[1] Franz Dieber,[2] Harald H. Kessler,[1] Egon Marth,[1] and Josef Köfer[2]

Institute of Hygiene, Medical University of Graz,[1] and Department of Veterinary Administration in Styria,[2] A-8010 Graz, Austria

Received 23 December 2004/Accepted 10 May 2005

Fecal samples from humans and food-producing animals were analyzed for the presence of vancomycin-resistant enterococci (VRE). The VRE carriage rate in humans was 6%, and there was a predominance of VanC-type resistance. *Enterococcus faecium* with *vanA*-mediated resistance was frequent in broiler chickens (42%) but rare in cattle and pig samples.

Gefahr aus dem Stall



Antibiotikaresistenz

FOCUS

Gefahr aus dem Stall

Ein gegen Antibiotika vielfach resistenter Bakterienstamm verbreitet sich unter Haustieren und befällt auch den Menschen

Von FOCUS-Korrespondentin Kerstin Schweighöfer

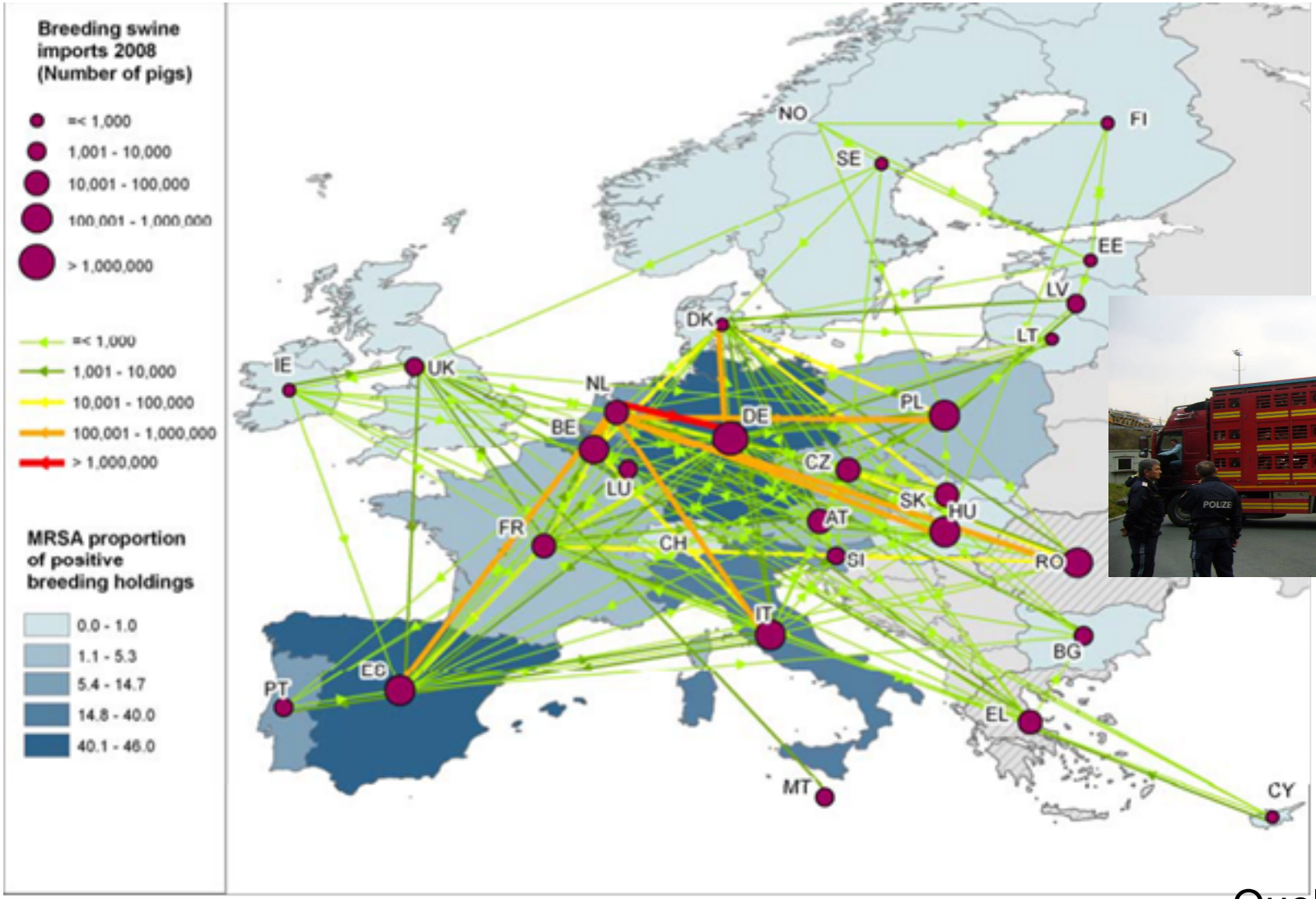
Den Verdacht hegte die niederländische Schweinezüchterin Ine van den Heuvel schon lange: Könnte es sein, dass sich ihre Familie im Tierstall immer wieder mit einem gefürchteten Bakterienstamm infizierte? „Wir versuchten alles, um die Keime loszuwerden", erzählt die dreifache Mutter aus Nistelrode. „Doch wir waren innerhalb kürzester Zeit wieder befallen."

Landwirte können sich im Stall mit gefährlichen Keimen anstecken

MRSA – EFSA Studie (2008)

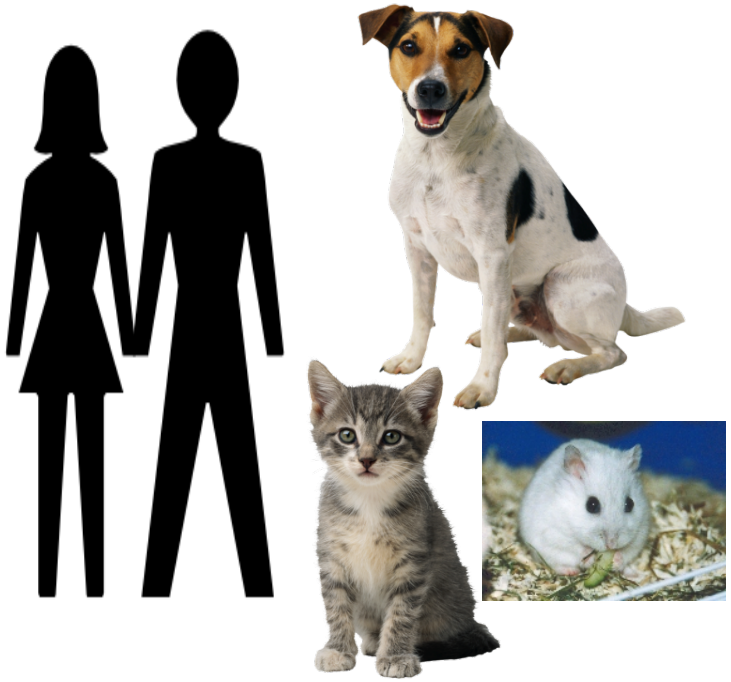
Prevalence of MRSA positive breeding holdings

MRSA & Community trades of pigs



Quelle: EFSA, 2009

Übertragung von MRSA ?



„These results suggest that companion animals of MRSA – infected patients can be culture-positive for MRSA, representing a potential source of infection or reinfection for humans“.
Jorge Pinto Ferreira et al., PLOS*one*

WIENER KLINISCHE WOCHENSCHRIFT
The Middle European Journal of Medicine

Methicillin-resistant *Staphylococcus aureus* : a new zoonotic agent ?

Burkhard Springer, Ulrike Orendi, Peter Much et al.,
Wiener Klinische Wochenschrift, 2009;121(3-4):86-90.

MRSA in Wundabstrichen - 479 *Staph. aureus*- Isolate

Hund (201): → 63 % MRSA

Katze (140): → 46 % MRSA

Pferd (138): → 41 % MRSA Vincze et al., PLOS*one*

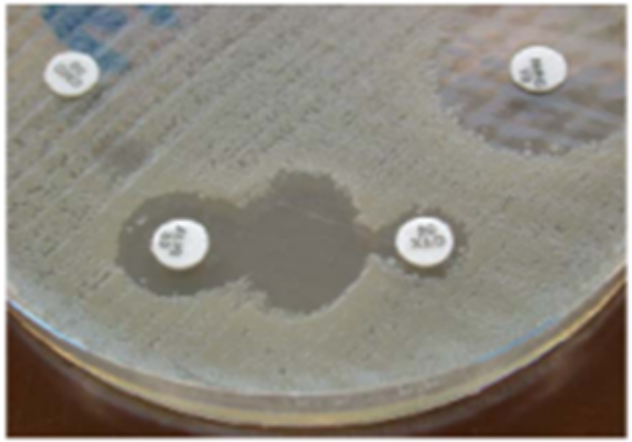
Gefahr aus dem Stall

ORIGINAL ARTICLE 10.1111/j.1469-0691.2011.03497.x

Dutch patients, retail chicken meat and poultry share the same ESBL genes, plasmids and strains

M. A. Leverstein-van Hall[1,2], C. M. Dierikx[3], J. Cohen Stuart[1], G. M. Voets[1], M. P. van den Munckhof[1], A. van Esse … l. van de Sande-Bruinsma[2], J. Scharinga[1], M. J. M. Bonten[1,5] and D. J. M … eillance group[6]

1) Departmer … trecht, Utrecht, 2) Centre for Infectious Disease Control, National Institute for Public Health and th … cteriology and TSEs, Central Veterinary Institute of Wageningen UR, Lelystad, 4) SALTRO, P … e for Health Sciences and Primary Care, University Medical Centre, Utrecht and 6) Departmer … rinary Medicine, Utrecht University, Utrecht, the Netherlands



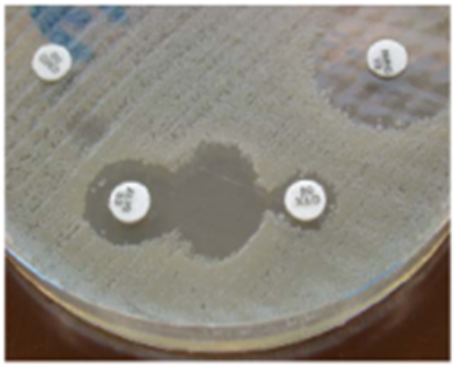
Clinical Microbiology and Infection 2011

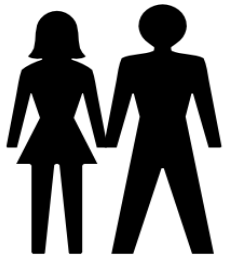
Charakterisierung *E. coli* – ß Lactamasen

N = 177

N = 34

CTX-M-1





N = 40

CTX-M-9

CTX-M-15

Übertragung von ESBL *E. coli* über Nahrungskette möglich

Anpassung von *E.coli* mit CTX-M-15 Genen an humanes Milieu (HWI)

Begrenztes Reservoir von *E. coli* mit CTX-M-15 ESBL bei Nutztieren

CAVE: Selektion CTX-M-1 tragender *E. coli* durch ß-Laktamantibiotika bzw. Co-Selektion durch FQ oder Tetracycline

QUELLE: BRUCKNER, 2011- AGES

AT – Erzeugung von Masthähnchen

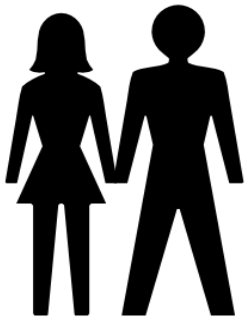
Großelterntierküken (1 Tag alt)		GB	***Cephalosporin***
Großelterntierherden		GB	kein Einsatz
Bruteier für Elterntierherden		AT	kein Einsatz
Eintagsküken od. Jungtiere		AT	kein Einsatz
Masthähnchen		AT	kein Einsatz

30 % ESBL *E. coli* > 50 % Resistenz bei 3. Gen. Cephalosporinen

Quelle:RESCH 2010, AGES

Datenerfassung von AB-Mengenströmen

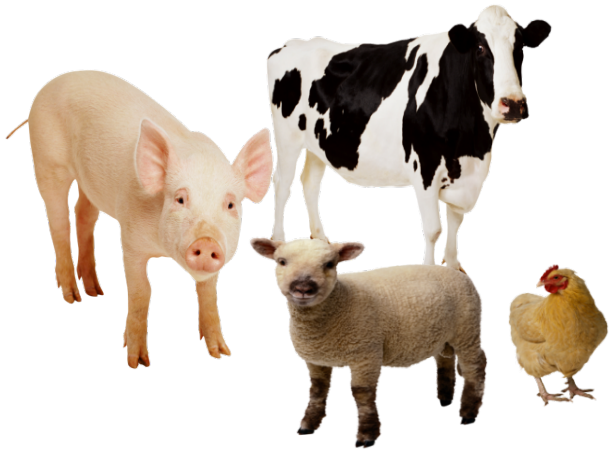
AB-Mengenströme „top – down“ 2015



8.5 Mio.

70 t AB pro 1 Mio GVE (äquivalent)

Σ **48 t** AB für 2,0 Mio GVE
~ 24 t pro 1 Mio. GVE



2010

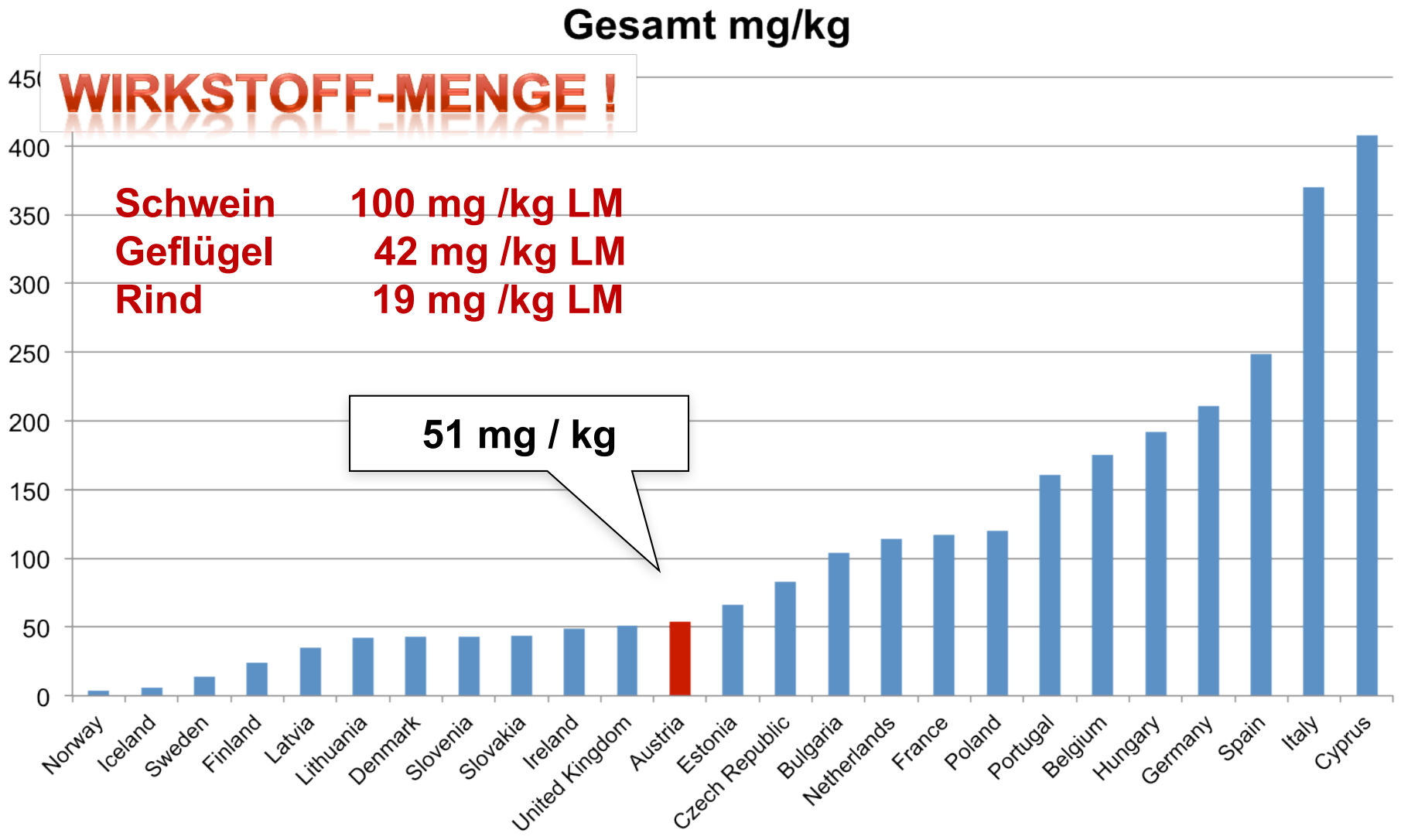
62,02 t

2015

48,78 t

Antibiotika-vertriebsmengen sind in der Tiermedizin **gesunken**

3rd ESVAC report 2015



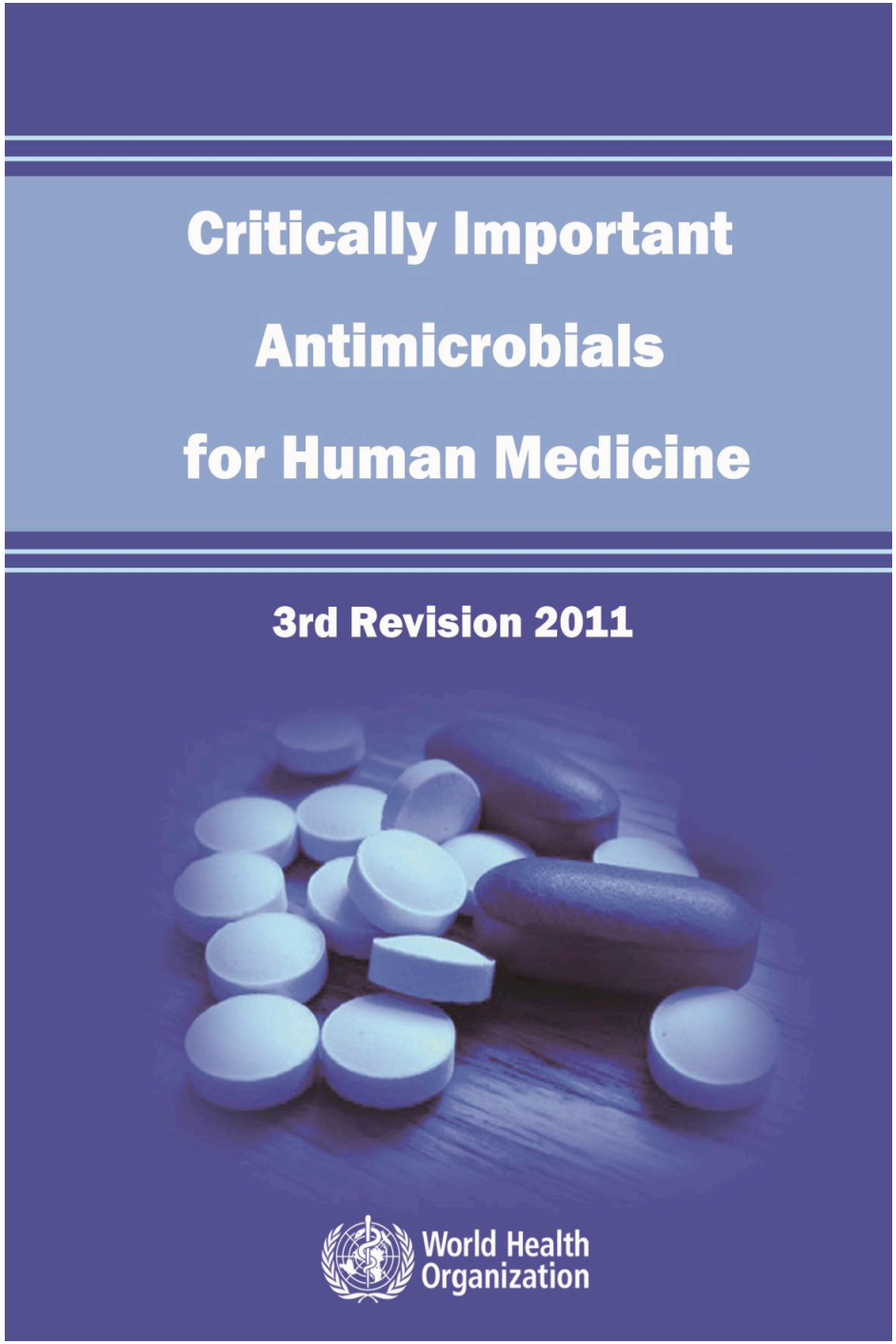
„Highest Priority Critically Important Antimicrobials“ ?

- **Fluoroquinolones**
- **3rd and 4th generation Cephalosporins**
- **Macrolides**
- Glycopeptides

have been categorized as being of highest priority for risk management among anti-microbials.

- Carbapenems
- Lipopeptides
- Oxazolidinones

currently have no veterinary equivalent. WHO recommends that these classes as well as any new class of antimicrobial developed for human therapy should not be used in animals, plants, or in aquaculture.



HPCIA – verkaufte Wirkstoffmengen 2015

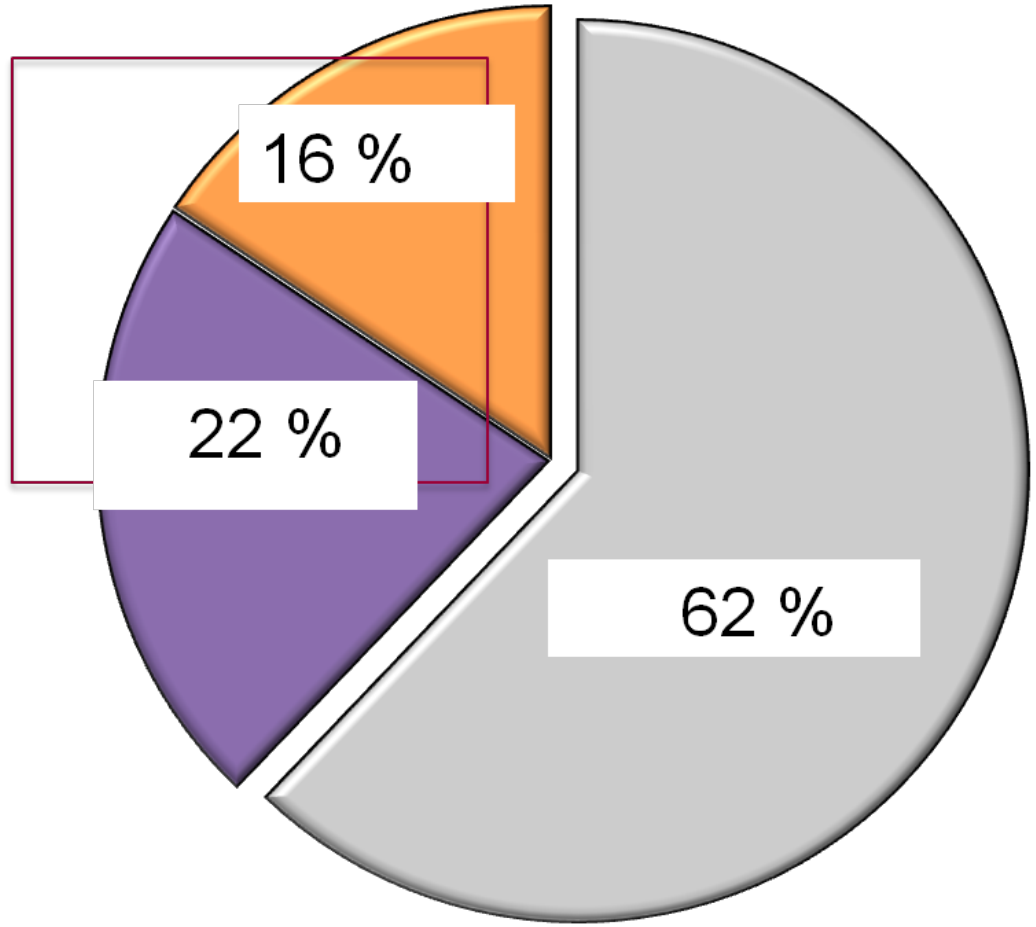
Makrolide	**3,9 t**
Fluorchinolone	**0,5 t**
3. u. 4. Generation Cephalosporine	**0,2 t**
Summe	**4,6 t**

„AB“ beim Geflügel - Totalerhebung

Gesamt 42 mg/kg LM für AT

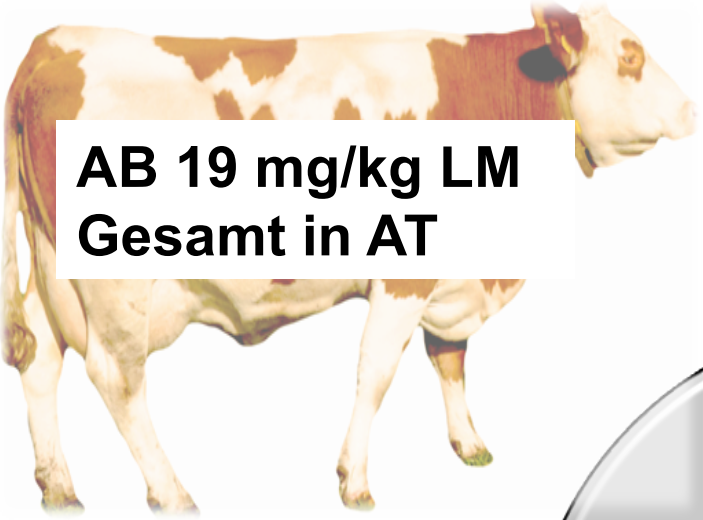
AURES, 2015

38% „HPCIA´s“



Obritzhauser et al., 2016

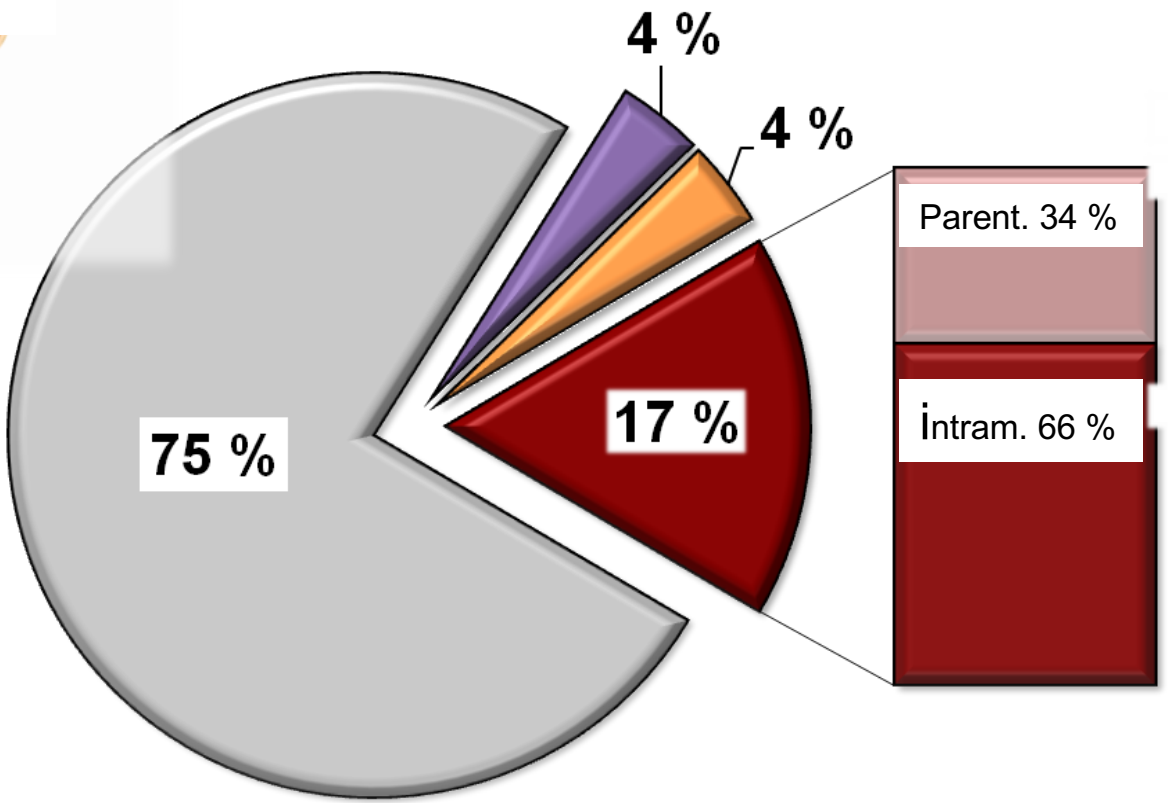
„AB“ bei Milchrindern - (Stichprobe: n = 14.858)



AB 19 mg/kg LM
Gesamt in AT

AURES, 2015

25 % „HPCIA´s“



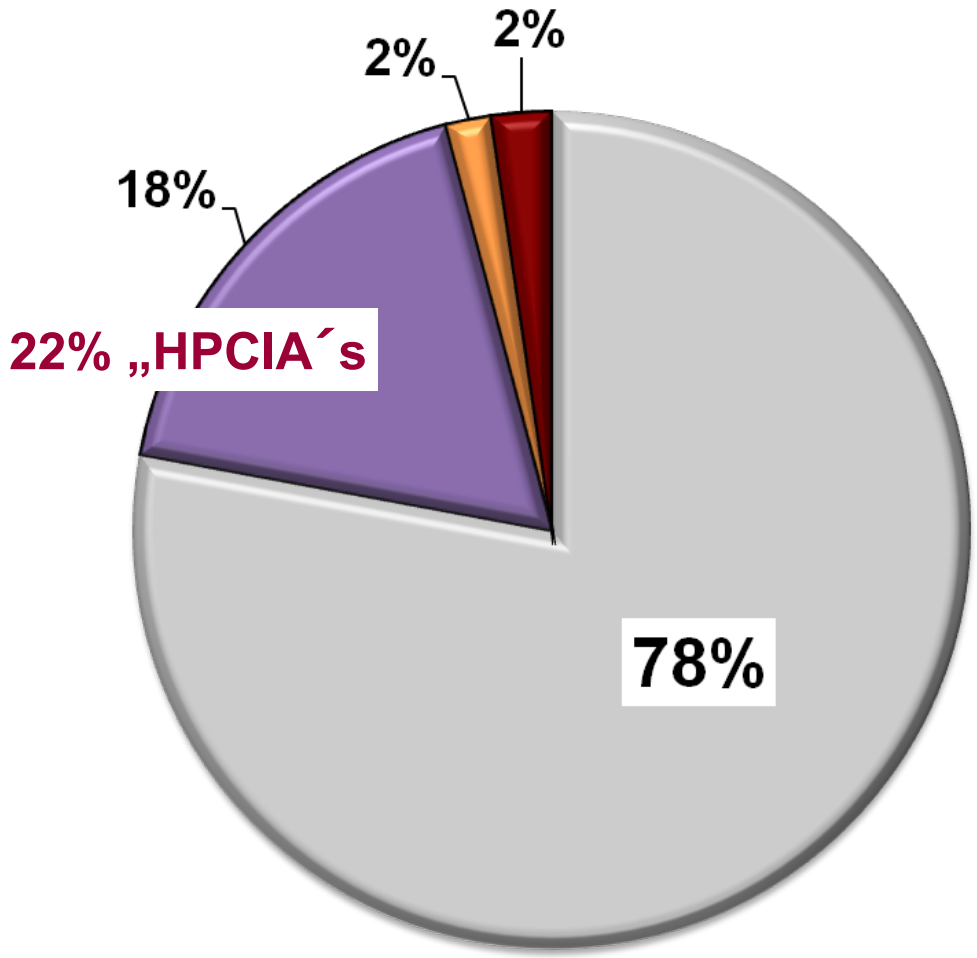
- **Makrolide**
- **Fluorchinolone**
- **Cephalosporine d. 3.u.4. Gen.**
- Andere Wirkstoffe

Obritzhauser, et al., 2015

„AB“ bei Schweinen (Stichprobe: n= 105.267 GVE)

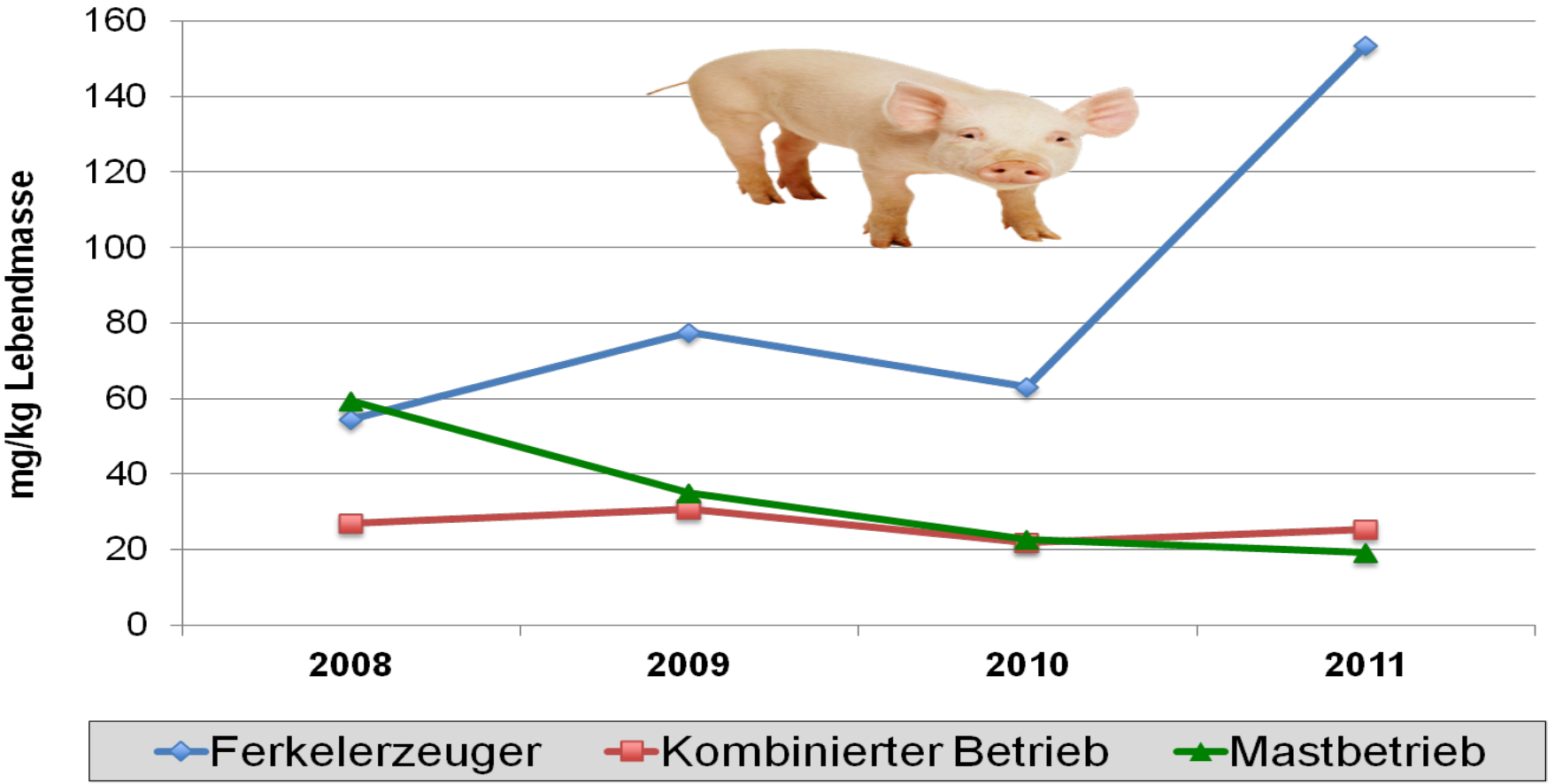
- **Makrolide**
- **Fluorchinolone**
- **Cephalosporine 3. und 4. Generation**
- Andere Wirkstoffe

AB 48 mg/kg LM in Stichprobe



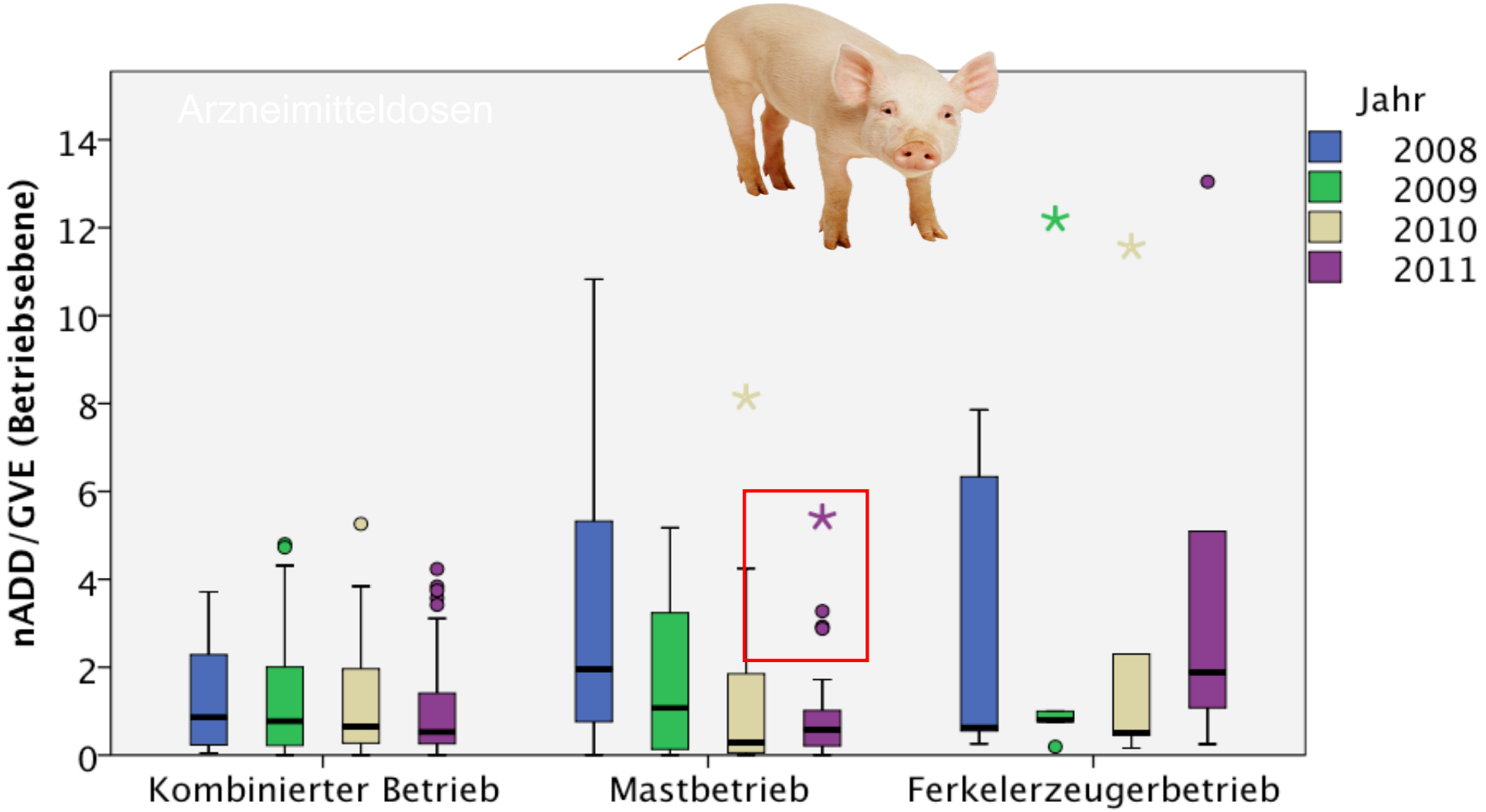
Trauffler et al., 2016

Antibiotikaeinsatz je Betriebsform in [mg/kg Lebendmasse] n= 256.916



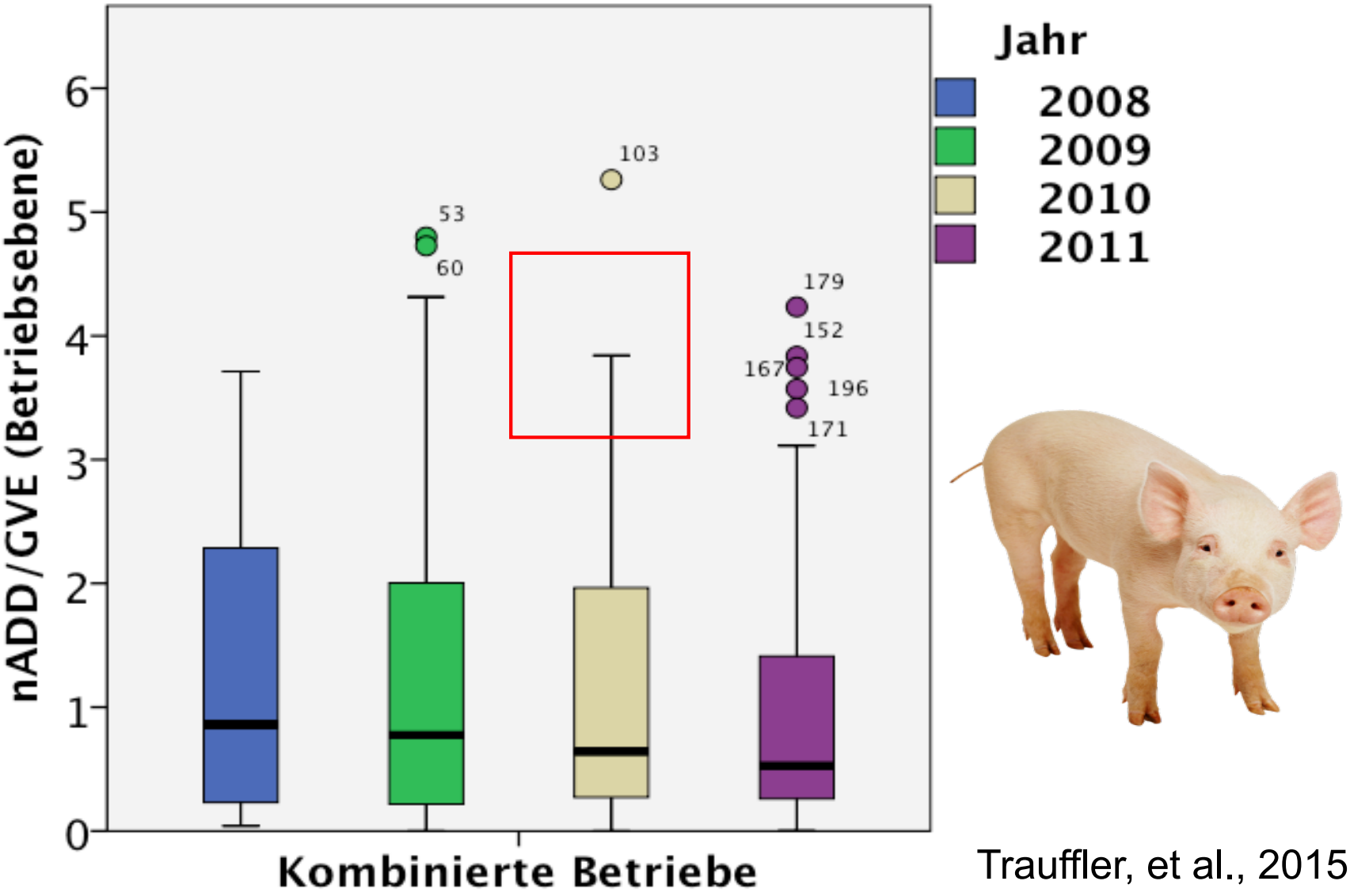
Trauffler, et al., 2015

AB-Einsatz (Arzneimitteldosen) pro Betriebsform
n = 256.916 Schweine



Trauffler, et al., 2015

AB – Einsatz (Dosis) – Betriebsform; n = 256.916



Trauffler, et al., 2015

AB Leitlinien

BUNDESMINISTERIUM
FÜR GESUNDHEIT

GZ: BMG-74330/0007-II/B/12/2013 **Wien, am 24. Juli 2013**

KUNDMACHUNG

zu § 20 Abs. 3 Tierärztegesetz – BGBl. 1975/16

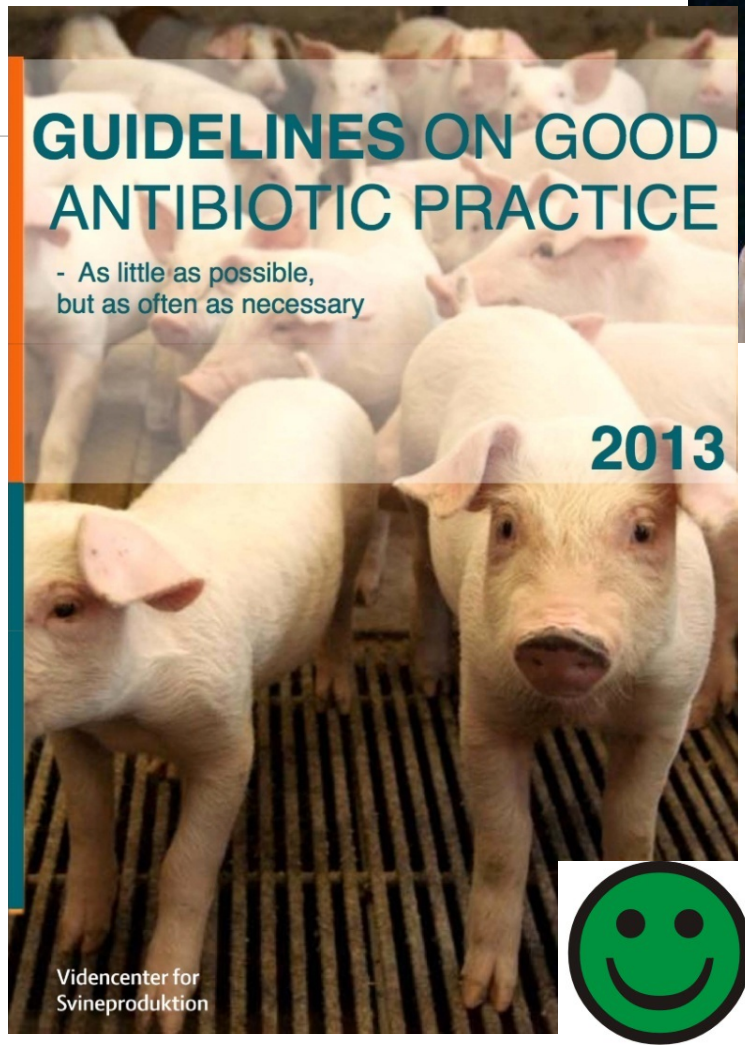
in der jeweils geltenden Fassung

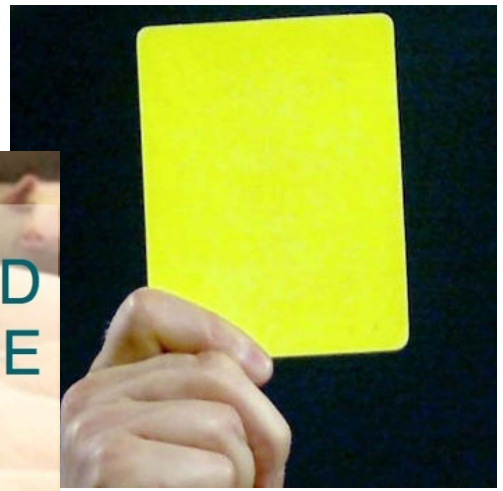
Leitlinien
für den sorgfältigen Umgang mit
antibakteriell wirksamen Tierarzneimitteln

Diese Kundmachung tritt mit 1. September 2013 in Kraft

Für den Bundesminister

Hon.-Prof. Dr. Aigner





Ausblick

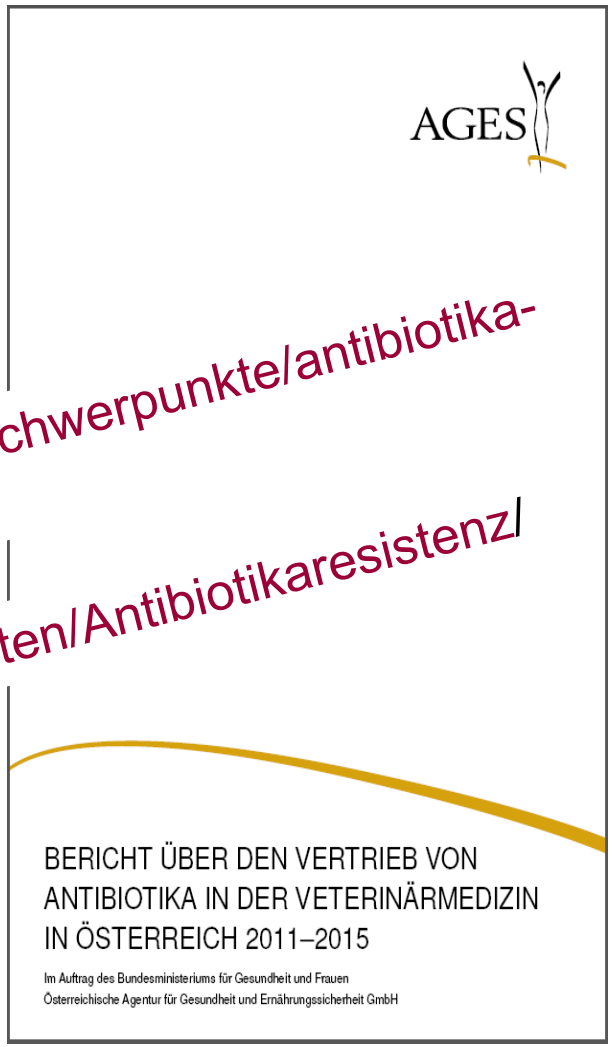
- AB – Rückgang 2010 – 2015 um 22 %
- QGV - „Poultry health data“
- K – Projekt Schwein
- ADDA Projekt - Rind (Elektronisches Stallbuch)

⇩ AB Reduktion um 30 % incl. HPCIA

„a must“ ⇨ „bottom up“ Erfassung (n ADD/Jahr/Kategorie)

„a must“ ⇨ „TGD – Alternativen“

Weiterführende aktuelle Informationen



http://www.ages.at/themen/ages-schwerpunkte/antibiotika-resistenzen/vertriebsmengen/

http://www.bmg.gv.at/home/Schwerpunkte/Krankheiten/Antibiotikaresistenz/

http://www.ema.europa.eu/

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