89TH ADVISORY FORUM
VIRTUAL, 4-5 OCTOBER

CARBAPENEM RESISTANCE: DETECTED SIGNALS AND NEXT STEPS

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OUTLINE

1. Introduction to the problem
2. Regulatory background
3. Previous EFSA advice
4. Data from most recent EFSA monitoring reports
5. Interest raised by MSs
6. Conclusion

INTRODUCTION TO THE PROBLEM

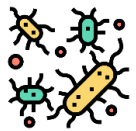
- **Carbapenems** are broad-spectrum **last resort** antibiotics used for the treatment of serious **infections** in humans.
- **Carbapenem antibiotics** are **not licensed** for use in food-producing animals in the EU
- Last decade: occasional detection of **carbapenemase-producing** (CP) bacteria in **food-producing animals** and their **environment**, *mostly* outside the EU.
- Recently (data from the EU AMR monitoring): presence of CP-producers in **several MSs** and **animal sectors**
- Carbapenemase genes are often **co-located** in **genetic structures** (e.g. plasmids) with several other AMR genes. **Co-resistance** is an important issue.
- **Co-selection** both in animals and in the environment is a feasible risk.

REGULATORY BACKGROUND

Commission Implementing Decision (EU) 2020/1729
(1 January 2021-December 2027)

Monitoring of AMR is mandatory:

- *Salmonella*
- *Campylobacter*
- indicator *E. coli*



major domestically produced food-producing animal populations and their derived meat

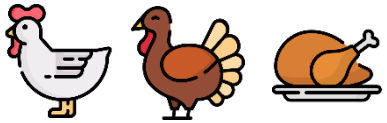
Categorisation as presumptive ESBL-, AmpC- or CP-producers

Phenotype **OR** WGS (from 2021)

Mandatory monitoring of:

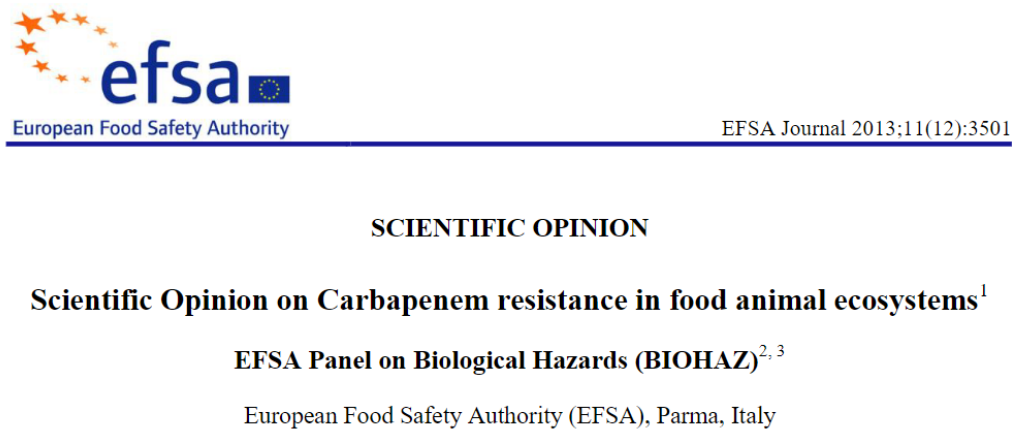
- ESBL-/AmpC-/CP-producing indicator *E. coli* and *Salmonella* spp.
- ESBL-/AmpC-/CP-producing *E. coli* in caecal samples of animals and their meat products
- In 2021: caecal samples fattening pigs and bovine animals under 1 year of age, as well as pig meat and bovine meat gathered at retail and border control posts

- In 2022: caecal samples of broilers, fattening turkeys and fresh broiler meat sampled at retail and border control posts



PREVIOUS EFSA ADVICE

Scientific Opinion on Carbapenem resistance in food animal ecosystems.
EFSA BIOHAZ Panel
Published: **17 December 2013**


efsa
European Food Safety Authority
EFSA Journal 2013;11(12):3501

SCIENTIFIC OPINION

Scientific Opinion on Carbapenem resistance in food animal ecosystems[1]

EFSA Panel on Biological Hazards (BIOHAZ)[2, 3]

European Food Safety Authority (EFSA), Parma, Italy

- CP strain confirmed: **more epidemiological investigations** (identifying the point of introduction, level of spread).
- The **most sensitive methods** should be used for all investigations and isolates should be targeted for detailed genotypic analysis/comparison.
- **Control measures** to contain the spread of CP bacteria in food-producing animals should be proactively implemented at national/international levels.

- Resistant strains can **spread** from the hospital environment to the animal population by a **variety of routes**. Measures addressing such transmission are important.

- Measures for the **containment** at the farm level may range from **identification** and **isolation** of carriers, animal **quarantine** through to **destruction** of infected flocks/herds. **Restrictions in the movement, increased farm biosecurity, controls on animal trade**, etc.

- **Surveys** should be started to verify the efficiency of any measure taken.

DATA FROM MOST RECENT EFSA MONITORING REPORTS

2020 and before

2020, **Austria**: 1 isolate from broilers (*bla*VIM-1)

2019, **Germany**: 3 isolates from pigs (*bla*VIM, *bla*OXA-48 and *bla*GES-5)

2018, no CP-resistance *E. coli* were detected

Previously, 2 isolates from broilers and 1 from meat from broilers reported in 2016 by **Romania** (*bla*OXA-162)

2021

Hungary: 2 isolates from bovine meat and 1 isolate from pig meat (*bla*NDM-5).

Spain: 2 isolates from pigs (*bla*OXA-48)

Italy: WGS revealed 26 isolates (21 from pigs and 5 from bovines).

Czechia: WGS revealed 3 isolates (from pigs)

WGS results included:

*bla*OXA-181
*bla*OXA-48
*bla*NDM-5

Recent data from humans (ECDC)

Recent **ECDC report**:
E. coli carrying *bla*NDM-5 is established as a significant concern in humans in EU/EEA.

Potential to increase dissemination within/between/outside EU/EEA countries, with severe health/economic consequences

spread of *E. coli* isolates carrying *bla*NDM-5 is occurring rapidly and on a large geographic scale

Concerns:

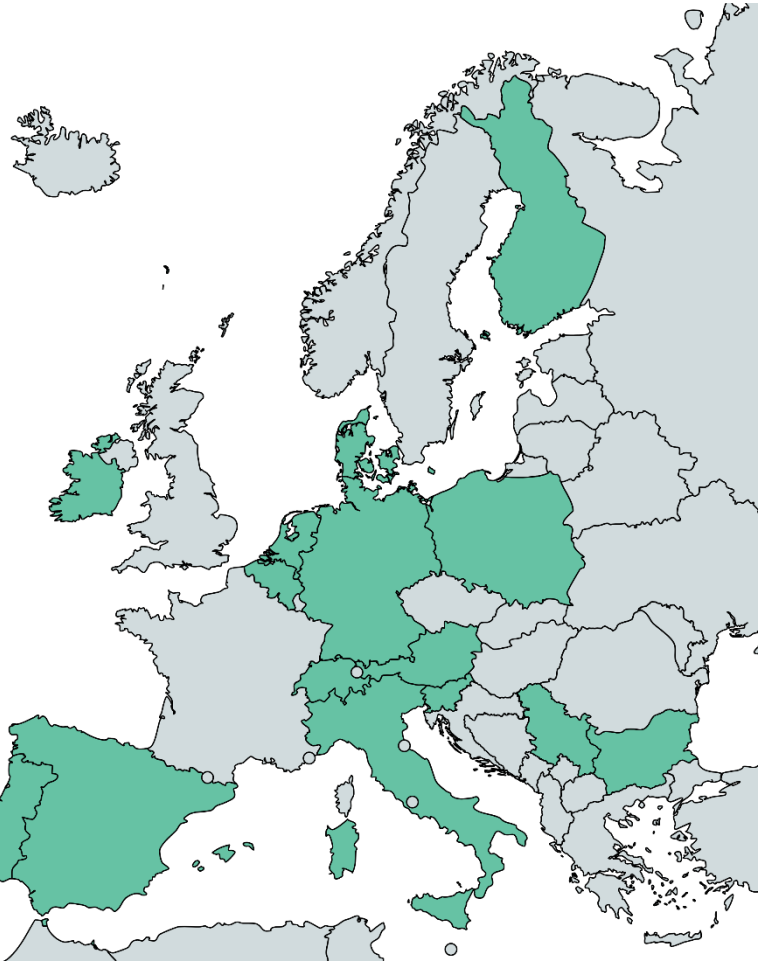
One Health Commission, 2023: *carbapenems are one of the "last-resort" antibiotics for treating infections caused by MDR bacteria. Our review found many reports of carbapenem resistance in livestock, aquaculture, and fresh produce across the globe.*

INTEREST RAISED BY MS TO ENGAGE IN INVESTIGATING FURTHER THE SIGNALS DETECTED

EFSA has asked **EURL AMR** to launch a **survey** to see if there would be interest in MSs to engage in a project on some (or all) these aspects:

- Further investigations additional/complementary to the observations in the official monitoring
- Traceback/longitudinal/network … farm investigations
- Intensive targeted exploratory sampling and testing
- Comparisons between countries/regions/animal species (include also pets if possible)/humans
- Investigation of possible sources and dissemination pathways (including farm environments and effluents)
- In depth genetic analysis (clonality, plasmids, ISs, Tns …)
- Explore potential issues of multi-resistance and co-selection by use of other antimicrobial classes and potential impact in the dissemination of these genes in animal populations
- Issues of underdiagnosis due to methodological problems (low sensitivity of current protocols ?)
- Could this be more spread than we think in other MSs ?

Interest to join in from following NRLs:



CONCLUSION & DISCUSSION

- **Importance of carbapenems** in **human medicine** is paramount
- **AMR monitoring has identified emerging resistance** to such antibiotics in bacteria from **food-producing animals**
- **Further detailed investigations** on the **origin and dissemination** should be urgently considered. This would help in preventing and controlling that the problem becomes endemic in food-producing animals.

How can EFSA & MSs collaborate to generate and collect data and provide recommendations ?

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