atf animal task force
A European Public-Private Partnership

EAAP European Federation of Animal Science

Joint session
of the Animal Task Force & the EAAP Commission on Livestock Farming Systems:
Livestock farming systems for the next generation: can we imagine the future?

"Future of Livestock Farming Systems – Health"

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Challenges regarding future animal health*

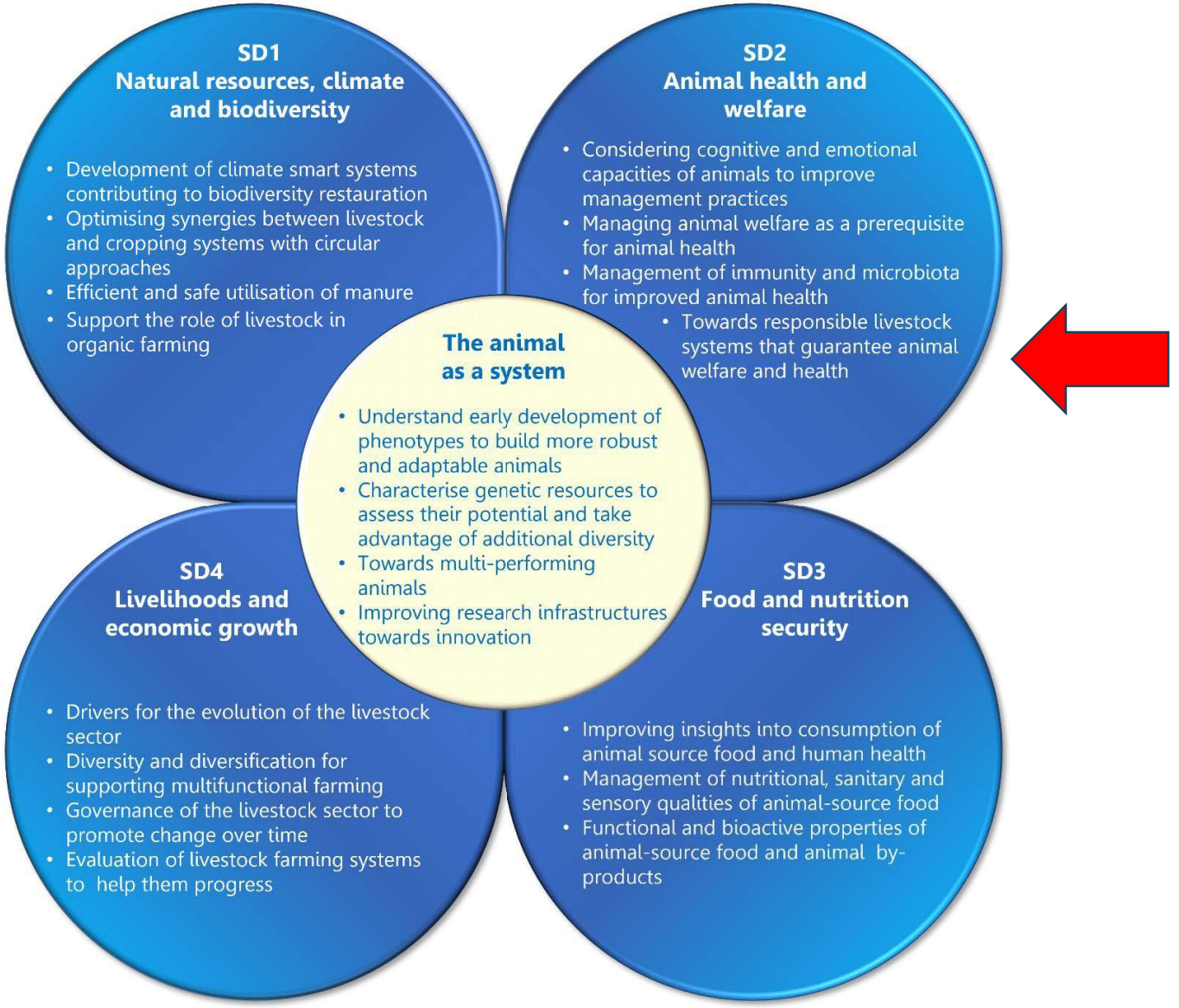
- Animal diseases can have a devastating impact on production levels and their prevention is essential to reduce the needs for unavoidable drastic control measures
- Healthy animals are a prerequisite for access to international markets
- Animal diseases and antimicrobial resistance can threaten human health, as human and animals share the same pharmacopoeia, so it is important to reduce the use of antimicrobials to reduce the risk of resistance and maintain efficacy

Case 1: African swine fever

Case 2: Antimicrobial Resistance (AMR)

*ATF Vision Paper for sustainable livestock sector in Europe – May 2024

ATF research and innovation priorities



Source: A Strategic Research and Innovation Agenda (**SRIA**) for sustainable livestock sector in Europe, ATF, August 2024

Case 1: African Swine Fever (ASF)

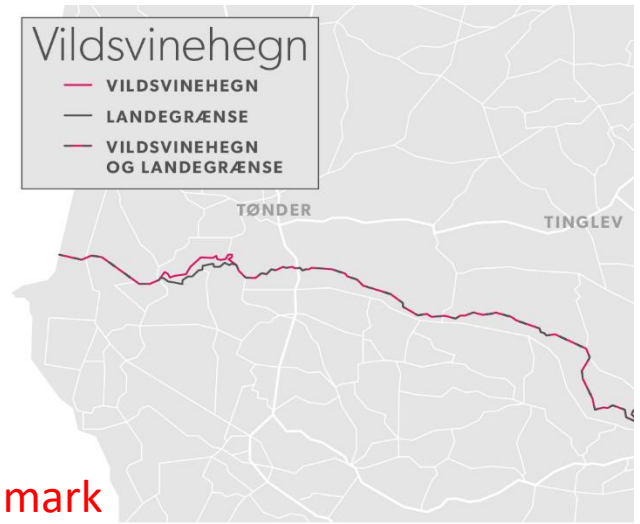
- Much research deals with the concern of infectious diseases, the transmission of zoonotic pathogens to humans and the development curative approaches
- Accurate monitoring of pathogens transmission requires that antropogenic (e.g. globalisation of trade) and biotic risks linked to new animal husbandry practices (e.g. exposure of contaminants and wildlife) will be taken into consideration
- ASF significantly impacts pork exports by causing trade restrictions and market disruptions. Outbreaks in major exporting countries can lead to bans on pork imports from those regions, even if the ASF is confined to a specific area.

- **Impact of ATF' Research and innovation priorities (see SRIA):**

Facilitation of free trade of animals and their products throughout Europe and strengthen the European livestock sector's position via initiatives

Supported initiatives: Reinforcing research on the interplay between health and welfare as described in e.g. the European Partnership on Animal health and welfare

EUPAHW - Home



Photos: Preventing transmission of ASF in Denmark

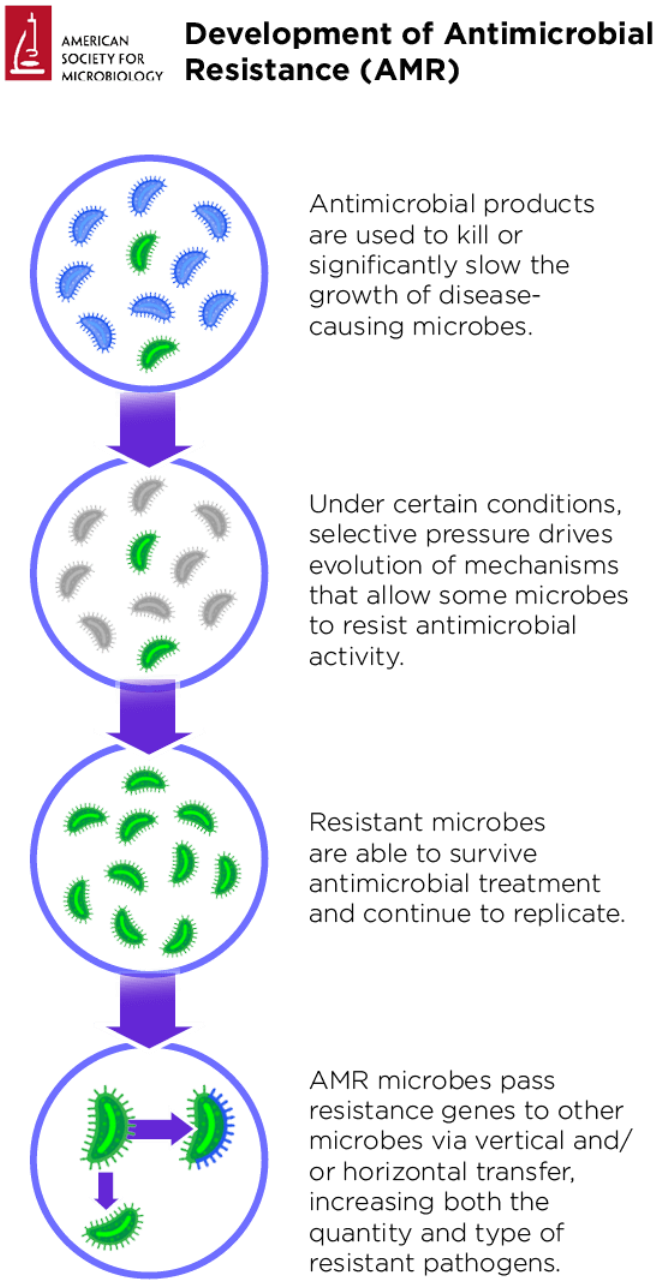
Case 2: Antimicrobial resistance (AMR)

AMR is a microbial state (genetic or epigenetic) in which microorganisms are no longer harmed or inactivated by one or more antimicrobials to which the were previously known to be sensitive.

Over the next 25 years, an estimated 39 million people are expected to die from drug-resistant pathogens, >5 times the number of deaths from COVID-19.

Currently considered a “silent pandemic”

https://asm.org/Articles/2024/October/Antimicrobial-Resistance-Pandemic-Breaking-Silence?

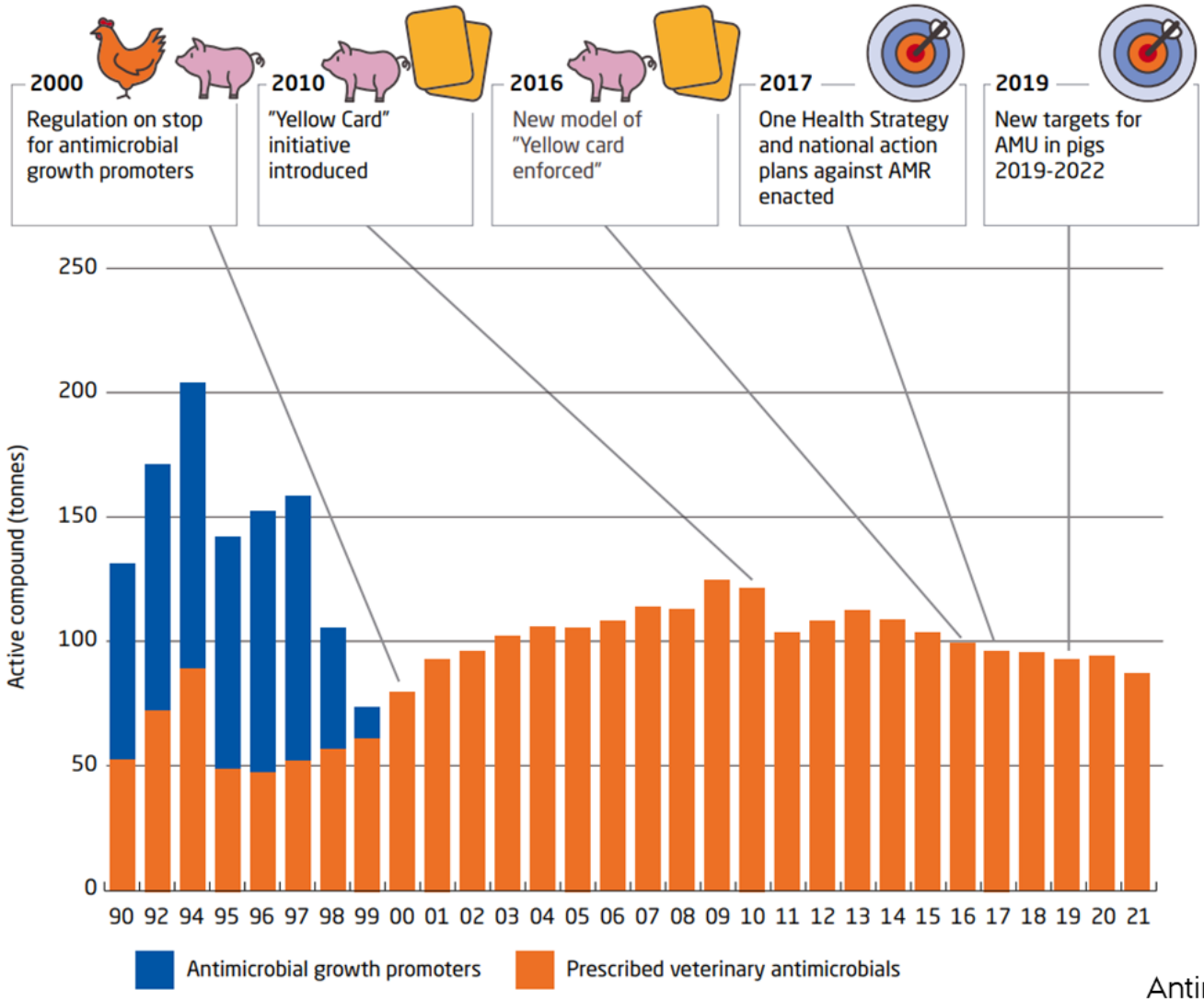


AMR:
State of the Art

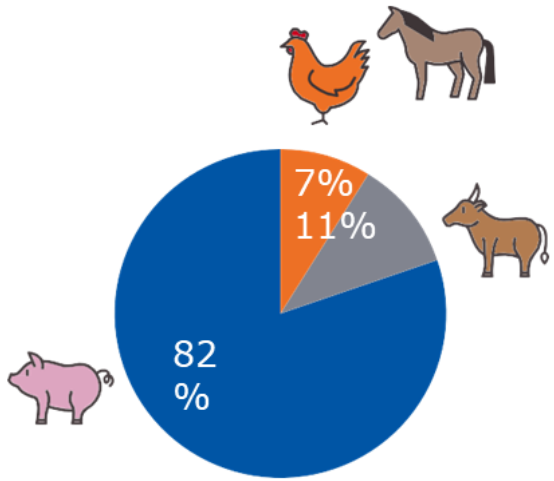
- Antimicrobials play an important role in veterinary medicine as in human medicine.
- However, antimicrobial resistance (AMR) now poses a major threat to global health, food safety, and food security
- Overuse or misuse of antimicrobials contributes to bacterial resistance that brings with it significant consequences for animal health and, by implication, human health and the environment.
- Resistant strains of bacteria threaten an increase in animal suffering and losses, as well as a reduction in the effectiveness of antimicrobial treatments in both human and veterinary medicine.

Antimicrobial consumptions in animals

Denmark, 1990 – 2021, (DANMAP)



Important initiatives to reduce antimicrobial use in animals



Antimicrobial use in main animal species

E. Coli infection in piglets – a major challenge

› Most outbreaks occur during the first 2 wk post weaning (=PWD)

→ Morbidity may be over 50%

→ Losses of piglets can be 17%

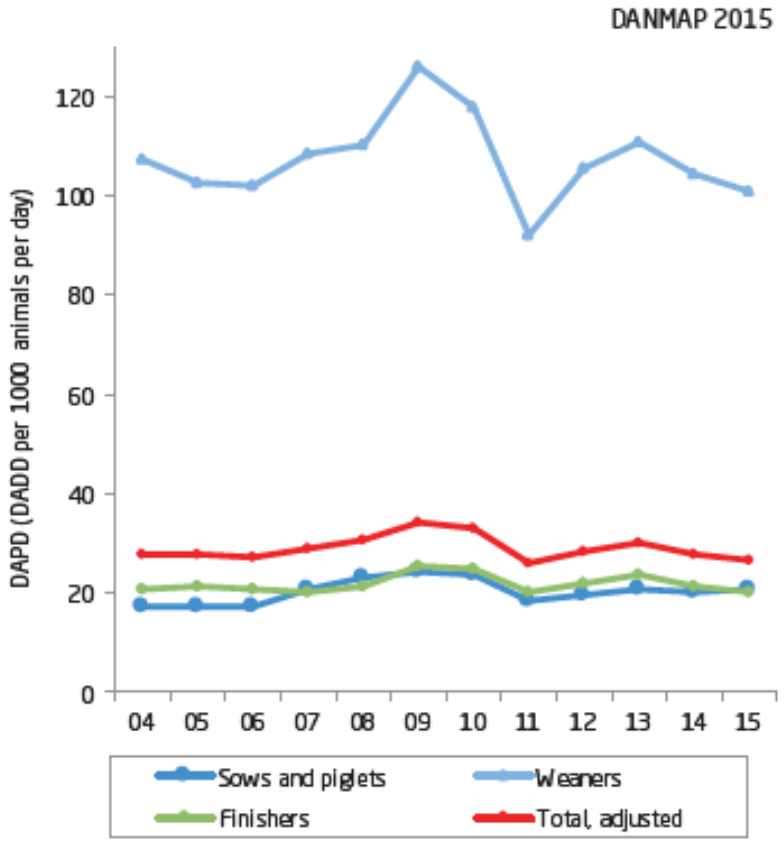
→ Growth reduction (100-400 g/d)

› Enterotoxigenic *E. coli* (ETEC) is an important etiological agent

→ ~10 million piglets die annually worldwide due to diarrhea, 50% is caused by ETEC

Post weaning diarrhoea is linked with impaired productivity, liveability and animal welfare

Figure 4.3. Antimicrobial consumption in the pig production, and the distribution on age groups, Denmark



Weaners: use of antimicrobials for treatment of GIT diseases

Knowledge gaps

- **Prevention** is the responsible path to reducing the need for antimicrobials to avoid generating an increase in untreated infections.
- Antibiotics are the only medicines that can treat bacterial diseases, which means disease prevention is the most effective way to avoid the need for antimicrobials.
- However, **prevention tools** are currently not available. One former example was the use of medical zinc to prevent post weaning diarrhoea in pigs post weaning, but this was banned by the EU in 2022 due to the risk of AMR development.

ATF Research & Innovation priorities (**SRIA**):

- Discover and exploit new antimicrobial, antiparasitic and antiviral pathways in livestock immune cells that could be harnessed to overcome microbial, parasitic and antiviral subversion of host immunity
- Develop more efficient strategies for a more prudent use of antimicrobial
- See H2020 funded projects related to this in appendix 2 of SRIA

PIG-PARADIGM project

- Antibiotic usage is high at weaning.
- A better understanding of factors responsible for post-weaning diarrhea will result in less antibiotic use.

Research Funding: DKK 150 million (€20.1 million)

Research Period: 2022 – 2026

novo nordisk fonden

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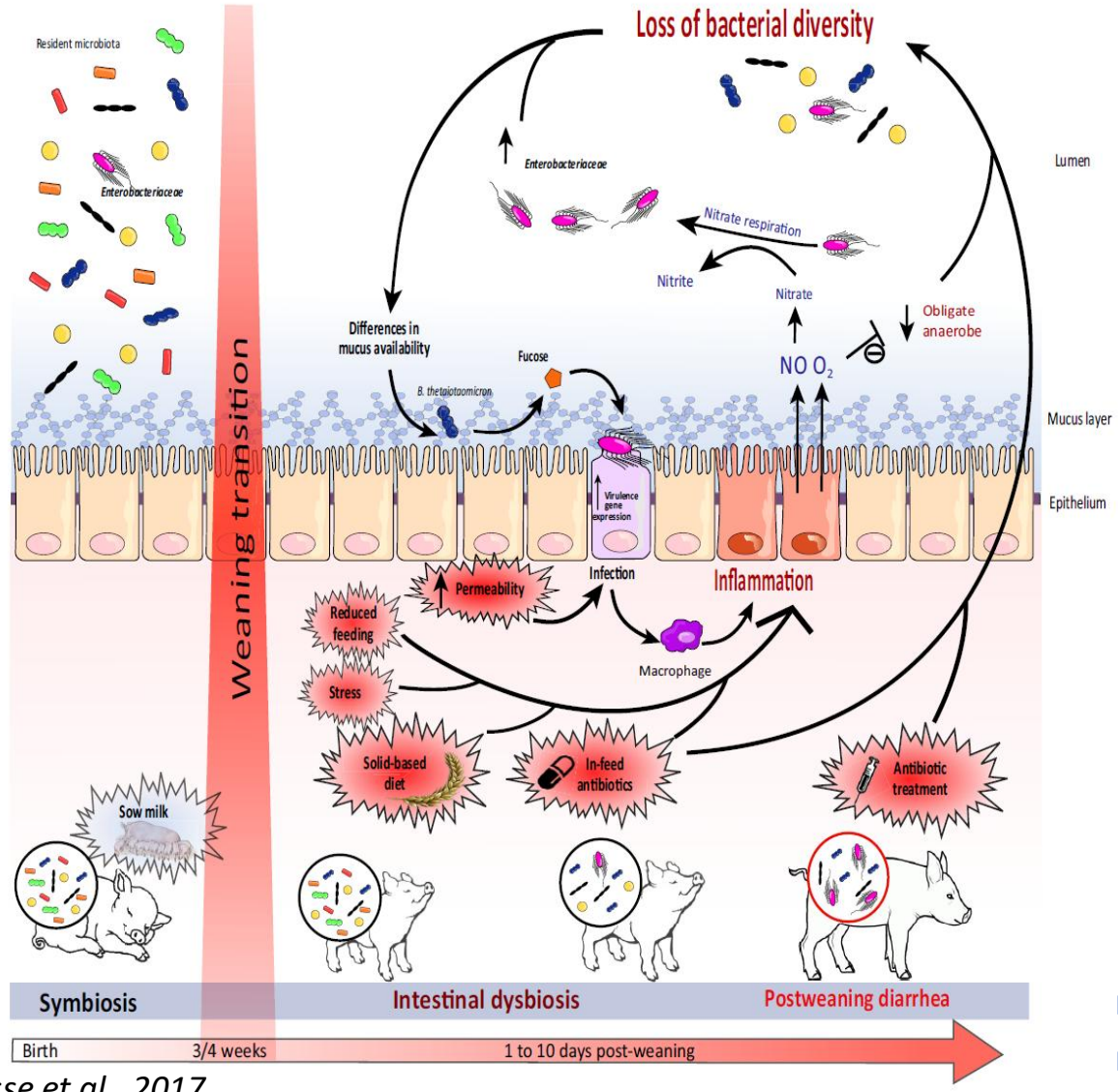
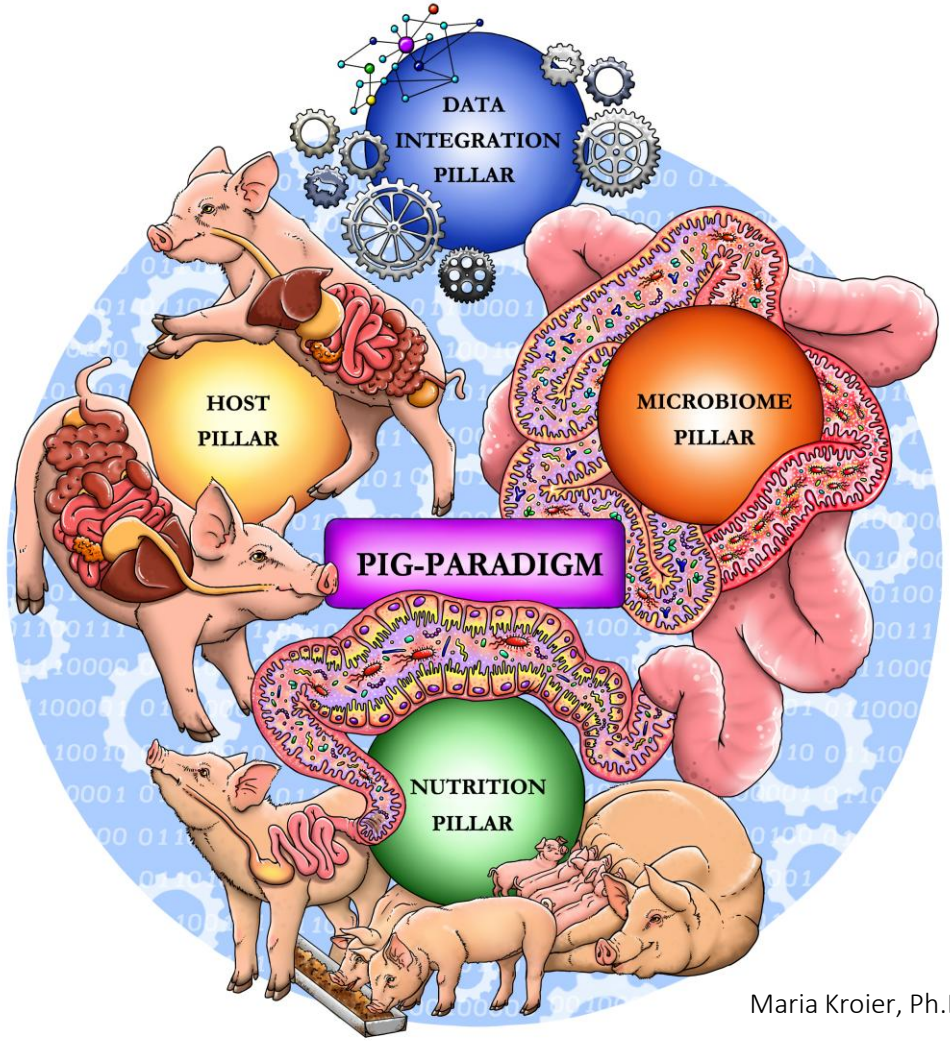
WAGENINGEN UNIVERSITY & RESEARCH

AALBORG UNIVERSITY

Management of immunity and microbiota for improved animal health*



Gresse et al., 2017

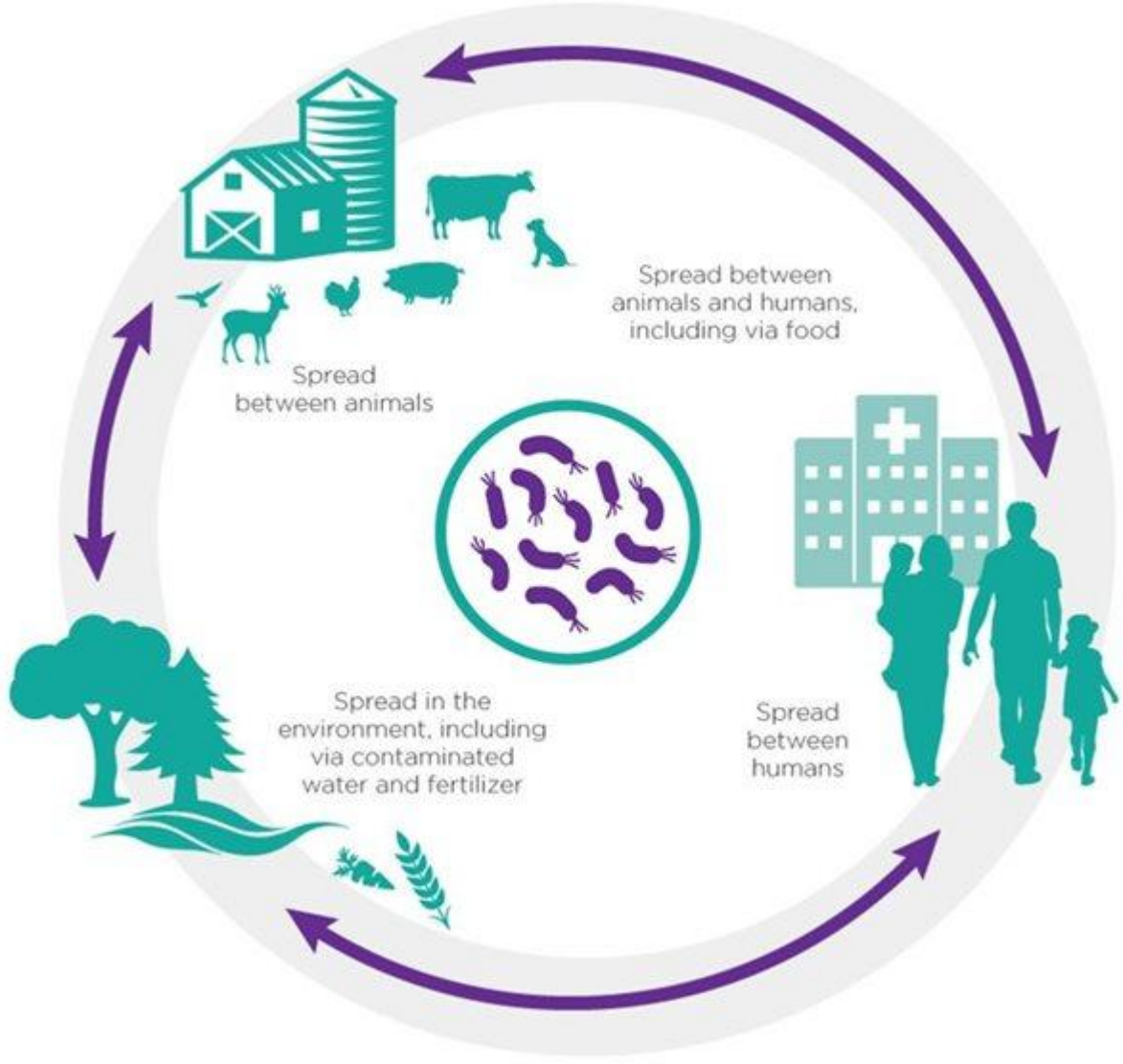


Maria Kroier, Ph.D.-student

PIG-PARADIGM: 'Preventing Infection in the Gut of developing Piglets - and thus Antimicrobial Resistance – by disentAngling the interface of DIet, the host and the Gastrointestinal Microbiome'. https://projects.au.dk/pig-paradigm

*ATF SRIA: R&I priorities: 2.3 and 2.4

Take home message: Future of Livestock Farming Systems – Health



ATF strongly support all research initiatives addressing the One Health approach:

One health (figure) shows the interconnectivity between agriculture and animal production and human health.

One health is defined as a unified approach to optimize the health of people, animals and the environment, under which multiple sectors must collaborate at varying levels [www.who.int]

One Health approach integrated in more domains:

- Animal health and welfare
- Food and nutrition security
- The animal as a system

https://asm.org/Articles/2024/October/Antimicrobial-Resistance-Pandemic-Breaking-Silence?