

Fighting AMR by optimizing Gastrointestinal Functionality

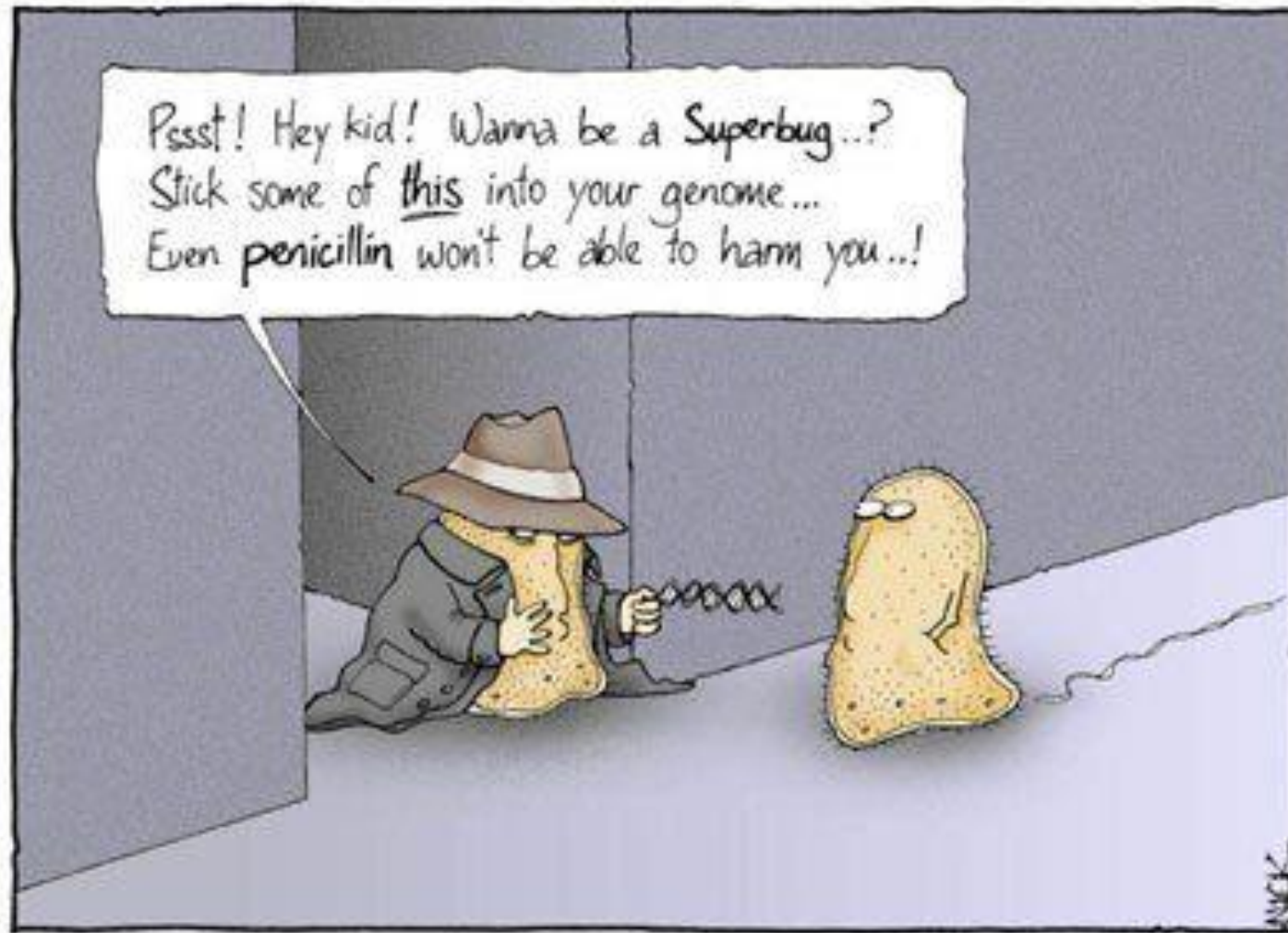
A HOLISTIC APPROACH

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16 December 2019

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ANTIMICROBIAL RESISTANCE



It was on a short-cut through the hospital kitchens that Albert was first approached by a member of the Antibiotic Resistance.

PRESENTATION OUTLINE



Introduction

- Sustainability
- Industry challenges

The Issue

- Antimicrobial Resistance (AMR)

GASTROINTESTINAL functionality

The Holistic approach

- Experiences from the field

Conclusions

INTRODUCTION

SUSTAINABILITY

INDUSTRY CHALLENGES

THE IMPACT ON HUMAN HEALTH AND ANIMAL WELFARE AND ENVIRONMENT IS UNDER SCRUTINY



Animal protein footprint

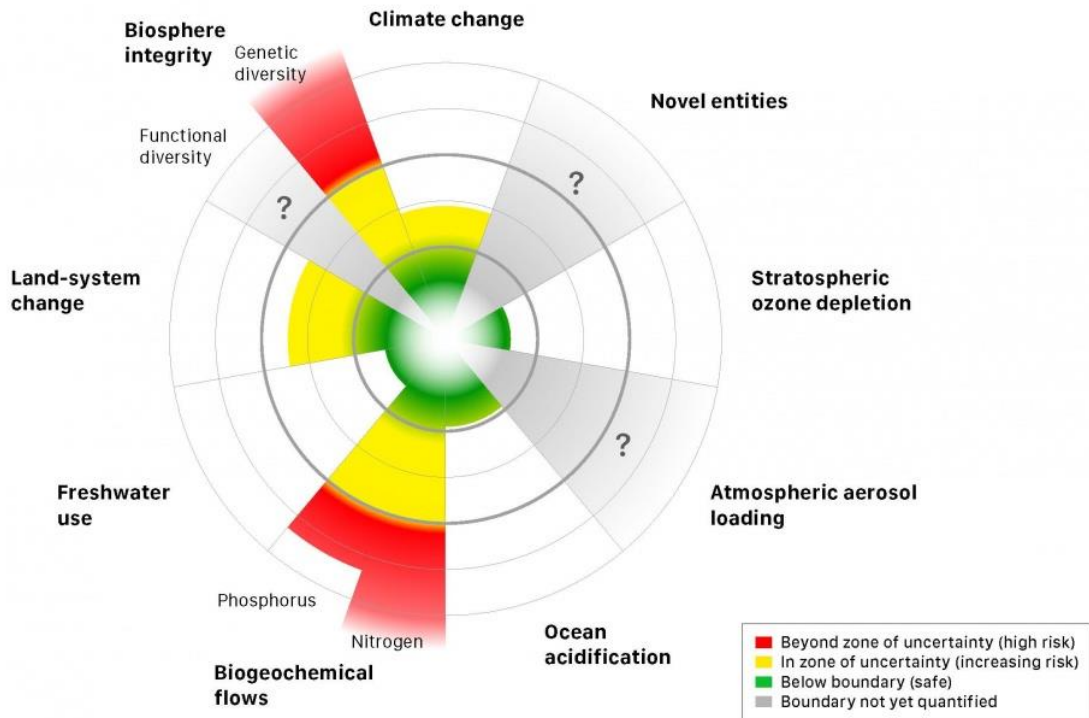
Increasing focus on AMR

Animal welfare

Meat consumption

PRODUCTION WITHIN BOUNDARIES

ANIMAL PRODUCTION HAS TO HAPPEN WITHIN PLANETARY BOUNDARIES



GHG emissions

Sustainable use of raw materials

Natural resource protection

Land use and water use

Biodiversity loss

Soil depletion & degradation

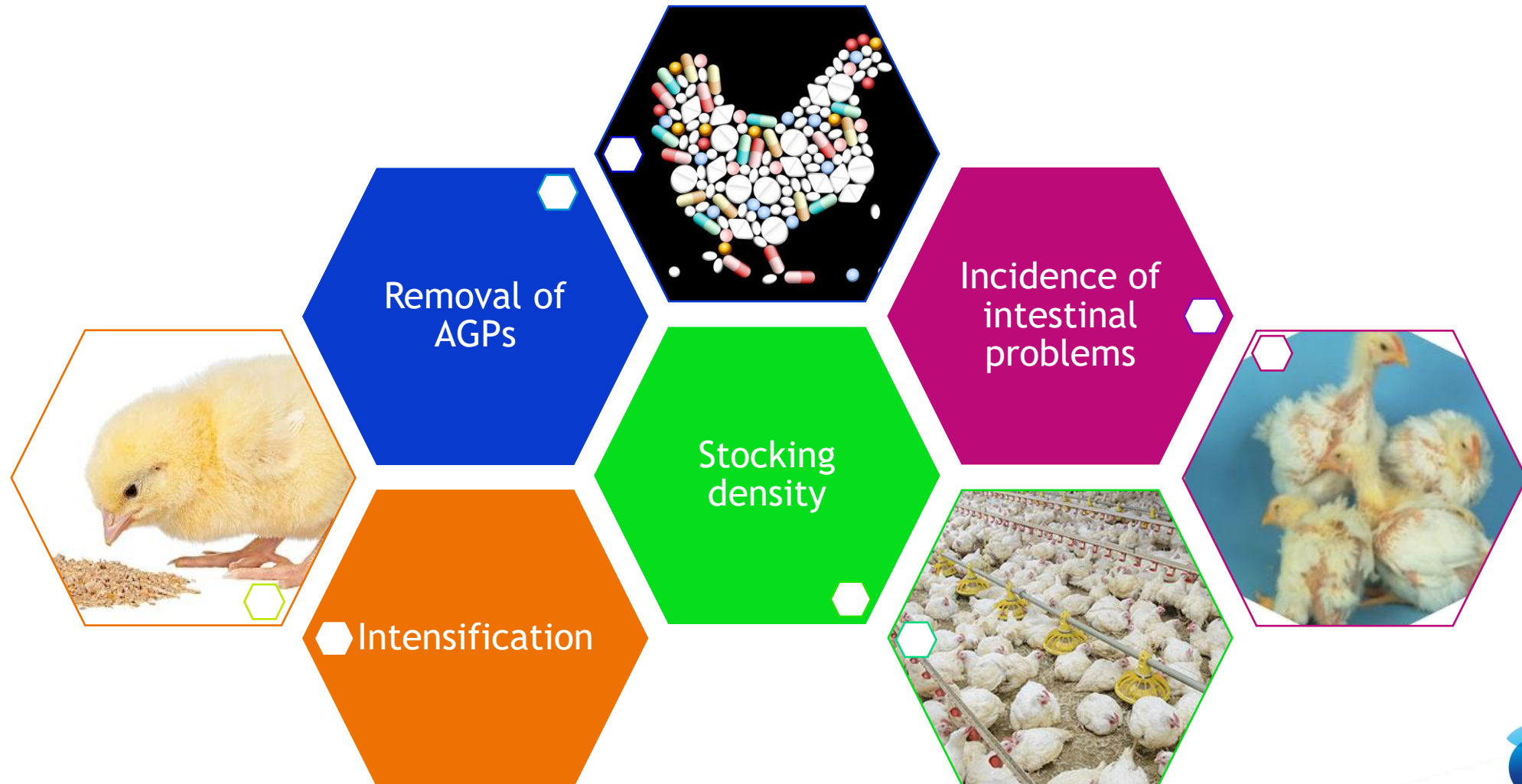
Improving animal welfare

Reducing the use of antibiotics

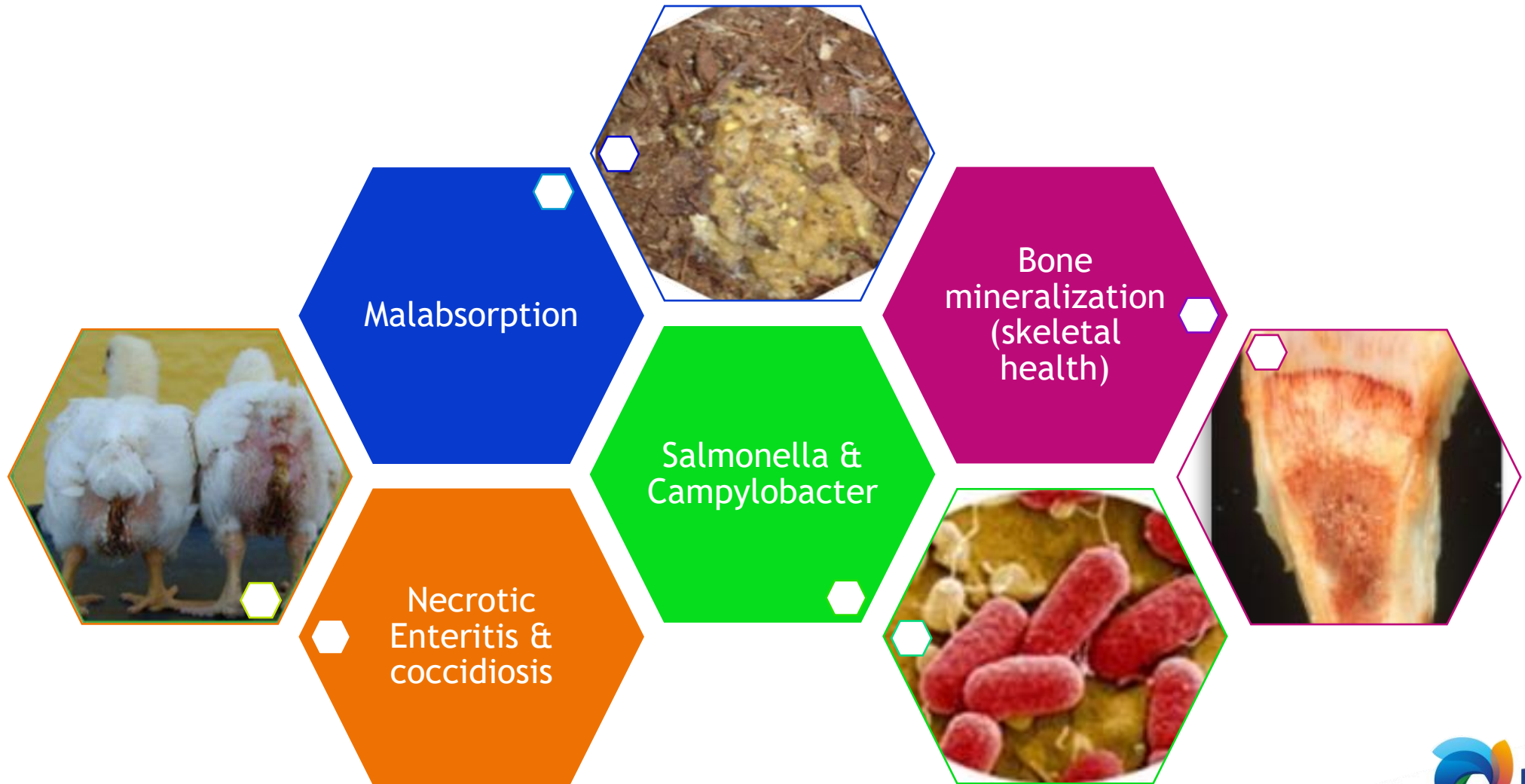
Reducing food loss and waste

Farmer / socio economic factors

CHALLENGES IN THE POULTRY INDUSTRY



INTESTINAL CHALLENGES



CONSUMER-DRIVEN PRESSURE

US sales of antibiotics for farm animals fall for first time since 2009: FDA

By Aerin Einstein-Curtis

08-Dec-2017 - Last updated on 08-Dec-2017 at 09:25 GMT

What do we want?



SCIENTIFIC REPORT

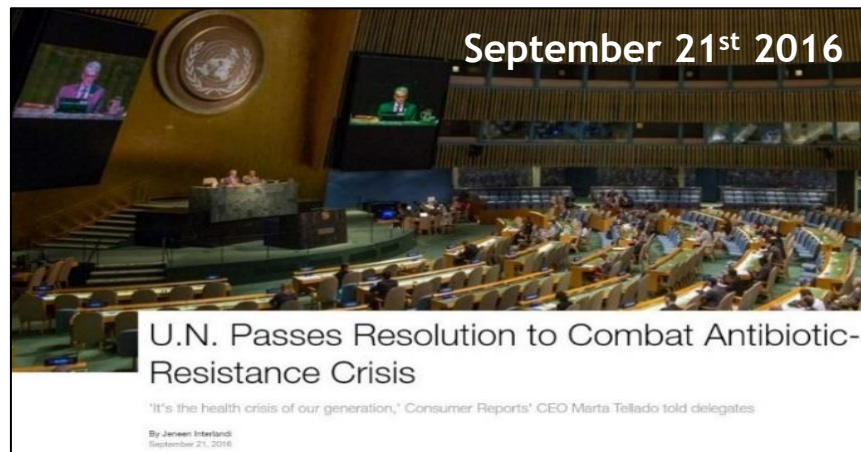
ADOPTED: 26 January 2017

doi: 10.2903/j.efsa.2017.4694



The European Union summary report on antimicrobial resistance in zoonotic and indicator bacteria from humans, animals and food in 2015

European Food Safety Authority
European Centre for Disease Prevention and Control



Three major UK supermarkets publish antibiotic usage data

By Jane Byrne

03-Jan-2018 - Last updated on 03-Jan-2018 at 11:38 GMT



Antibiotic free chicken production: Tyson Foods shifts up a gear

By Aerin Einstein-Curtis

23-Feb-2017

Last updated on 24-Feb-2017 at 11:31 GMT

Post a comment



Related tags: Tyson, Antibiotic use, Perdue, Sanderson Farms, Antibiotic resistance, Poultry production

Tyson Foods is set to switch its retail line of company-branded chicken products to birds raised without any antibiotics.

Significant unmet need for new solutions



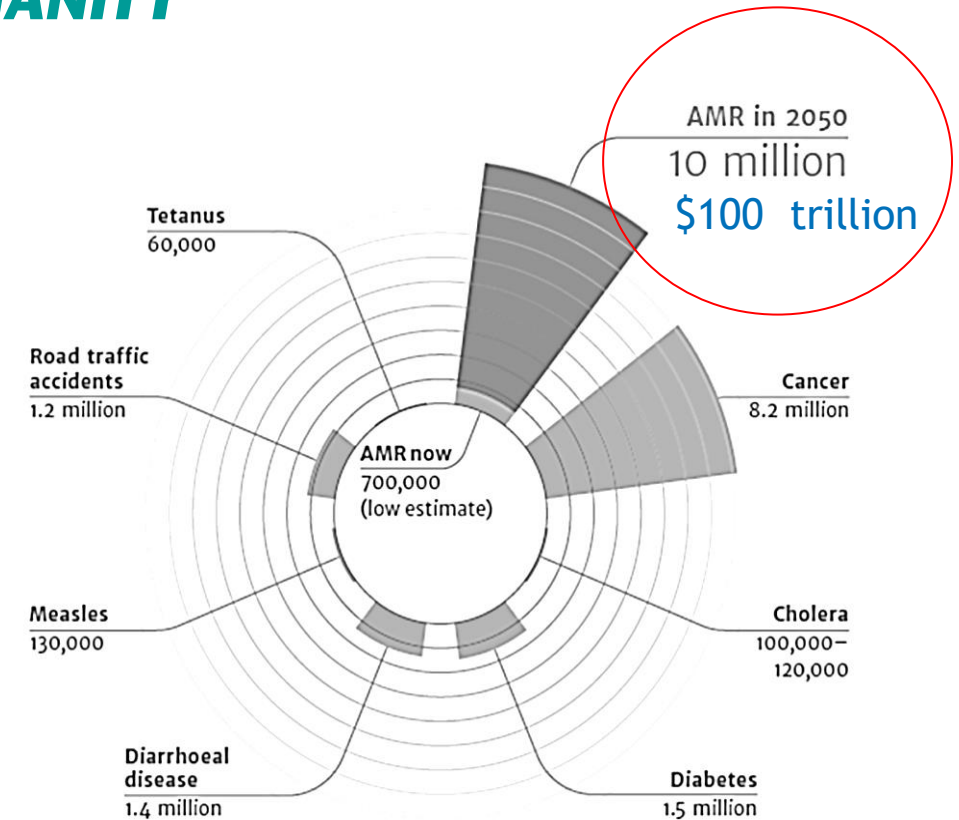
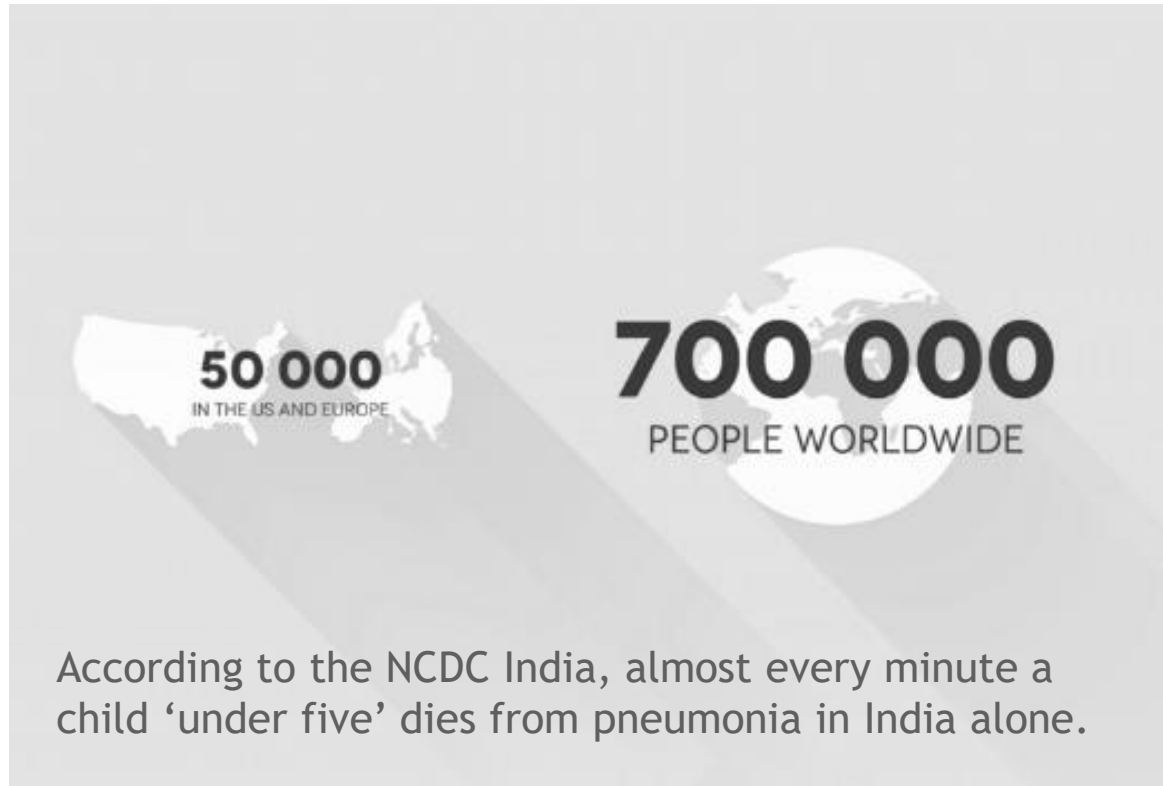
TACKLING ANTI- MICROBIAL RESISTANCE

**ANTIBIOTICS SAVE MILLIONS OF LIVES A YEAR BY CURING
BACTERIAL INFECTIONS – THEY ANCHOR MODERN
HEALTHCARE**

NOW WE HAVE TO SAVE THEM

ANTIMICROBIAL RESISTANCE (AMR)

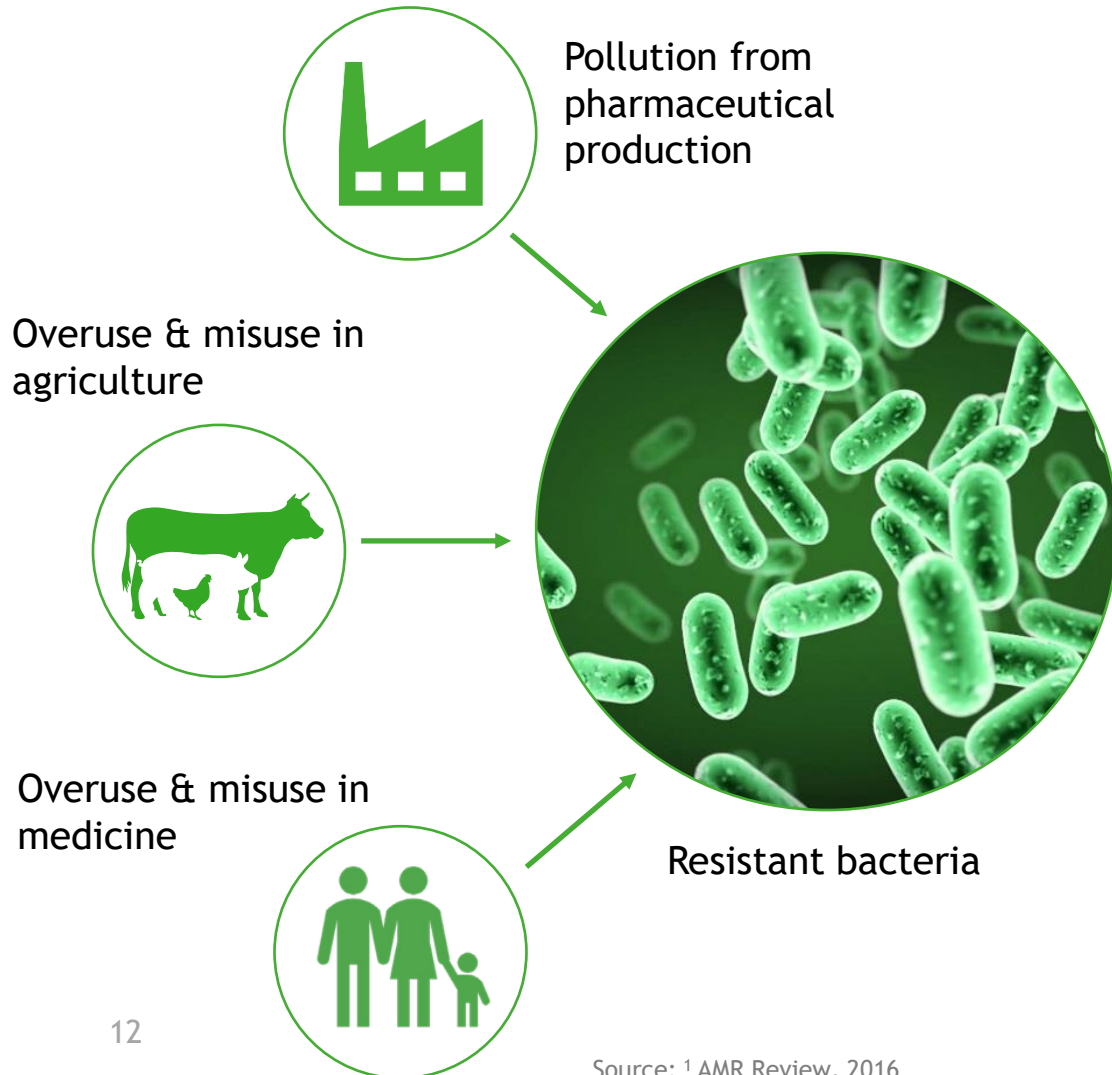
THE GREATEST HEALTH THREAT FACING HUMANITY



Source: The Review on Antimicrobial Resistance, Jim O'Neill (2015)

“Antimicrobial resistance poses a fundamental, long-term threat to human health, sustainable food production and development. [...] It is a very present reality - in all parts of the world, in developing and developed countries; in rural and urban areas [...].”

AMR HAS ACCELERATED DUE TO THE OVERUSE & MISUSE OF ANTIBIOTICS

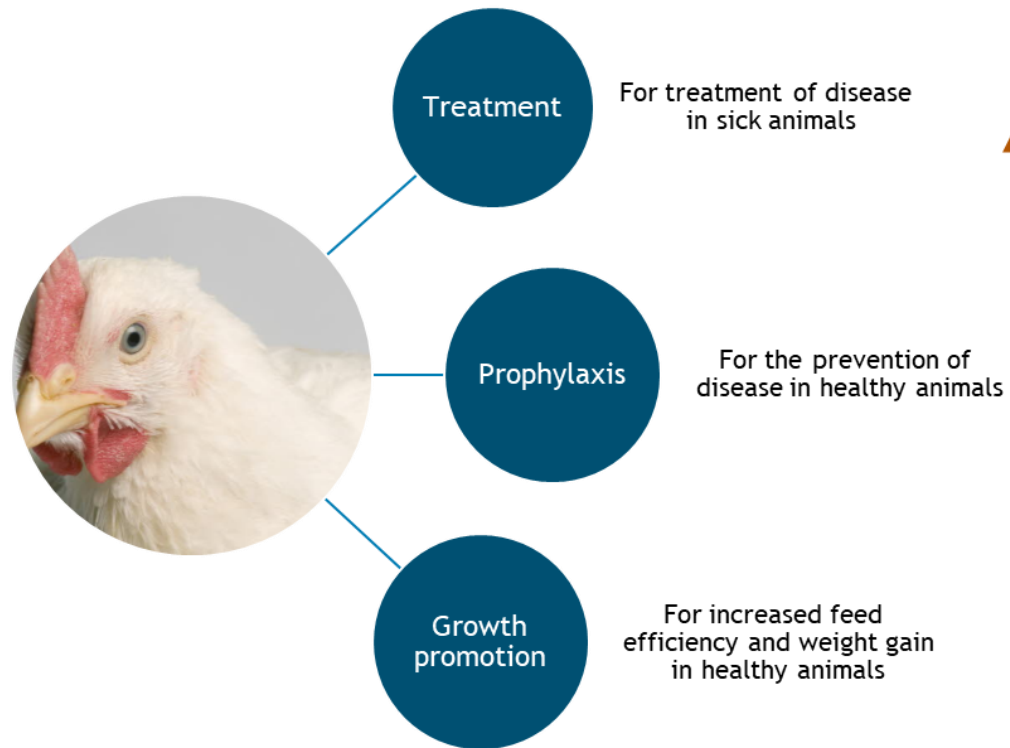


Livestock production is the largest antibiotic user (70% of world's total)

Prescription use of antibiotics in human medicine to be reduced

Antibiotic pollution via manufacturing to be reduced

CURRENT USES OF ANTIBIOTICS IN ANIMAL PRODUCTION



EFSA has concluded that use of certain antibiotics in animals and humans leads to resistance.

EU banned the AGP use of antibiotics in 2006 and prophylactic use in 2018.

USA is moving towards a voluntarily re-labelling of antibiotics to reduce their use as growth promoters

Pressure is on emerging markets to reduce or even ban AGP use in livestock production like the EU and US.

Expectation is tighter regulations against AGPs and to first go antibiotic-light (like the EU) with minimal performance disruption at farm level

REGULATORY ENVIRONMENT ON ANTIBIOTIC USE

North America

- ❑ Since Jan 2017 : Use of medically important antibiotics for growth promotion or improved efficiency eliminated
- ❑ Transition from over-the-counter (O-T-C) availability of medically important antibiotics to veterinary oversight
- ❑ Ionophores, bacitracins, bambermycins not considered medically important

Latin America

- ❑ AGPs are authorized (excepting - Colistin banned in Brazil in Nov 2016)
- ❑ All coccidiostats (ionophores and chemicals) allowed and no plan of banning or restricting their use in near future
- ❑ Growing development of AB free production

Europe

- ❑ AGPs are banned since 2006 in EU
- ❑ Anticoccidials are still allowed (including ionophores) for poultry
- ❑ Since 2010: antibiotic reduction plan for animal production with Monitoring of antibiotic usage
- ❑ Antibiotic treatments under veterinary supervision are allowed, but under scrutiny
- ❑ Most neighboring countries to the EU apply similar laws
- ❑ Countries exporting to EU have similar laws
- ❑ Forthcoming new legislation on low zinc and copper diets

China

- ❑ Colistin banned in November 2016
- ❑ Launched national action plan on AMR
- ❑ Ban planned on the other AGPs and anticoccidials
- ❑ Growing interest in AGP free production

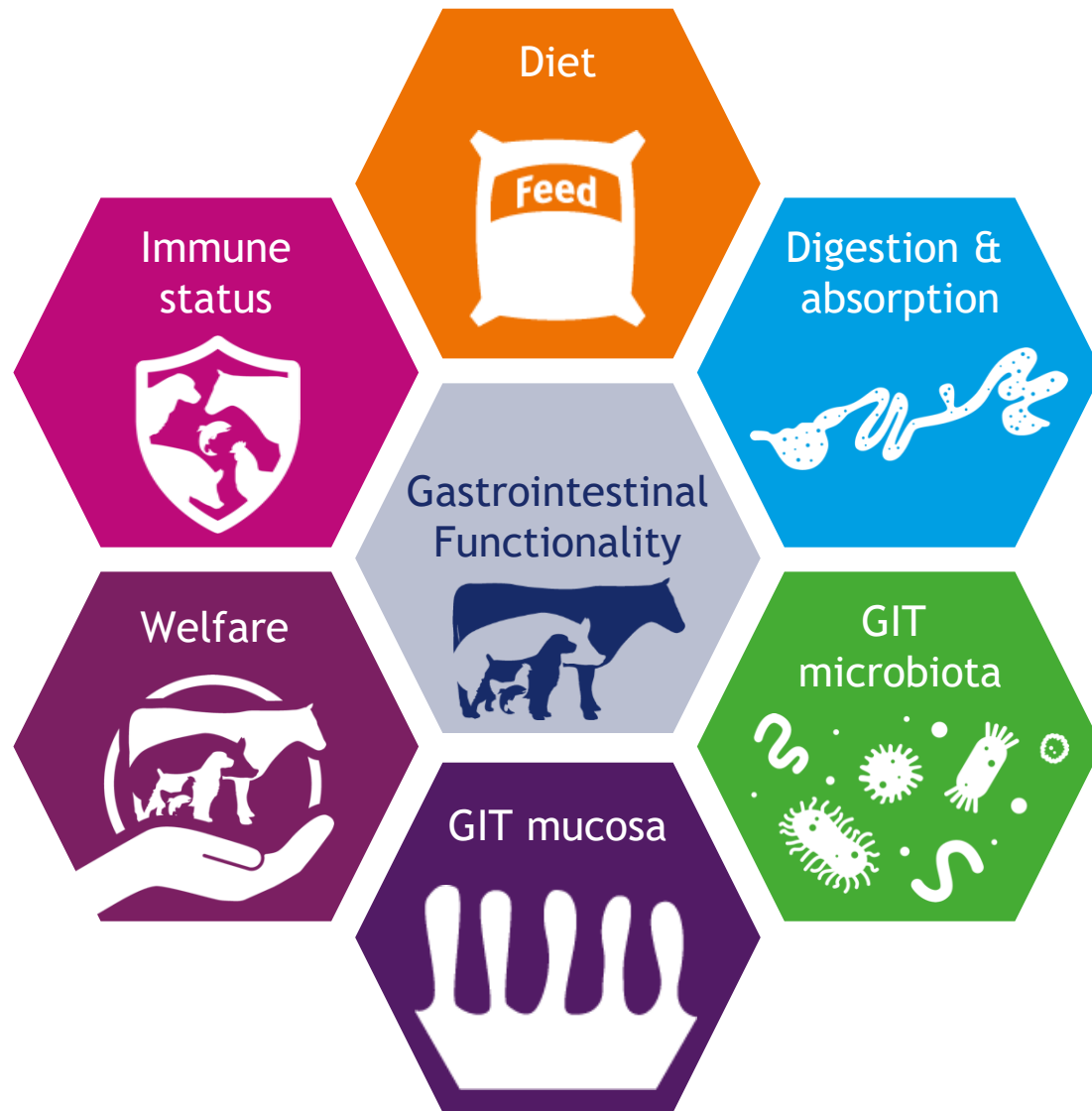
APAC

- ❑ Indonesia : ban of AGPs January 2018
- ❑ Bangladesh : AGP are banned but implementation is poor
- ❑ Other countries : continuous development of AGP free production (Thailand, South Korea, Taiwan, ...)

Significant acceleration of regulatory restrictions for the use of antibiotics leading to a growing opportunity space for Eubiotics and gut health solutions !!!

GASTROINTESTINAL FUNCTIONALITY

GASTROINTESTINAL FUNCTIONALITY



Animal Feed Science and Technology

Volume 234, December 2017, Pages 88-100



Review article

Gastrointestinal functionality in animal nutrition and health: New opportunities for sustainable animal production

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‘a **steady state** where the microbiome and the intestinal tract (host) exist in **symbiotic equilibrium** and where the **welfare** and **performance** of the animal is not constrained by intestinal dysfunction’

WHY GASTROINTESTINAL FUNCTIONALITY?



Animal
performance



Antimicrobial
resistance
(AMR)



Welfare &
Environment



Food safety

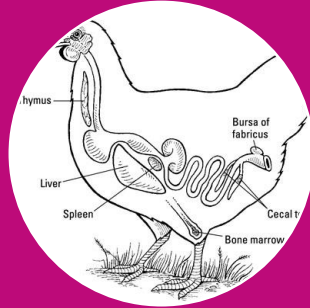
Gastrointestinal Functionality is the single most important factor impacting producers' profitability and license to produce

GASTROINTESTINAL FUNCTIONALITY

WHAT IS NEEDED



Maximise
value from
feed



Robust
immune
system



Nutrient
digestibility



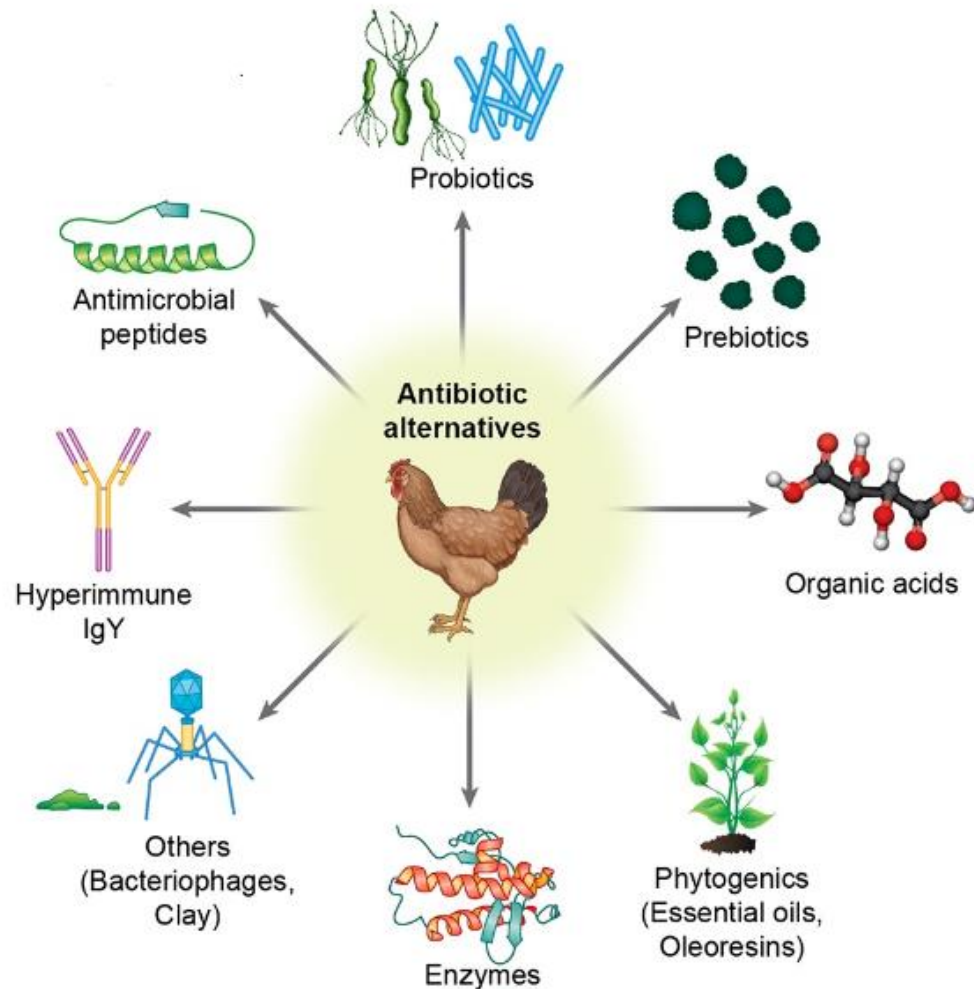
Management
practices



Is there
something
new out
there?



ALTERNATIVES TO ANTIBIOTICS : CURRENT OPTIONS



How can we maintain health, welfare and performance?

Nutrition

- Coarse grain grinding
- Limiting feed changes
- Electrolyte balance
- Vitamins
- Feed enzymes
- Novel and unique feed additives



THE HOLISTIC APPROACH

TO REDUCE THE INCIDENCE OF AMR FROM ANIMAL PRODUCTION A COORDINATED ACTION IS NEEDED

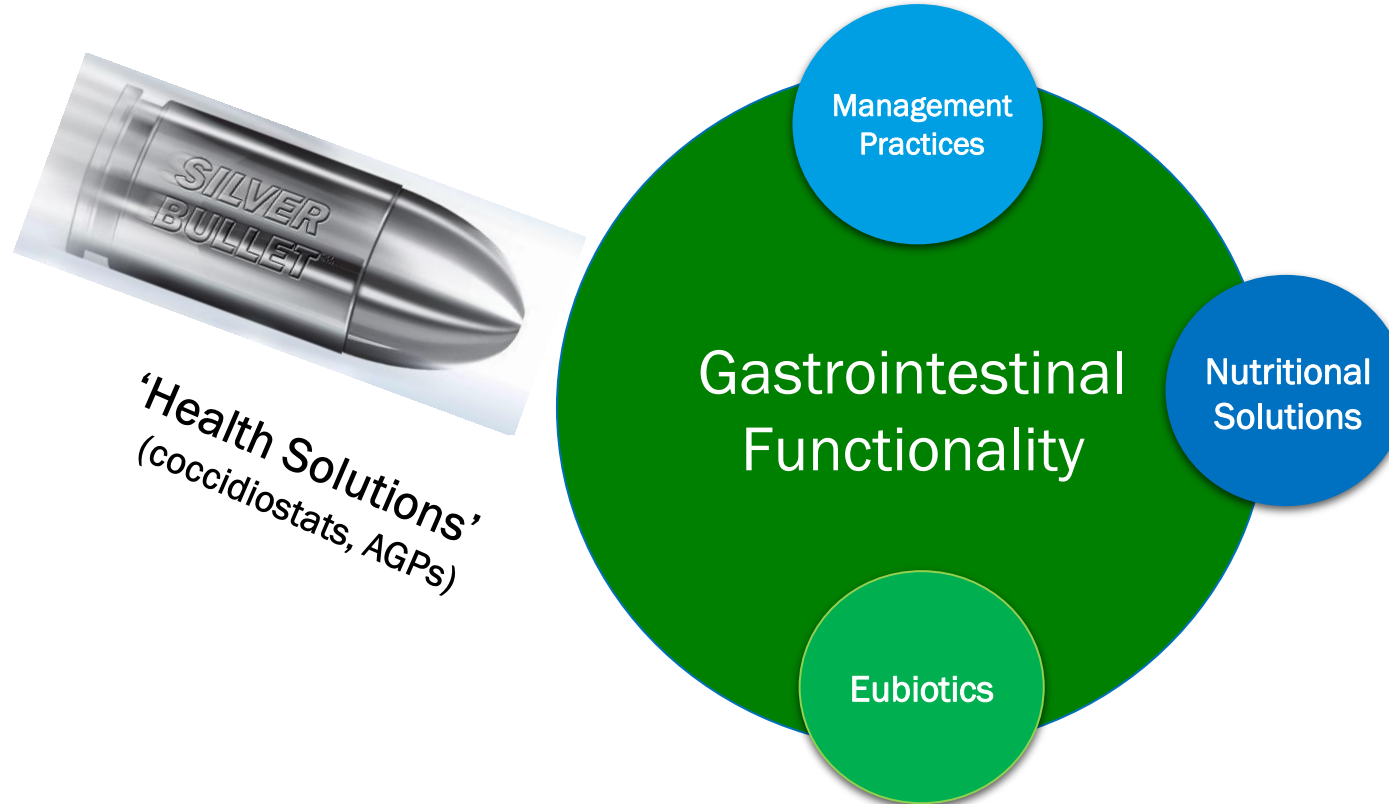


World
Organisation
for Animal
Health



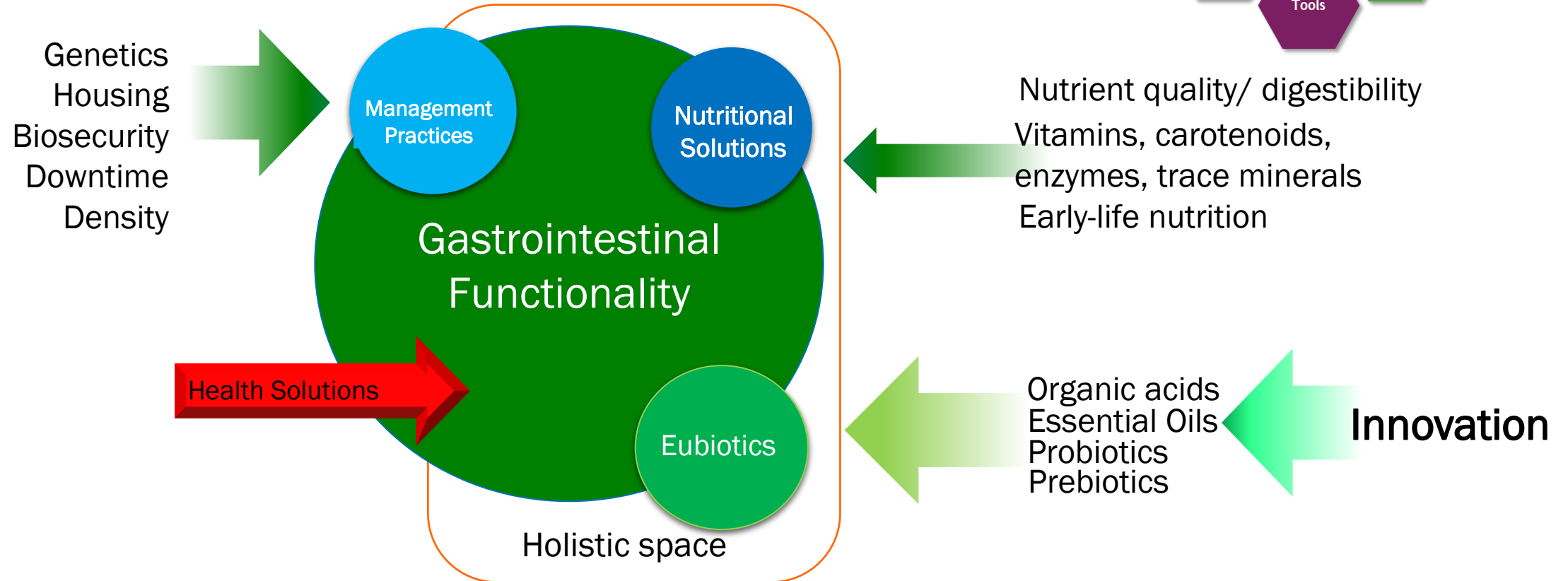
- Regulations: ban sub-therapeutic use
- Tax: increased cost of use minimizes use
- Surveillance: increase at country level
- Improved sanitary controls, diagnostics, husbandry & nutrition
- Greater use and development of vaccines
- Multi-sector approach: animal, human, API production
- Alternative solutions: feed additive innovation & education

UNTIL RECENTLY, THE 'HEALTH SOLUTIONS' CATEGORY PROVIDED THE 'SILVER BULLET' FOR GASTROINTESTINAL FUNCTIONALITY



The current industry approach conceals fundamental gaps in basic management practices and nutrition

HOLISTIC APPROACH TO OPTIMIZE GASTROINTESTINAL FUNCTIONALITY

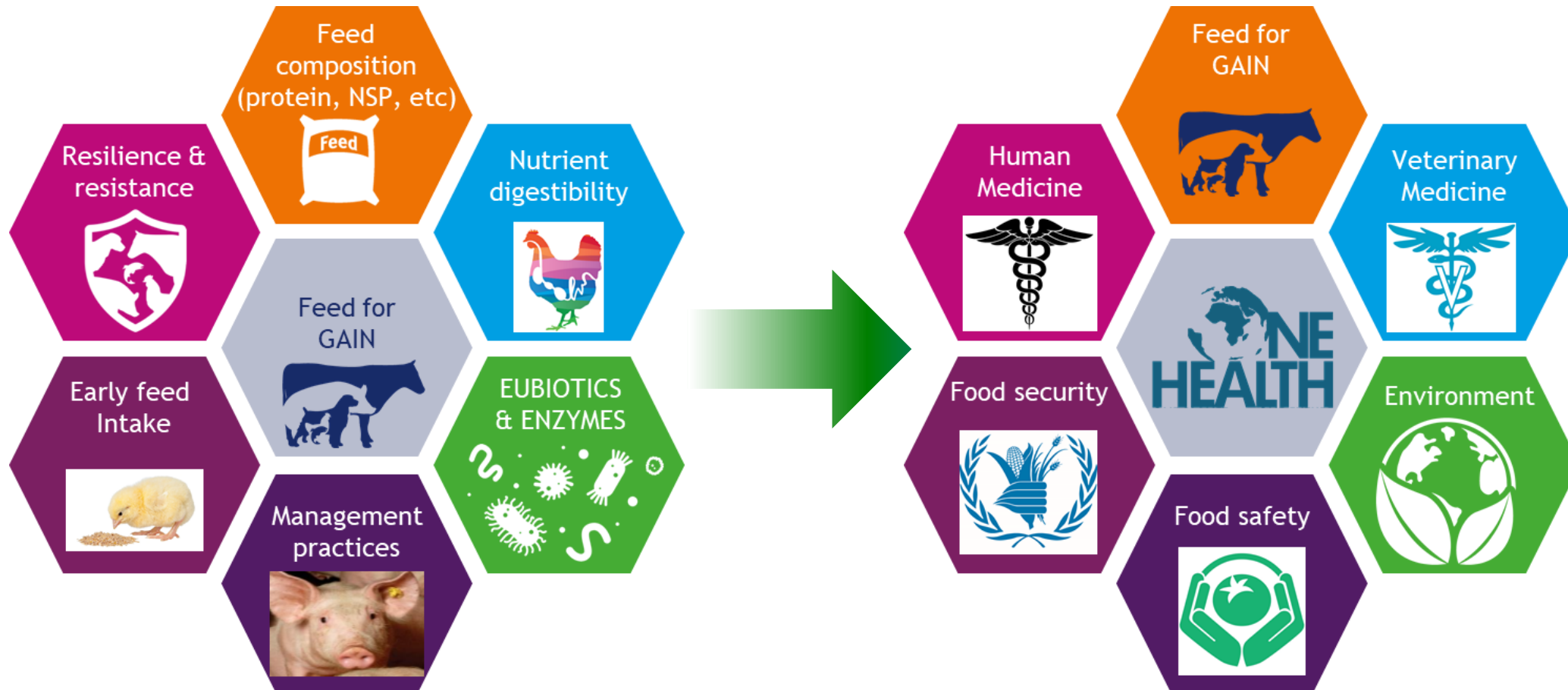


The holistic approach considering all aspects of nutrition, health and management is of utmost importance to optimize gastrointestinal functionality



FEED FOR GAIN: A ONE HEALTH APPROACH

NEED COORDINATED ACTION WITH HUMAN MEDICINE



DANISH SWINE INDUSTRY IS A GOOD EXAMPLE OF CHANGE

DK swine industry removed AGP by 2000

The industry grew 47% in volume (85% of meat exported)

But there were farm closure and consolidation. Those farms with good management remained.

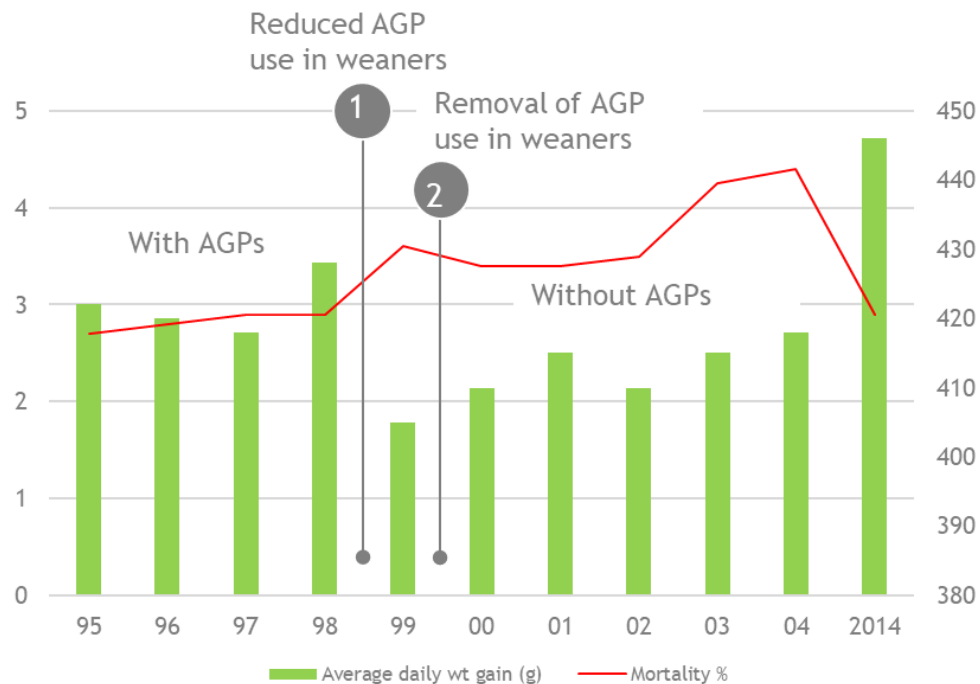
Initially the change was costly to farmers:

- Lower weight at end of growth period;
- Greater heterogeneity in weight;
- Performance down
- Higher incidence of diarrhea

Now more than compensated through

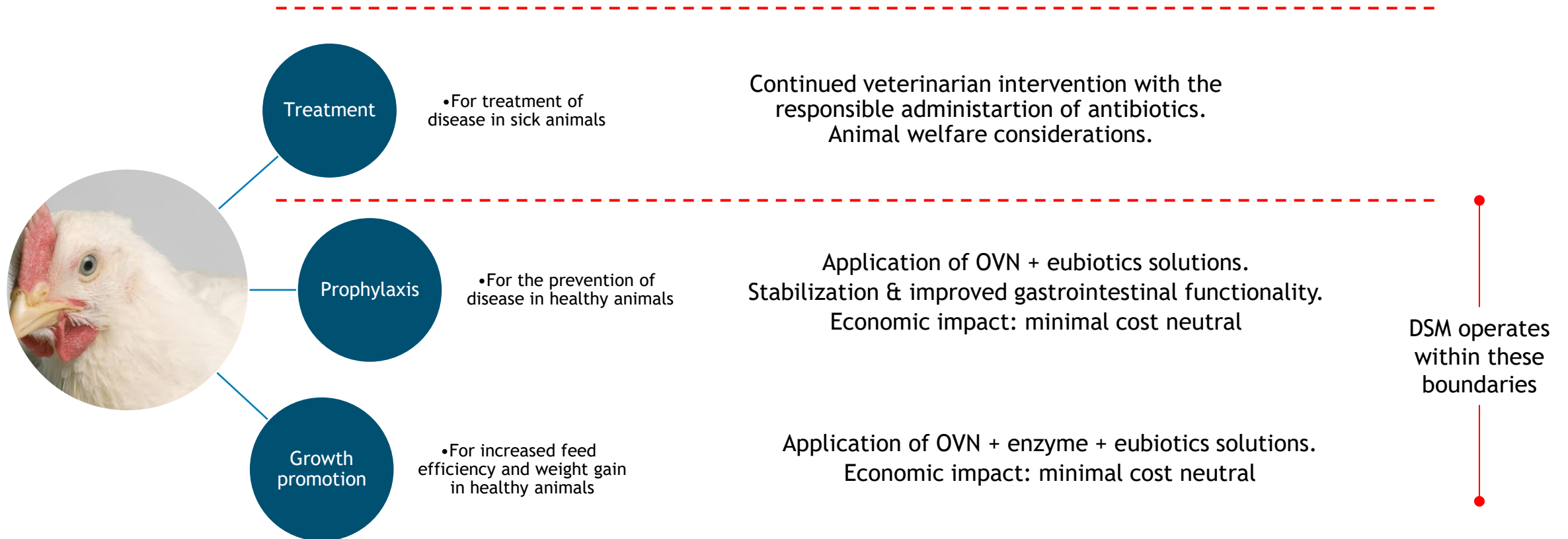
- Sanitary controls
- Husbandry
- Nutrition (EUBIOTICS)

Danish Crown recently announced to go fully antibiotic free.



DK swine industry historical animal performance

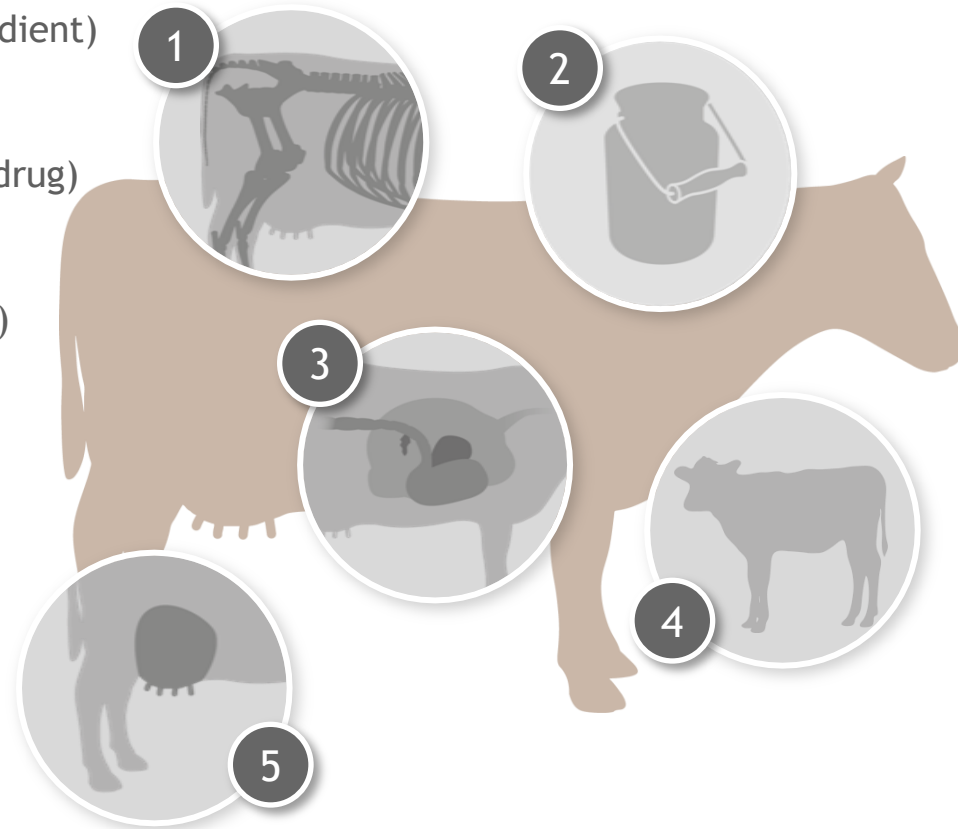
DSM HAS MARKET PROVEN SOLUTIONS TO HELP REDUCE ANTIBIOTIC USE IN ANIMAL PRODUCTION



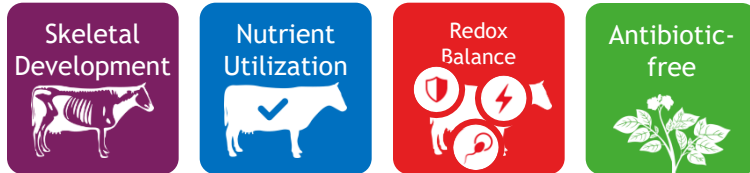
DAIRY COWS HAVE SEVERAL SEVERE ISSUES...

THE TYPICAL ANSWERS ARE FEED INGREDIENTS OR DRUGS

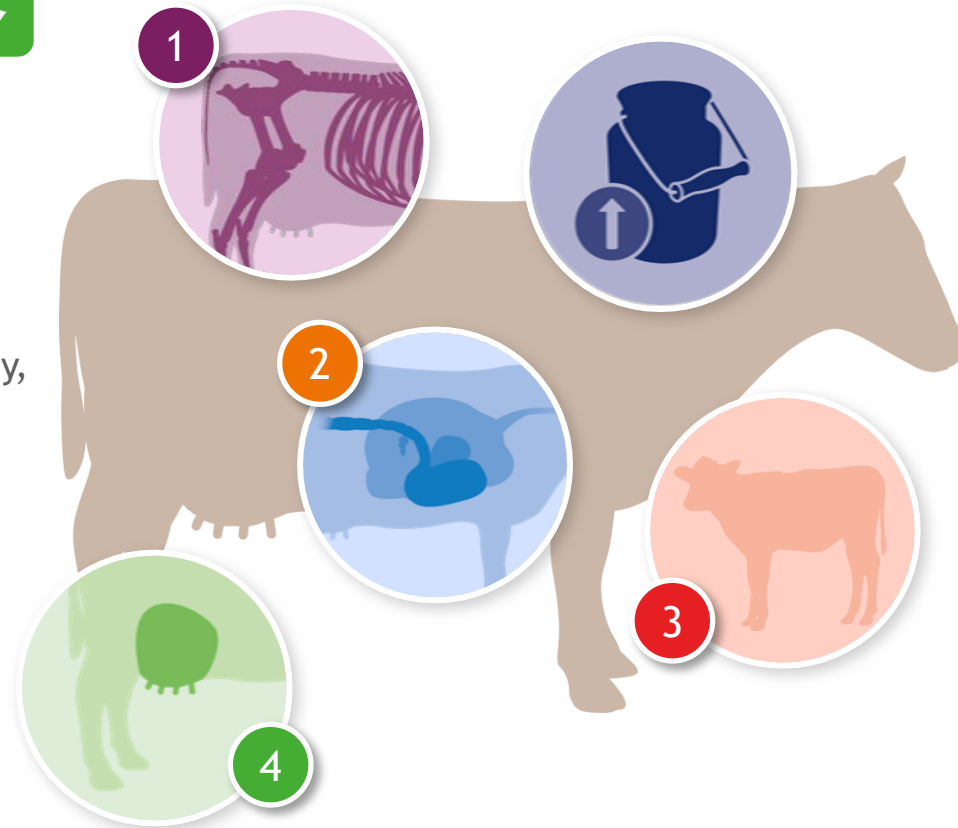
- 1 Hypocalcaemia
Prevention: Anionic salts (feed ingredient)
- 2 Milk yield, feed efficiency, ketosis
Prevention/treatment: Ionophores (drug)
- 3 Acidosis
Prevention: Buffers (feed ingredient)
- 4 Fertility problems
Treatment: Hormones (drug)
- 5 Mastitis and lameness
Treatment: Antibiotics (drug)



WE HAVE A DIFFERENT APPROACH



- 1** Optimum blood calcium levels: 25-OH-D3 for skeletal development & health
- 2** **Nutrient utilization:** Essential oils x Biotin x amylase for high milk efficiency, acidosis and ketosis prevention
- 3** **Fertility:** β -Carotene (fertility vitamin)
- 4** **Mastitis and lameness:** Vitamin E and Biotin



This adds up to improved longevity,
more milk production and **NO**
ANTIBIOTICS or **DRUGS**.

CONCLUSIONS

DSM POSITION STATEMENT ON AMR RELATED TO LIVESTOCK PRODUCTION



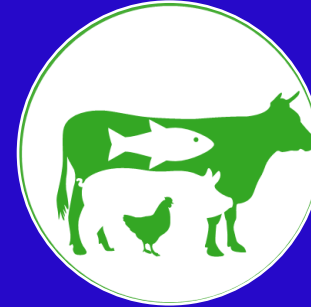
DSM recognizes that AMR is an issue of global concern.



DSM will proactively collaborate with WHO, FAO and OIE on the One Health initiative.



DSM supports the responsible use of antibiotics to ensure the health and welfare of animals.



DSM advocates the replacement of AGPs and reduction in the prophylactic use of antibiotics.



DSM will continue to apply its leading scientific knowledge to accelerate the transformational change needed to combat AMR.

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