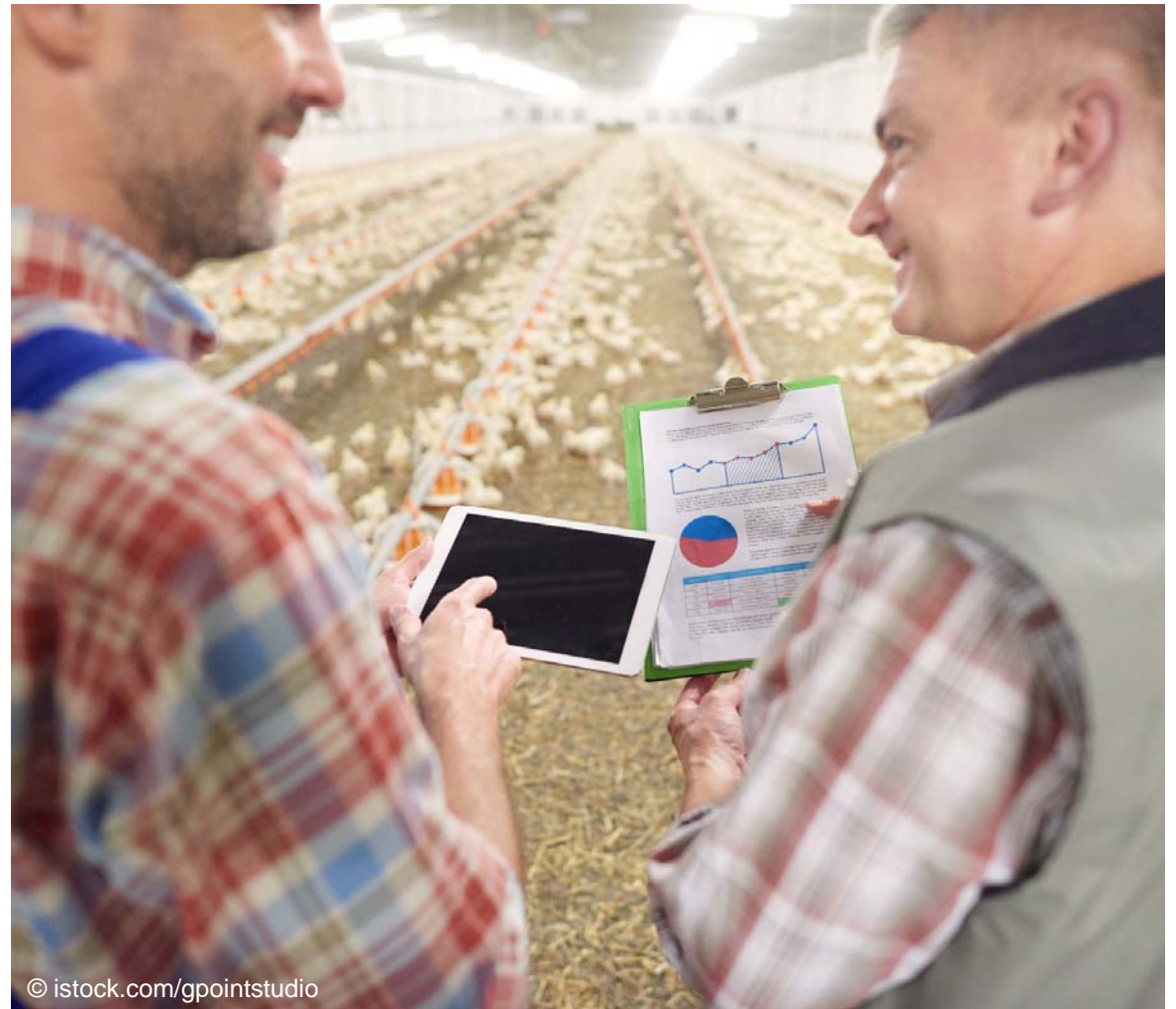


# How we're bringing digitalization to the chicken farm

Stefan Pelzer  
October 5, 2017, Essen



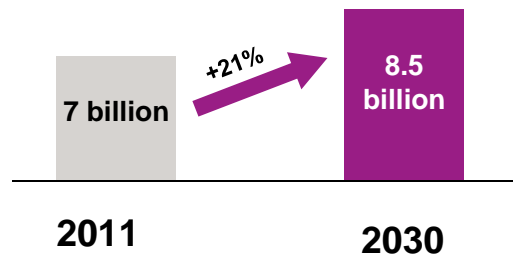
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# The world's growing population needs to be fed

## POPULATION GROWTH



Billions of people

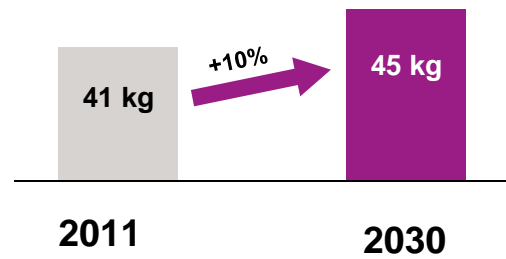


© barcroft image / Pablo Lopez Luz

## INCREASING STANDARDS OF LIVING



Meat consumption per individual



© Alex Schwander

## RESOURCE SCARCITY



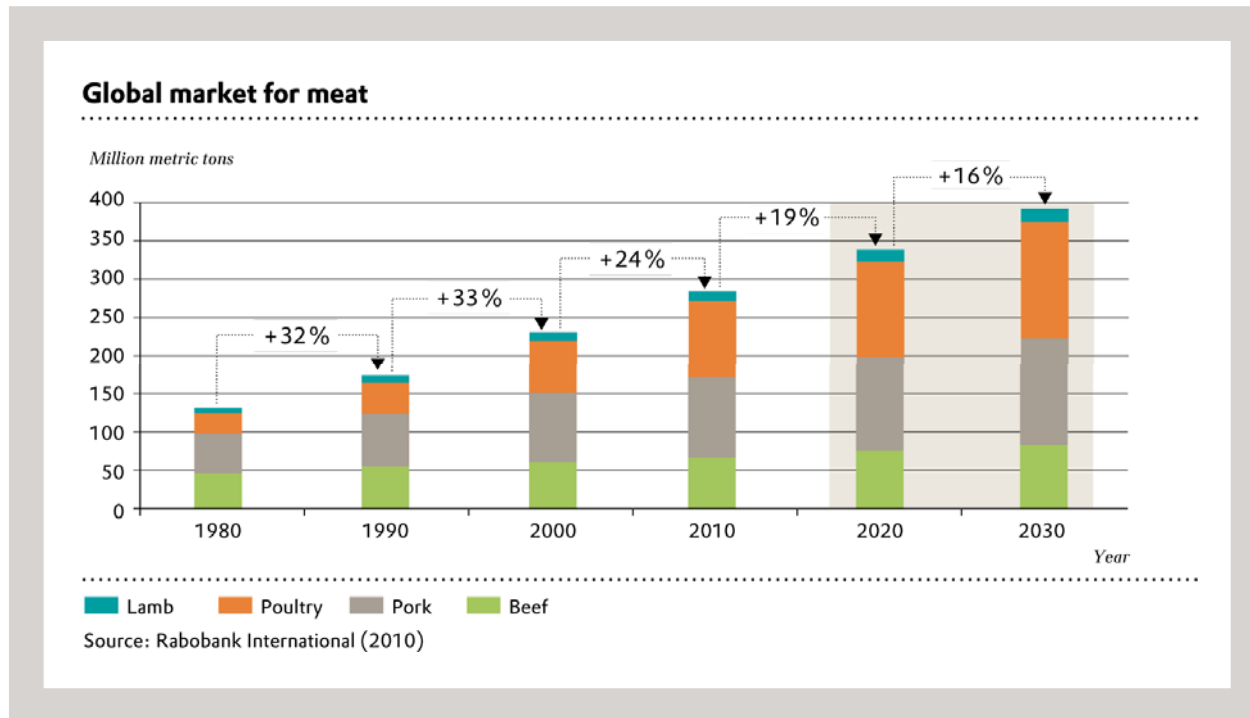
Area per individual



© fotolia / apfelweile

...in times of limited resources

# The importance of chicken meat is growing

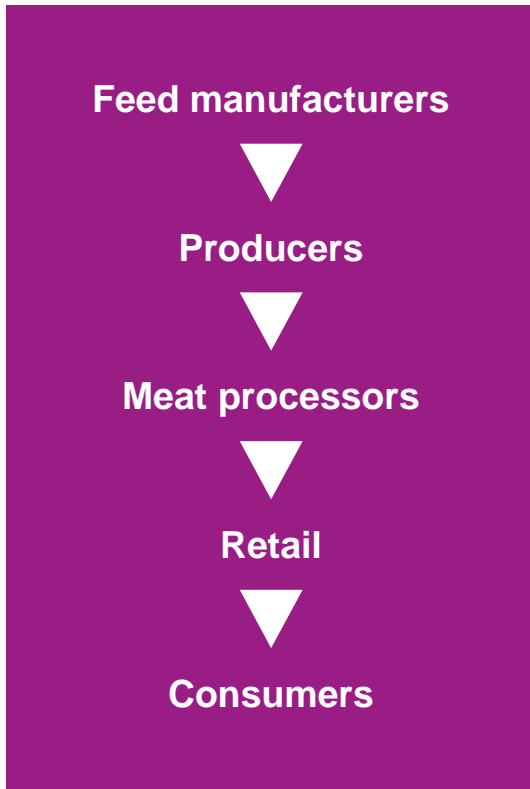


## ADVANTAGES OF CHICKEN AS A SOURCE OF MEAT:

- Not associated with religious taboos
- Robust, relatively easy to farm
- Highly productive and cost-efficient

**According to estimates from the FAO, global consumption of chicken will exceed that of pork in 2020.**

# Meat products are subject to increasing requirements



© OJO Images / Maria Teijeiro

## WHAT CONSUMERS WANT:

.....  
Sustainably produced

.....  
Affordable

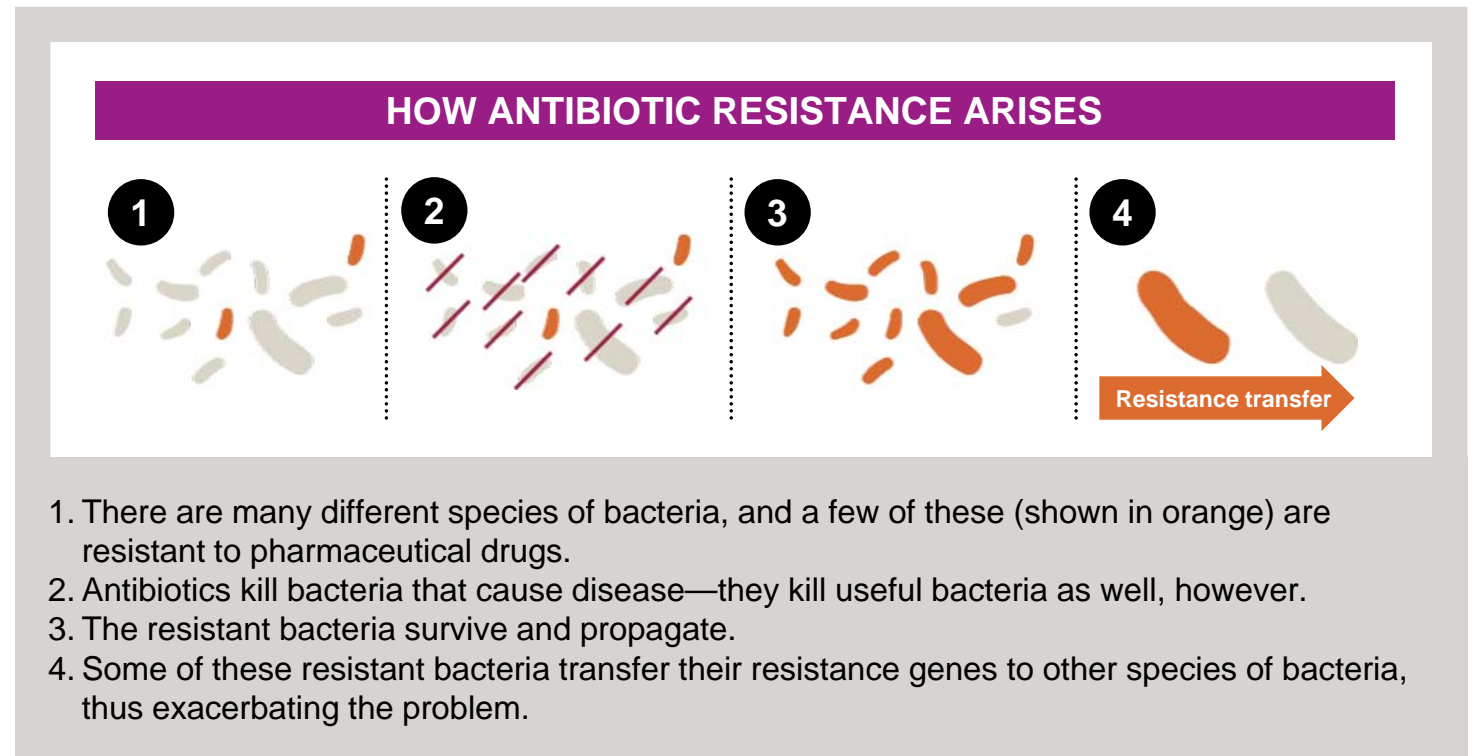
.....  
Healthy

.....  
High quality

.....  
Animal welfare

## Why antibiotics in husbandry are a problem

- Their use is not limited to medical treatment—they are also used as growth promoter
- Antibiotic growth promoters have been banned in the EU since 2006, but their use remains commonplace in other regions
- The WHO sees a correlation with the increased incidence of multiresistant microbes
- Multiresistant microbes limit treatment options for patients



# Antibiotic growth promoters are under pressure worldwide



## McDonald's in US to phase out chicken injected with antibiotics

Fast-food giant says 'We're listening to our customers' and within two years will only buy chicken raised without antibiotics

Wednesday 4 March 2015

Business | Thu Mar 12, 2015 2:56pm EDT

Related: HEALTH

**KFC faces pressure after McDonald's says no antibiotics in chicken**

The screenshot shows the Poultry World website interface. At the top, there is a navigation bar with 'POULTRY WORLD' in orange and black, and several menu items: 'Home' (with a house icon), 'Feed' (with a leaf icon), 'Pigs' (with a pig icon), 'Dairy' (with a cow icon), and 'Proagrica' (with an envelope icon). Below this is a secondary navigation bar with 'Genetics', 'Meat' (highlighted in orange), 'Eggs', 'Nutrition', 'Health', 'UK', and 'Digital Magazine'. The main content area features a sub-header 'Meat' in orange, followed by 'News | Aug 25, 2017 | 2150 views | update: Aug 28, 2017'. The article title is 'McDonald's to limit antibiotics used by its chicken suppliers' in large black font. To the left of the title are social media sharing icons for Facebook, Twitter, LinkedIn, Email, and Print. The article text begins with 'Global fast food chain McDonald's has announced it is to limit the use of antibiotics by its global chicken suppliers.' and continues with 'The new action is part of an update to its Global Vision for Antibiotic Stewardship in Food Animals, which McDonald's unveiled 2 years ago.'



## Action needs to be taken on the part of producers

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### REQUIREMENTS:

.....  
+ Increase productivity  
.....

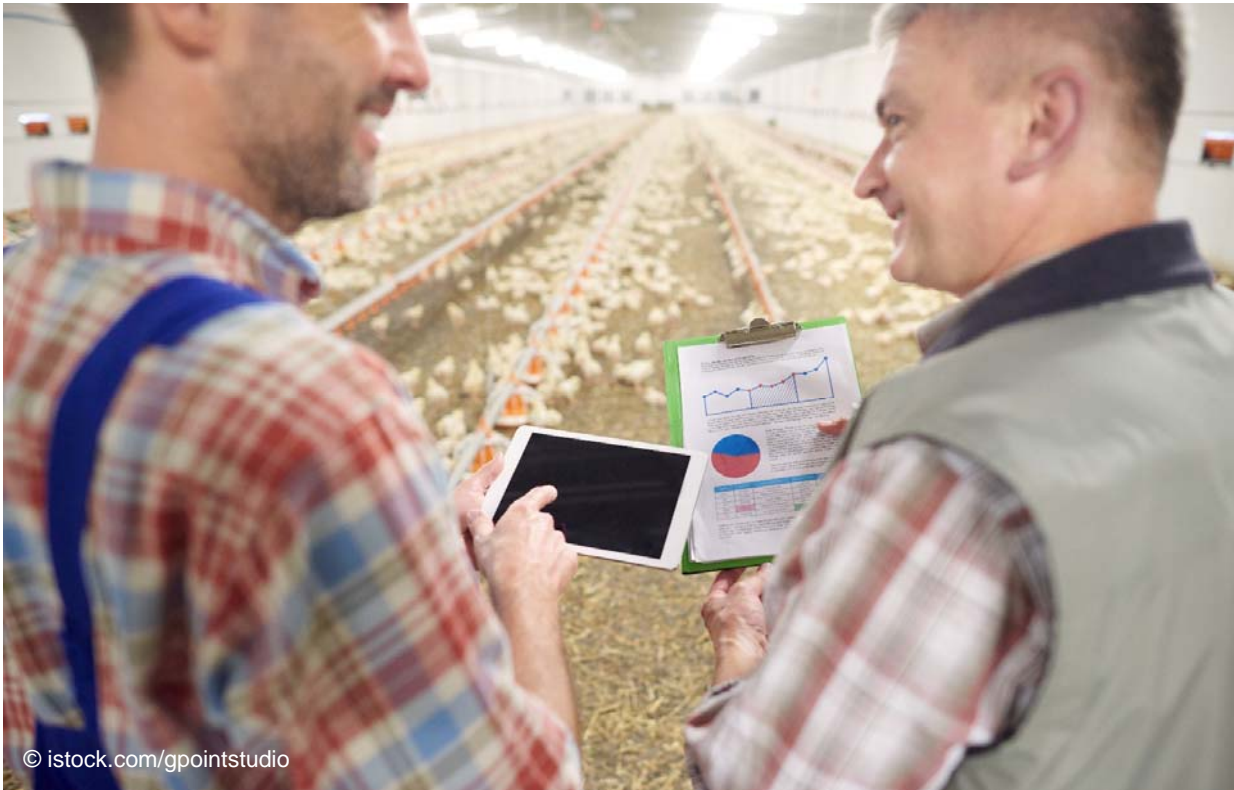
+ Improve quality  
.....

+ Address animal welfare

### BUT:

.....  
- Eliminate the use of  
antibiotic growth promoters  
.....

## Our vision



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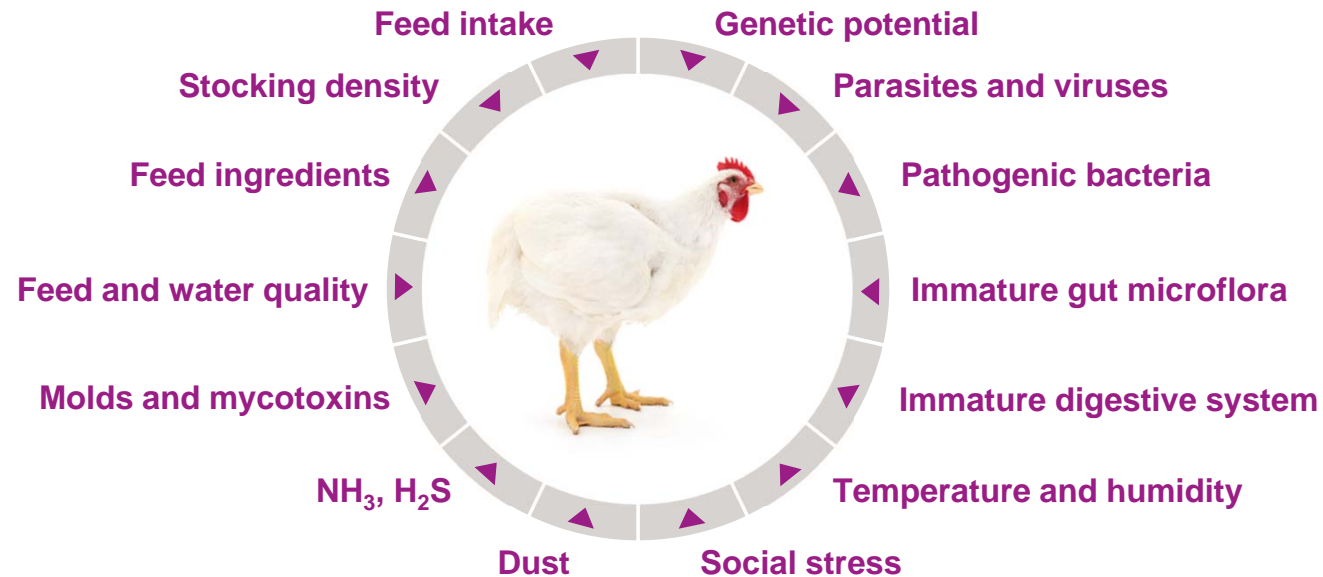
Our aim is to pursue a holistic, **data- and knowledge-based** approach to optimizing health, animal well-being, and productivity in the poultry farm.

Our goal is to keep animals healthy and raise them without any unnecessary drugs.



# The farm is a complex system

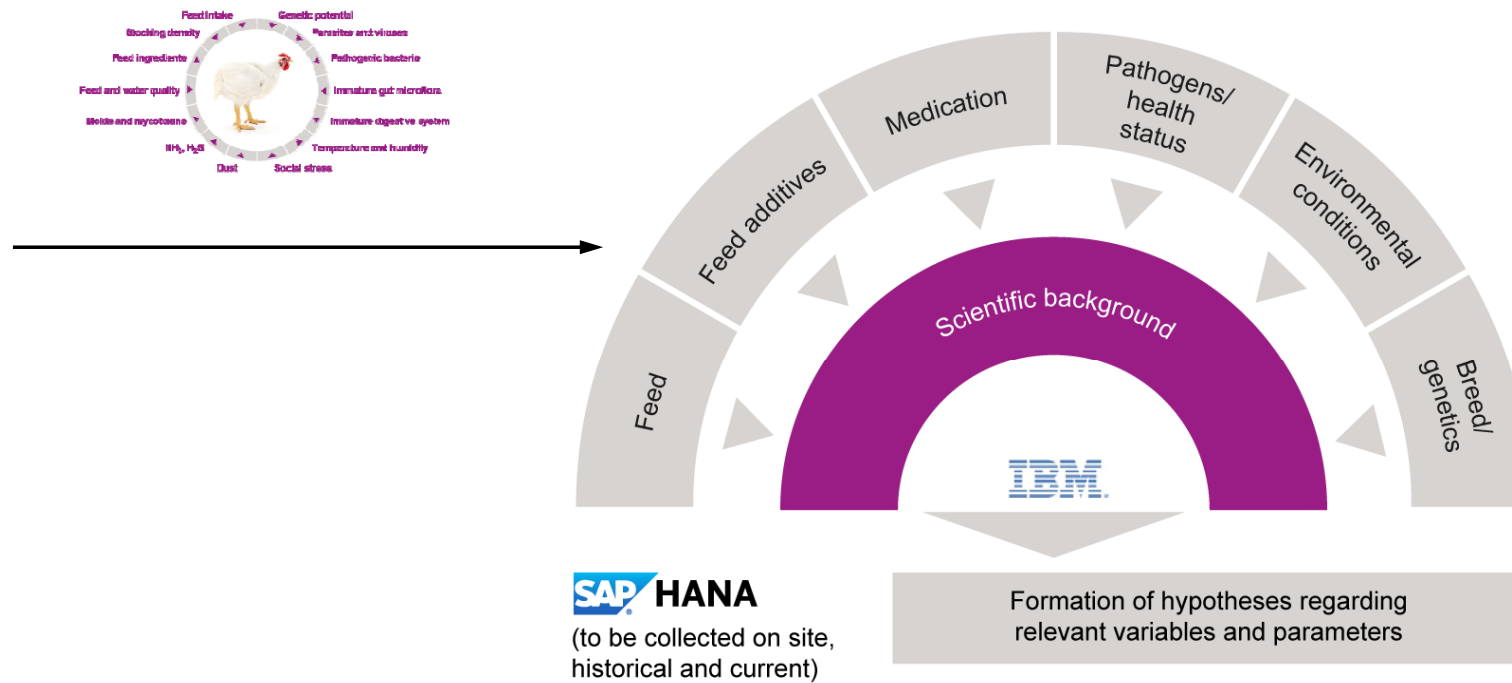
SOME OF THE FACTORS INFLUENCING PRODUCTIVITY ARE:



© shutterstock / Tsekhmister

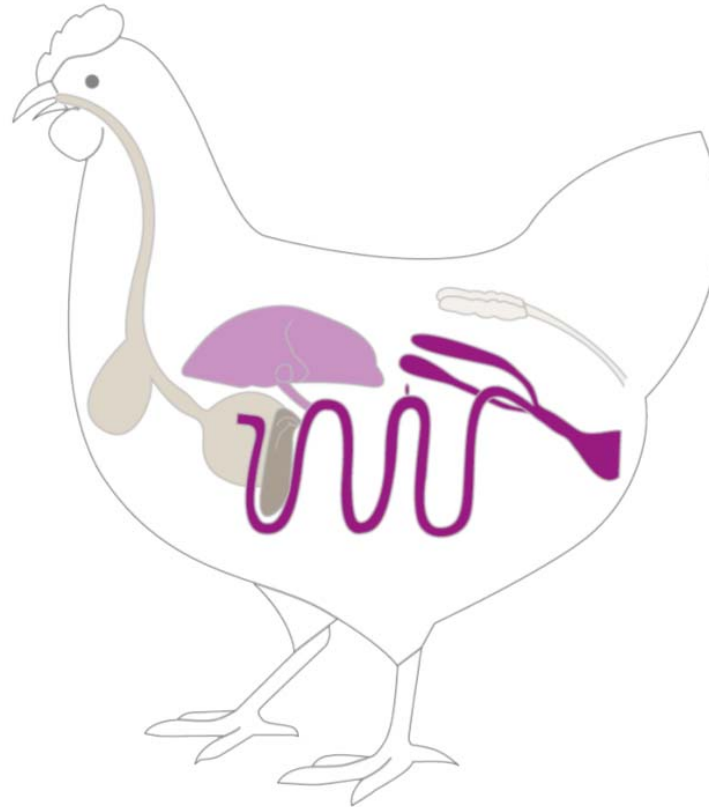
Not all influencing factors are understood and are now used systematically to realize the animal's genetic potential.

# Identifying the relevant parameters and making them accessible



## Gut health is key

- Processes in the gut decide between health and disease
- Our understanding of microflora is growing at a rapid pace
- We still need the following, however:
  - Meaningful / predictive models
  - Diagnostics
  - Effective products



### **MICROFLORA OF A CHICKEN'S DIGESTIVE TRACT:**

- 600 different species of bacteria
- 100 billion microorganisms per gram of cecum contents

# Closing scientific gaps in our understanding: the chicken intestine simulation model

## The GOBI-FEED Project\*:

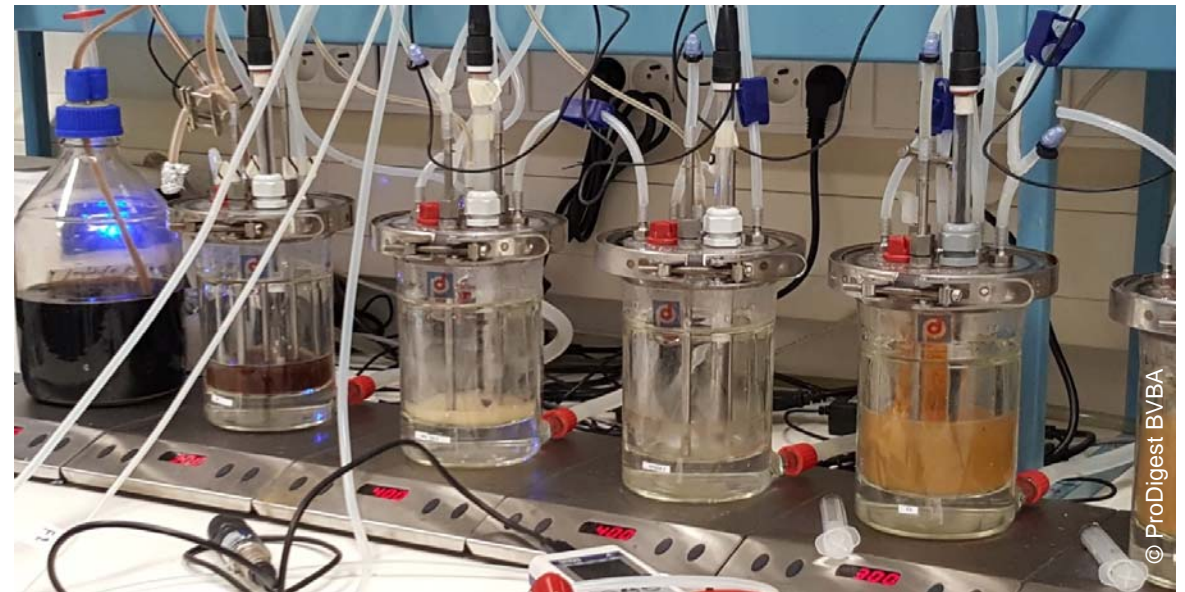
Development of a gut simulation model for the following purposes:

- To model interactions between diet, the immune system, and microflora
- To test the effects, dosage, and interactions of alternative feed additives
- To speed up development of new, effective additives more quickly

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Federal Ministry  
of Education  
and Research



\*BMBF (German Federal Ministry for Education and Research)  
funding reference number: 031B0074 C

# Closing the gaps in data: an early-detection diagnostic platform

## Identifying biomarkers and developing test systems to obtain meaningful information about the health of a chicken flock

- Non-invasive
- Information on the entire flock
- On-site laboratory analysis
- Detection of subclinical infections

### Example: *Clostridium perfringens*

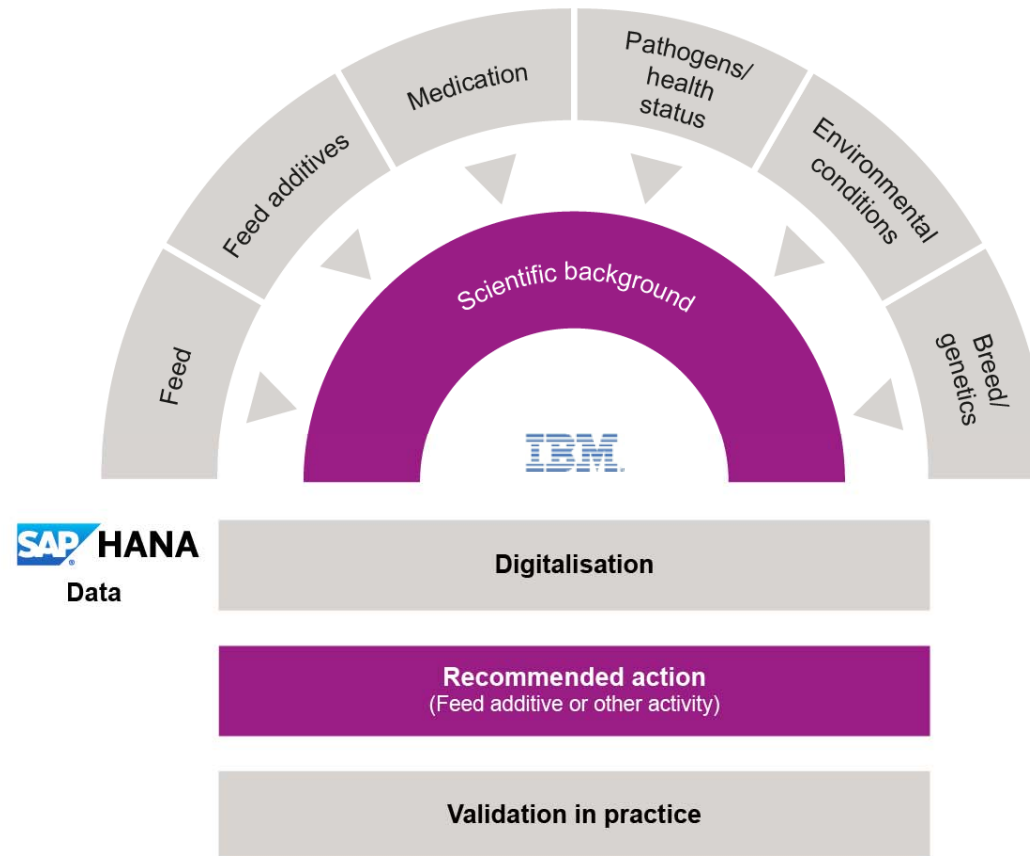


- Pathogen causing subclinical necrotic enteritis
- Damages the intestinal wall, inhibits feed conversion and growth
- US\$ 4-6 billion in damage throughout the world each year

Source: Wade, B., & Keyburn, A. (2015). poultryworld.

© istock Essentials / decade3d

# Making knowledge practical: recommendations and customized products

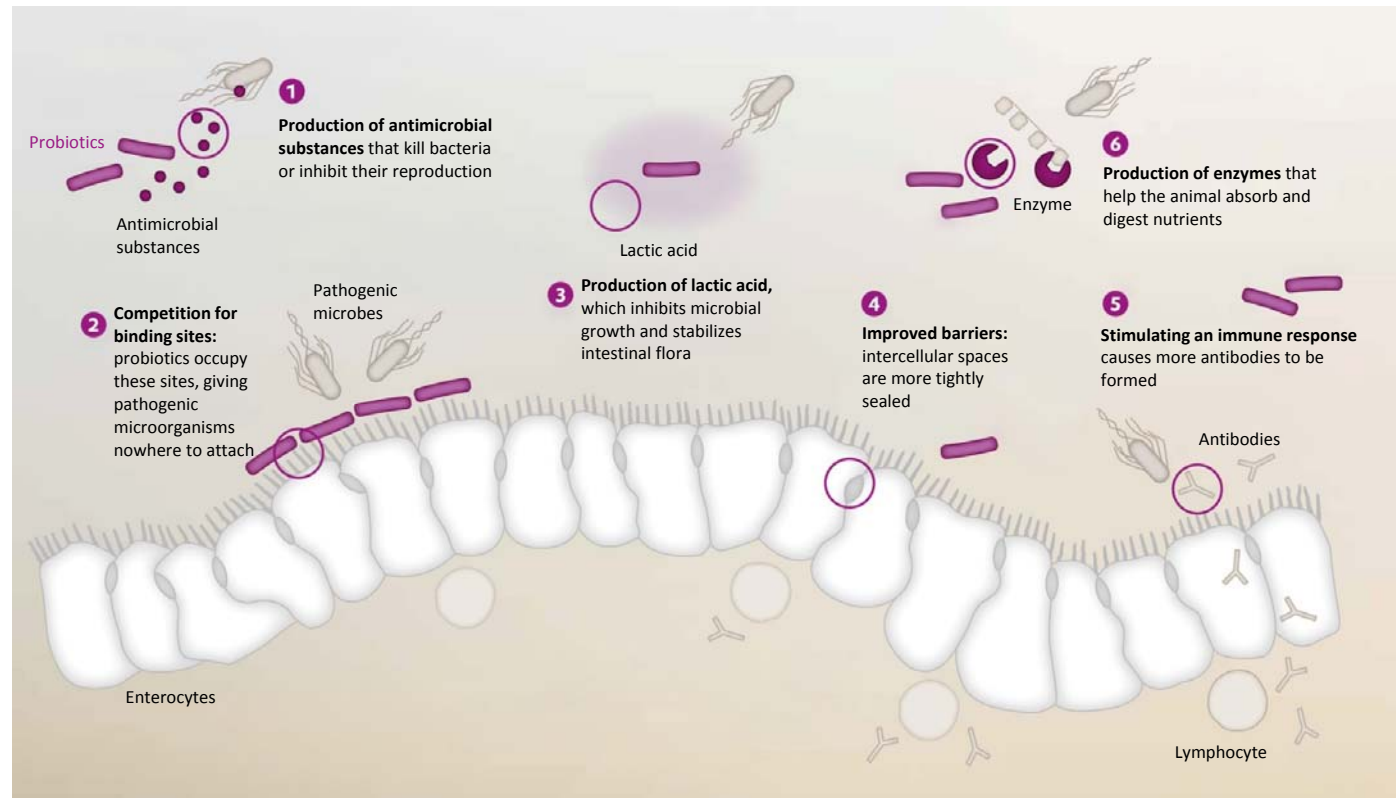




# Effective means of promoting animal health

## Example: **PROBIOTICS:**

Living microorganisms whose metabolic products influence the composition of bacteria in the gut and improve animal health.

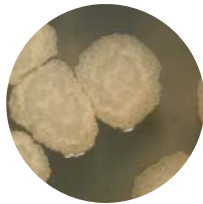


# Selective pathogen inhibition with GutCare®

## SCREENING

500 strains

20 criteria



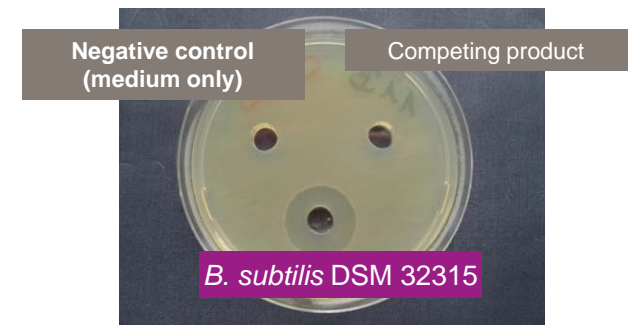
Colonies of *B. subtilis* DSM 32315

### *Bacillus subtilis* DSM 32315

- Inhibits *Clostridium perfringens*, the pathogen that causes subclinical necrotic enteritis
- Improves the composition of gut bacteria

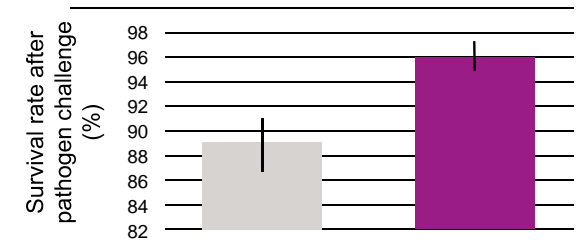
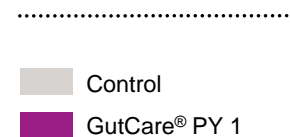
## EFFECT

### *in vitro*



Inhibition test for *Clostridium perfringens*

### *in vivo*

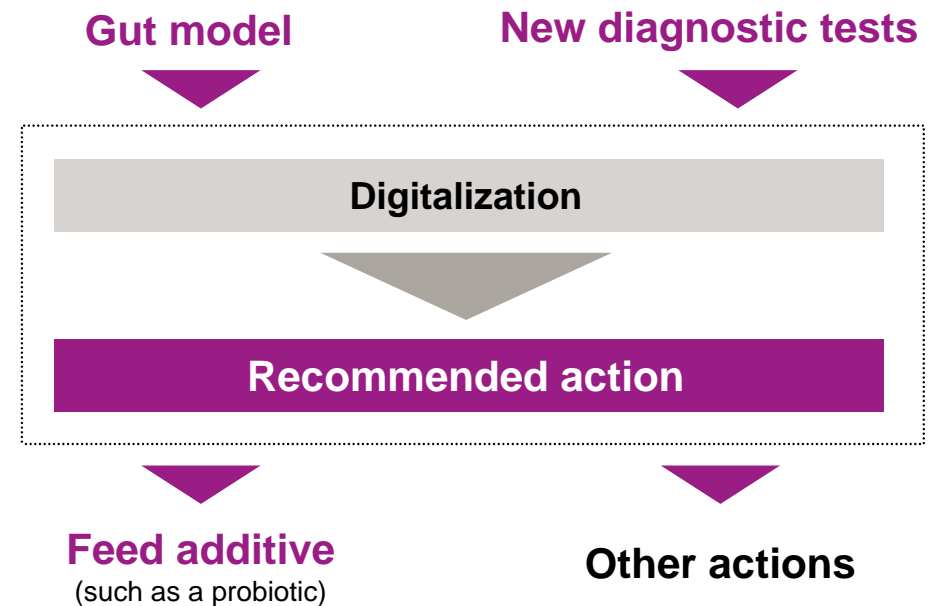


# Understanding the system, recommending action, delivering solutions

## PRECISION LIVESTOCK FARMING

as we understand it:

Using digital technologies to utilize knowledge and data in order to offer effective, verifiable solutions—not just virtual!





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**POWER TO CREATE**