How we’re bringing digitalization to the chicken farm

Stefan Pelzer
October 5, 2017, Essen
The world’s growing population needs to be fed

**POPULATION GROWTH**

In 2011, there were 7 billion people. By 2030, the population is projected to reach 8.5 billion, an increase of 21%.

**INCREASING STANDARDS OF LIVING**

Meat consumption per individual is expected to increase from 41 kg in 2011 to 45 kg in 2030, an increase of 10%.

**RESOURCE SCARCITY**

Area per individual is expected to decrease from 0.25 ha in 2011 to 0.22 ha in 2030, a decrease of 10%.

...in times of limited resources

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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

WHAT CONSUMERS WANT:

- Sustainably produced
- Affordable
- Healthy
- High quality
- Animal welfare

Feed manufacturers

Producers

Meat processors

Retail

Consumers

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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

**HOW ANTIBIOTIC RESISTANCE ARISES**

1. There are many different species of bacteria, and a few of these (shown in orange) are resistant to pharmaceutical drugs.
2. Antibiotics kill bacteria that cause disease—they kill useful bacteria as well, however.
3. The resistant bacteria survive and propagate.
4. Some of these resistant bacteria transfer their resistance genes to other species of bacteria, thus exacerbating the problem.
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

McDonald's to limit antibiotics used by its chicken suppliers

Global fast food chain McDonald's has announced it is to limit the use of antibiotics by its global chicken suppliers.

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

**REQUIREMENTS:**

- Increase productivity
- Improve quality
- Address animal welfare

**BUT:**

- Eliminate the use of antibiotic growth promoters
Our vision

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:

Feed intake, Stocking density, Parasites and viruses, Genetic potential, Pathogenic bacteria, Immature gut microflora, Immature digestive system, Temperature and humidity, Social stress, Dust, NH₃, H₂S, Feed and water quality, Feed ingredients, Molds and mycotoxins.

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

SAP HANA
(to be collected on site, historical and current)

Environmental conditions
Breed/ genetics
Pathogens/ health status
Medication
Feed additives
Feed

Scientific background
Formation of hypotheses regarding relevant variables and parameters

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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

*SMBF (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


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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®

SCRENNING

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

Survival rate after pathogen challenge (%)

Control
GutCare® PY 1

98 96 94 92 90 88 86 84 82
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!

- Gut model
- New diagnostic tests
- Digitalization
- Recommended action
- Feed additive (such as a probiotic)
- Other actions

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