

Dare digital

Big data, biostatistics, and smart algorithms
for optimized poultry production

Porphyrio®



Sustainable food systems

We strive for a world with sufficient, safe, and nutritious food for everyone. As natural resources become depleted, we believe that we will have to rely on science to produce enough food, while at the same time protecting natural resources. We are convinced that precision livestock farming – modern feeding concepts along with appropriate digital technologies and connectivity – is the only way forward.

Challenges in animal protein production drive the need for precision livestock farming concepts

1 Farms have become larger and more complex in terms of management, with more animals per employee.



4 The environmental footprint of farming needs to be reduced.



2 There is a need to reduce costs and create more value to improve competitiveness.



5 Farmers need to address societal concerns about animal welfare and improve transparency in the sector.



3 Productivity needs to be improved to meet rising animal protein demand.

Produce more, use less –
The Porphyrio® effect



4%

more eggs produced

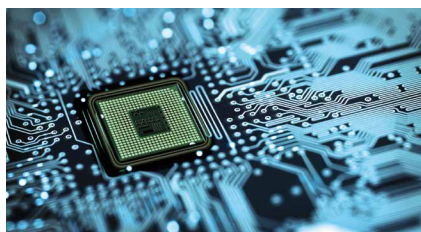


10 points

feed conversion
rate (FCR) reduced

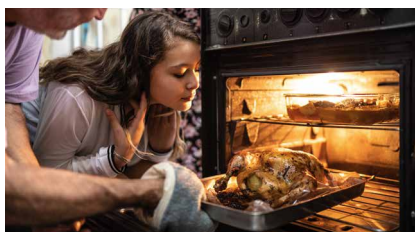
(Examples available upon request)

Source: *Livestock Farming Could Get Smarter: The Potential of Precision Livestock Farming*, RaboResearch 2017.



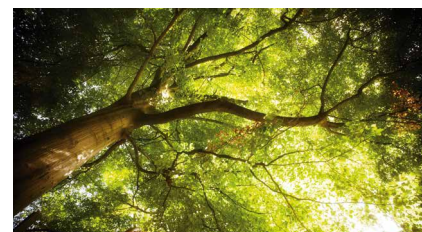
DIGITALIZATION AND CONNECTIVITY

Artificial intelligence, cloud computing, and big data – digital technologies and seamless connectivity offer great potential for the food production sector to improve efficiency and bottom lines.



HEALTH AND WELFARE

Consumers have become more health-conscious and expect supply chain transparency. They want to know where their food comes from and whether the animals were treated well.



RESPONSIBLE CONSUMPTION AND PRODUCTION

We all want to breathe fresh air, drink clean water, and enjoy the beauty of nature. To protect ecosystems critical to climate change mitigation, food must be produced within planetary boundaries.



THREE QUESTIONS

The people who make up Porphyrio®

1. What are the benefits of using big data?

In simple terms: you just know a lot more about your own production and processes! When working with customers, we have experienced that people are often surprised about what they did not know or were not even aware of. Analyzing large volumes of data allows a much better grip on the production system and enables farmers to find the weak spots – and that's when things get really interesting!

2. What's your favorite feature of your software?

That's certainly the prediction and planning aspect of our software. Success is not about data, it's about what you do with data and how you use your insights. On the basis of our smart algorithms we can make predictions and, for example, target a very specific body weight or weight gain. That's exactly what animal protein producers need today – from an economical, sustainable, as well as animal welfare point of view.

3. What's the most rewarding aspect of your job?

The first ideas for using big data, biostatistics, and algorithms in livestock production came to my mind when I did my PhD in Bioscience Engineering about 15 years ago. Today, every time we present our solution and I see the audience impressed about what's possible with data – that's what gives me a good and rewarding feeling. Starting as a university spin-off in Leuven, Belgium, in 2013, we have succeeded in creating a culture of openness, positive attitude, focus, and ambition.



"Being able to inspire more and more people to join our journey makes me truly happy."

KRISTOF MERTENS

*Global Business
Development Evonik PLF |
Porphyrio®*

Digitalization is the next stage of optimization

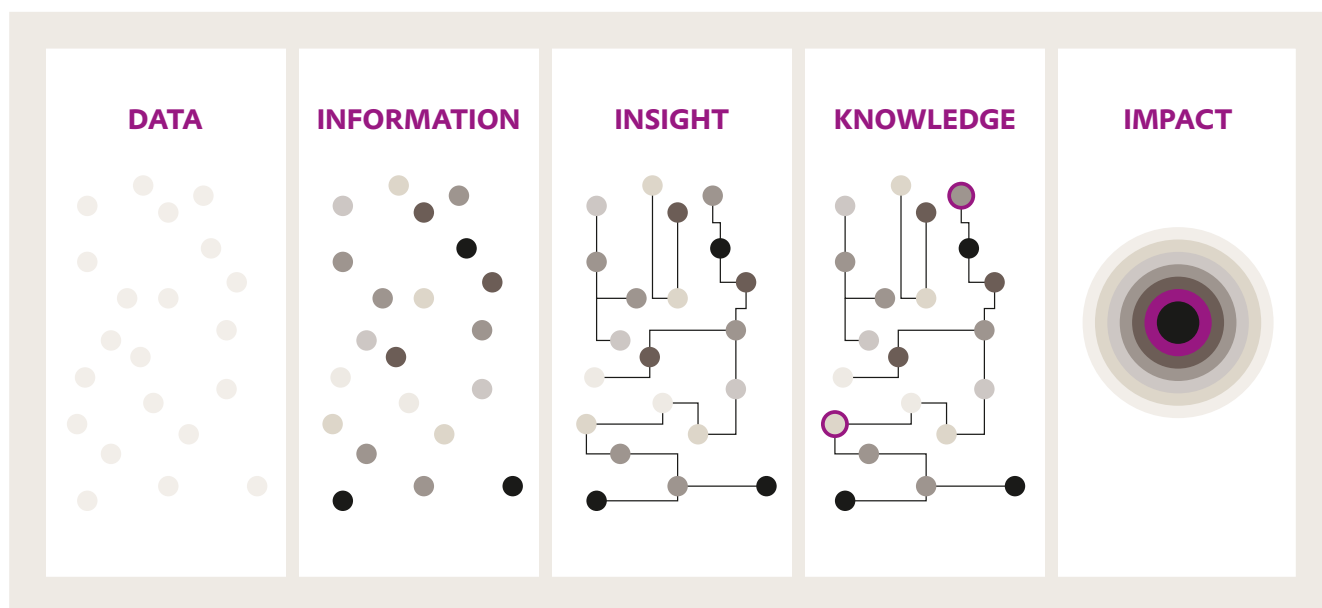
Within the next two decades, the animal protein market is projected to grow about 45% (Rabobank 2018), where poultry is the fastest growing market with annual growth rates of up to 2.4%. To keep up with this increasing demand, smart use of resources, efficiency, and precision is key: do more, use less.

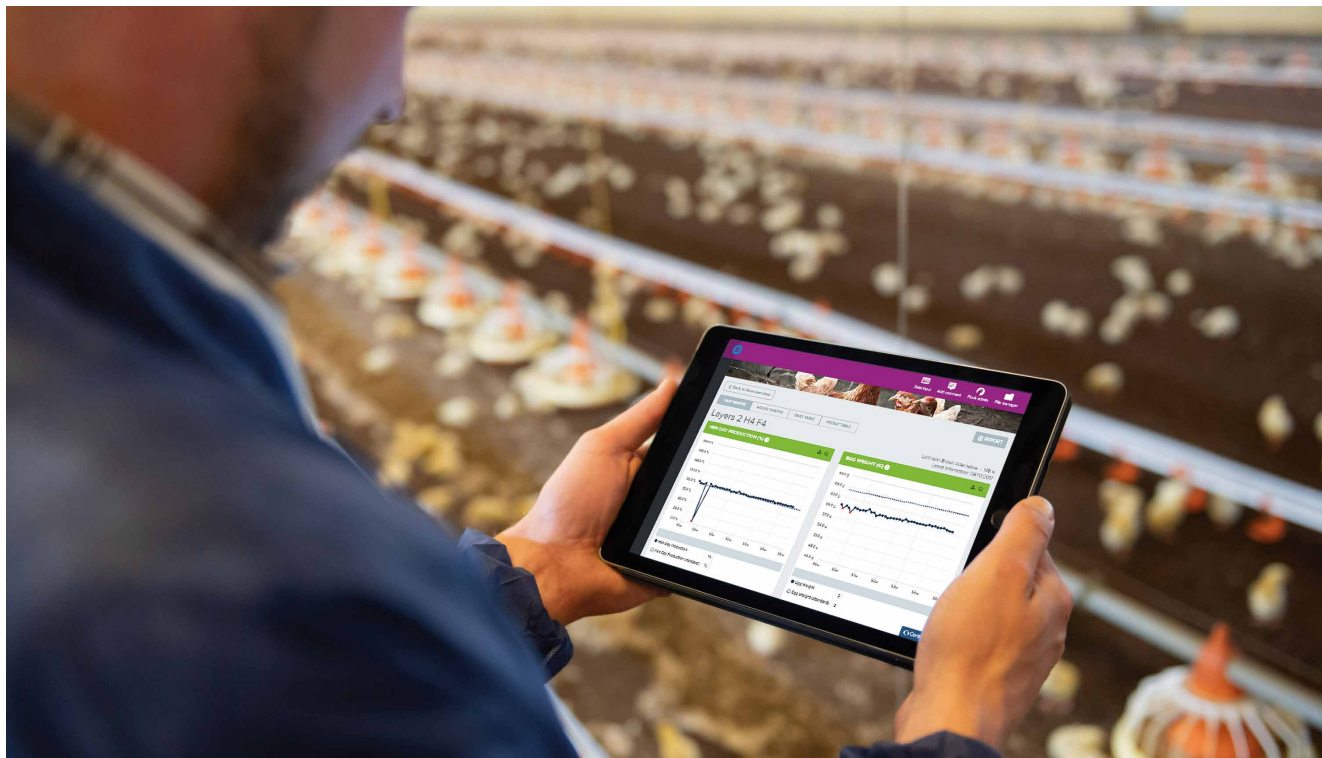
Precision livestock farming technologies from sensors to big data can help farmers improve productivity and decrease costs, while at the same time reduce their environmental footprint. Ultimately, moving to the next stage of optimization within the boundaries of sustainable production requires an even better understanding of the needs of the individual animal, along with a further integrated approach to farm management.

We believe that digital technologies – ICT technologies like the cloud, the Internet of Things (IoT) and big data – combined with animal science and biostatistics will enable the industry to get a much better grip on livestock production and gain an unprecedented in-depth knowledge of what really happens on a farm.

One major pillar of precision livestock farming is continuous collection and monitoring of a wide variety of farm data from feed to health. On the basis of this data, farmers can make better-informed decisions earlier in the process and create optimal living conditions for the animals. This leads to improved results on key farm performance indicators such as yield, animal health and welfare, technical performance, environmental impact, and – last but not least – financial performance.

FROM DATA, TO PATTERN
RECOGNITION, TO PREDICTIVE
ANALYTICS – UNLOCK THE
VALUE OF DATA



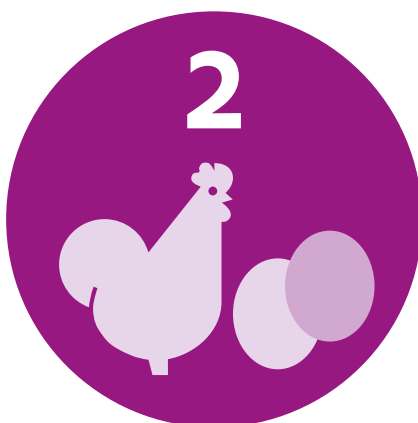


Best results in **three steps**



MONITOR Livestock production

The advantages of going digital are clear. Using sensors in your poultry facilities allows you to collect a variety of live data – 24 hours a day, every day of the year, automatically or manually. It also means that you can compare it to historical data, allowing you to identify trends and any emerging longer-term issues. Cloud-based software enables you to always supervise your flock – anytime and anywhere.



PREDICT Livestock product

Based on your available data and our big data database, our software detects deviating patterns and accurately predicts future performance of your birds, for body weight, and for egg production. This allows you to control performance according to your long-term strategy and achieve your goals.



PLAN Food product

The poultry meat and egg market is a customer-based production chain. The specific needs and requirements of your customers regarding the food product in terms of size, weight, and quality, are driving your production. Our software will enable you to move from accurate predictions to optimal planning. Let our smart algorithms do the thinking and help you deliver the right product at the right time.



Porphyrio® benefits

- **Lower feed cost**
- **Better animal performance**
 - weight gain, egg production
- **Better product quality**
 - carcass yield, meat and egg quality
- **Healthier animals**
 - lower mortality, better uniformity
- **Improved animal welfare**
 - lower foot pad lesions, better feather quality, less cannibalism
- **Improved supply/demand ratio**
- **Reduced administrative costs**

(Examples available upon request)

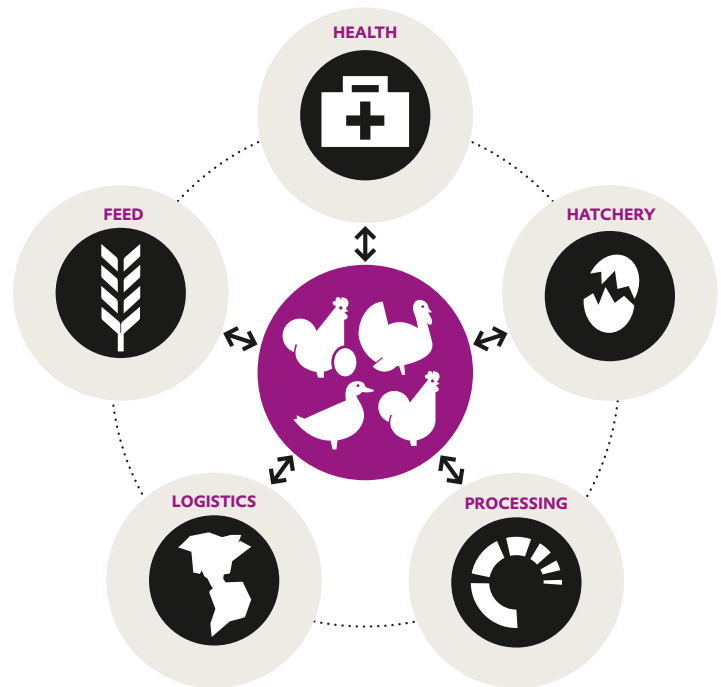
Biostatistics and big data technology changing poultry meat and egg production

Our innovative self-learning algorithms are helping the poultry meat and egg industry to monitor, control, and optimize the entire production process.

Cloud-based self-learning algorithms predict the outcome of livestock farming. It takes all crucial elements of production into account: feed, climate, health, welfare, and many more parameters.

Our expertise is firmly rooted in animal science. In combination with the latest advancements in big data technology and biostatistics, Porphyrio stands for safety, reliability, and accuracy. Whether your company is an individual farm or a vertically integrated egg or poultry meat producer, the modular and functional flexibility of our systems enables us to find the best solution for your business.

Scientifically proven solutions help stakeholders from across the industry to optimize their business, online and in real time and make better strategic decisions based on short-term and long-term predictions of the production process and market.



Using information intelligently results in an optimized enterprise process

Serving all poultry sectors

We provide applications for the use in layer, broiler, turkey, or duck farming.



LAY
INSIGHT



BROILER
INSIGHT



TURKEY
INSIGHT



DUCK
INSIGHT

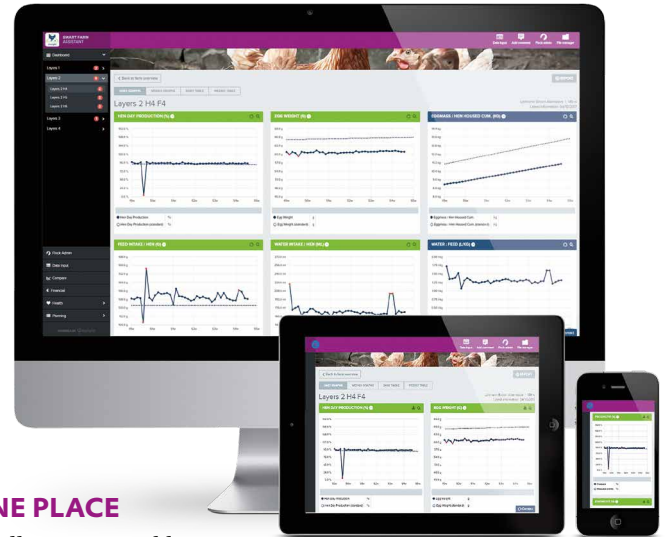
OUR EXPERTISE

- Livestock science
- Livestock production chain
- Biostatistics
- Big data ICT

Right product at the right time

In a customer-based production chain, it's vital that the right products, the correct number, and the required quality are delivered on time and at an acceptable cost for both buyer and seller.

From health management to feed stock management: Running a poultry farm successfully means mastering multiple tasks simultaneously. Our software offers a wide range of solutions to monitor, analyze, and visualize all your different farm data – your helping hand to achieve optimal conditions. The dashboard is completely customizable to your company's needs, giving insight in and control over your process. Short-term predictions (early warning) as well as long-term predictions (planning) significantly contribute to the efficiency of your birds' performance. As such, it ensures that daily priorities as well as long-term strategies can be perceived at a glance.



ALL DATA IN ONE PLACE

The dashboard is fully customizable to your requirements.

Solutions



1. Flock management and early warning system

BIOSTATISTICS



2. Integrated health management



3. Customized reporting



4. QCS enabling work planning



5. Integrated process analytics

BIOSTATISTICS



6. Predictive feedstock management

BIOSTATISTICS



7. Production planning



8. Predictive egg flow / egg mass management

BIOSTATISTICS



9. Predictive optimized slaughter planning

BIOSTATISTICS

Modules and functionalities

Our packages

KEY MODULES	FUNCTIONALITIES
DATA COLLECT & INTEGRATE	<ul style="list-style-type: none"> Seamless data collection Intuitive and customized dashboard Smartphone app Manually add and edit data Historical flock upload Automatic calculation of KPIs Silo monitoring
REPORT	<ul style="list-style-type: none"> Excel reporting of all available KPI's through download – daily update Custom configuration of each report Automatic mailing of reports Add technical logs and attach files
BENCHMARK	<ul style="list-style-type: none"> Interactive comparison of all available flocks – active and historical Compare performance both internally and with the market View selected parameters for the entire production cycle, or a set of more than 20 parameters for a specific production week Graphical representation and table
INTEGRATED HEALTH	<ul style="list-style-type: none"> Vaccination schemes Treatment lists Health logs and attached files, health reports Salmonella, campylobacter, and parasitology monitoring
ACTIVE MANAGEMENT	Production agenda: <ul style="list-style-type: none"> Flock action lists: technical actions, feed planning, light schemes, etc. Work lists: unloading, cleaning, machine check, etc. Automatic reminders via email and dashboard File manager (electronic archive)
PRO-ACTIVE MANAGEMENT	<ul style="list-style-type: none"> Prediction of problems Self-learning “Early Warning System” Notifications via mailing and/or app
FINANCIAL	<ul style="list-style-type: none"> Financial dashboard Custom configuration financial dashboard Financial reporting – weekly update Insurance overview report
PREDICTION	<ul style="list-style-type: none"> Prediction of body weight Prediction of feed intake Prediction of egg production, egg weight Prediction of hatchability
PRODUCTION PLANNING	<ul style="list-style-type: none"> Plan the setup of your flocks, in function of requirements in terms of meat and/or egg production Includes DOC & pullet placement
SLAUGHTER PLANNING	<ul style="list-style-type: none"> Combining accurate predictions (depending on input data) with the product demand of the slaughterhouse, resulting in optimal slaughter plan
ERP CONNECT	<ul style="list-style-type: none"> Automatic collection of data from egg processing, slaughterhouse, feed mill
BIG DATASET	<ul style="list-style-type: none"> Specific report for customers with high volume of farmers Estimating the effect of independent variables (genetics, housing system, feeding program, etc.) on the technical performance of poultry

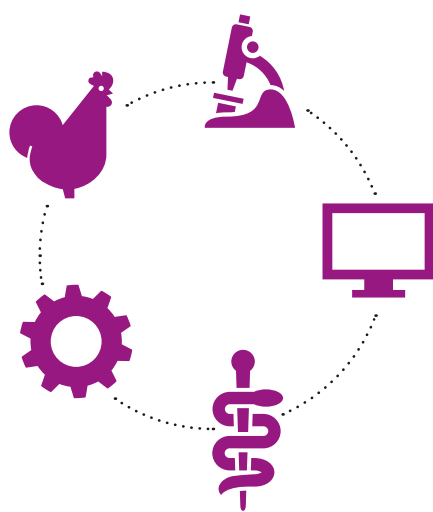
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Porphyrio uses enterprise data intelligently, based on self-learning algorithms, to improve and optimize your production process and business process.

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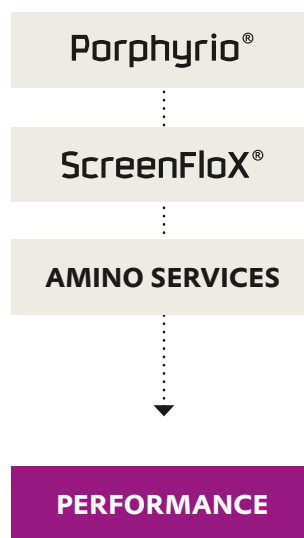
Our solutions are modular and functional, enabling you to start with one or fewer modules and minimal functionalities and expand with complementary assets as you go. Accessibility by different stakeholders in the production process contributes to the strength and benefit of our system.

A winning combination



DRIVEN BY SCIENCE

Evonik Precision Livestock Farming (PLF) is the next step for Animal Nutrition to expand our portfolio that helps sciencing the global food challenge. PLF means combining science-based production and process know-how with digital technologies and seamless connectivity to optimize every stage of livestock production – animal nutrition, health, and farming – in one holistic approach. Within PLF, we bring together animal scientists, nutritionists, data scientists, and software developers to help deliver solutions before real problems occur.



COMMITTED TO PERFORMANCE

Alongside **Porphyrio®**, essential parts of our PLF platform are **ScreenFloX®** and **Amino Services**. Our well established analytical, dosing, and handling services target at an optimal feed composition and precise feed manufacturing. Our DNA-based test solution **ScreenFloX®** supports the control of whole flocks on farms and enables real-time quantification of several pathogens through qPCR. This puts you in a position to take early action. The net result of Evonik PLF: higher efficiency, better margins, and improved livestock performance.



CONNECTED GLOBALLY

With offices in more than 60 countries, we ensure maximum coverage and service quality for customers in over 100 countries. With production plants on three continents, over 50 warehouses worldwide, and more than 10 labs for NIR and wet chemistry services, we can deliver reliably – on time and in the right quantity. Evonik scientists stay in close contact with universities and research institutes, and share their knowledge in scientific papers and trainings. Our customers can count on a service level that adds up to best results.

Evonik at a glance

Evonik is one of the world's leading specialty chemicals companies. The central elements of our strategy for sustained value creation are profitable growth, efficiency, and values. In 2019, Evonik's more than 32,000 employees generated sales of €13.1 billion.

One of the three operative segments of Evonik is the Nutrition & Care segment, which makes products for applications in consumer goods for everyday needs, in animal nutrition, and in the healthcare industry. In this segment are seven Business Lines, of which Animal Nutrition is the one active in the food and animal feed market. It is one of Evonik's key end markets.

EVONIK ANIMAL NUTRITION

Evonik Animal Nutrition is a highly reliable, globally operating provider of science-driven products and services for sustainable and efficient production of meat, fish, eggs, and milk. The organization is marked by scientific excellence and sensitivity to the needs of our customers and society.

OUR MISSION

We use science to improve sustainability, health, and efficiency along the food chain to feed growing populations with animal protein for generations to come.

WHAT WE STAND FOR

Our unique combination of scientific excellence and customer-centered products and services sets us clearly apart. Our customers know they can count on us, because everything we do is firmly rooted in proven science and implementation expertise.



IN DIALOGUE

You can reach us in many ways – by email, social media, telephone, or a personal visit. We look forward to serving you.

Contact:
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Check out our video –
Precision Livestock Farming
at Evonik Animal Nutrition.

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