Nutreco, our track towards digitalisation

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AgroConnect-zomerseminar

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About Nutreco

Nutreco today

>100
Production plants in **37** countries

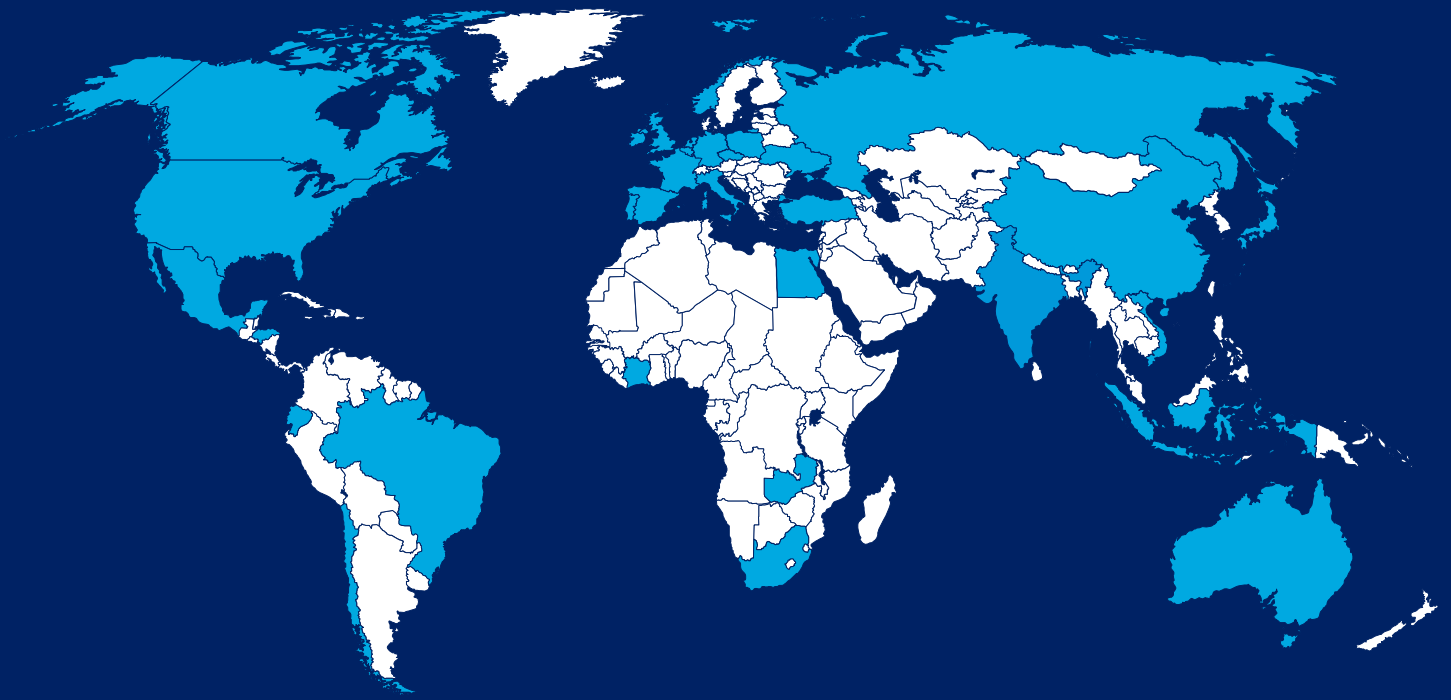
>11,000
Employees

€6.4 billion
Revenues

>4,000
Employees in growth geographies

trouw nutrition
a Nutreco company

SKRETTING
a Nutreco company



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Times are changing…

Consumer:
- Divergent diets
- Unequal cost of food
- Food safety & health
- Sustainability & Environmental impact
- Transparency
- Urbanization
- Humanization of animals
- Animal welfare
- New food Production systems

Our customers:
- Integration
- Consolidation
- Professionalization, more knowledgeable buying behavior
- Market differences (species, geographies, products, channels)
- Need for convenience (e.g. inventory management)
- Changing trade & regulations

Business:
- Sustainability
- Scarcity of natural resources
- Globalization. glocalisation and locavorism
- Emerging economies
- Trade barriers
- Political instability
- War for talent

Technology:
- Big data and analytics
- Internet of Things
- Sensors
- Artificial intelligence
- Machine learning
- Biotechnology
- Bioinformatics
- Alternative proteins
- High-Tech farming systems

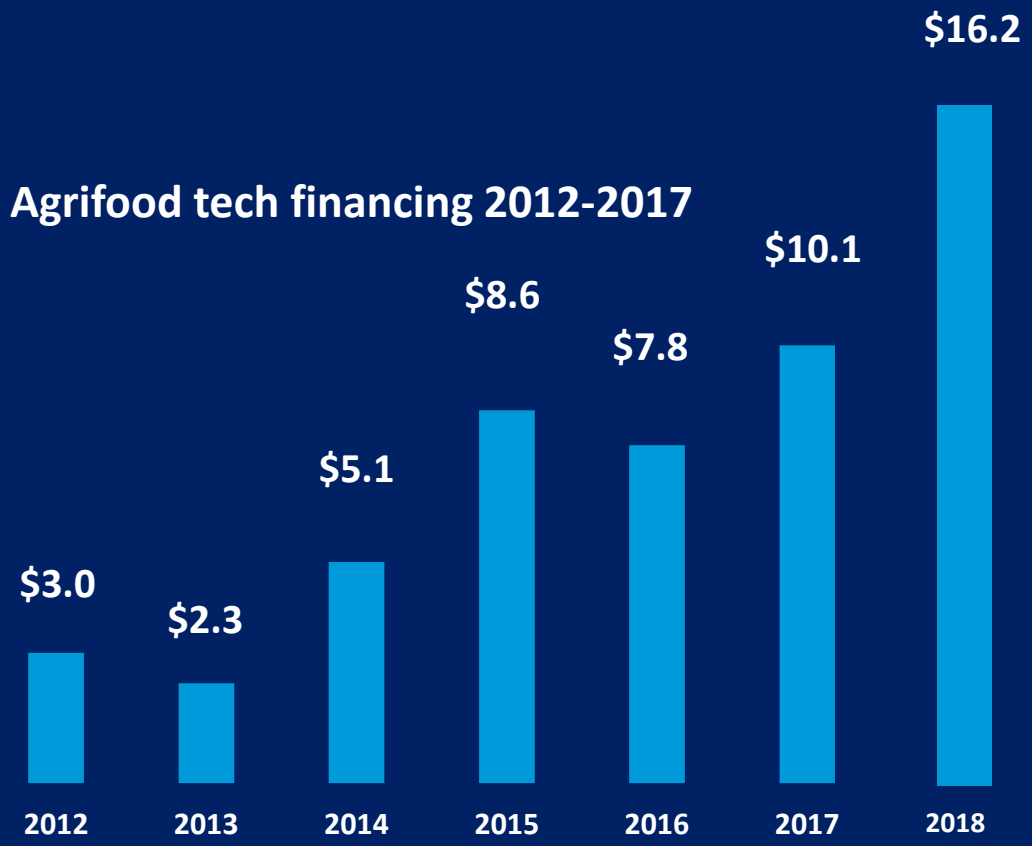
… while major industry disruptors are on the horizon

FINANCIAL TIMES JANUARY 8, 2018

Agricultural trade + Add to myFT

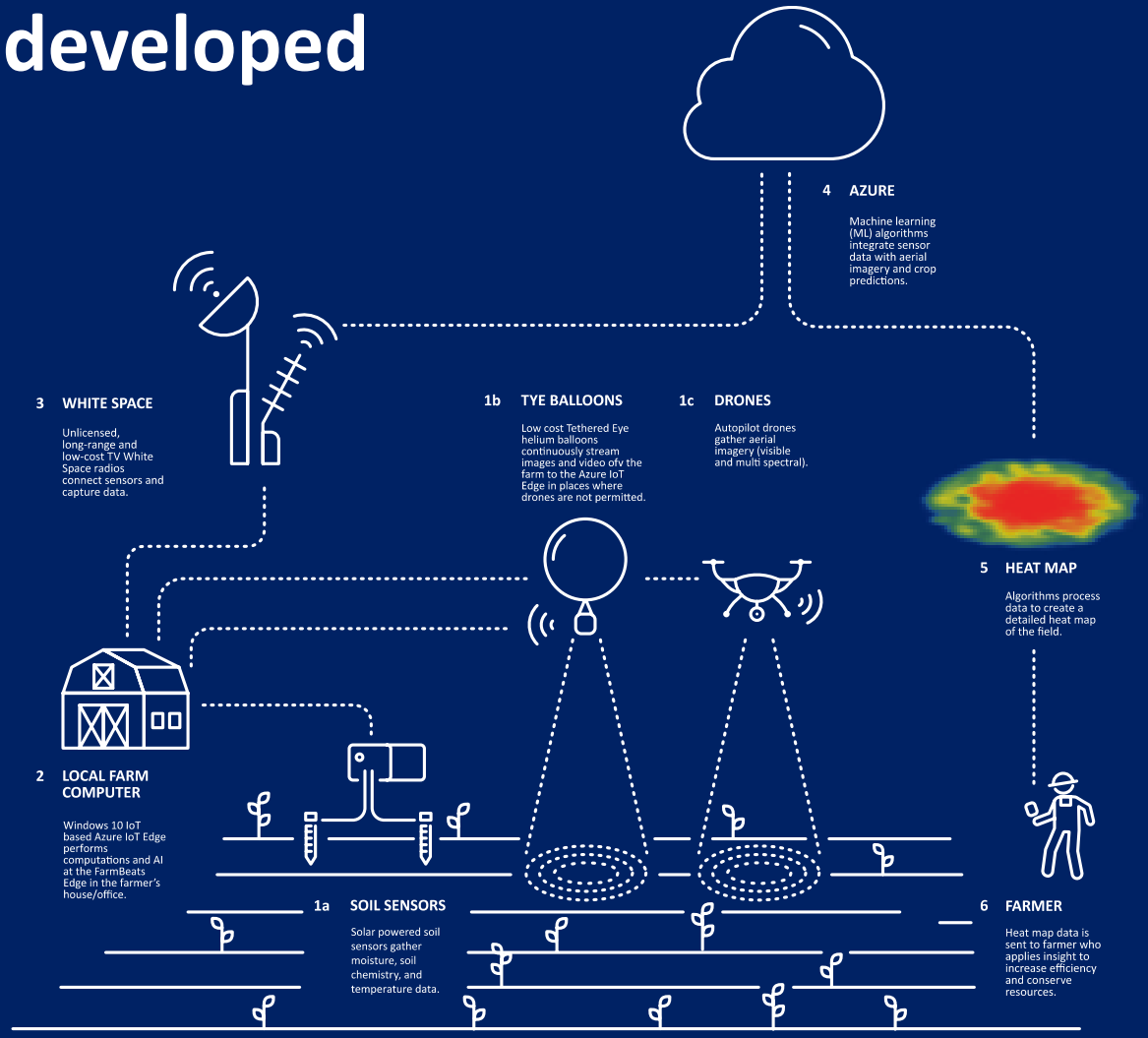
Ag tech fundraising doubles as farmers seek disruptive solutions

'Big ag' companies increased their investments in 2017 alongside venture capitalists



Food & agricultural technology is developed outside of traditional players

Microsoft Azure and AI technologies enable farmers to improve yields, lower costs and reduce environmental impact of farming



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Large tech companies ‘consume’ retail and expand their platform to food & agriculture

The Moonshot Factory

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Even e-commerce giants are looking at livestock farming

FINANCIAL TIMES JUNE 7, 2018

Alibaba + Add to myFT

Alibaba brings artificial intelligence to the barnyard

Ecommerce group experimenting with smart systems to boost productivity of Chinese farms

Alibaba is using AI technologies and smart sensors to monitor each hog's activity and state of health — data that will then be analysed and turned into a real-time report card for the pigs: more exercise for slothful ones that need to burn fat and grow more meat, say, or increasing feed for pregnant sows.

The technology will also be able to detect sick hogs and collect data allowing the farmer to create the optimum environment for the herd, crops or orchards.

Alibaba reckons its self-styled "agricultural brain" could lead to three more piglets being born per sow and cut the newborn death rate. That would lift the pigs per sow per year to 32, bringing China in line with advanced pig-farming countries — a handy increase in supply for consumers at a time of higher tariffs on US pork.

Have you heard about synthetic biology?

GINKGO BIOWORKS
THE ORGANISM COMPANY

> With help from software-directed robots, 10 technicians in [Ginkgo's] factory can equal the output of 50 to 100 scientists working by hand at a bench.
>
> THE WALL STREET JOURNAL

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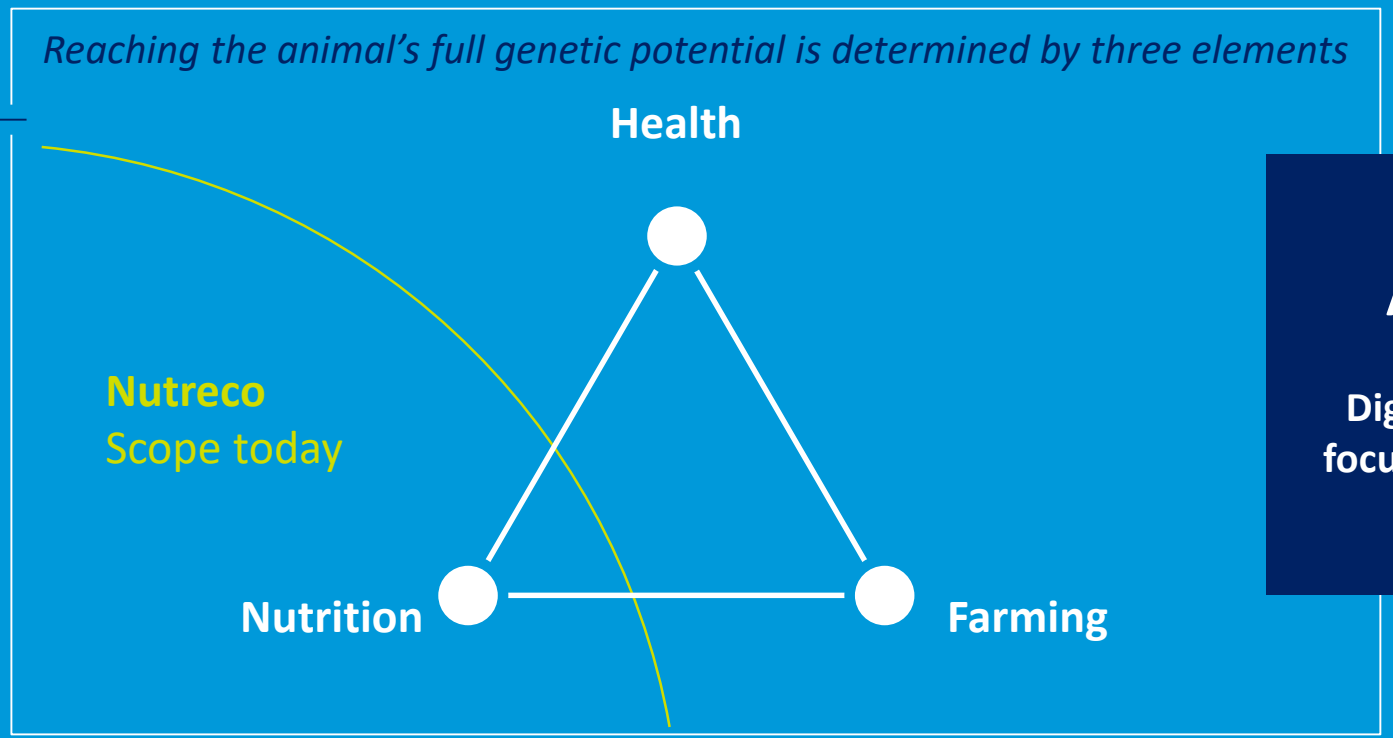
Nutreco Vision 2030

Digital is key in offering solutions to our customers that promote animal health and performance in an integrated way

OUR OBJECTIVE

Be the partner of choice of professional farmer

Reaching the animal's full genetic potential is determined by three elements



Ambition 2023

Digitally-enabled farm-focused solution provider

NuFrontiers is Nutreco's strategic innovation and investment arm, investing in technology-driven early stage companies and partnerships

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Start-ups & Scale-ups

Partnerships & Joint-ventures

Eruvaka

VIAQUA THERAPEUTICS

fodjan

Kiverdi

Feed Algae Ltd.
Making Algae Affordable

seafarming systems

ROXEL

eg. Eruvaka

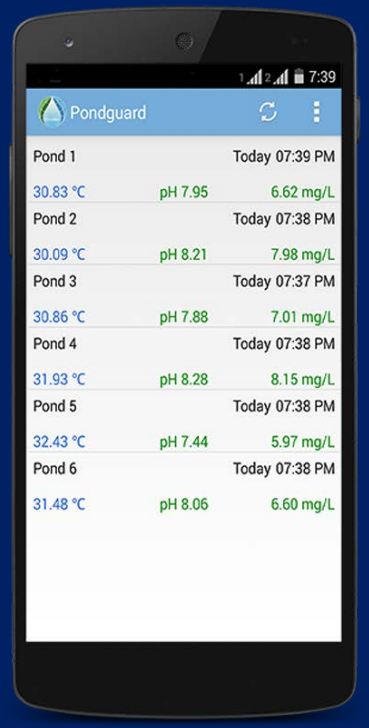
Nutreco takes share in IoT start-up Eruvaka to help shrimp farmers increase productivity

Eruvaka's products monitor pond parameters and remotely control automated equipment

- reducing farming risk
- increasing feed efficiency, shrimp growth and farm profitability.

Skretting will work directly with Eruvaka to implement the latest in precision farming technology, firstly in Latin America

The technology will be incorporated into AquaSim



PondGuard
Real Time Monitoring
Voice Call Alert
Pond Protection
Automatic Control

PondMother
Automatic feeder
Intelligent feeder
Feeding schedules
Reduces FCR

PondLogs
Pond Management Software
Feed Records Integration
Yield analysis

Skretting 360

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eg. fodjan

Smarter livestock feeding

- On-farm dairy feed formulation app enabling multi-parameter ration optimization linked to input and output data
- Significant potential to contribute to Trouw Nutrition dairy strategy by leveraging their platform for deployment of our nutritional models
- Potential to expand to other species

On-site advisor

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These pigs are watched very closely

Collaborative research project:

Trouw Nutrition: welfare-related precision feeding and nutritional additives with (in vitro) models, data science and behavioural studies to support the health and improve performance.

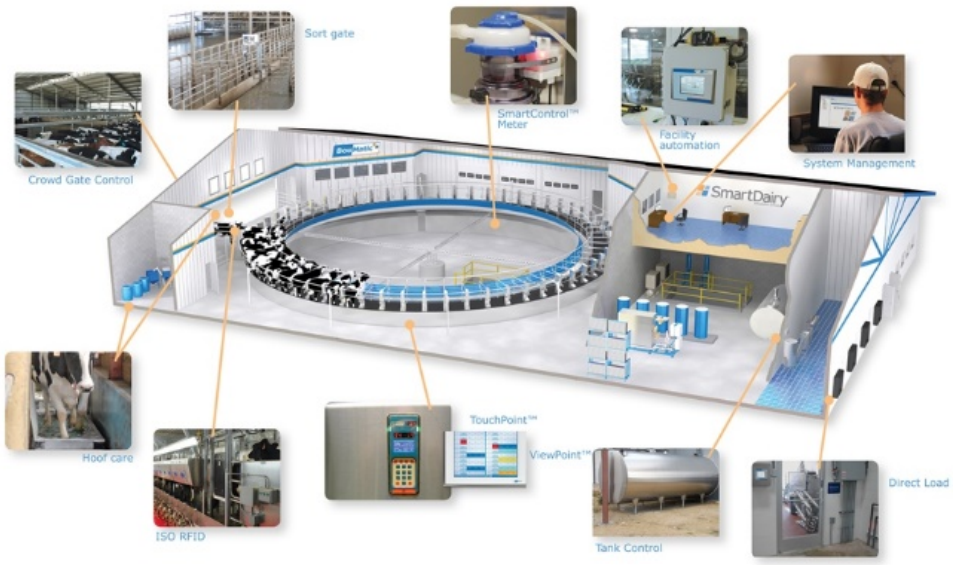
Noldus: behavioural research, providing sensors and develop the ‘Intelligent Behaviour Research Platform (IBRP)’, where all the data will come together and be made accessible and easily usable.

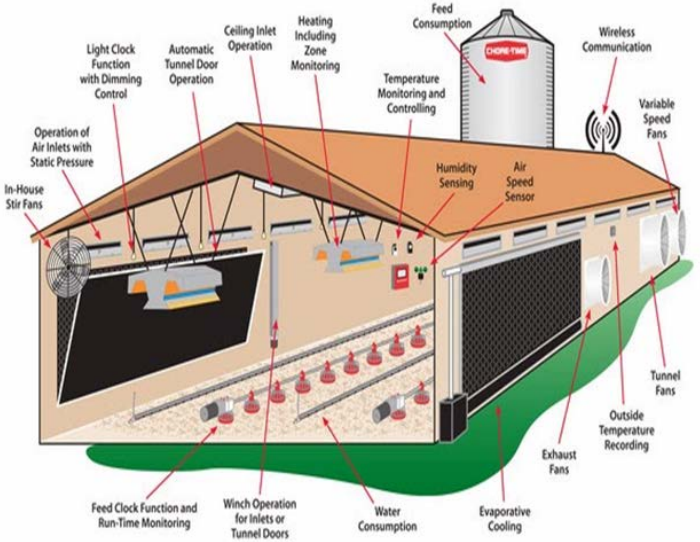
Sorama: 3-D video camera which is able to capture, distinguish and interpret sounds

Radboud UMC understanding the mechanistic underpinnings of human cognition and behaviour in health and disease.

WUR: developing models on d ‘intestinal organoids’.

Digital farming is here today and here to stay





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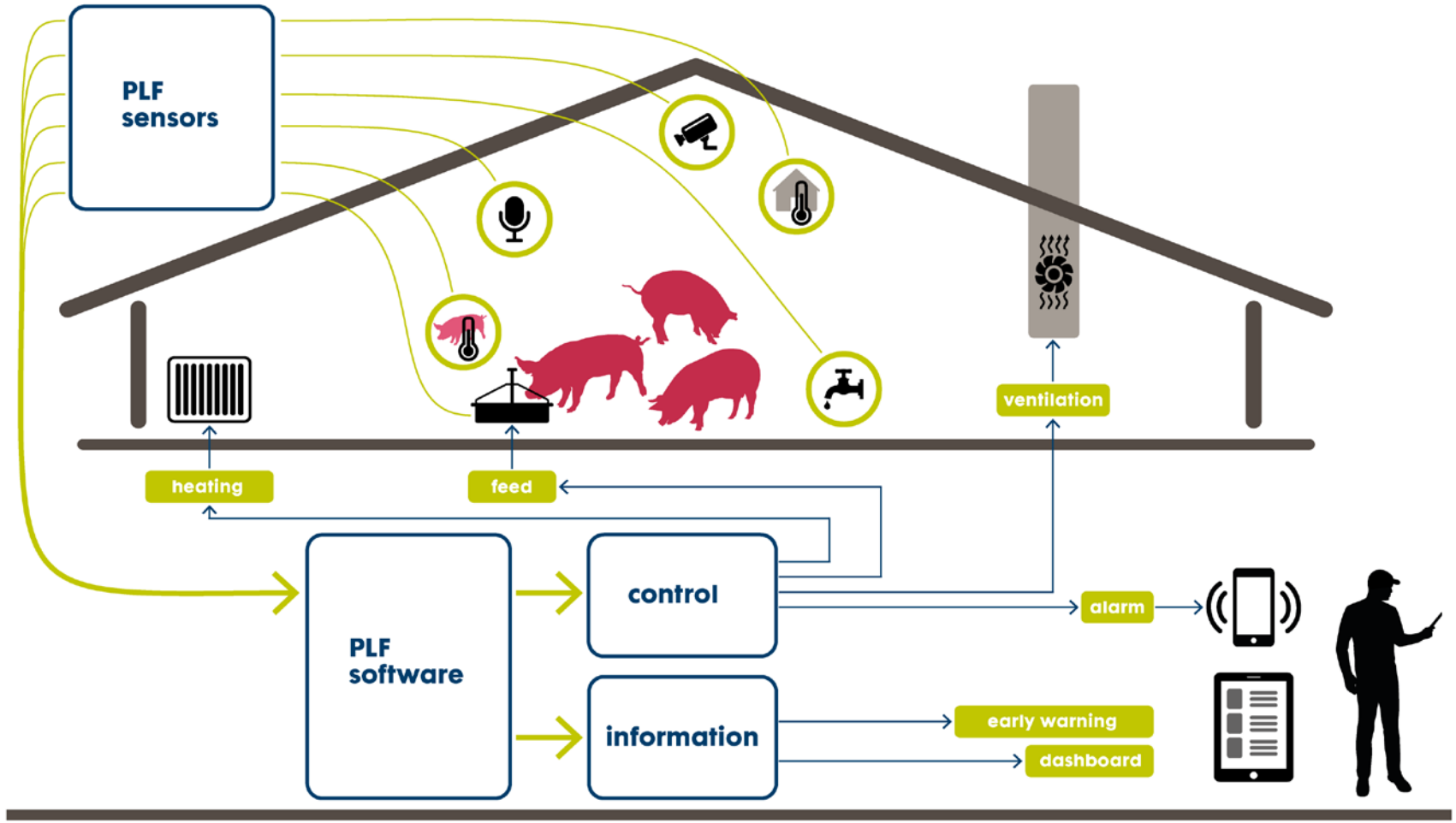
Precision Livestock Farming



ØDYSSEY

ENABLING THE MOST SUSTAINABLE, SECURE AND FAIR FOOD VALUE CHAIN

Building next-level infrastructure for open, sustainable, fair global food production. Decrease the volatility and inefficiencies at the core of the protein value chain by incentivizing farmers to establish proof of their production outcome and rewarding them fairly for it. Work on a new solution with the industry and tech experts of Nutreco and find new ways to solve the planet's food problems.

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feeding the future

Ecosystem lead partners

Ministry of the Interior and Kingdom Relations

ENEXIS NETBEHEER

NUON VATTENFALL

Ecosystem members

provincie groningen

New Energy Coalition

provinsje fryslân provincie fryslân

provincie Drenthe

Deloitte.

FACTOM PROTOCOL

NOM WE INVEST IN DEVELOPMENT

University Medical Center Groningen

IOTA

gasunie

Strategic partners

EUROPEAN UNION European Regional Development Fund

Dienst Uitvoering Onderwijs Ministerie van Onderwijs, Cultuur en Wetenschap

KVK

PBNF

Hanzehogeschool Groningen University of Applied Sciences

TVM VERZEKERINGEN

KLM

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Our Common Future ROADMAPS FOR OUR FUTURE SOCIETY

Radboud University

Gemeente Groningen

kadaster

Ministry of Justice and Security

university of groningen

ebpi

SNN

Track lead partners

apg

IFV Instituut Fysieke Veiligheid

Regulation partners

DeNederlandscheBank EUROSYSTEEM

AFM

Community partners

Crypto Valley Supporting Partner

ethereum DEV NL MEETUP

HOLLAND FINTECH

StartupDelta

Tech friends

MATTEREUM

ocean

sweetbridge™

Software Improvement Group

BIGCHAIN DB

Legal partner

LOYENS & LOEFF

Acceleration partner

Brightlands Knowledge crossing borders

YES! DELFT

VENTURELAB North

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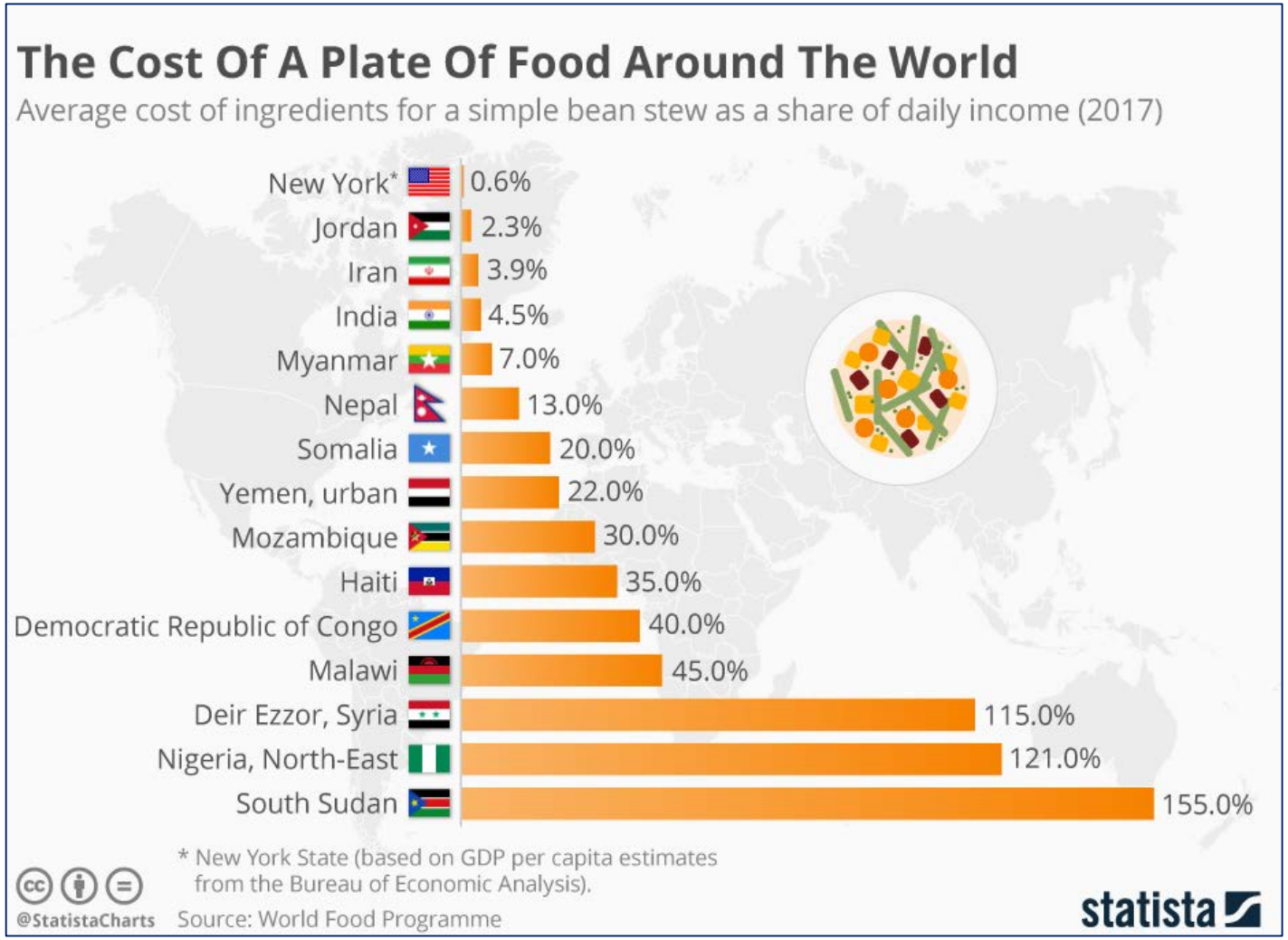
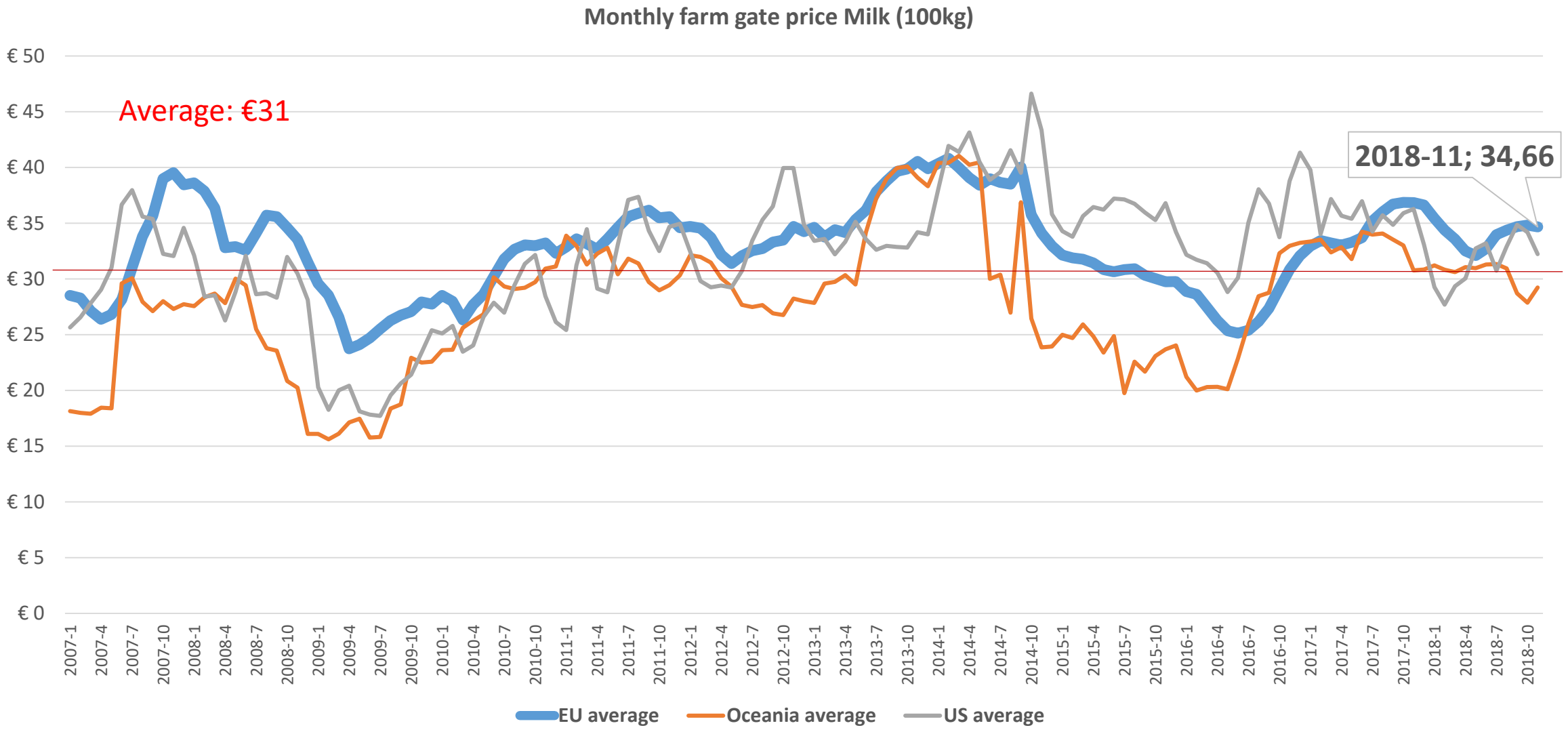
feeding the future

If people go hungry, it is often because food is unaffordable: our world is riddled with disparities in the cost of basic nourishment.



https://www1.wfp.org/publications/2017-counting-beans-true-cost-plate-food-around-world


Monthly farm gate price Milk (100kg)
Average: €31
2018-11; 34,66
€ 50
€ 45
€ 40
€ 35
€ 30
€ 25
€ 20
€ 15
€ 10
€ 5
€ 0
2007-1
2007-4
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2018-1
2018-4
2018-7
2018-10
EU average
Oceania average
US average

0.61
0,5 l

AH Halfvolle melk

0.71
0,5 l

AH Karnemelk

0.71
0,5 l

AH Volle melk

0.98
1 l

AH Magere melk

0.98
1 l

AH Karnemelk

1.02
1 l

AH Halfvolle melk

25% KORTING

~~1.08~~
0.81
1 l

AH Magere melk fles

25% KORTING

~~1.12~~
0.84
1 l

AH Halfvolle melk fles

25% KORTING

~~1.12~~
0.84
1 l

AH Karnemelk vol

1.12
1 l

AH Volle melk

You pay

Farmer gets €0,34

25% KORTING

~~1.29~~
0.97
1 l

AH Volle melk fles

1.29
1 l

AH Halfvolle melk met extra calcium

1.33
1 l

AH Karnemelk fruit framboos

1.36
1,5 l

AH Karnemelk

1.43
1,5 l

AH Halfvolle melk

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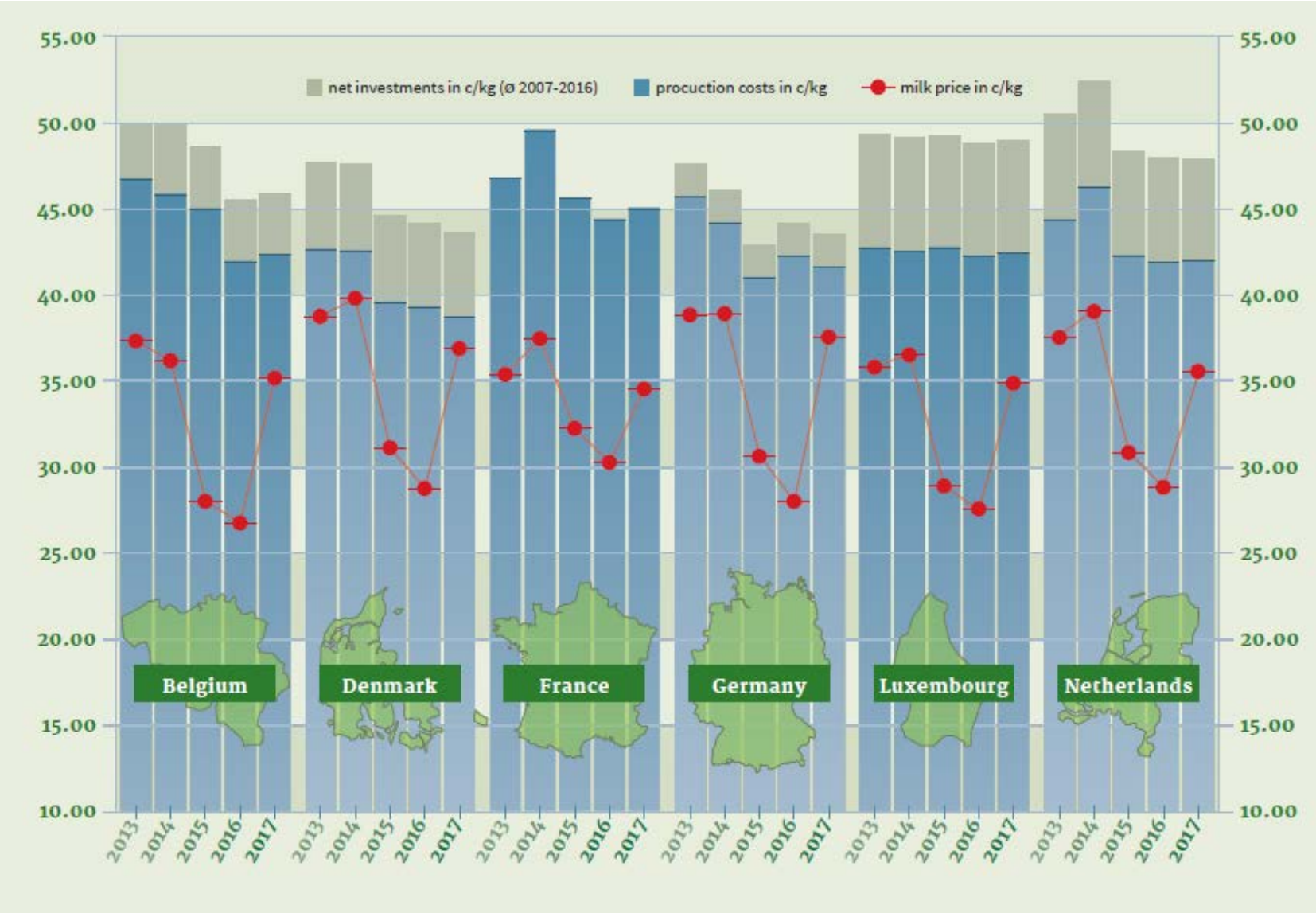
https://www.ah.nl/appie-app

There is a gap between milk production costs and producer prices



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http://www.europeanmilkboard.org

Odyssey hackthon, the end of a journey…

Nutreco
37,430 followers
1d

Time's up! After two days of coding and co-creating, all teams must take their hands off their keyboard at 12:00h CET. Time to give a big virtual high five to the teams who compete in the #FeedingTheFuture challenge at the Odyssey hack… ...see more

Nutreco
37,430 followers
1d • Edited

Our colleagues Teresa Debesa, Gijs Nijman, Drs. Erik Beckers RE CISM, Maria Angela Calmet, Neil W. Jaworski and our partners Denise Schweitz and Henk Bethlehem actively collaborate with the coders competing in the hackat ...see more

….the start of a new one!

Challenges in the food value chain

Highly competitive, low margins	Very diverse industry	Many, many actors	Capital intensive	Perishability, quality and safety not visible
Not digital yet, but about to change	Very little standardisation of definitions, practices and legislation	Data ownership	Integrate data flows from devices	No global coverage
We need aggregators to get global level	Historical data needed for prediction	Use established standards on the cloud	Simple for the farms, no extra or less work	Data to information

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Thank
you