



*Proteins of the future, now!*

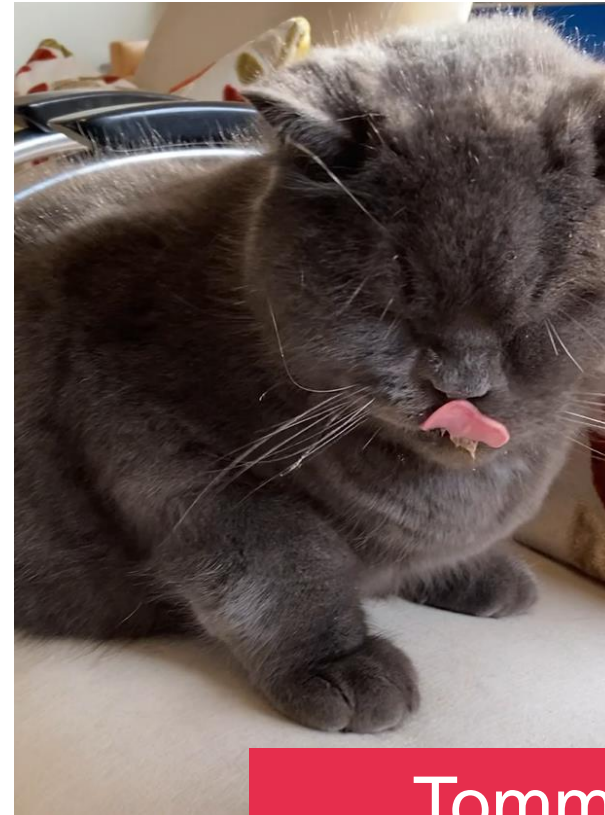


Herman Sloot  
Calysta Germany GmbH  
Heidelberg

# First happy customers already! around Heidelberg....



Frankie




Tommy & Jonny

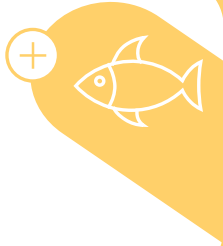


# Petfood industry faces constraints in future protein availability


**More aquaculture**




Global aquaculture production to grow 22% from 2022 to 2030




**More pets**




Global population of dogs and cats to grow 21% from 900 million in 2022 to 1.1 billion by 2030



**More people**




Global human population is expected to grow 10% – an incremental 800 million – to 8.5 billion by 2030



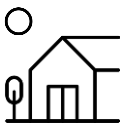
**Limited natural resources: arable land & water**

**Food production is the largest global consumer of freshwater worldwide**



Currently **70%** of the planet's freshwater

**Arable land used for global food production**



Currently **40%** of land use

**Current protein production systems are unsustainable**

**Intensified animal and crop production systems accelerate:**

- Climate change
- Pollution – air, soil and water
- Deforestation
- Loss of biodiversity
- Soil erosion
- Animal welfare issues
- Antibiotic resistance
- Unfair working conditions

**We cannot extrapolate current animal- and plant-based systems into the future, as we did in the last 25 yrs. We need new technology, to become part of a diversified and sustainable protein supply**

# Proteins by Fermentation of Bacteria

As an alternative to animal-based and plant-based, Calysta produces proteins by **fermentation of natural bacteria**:

- Abundant low-cost and non-food feedstock (natural gasses), driving production at scale at affordable cost
- Sustainable: No need for arable land, almost no water, and no plants nor animals, Path to net zero production in place. No competition with Food Feedstock. 100% NON-GMO

## A long journey:

- **2013** founded in San Mateo (USA): **Developing at Lab-scale**
- **2017** Pilot plant: from lab to **semi-industrial scale** in Teesside (UK)
- **2020**: Joint Venture with *Adisseo* – construction of **full commercial production** (production commissioning Started Q1 2023), invested > USD 150 mio)
- **2022**: Founding Calysta Germany GmbH: Global **commercial development** from *Heidelberg*



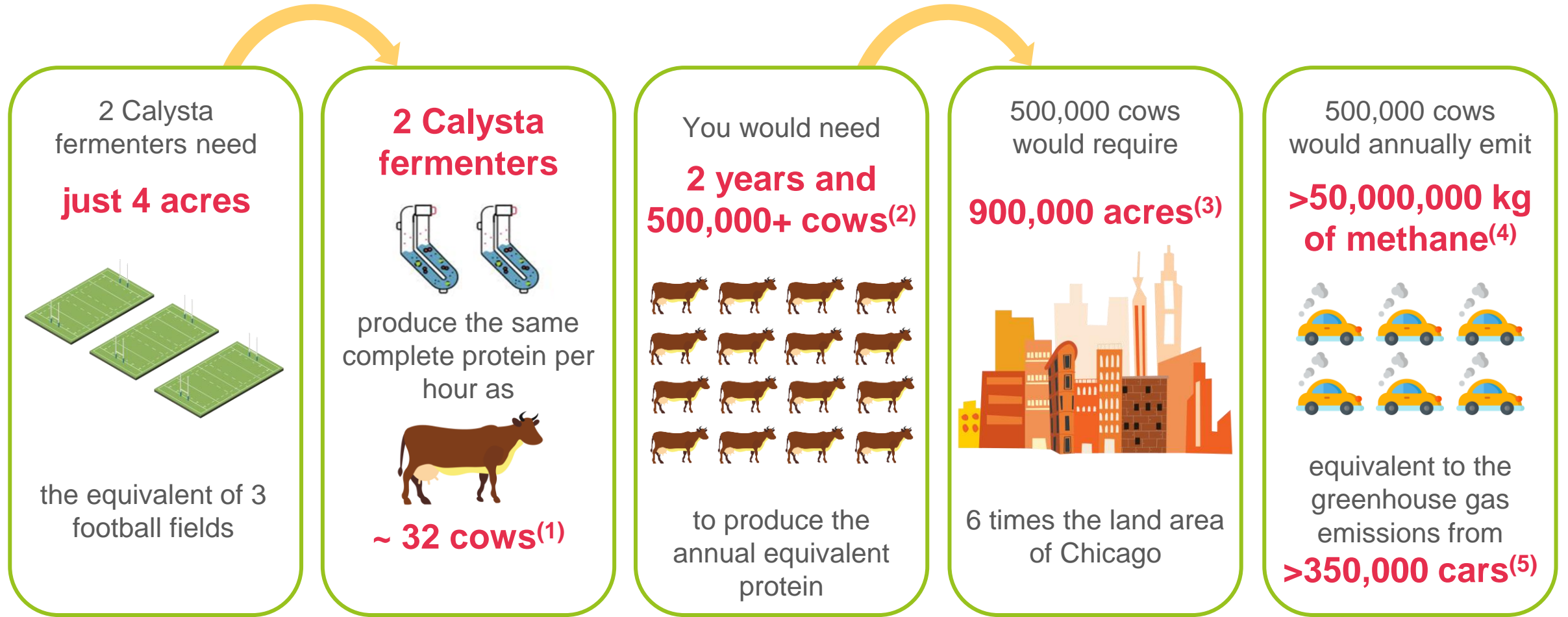
Calysta is targeting feed- and petfood applications globally with a fully controlled, scalable production of high-quality microbial proteins

# Factory fully online

Calysta: From start up in 2013, to a full industrial scale fermentation plant in 2024, with regulatory approval in Feed in place, producing ready to produce up to 20.000 Mt Non-GMO protein



# Fermentation will redefine the Meaning of Protein Sustainability



(1) 2 Calysta fermenters produce ~20 ktpa or 20 million kg per year; assuming 70% protein content results in 14 million kg of protein per year; 8,760 hours in a year implies ~1,600 kg of protein per hour; one 200 kg cow produces ~50 kg of protein at 25% conversion; 1,600 kg / 50 kg implies that 2 Calysta fermenters produce the equivalent of 32 cows per hour  
 (2) Assuming an average of 2 years to raise cattle; 2 Calysta fermenters produces 14 million kg of protein per years or 28 million kg of protein over 2 years; Assuming 50 kg per cow implies 560k cows  
 (3) Assuming 1 cow requires ~1.8 acres of land usage  
 (4) Assuming each cow emits 100 kg of methane  
 (5) Assuming each car emits 4,500 kg of CO<sub>2</sub> and methane has a global warming potential of ~31x CO<sub>2</sub>

# FeedKind as match to Petfood

Intrinsic qualities making it perfect for current trends in the petfood:

## Regulatory status

Fully approved in EU and many other countries (incl. first GRAS in USA)

## Green transition

Hardly land use, water use, reduction of CO<sub>2</sub>, enabling biodiversity, VEGAN

## Healthy Pets

High protein, low ash, full Amino Acid profile, high digestible , POSTBIOTIC benefits

## Techno functionality

Emulsification, building viscosity

## Palatability

Excellent acceptance by dogs AND cats, high glutamic acid content



*First full commercial introductions underway*

*Interzoo 2024*

*More to follow....*



**Seit 1957**  
**Dr. Clauder's®**  
 Tierernährung aus Verantwortung

**Dr. Clauder's Trainee Snack - kultiviertes Protein-**

Dieser Snack enthält eine innovative Proteinquelle aus der natürlichen Bakterie *Methylococcus capsulatus*, die durch einen patentierten Fermentationsprozess gewonnen wird.  
**Das Protein ist vollständig frei von tierischen Inhaltsstoffen.**

**EXCLUSIVE - PATENTED - INGREDIENT**  
 Product Innovation of the year

**Dr. Clauder's**  
 HIGH PREMIUM  
**TRAINEE SNACK**  
 Natural Cultivated Protein  
 (Methylococcus capsulatus)

1. Substrat  
 2. Fermentation Technology  
 3. Cultivated Protein

- + Hypoallergen
- + High digestible protein
- + Excellent nutritional value
- + Best acceptance
- + Instant application
- + 2 years M.O.
- + Sustainable CO<sub>2</sub> Capture
- + Saves land, resources & energy

FeedKind pet  
 Produziert über patentierte Technologie





# Thank You!

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