Business Meets Science Event

Samenwerking van DPC en WLR

16 december 2025, Omnia, Wageningen

R.A. (Rick) van Emous

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DUTCH POULTRY CENTRE

Agenda

- 13:00 – Inloop
- 13:30 – Welkom door DPC vz. Jan Wolleswinkel
- 13:40 – Uitleg middag (Rick)
- 13:50 – Pitches van 5 minuten (incl. 1-2 vragen)
- 15:00 – Pauze
- 15:30 – Matchmaking (3-4 ronden)
- 16:30 – Plenair samenvatten en vervolgstappen
- 17:00 – Bites en drinks
- 18:00 – Einde

Business Meets Science

- Pichtes:
  - Overzicht van het onderzoek waar WLR/WUR mee bezig is
  - Nieuwe innovatieve onderwerpen waarbij we willen samenwerken met pluimvee bedrijfsleven

- Matchmaking:
  - Contacten leggen tussen (jonge) onderzoekers en bedrijfsleven
  - Samenwerken op innovatie !

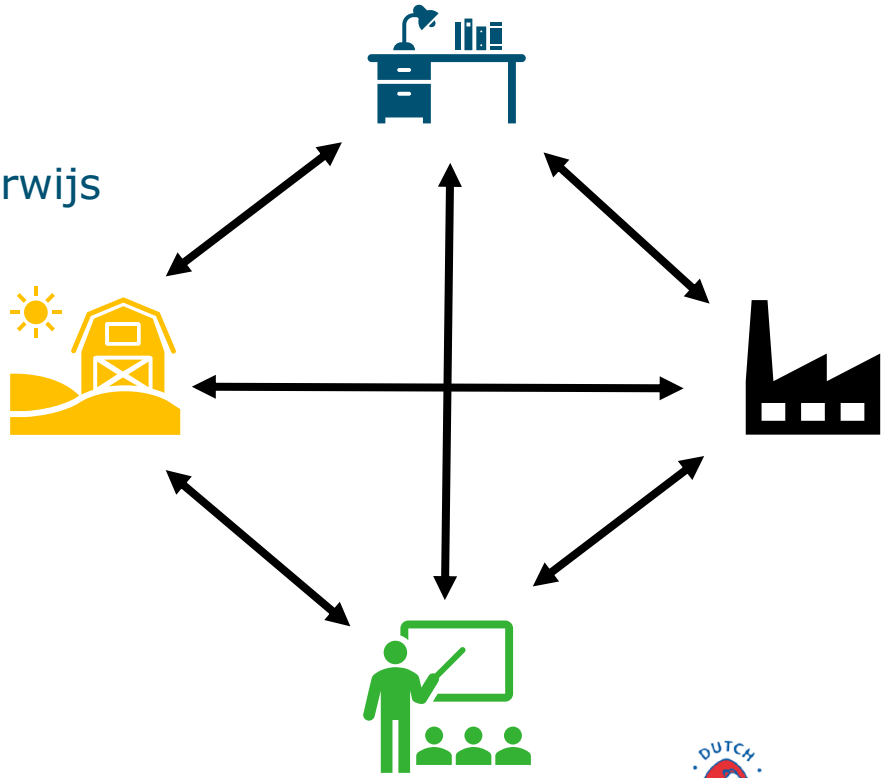
Structuur NL voor innovaties en samenwerking!

- Onafhankelijke pluimveehouders (nauwelijks integraties)
- Samenwerken binnen het BOBO vierluik
- Goed contact tussen onderzoekers en pluimveehouders
- Publiek Private Samenwerking (PPS) projecten
- Regelgeving
- BAF aanpak

‘BOBO‘-vierluik aanpak

- Vroeger hadden we het OVO drieluik:
  - Onderzoek, Voorlichting, Onderwijs

- Nu het BOBO vierluik!:
  - Boeren
  - Onderzoek
  - Bedrijfsleven
  - Onderwijs

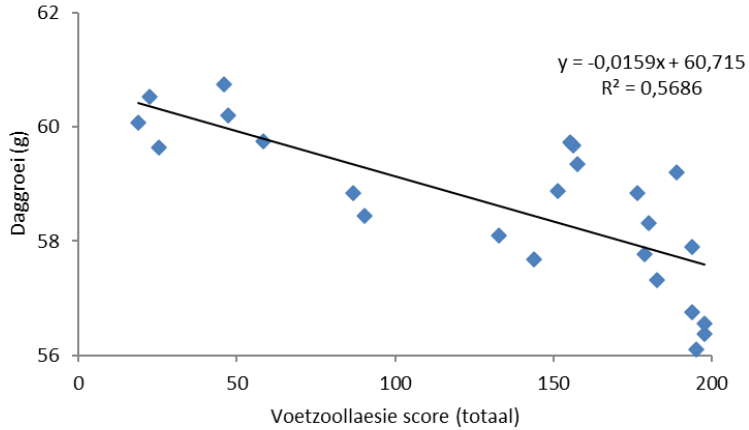


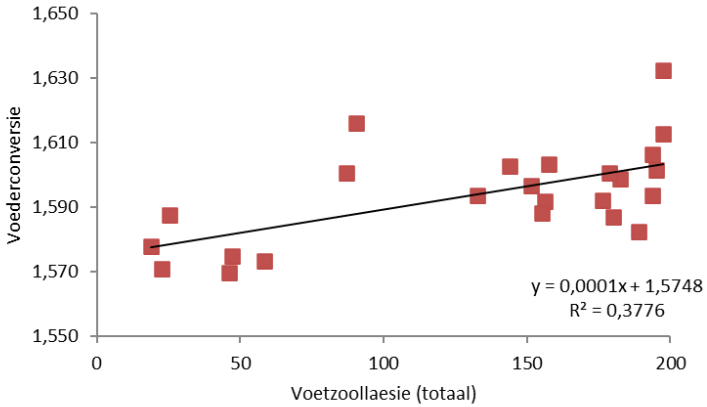
PPS project (bijv: BOF)

- Breeders Of the Future
- Vleeskuikenouderdieren
- 4 jaar project (2024 - 2027)
- Partners:
    - LVVN
    - Pluimveesector (vermeerderaars: AVINED)
    - Keten partijen: fokkerij, voerfabrikanten, inrichting, dierenarts, additieven, diergezondheid

BAF aanpak

- BAF = Better for Animal and Farmer
- Verbeterd welzijn i.c.m. positieve effecten op technische resultaten, uitval, etc.
- Voorbeelden: voetzoollaesies, volière systemen, trager groeiende vleeskuikens





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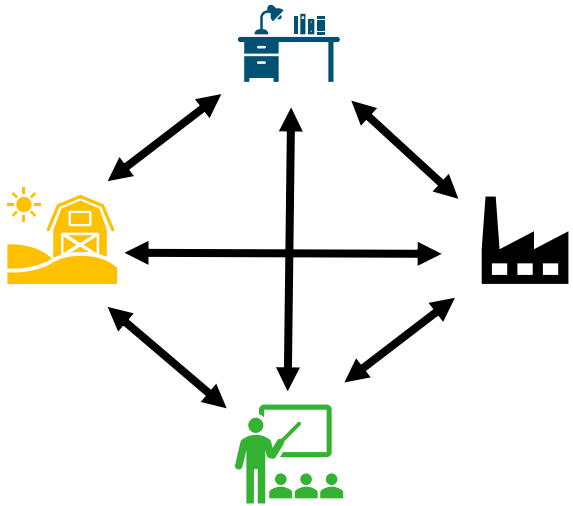
Business Meets Science vervolg

- Brainstorm sessies:
  - Begin 2026 met geïnteresseerde partners
  - Organisatie WLR
- Ontwikkelen van projecten met innovatie en samenwerking!



Pitches

Pitches

1. Malou van der Sluis - ‘Het meten van individueel gedrag met sensoren’
2. Roos Molenaar – ‘Small beaks, Big questions: The future of early feeding research’
3. Kathy Broekmeulen - ‘De kunstmatige kloek. Licht-donker cycli om de start van jonge kuikens te bevorderen’
4. Teresa Johansson - ‘The sound of happiness: geluksgeluiden voor kippen’
5. Anna Doerper - ‘Live insects as feed for poultry’
6. Sonja de Vries - ‘Wanneer vezels de context bepalen: eiwit- en aminozuurverteerbaarheid in perspectief’
7. Arya Rezaei Far - ‘Local Protein Sources in European Poultry Diets’

1. Het meten van individueel gedrag met sensoren

Malou van der Sluis, onderzoeker Wageningen Livestock Research

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Waarom individueel gedrag meten?

- Manier waarop een dier kan reageren op omgeving
    - Inzicht in gezondheid en welzijn
- Individueel niveau
    - Dier als eigen baseline: detecteren van afwijkingen
    - Mogelijkheid om dit in fokkerij mee te nemen

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Het gebruik van sensoren

- Sensoren aan het dier zelf
  - RFID-tags
  - ultra-wideband tags
- Sensoren in de omgeving
  - video-tracking

1 *ruimtegebruik*

2 *loopscore*

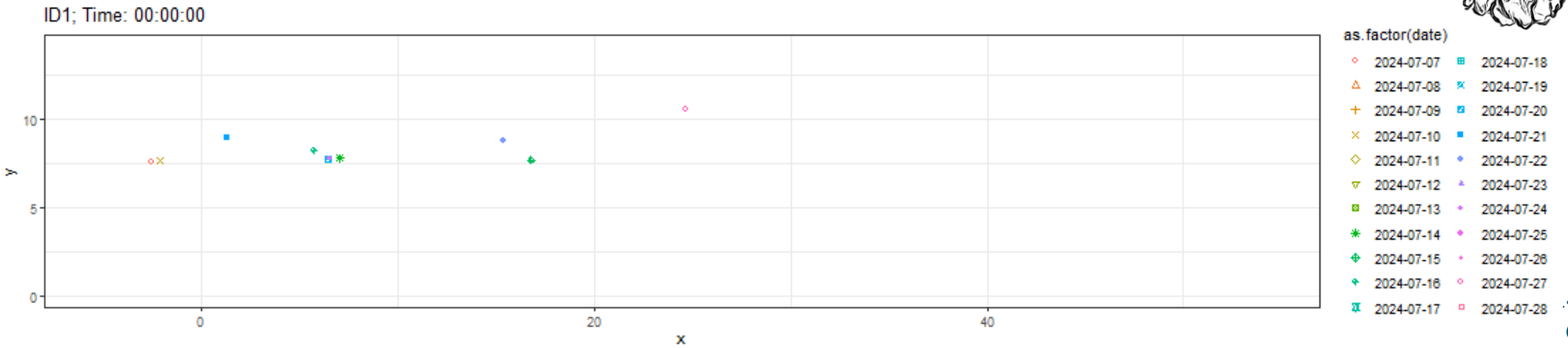
3 *kippen volgen*

Ruimtegebruik in vleeskuikenouderdieren

1

- Ultra-wideband sensor in rugzakje
- Ontvangers in de omgeving → soort kleinschalige GPS

- Waar in de stal zitten kippen en op welke momenten?



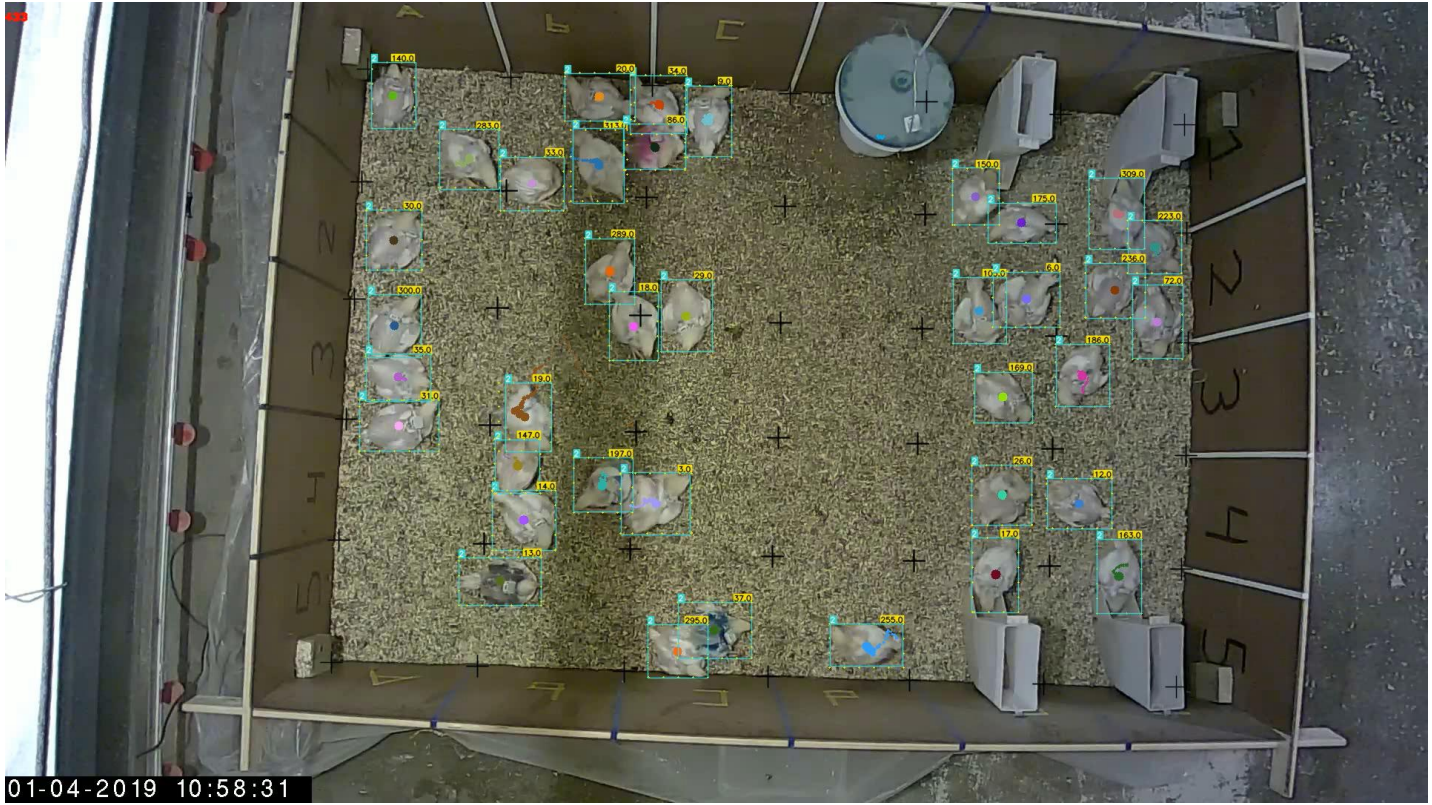
Loopscore van vleeskuikens

2

- Automatisch herkennen van lichaamsdelen
- Berekenen van houding en staphoogte
- Voorspellen van de loopscore

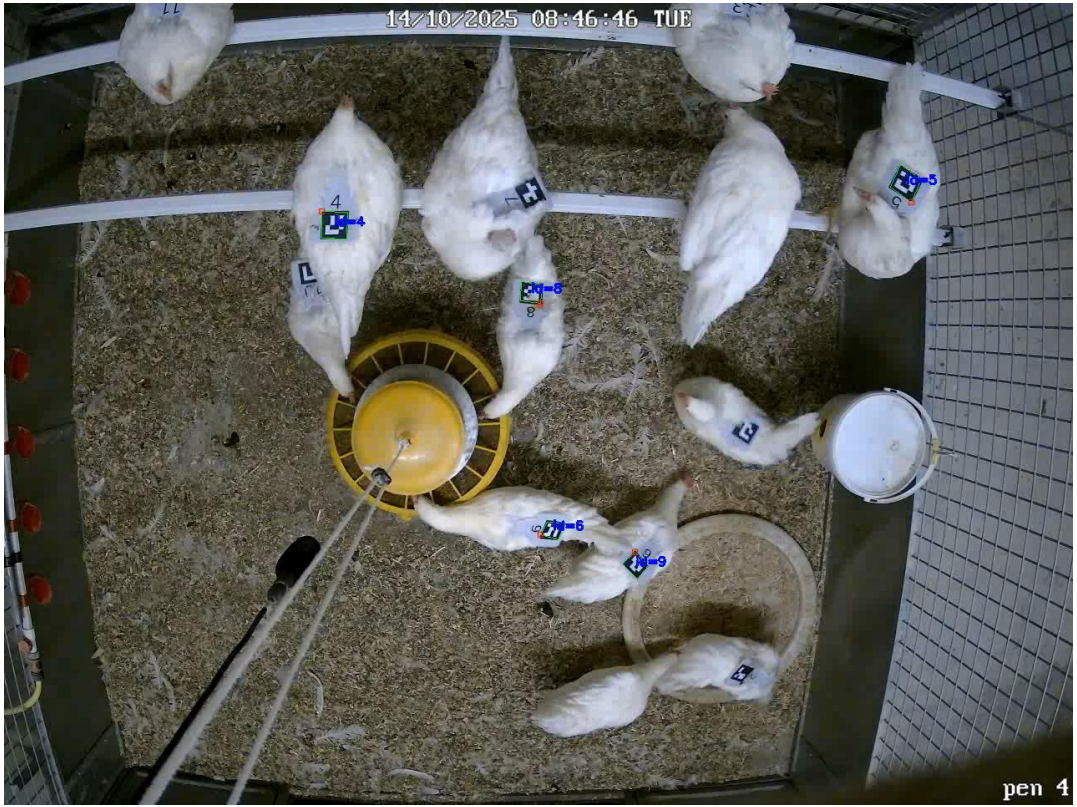
Kippen volgen: vleeskuikens

3



Kippen volgen: leghennen

3



Vraag voor de matchmaking

Wat zou u in de toekomst automatisch willen meten bij kippen?

Bedankt voor uw aandacht!

malou.vandersluis@wur.nl

2. 'Small beaks, Big questions':
De toekomst van vroege voeding onderzoek

Roos Molenaar
Adaptation Physiology Group (ADP), Wageningen University & Research (WUR)

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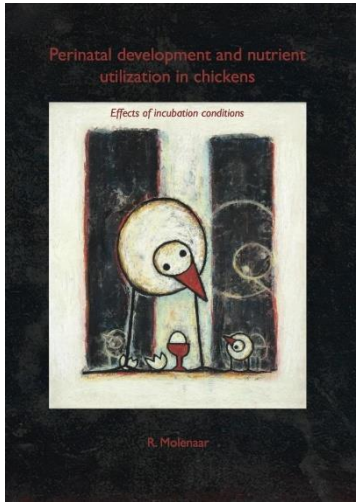
Mijn achtergrond

- Onderzoeker
  HatchTech, NL – tot 2013
- PhD project '*Incubatiecondities*'
  WUR, NL – behaald 2010
- Kwaliteitsmanager
  Broederijen, Australië – tot 2017
- Onderzoeker Adaptatiefysiologie (ADP)
  WUR, NL – tot nu



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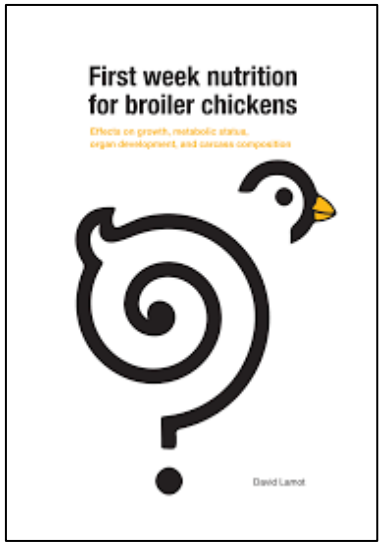
Onderzoek Vroege Voeding ADP

2017



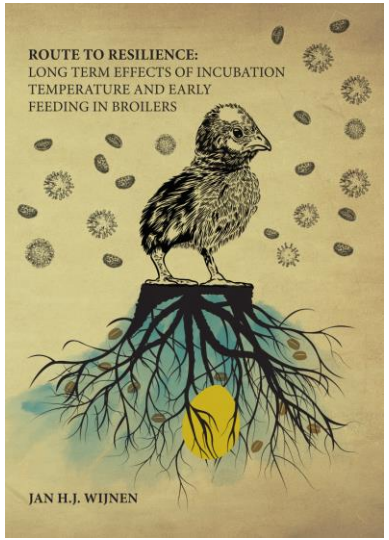
2019 - 2022

健康畜禽 Healthy Livestock

Effect van verschillende uitkomstsystemen op:

- Productie
- Welzijn
- Gezondheid

2022



2023 - 2026

Rapport LVVN Voorjaar 2026

Effect van vroege voeding bij leghennen op:

- Opname voer/water
- Welzijn

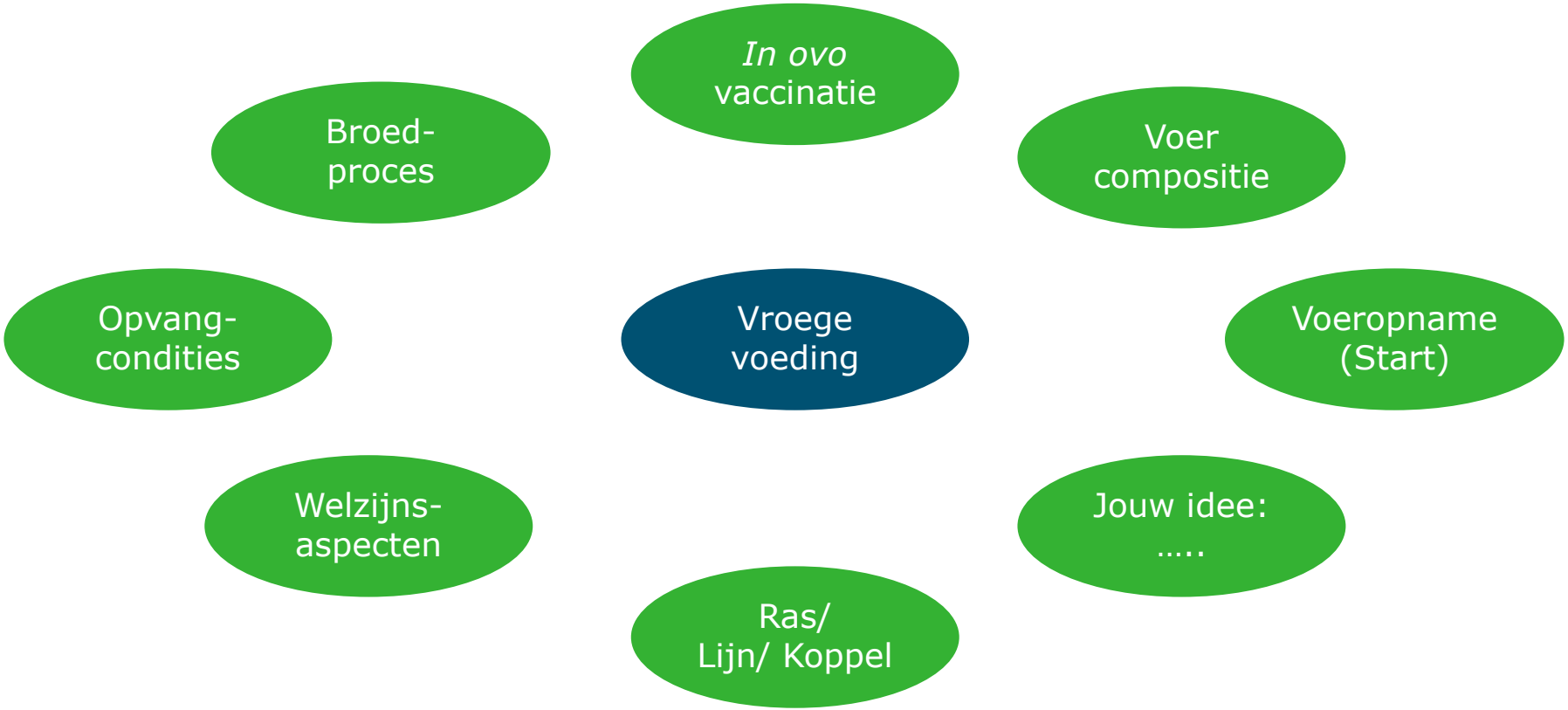
Toekomst Vroege Voeding onderzoek

PPS Project '*Welfare on the Move*' - 2026-2029

Effect van transport van bebroede eieren of gevoerde kuikens

1. Stress en welzijn op korte en lange termijn
2. Factoren om welzijn te verbeteren

Toekomst Vroege Voeding onderzoek



3. De kunstmatige kloek

Licht-donker cycli om de start van jonge kuikens te bevorderen

Kathy Broekmeulen

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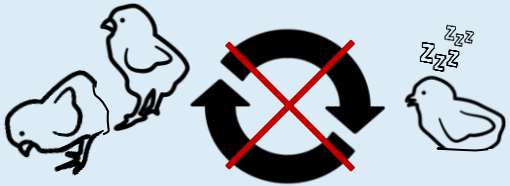
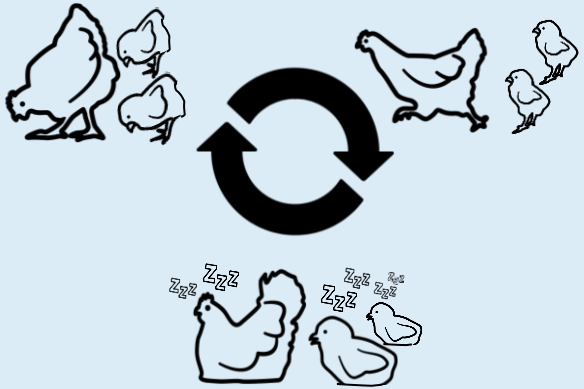
In de stal



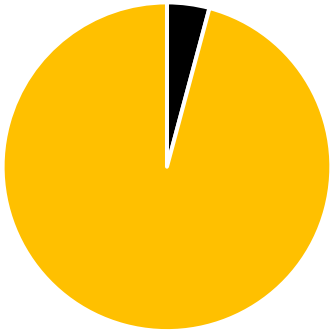
In de natuur



(Nielsen et al., 2008; Riber et al., 2007, 2016; Edgar et al., 2016; Forslind et al., 2022)

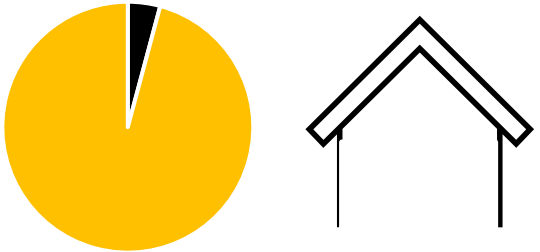
Betere gedragssynchronisatie bij kuikens

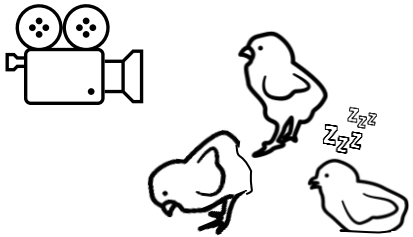
☼ 23 u / ☽ 1u

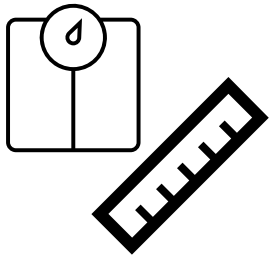


Intermittent

Dark brooder







Dank voor de aandacht!

Vragen of suggesties?

kathy.broekmeulen@wur.nl

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4. The sound of happiness: geluksgeluiden voor kippen

Teresa Johansson, WLR Animal health & welfare

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In-house noise, unexpected noise from outside

Inside

Feeding lines

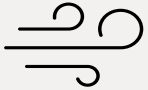
Ventilation

Flock

People

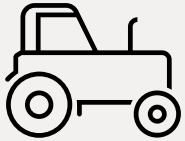
Outside

Storms



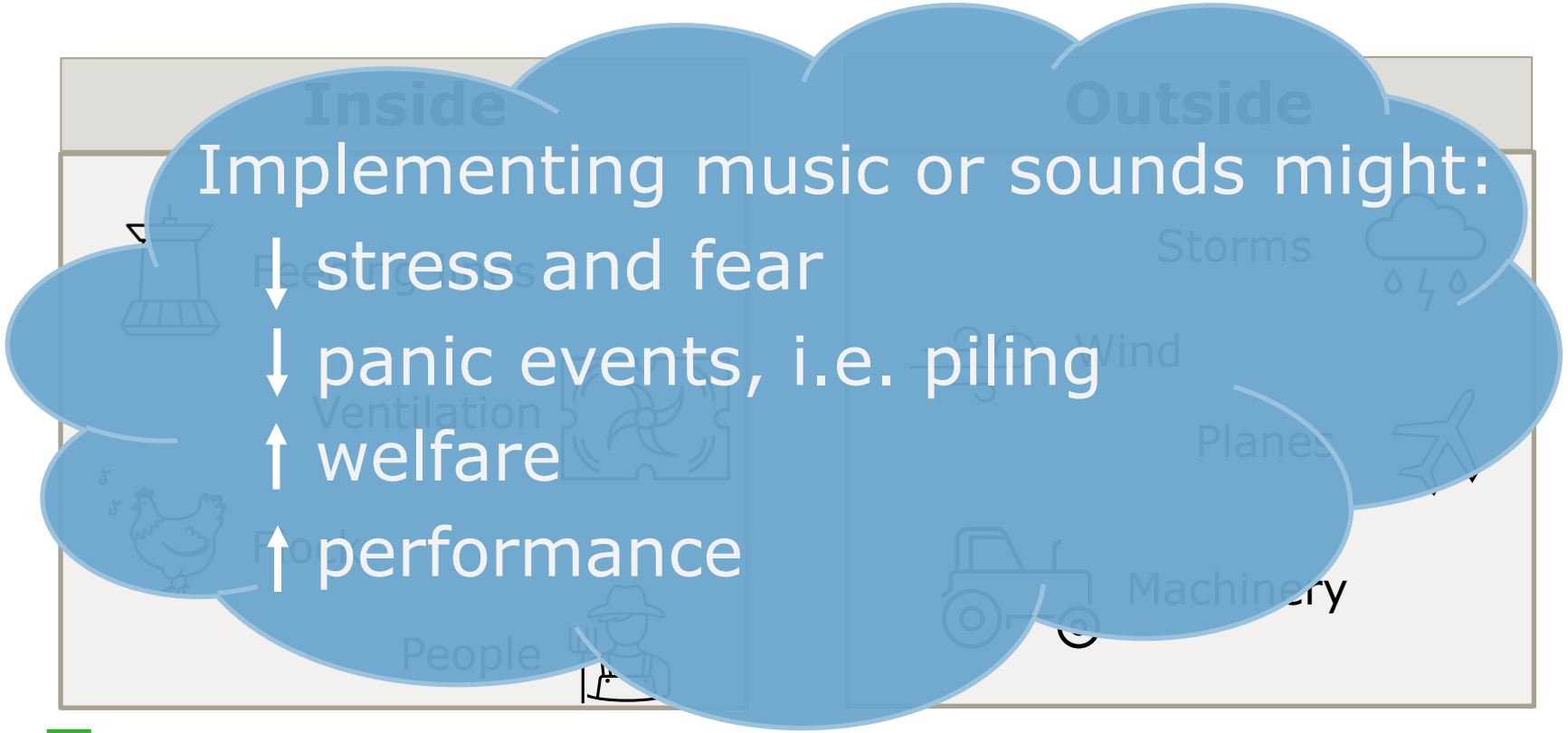
Wind

Planes



Machinery

In-house noise, unexpected noise from outside



Implementing music or sounds might:

- ↓ stress and fear
- ↓ panic events, i.e. piling
- ↑ welfare
- ↑ performance

Sound as an enrichment?

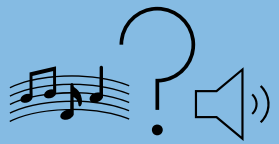
1. Preferences


Music


Nature sounds/
happy flock

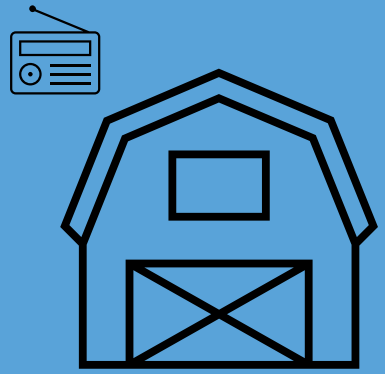

No additional sound

2. Optimisation



- Daily duration
- Volume
- Choice
- Age effect

3. On-farm



Welfare — Behaviour — Performance

Stress biomarkers

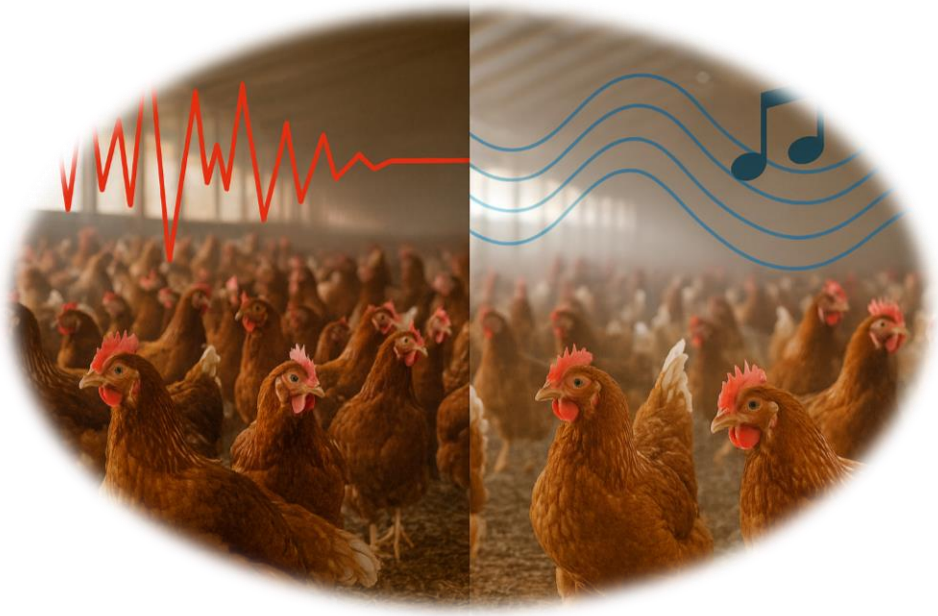
Mortality

Dank je wel!

Vragen?/Ideeën?

Contact details:

teresa.johansson@wur.nl



5. Live insects as feed for poultry

Dr. Anna Dörper

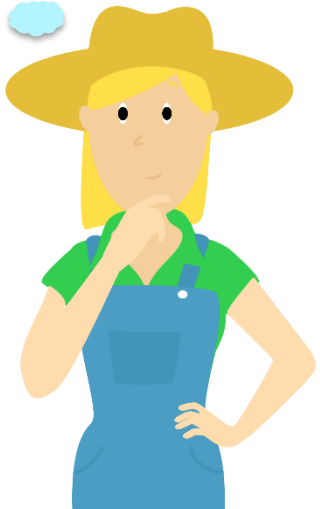
Why live larvae?

- Naturally attractive
- Stimulate activity
- Immunomodulatory
- Nutritional profile

Veldkamp et al. 2019

Example: Black soldier fly larvae

How to provide live larvae?

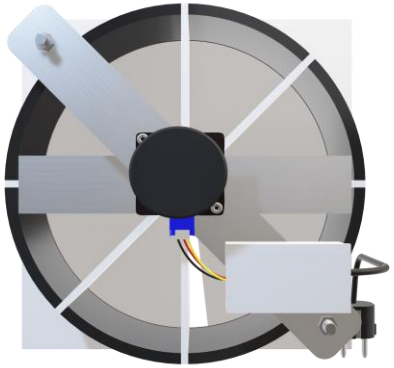


Existing methods

Key requirements

- Easy handling → Low labour
- Extended release → Increase activity
- Flexible amounts → Growing poultry

Dispenser system motorized



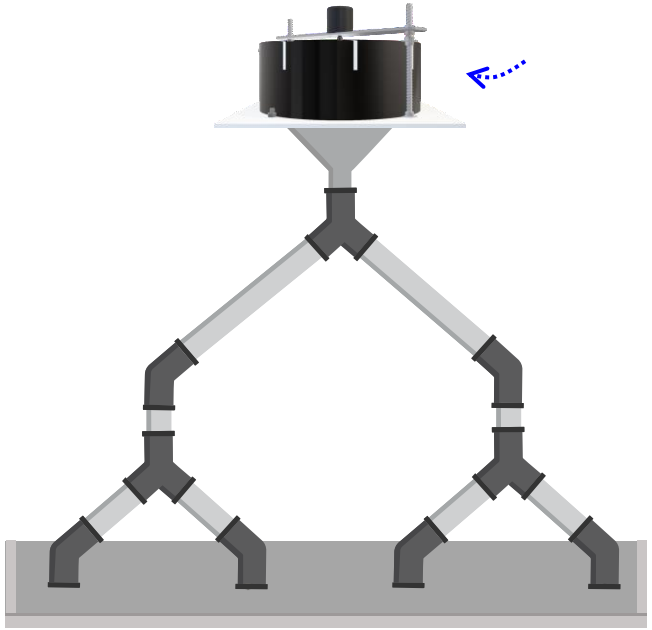
8 chambers

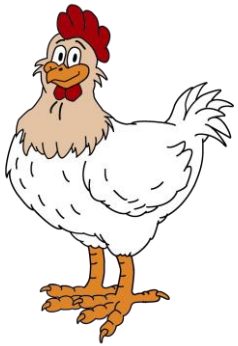
Outlet

Timed motor

Dörper et al. 2023

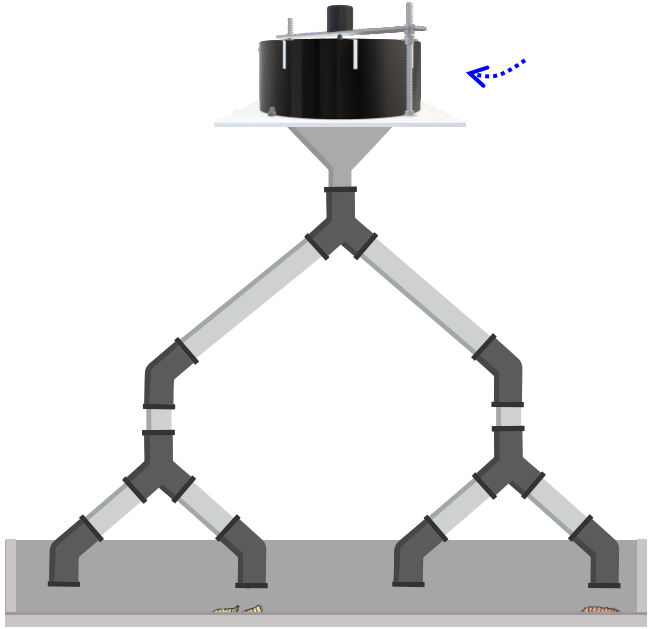
Dispenser system motorized

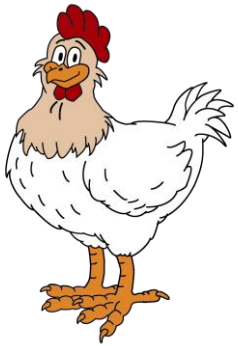




Dörper et al. (2023)

Dispenser system motorized





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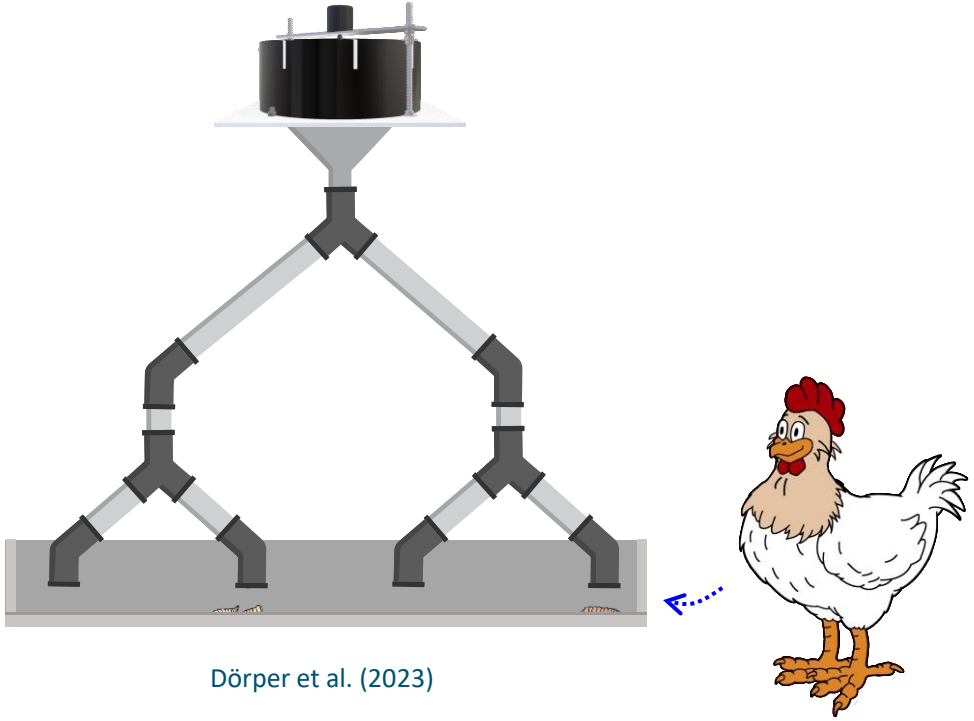

Dörper et al. (2023)

How to provide live larvae on farms?

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Let’s design
a practical solution
together!

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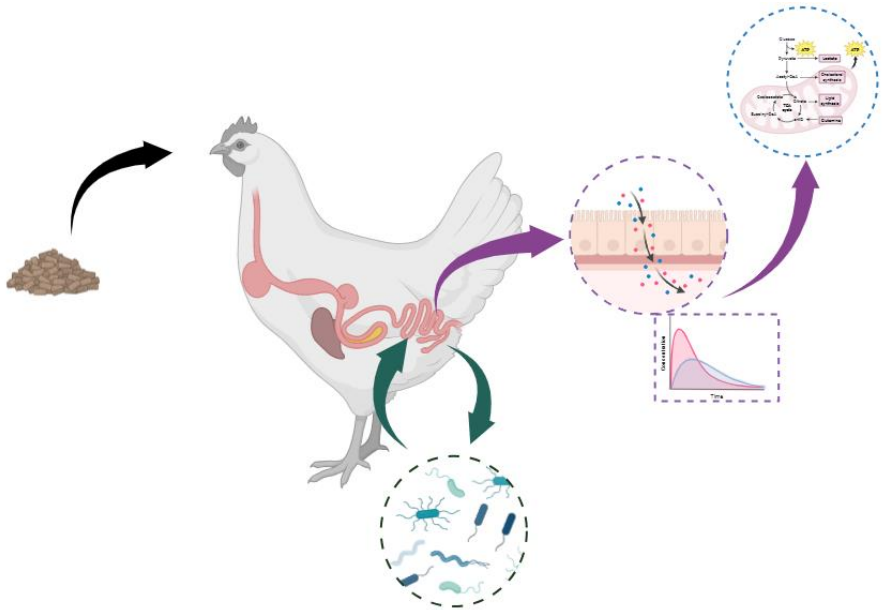
6. WANNEER VEZELS DE CONTEXT BEPALEN

Eiwit- en aminozuurverteerbaarheid in perspectief



Sonja de Vries
Animal Nutrition Group

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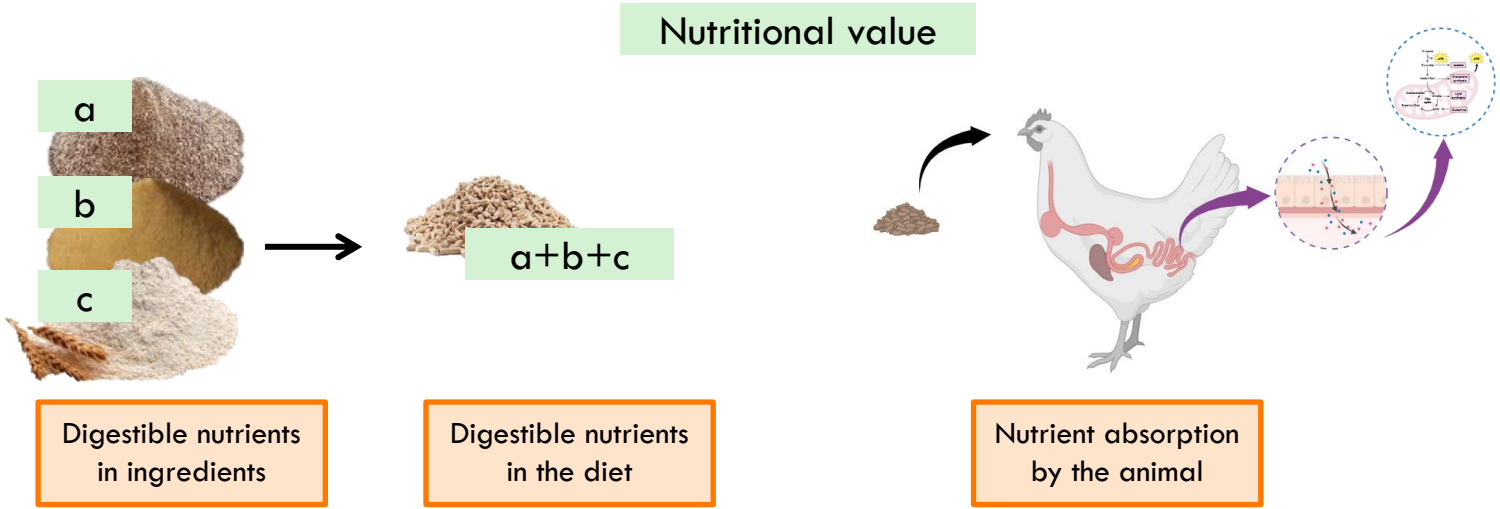
Business Meets Science, Dutch Poultry Centre
16 December 12, 2025, Wageningen, NL

Voederwaardering gebaseerd op SID aminozuren

Standardized **I**leal **D**igestibility

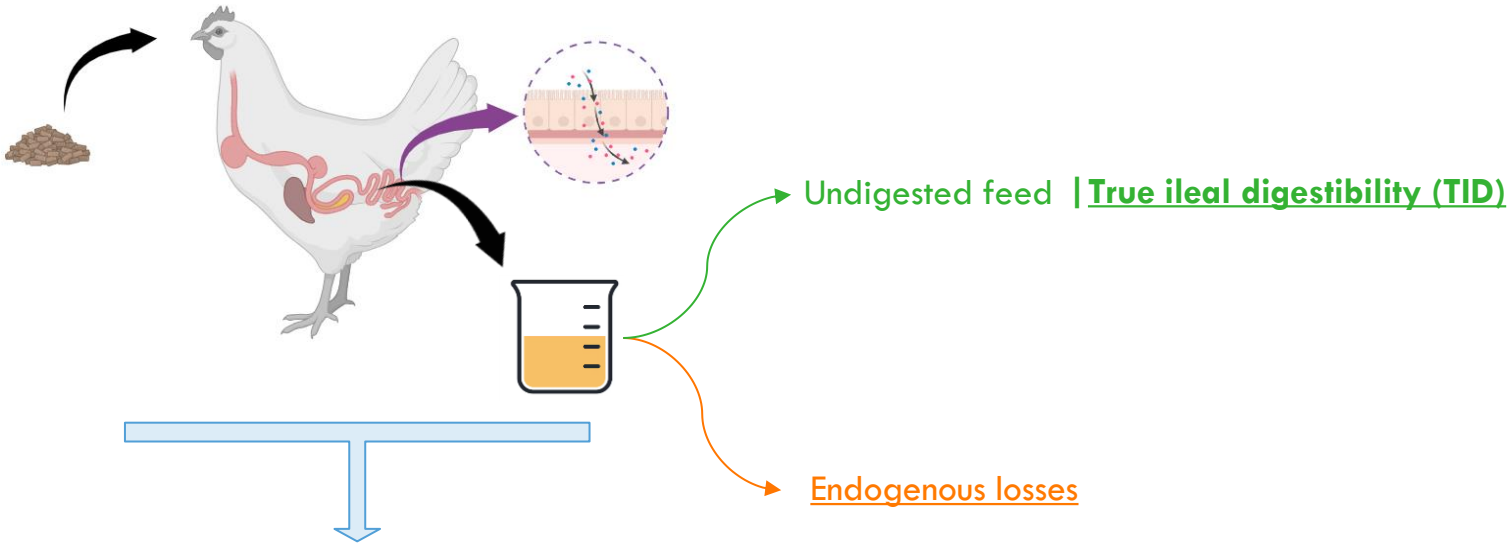
- Nutrient disappearance (before the ileum) as a proxy for the amount of nutrients absorbed by the animal
- Nutrient digestibility is considered an ingredient property



Hoe wordt SID gemeten?

Standardized **I**leal **D**igestibility

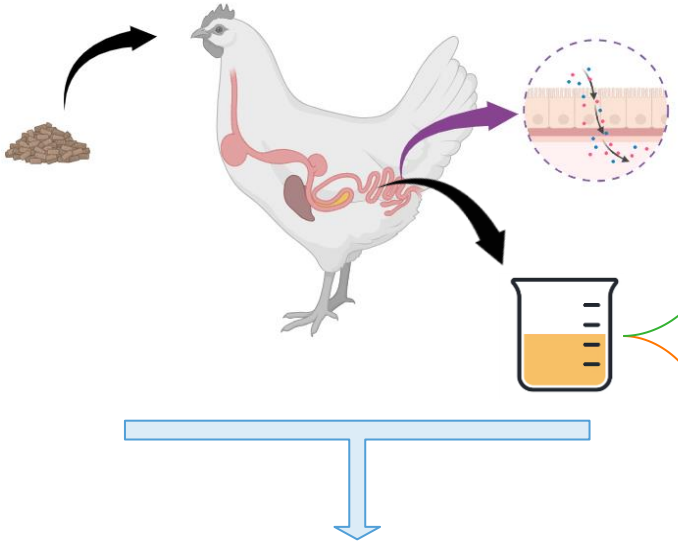
- Apparent digestibility : Input - output = net disappearance
- True digestibility : Apparent digestibility corrected for total endogenous losses



Hoe wordt SID gemeten?

Standardized **I**leal **D**igestibility

- Apparent digestibility : Input - output = net disappearance
- True digestibility : Apparent digestibility corrected for total endogenous losses
- Standardized digestibility : Apparent digestibility corrected for basal endogenous losses



Undigested feed | **True ileal digestibility (TID)**

Endogenous losses

- Basal endogenous losses

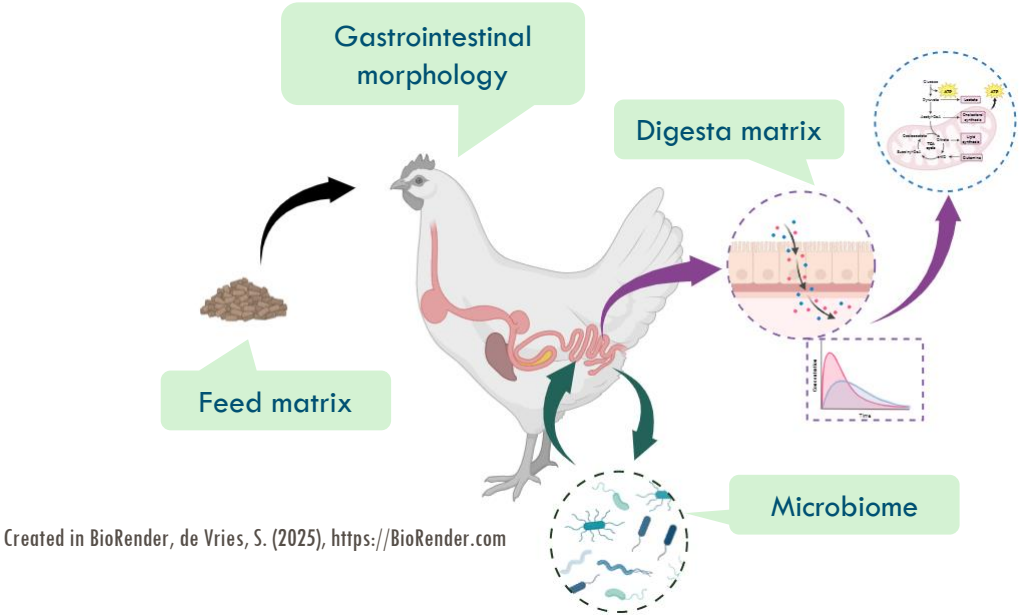
| **Standardized digestibility (SID)**

Apparent ileal digestibility (AID)

Vezels beïnvloeden verteringsprocessen

Physicochemical properties of the diet

e.g. Viscosity / gelling properties
Water binding capacity
Bulk (volume)



Created in BioRender, de Vries, S. (2025), https://BioRender.com

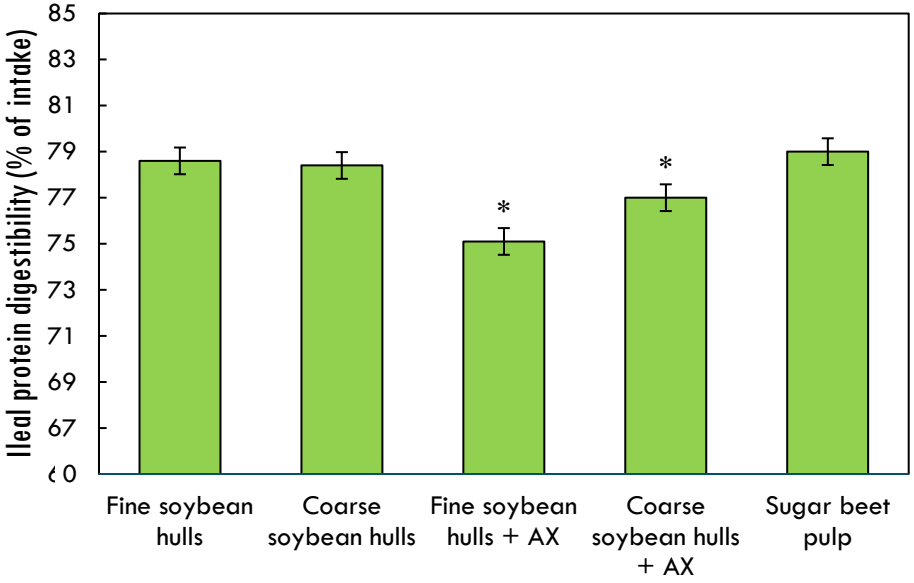
Fibres modulate nutrient bioavailability through (a.o) :

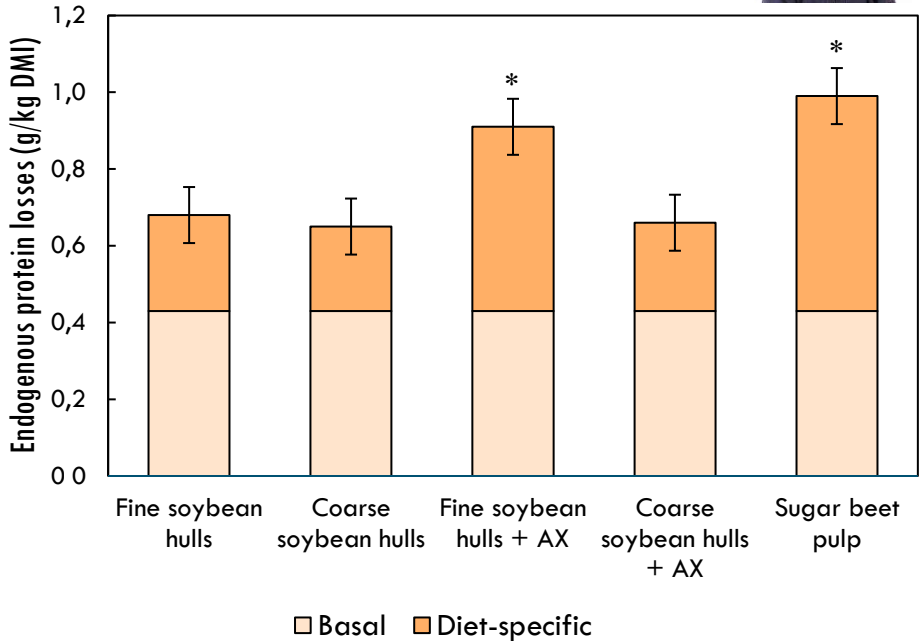
- Nutrient hydrolysis and absorption → True digestibility
- Endogenous losses → Apparent digestibility

Vezels beïnvloeden ware vertering én endogene verliezen

Habibi et al., Animal 2025, submitted;
Habibi et al., in preparation

Measured in 5-wk old broiler chickens, dietary N-intake: ~30 g/kg DM

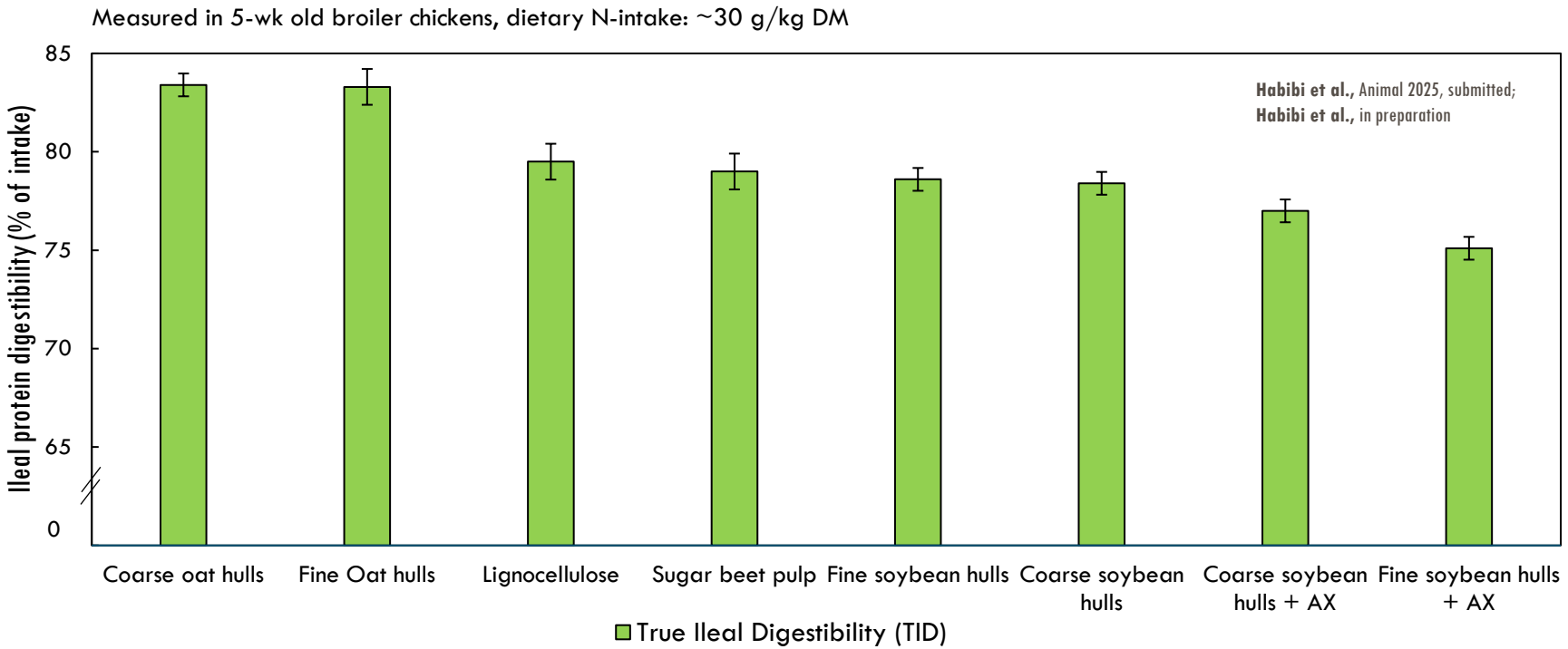




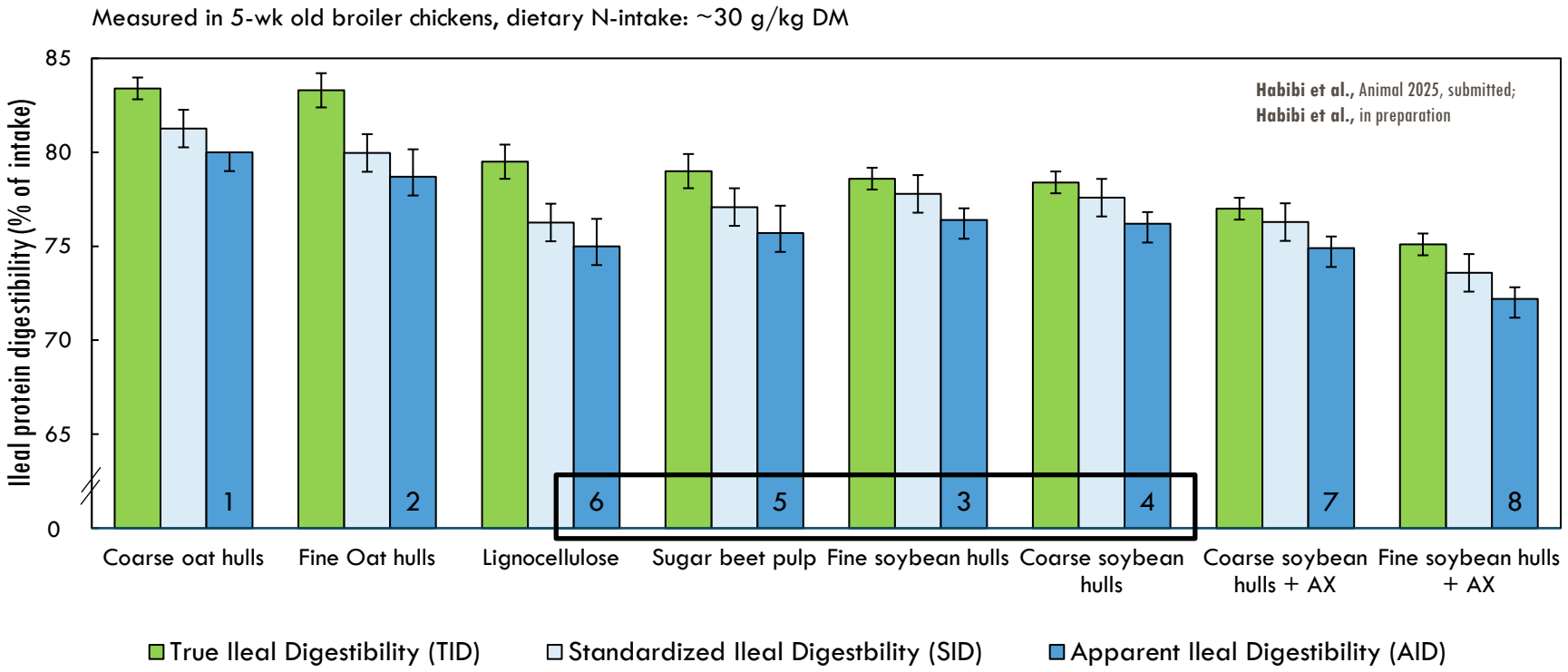
*Asterisks indicate differences from fine soybean hull diet (P< 0.05)

Basal endogenous losses estimated based on highly digestible protein (hydrolysed casein) diet in Habibi et al., 2025

Hoe beinvloedt dat de schattingen van vertering?



AID en SID maskeren een deel van het effect



WANNEER VEZELS DE CONTEXT BEPALEN

Vertellen SID-waarden niet genoeg

Vezels beïnvloeden niet alleen de ware eiwit- en aminozuurvertering, maar ook endogene verliezen. Daardoor kunnen AID- en SID-waarden belangrijke effecten maskeren en vraagt voederwaardering om interpretatie mét context.

Acknowledgements

- Animal Nutrition group, WUR
  - Walter Gerrits, Mochammad Fahmi Habibi, René Kwakkel, Yulia S. Putri, Despoina Georgaki, Sebastián Dorado Montenegro
- Trouw Nutrition R&D
  - Ana Isabel Garcia Ruiz, Wilfredo Mansilla, Reza Akbari Moghaddam Kakhki

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- The Netherlands Organisation for Scientific Research (NWO) within the framework of the research program Innovational Research Incentives Scheme Veni (15948) & Trouw Nutrition.

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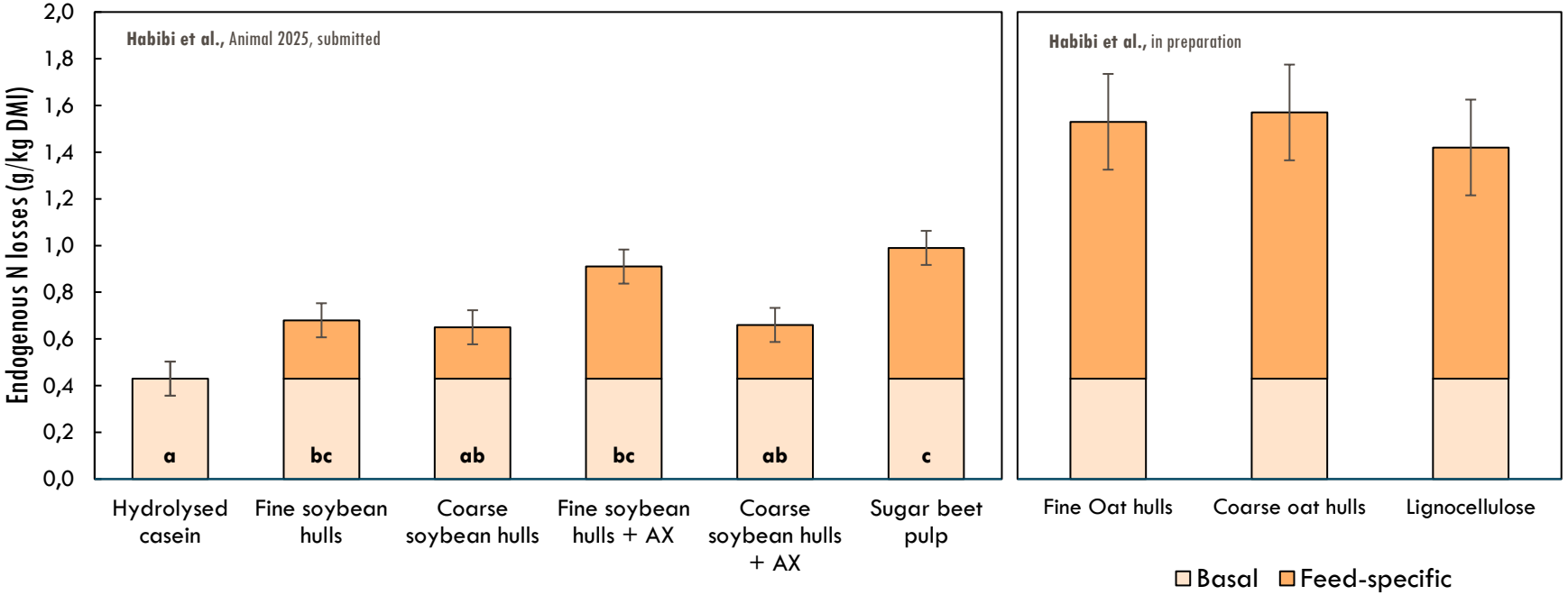
Vezels beïnvloeden endogene verliezen

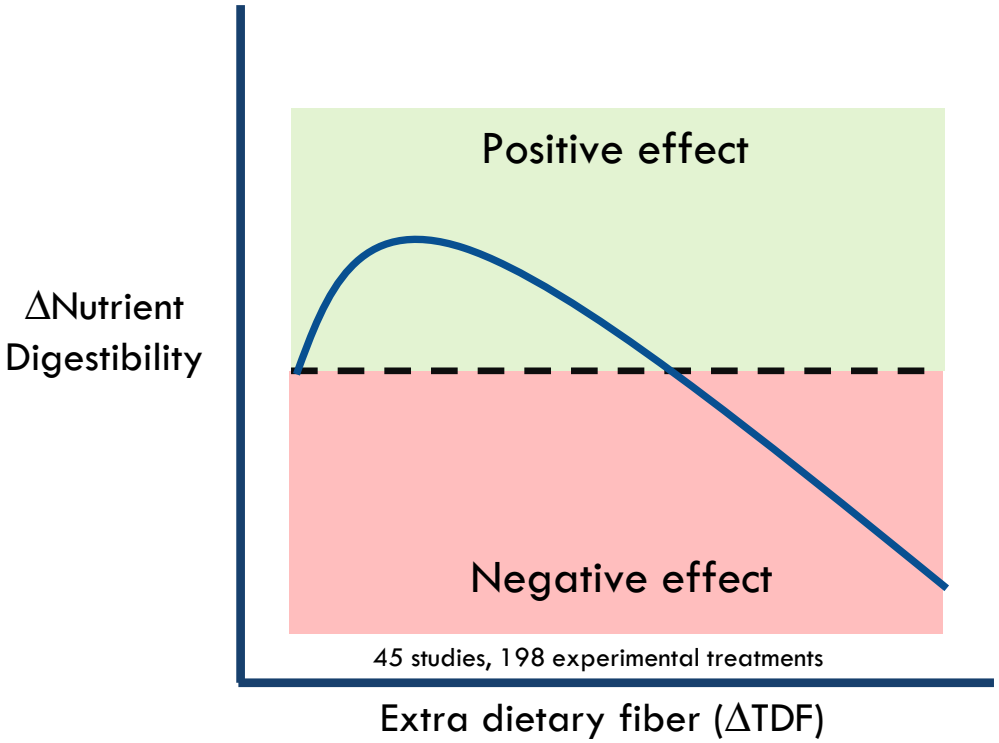
Measured in 5-wk old broiler chickens, dietary N-intake: ~30 g/kg DM



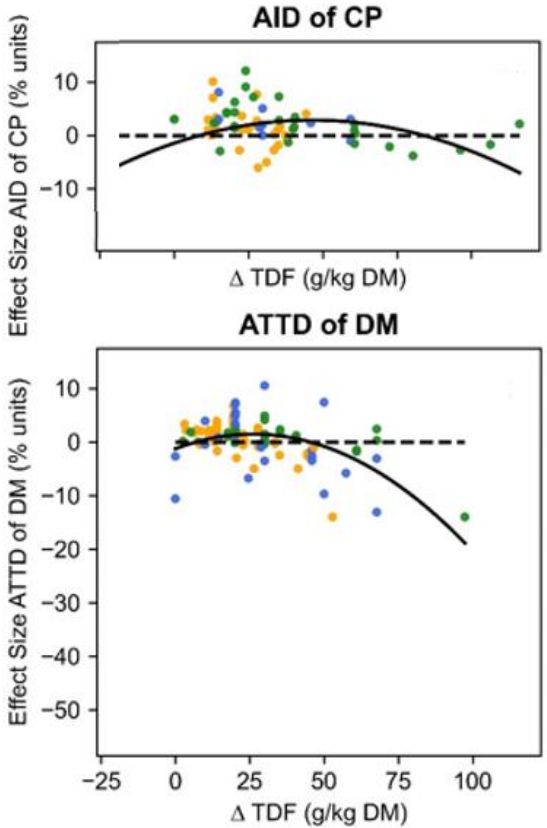
[a-c] Within experiment, bars lacking a common superscript differ (P< 0.05)

Basal endogenous losses estimated based on highly digestible protein (hydrolysed casein) diet in Habibi et al., 2025

Fibres affect apparent protein digestibility



In addition to maize soybean meal diet (Total Dietary Fibre, TDF ~100 g/kg)



Fibre source: Cereal, soluble pectin, other

Fitted curve for the model: a + ΔTDF – ΔTDF^2

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Vivares et al., Anim Feed Sci Technol. 2025:321, 116241.

How to account for fibres when formulating diets?

- Account for dual impact of fibres on digestibility
  - Beyond apparent and standardized ileal digestibility values
  - Evaluate effects of fibre sources varying in physicochemical properties, like particle size, gelling-, and hydration properties

- Account for interactions among ingredients
  - Modelling nutrient absorption kinetics integrating ingredient and animal level factors
  - Total Dietary Fiber (insoluble + soluble), instead of CF or NDF
  - Correct fixed ingredient digestibility values (e.g. SID AA) for fibres present in the diet
  - Extent with key-physicochemical properties of the feed

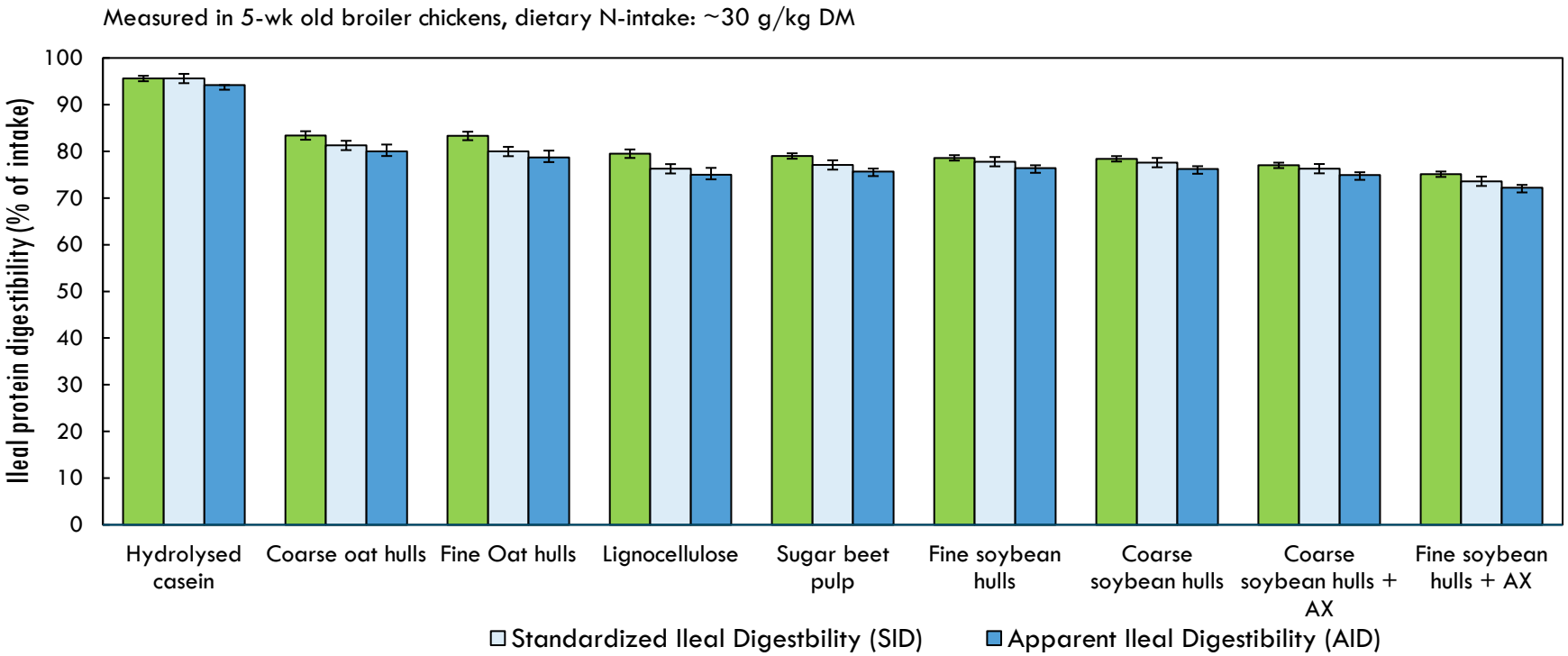
Schop et al.
Animal
2023:17(5) 101025

Zhang et al.
Anim Feed Sci Technol.
2024:308, 115864

Vivares et al.
Anim Feed Sci Technol.
2025:321, 116241

Dorado Montenegro et al.
Anim Feed Sci Technol.
2025:321:116242

Hoe beinvloedt dat de schattingen van vertering?



7. Local Protein Sources in European Poultry Diets

Dec 2025, Arya Rezaei Far, Wageningen Livestock Research

arya.rezaeifar@wur.nl

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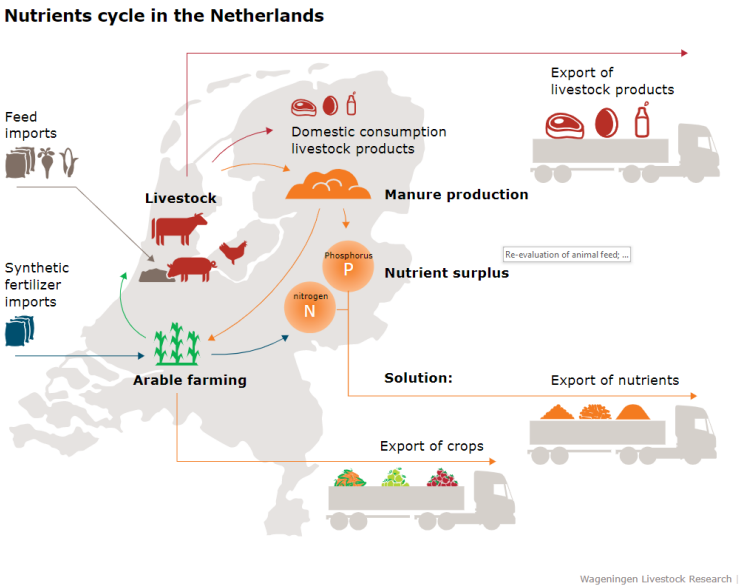
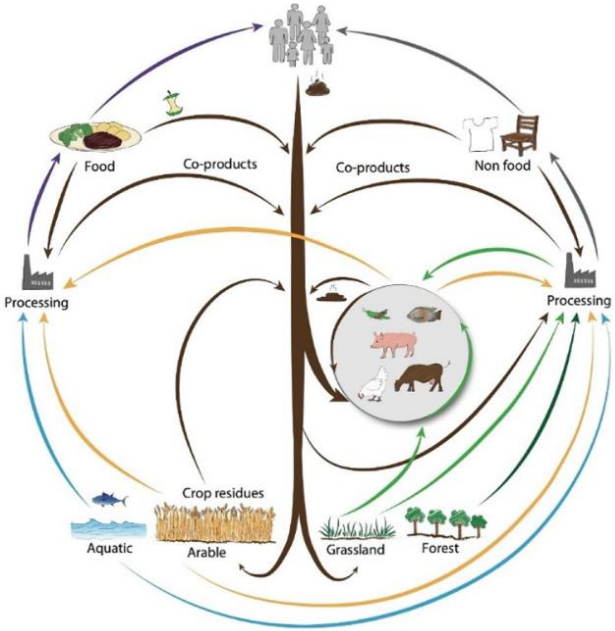
Status-quo vs Circular food system

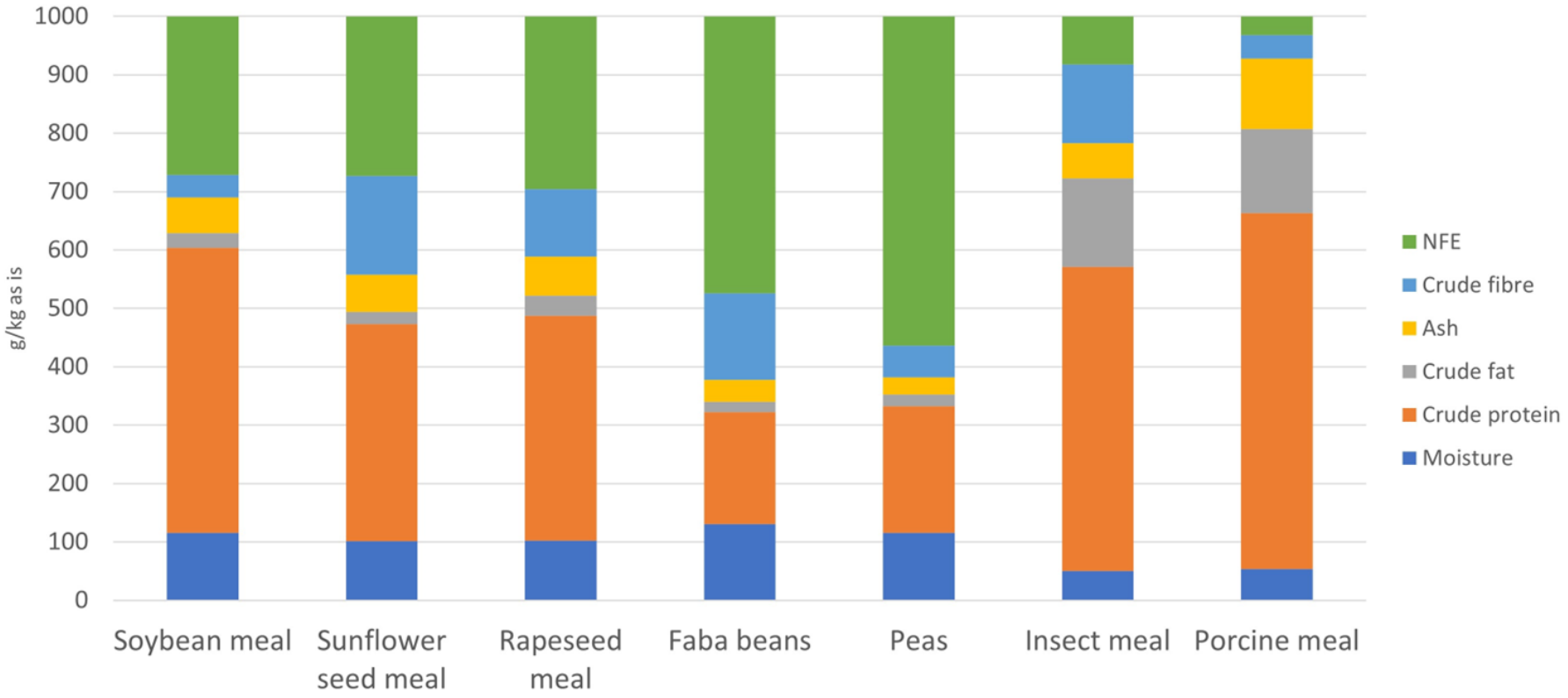




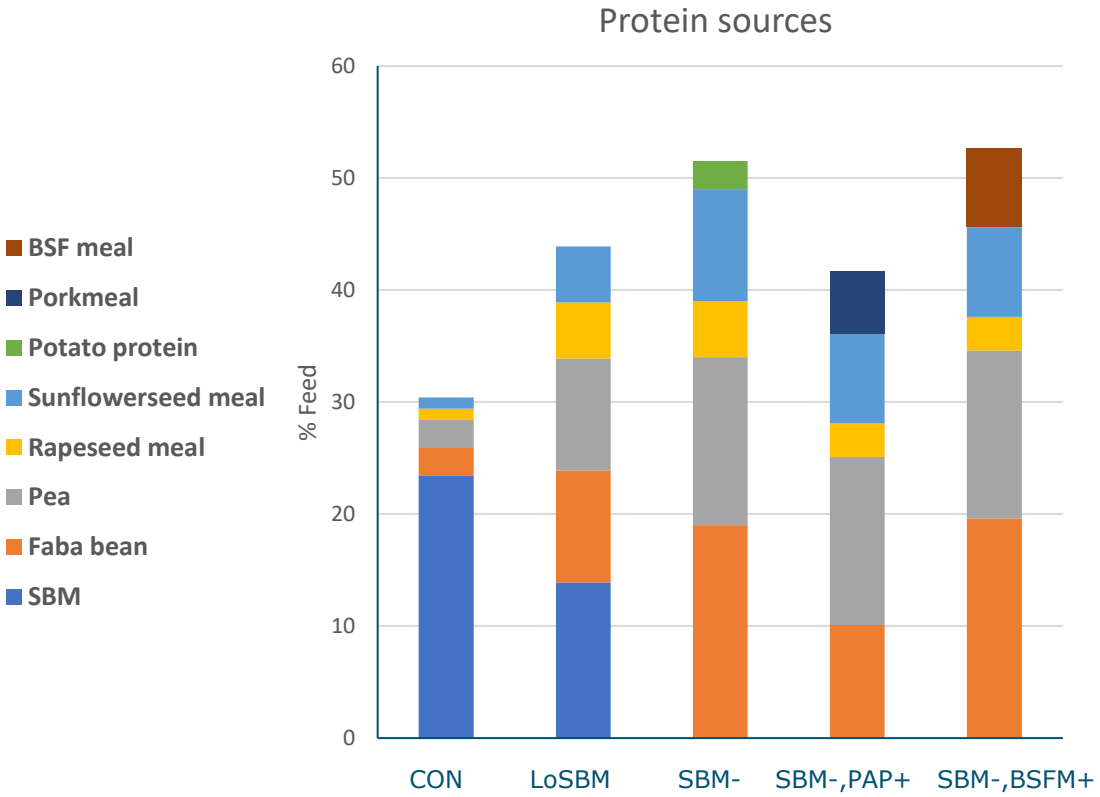
Livestock as an important tool to unlock nutrients within human inedible biomass

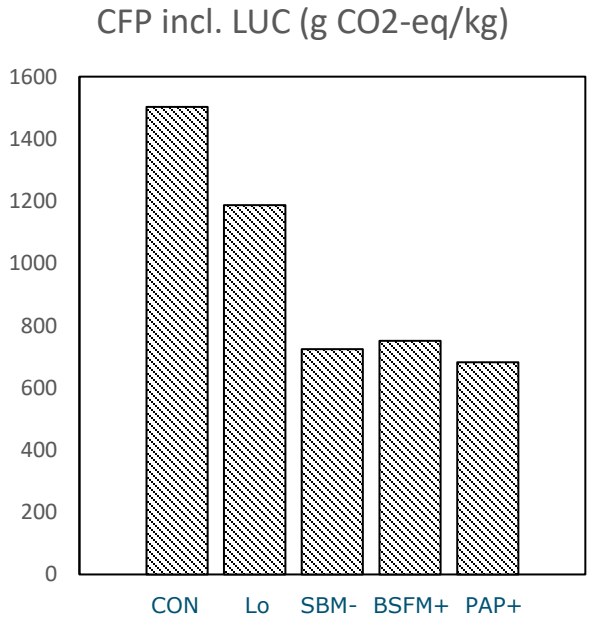
Muscat, 2021

Local protein sources



Local protein sources

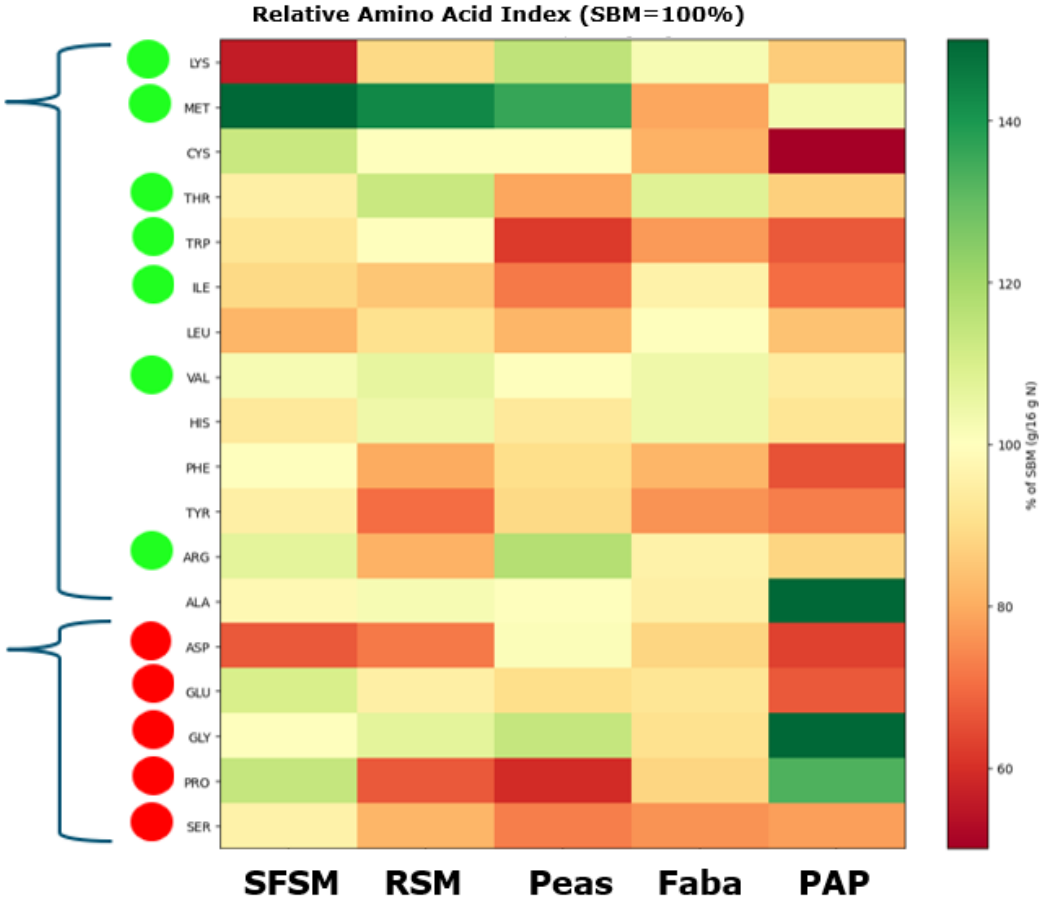




Birds don’t care about our requirement tables?

Synthetic sources exist or would rarely become limiting

Functional bottlenecks in No-SBM diets!



Challenges and opportunities for alternative protein

NEAA functionality: (Gly, Pro, Ser, Glu and Asp)

- Meat quality
- Gut health
- Immune response
- Antioxidant

Bioactive compounds:

Black Soldier Fly larvae meal: chitin, C12, bioactive peptides

Pork meal: bioactive peptides

Sunflower seed meal: Chlorogenic acid

Challenges and opportunities for alternative protein

NEAA functionality:

- Meat quality (Gly, P
- Gut health (Glu
- Immune re
- Antioxida

Bioactive co

Black Soldier

Pork meal: bioactive

Sunflower seed meal: Chlorogenic aci

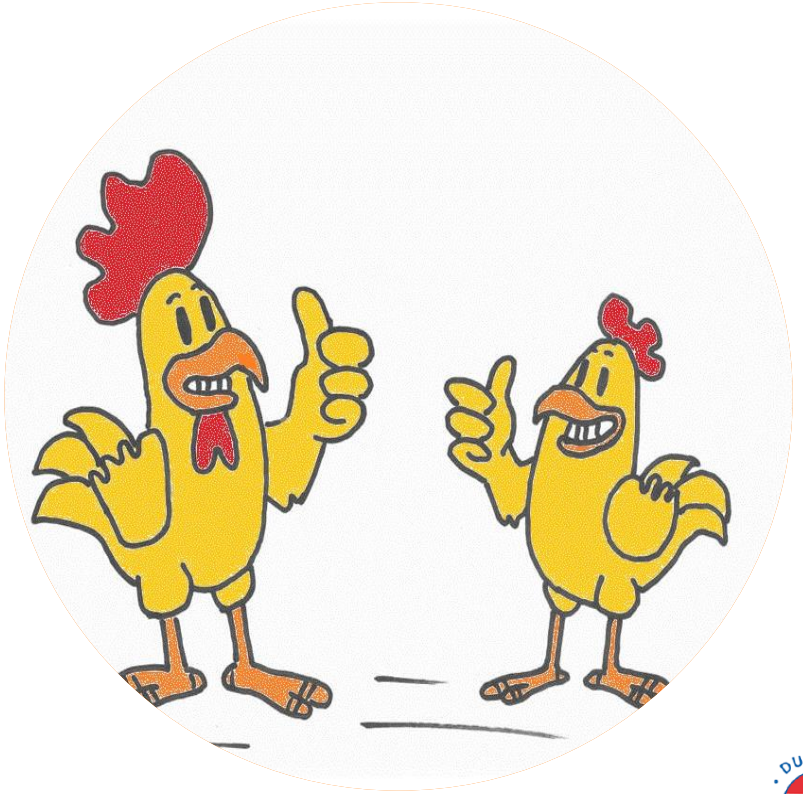
Diversifying protein sources can be an opportunity to design customized feed for the needs of the clients!

Challenges and opportunities for alternative protein

- How do different intake of NEAAs influence meat quality, gut health, and stress resilience?
- What is the optimum combination of protein sources to balance functional amino acid requirements maintaining growth, improve health, welfare, meat and egg safety and quality?

From Trials to Commercial Reality: Scaling Soy-Free Diets in European Poultry

Einde



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