

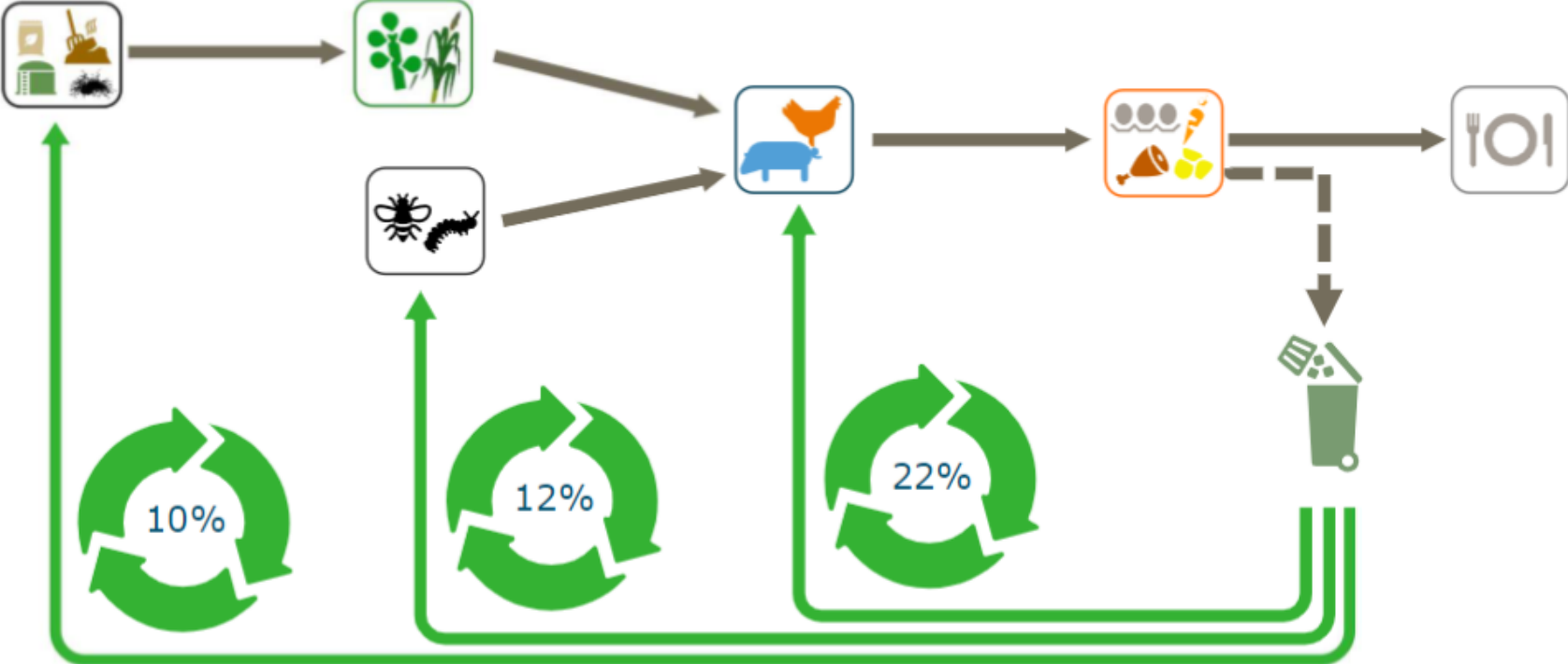
Research on side flows for animal feed

EU Platform on Food Loss and Food Waste – subgroup Action & Implementation

25 May 2023, Dr Hilke Bos-Brouwers, Wageningen University & Research



Circular valorisation of side flows for feed is relatively efficient



The food saving potential of animal feed

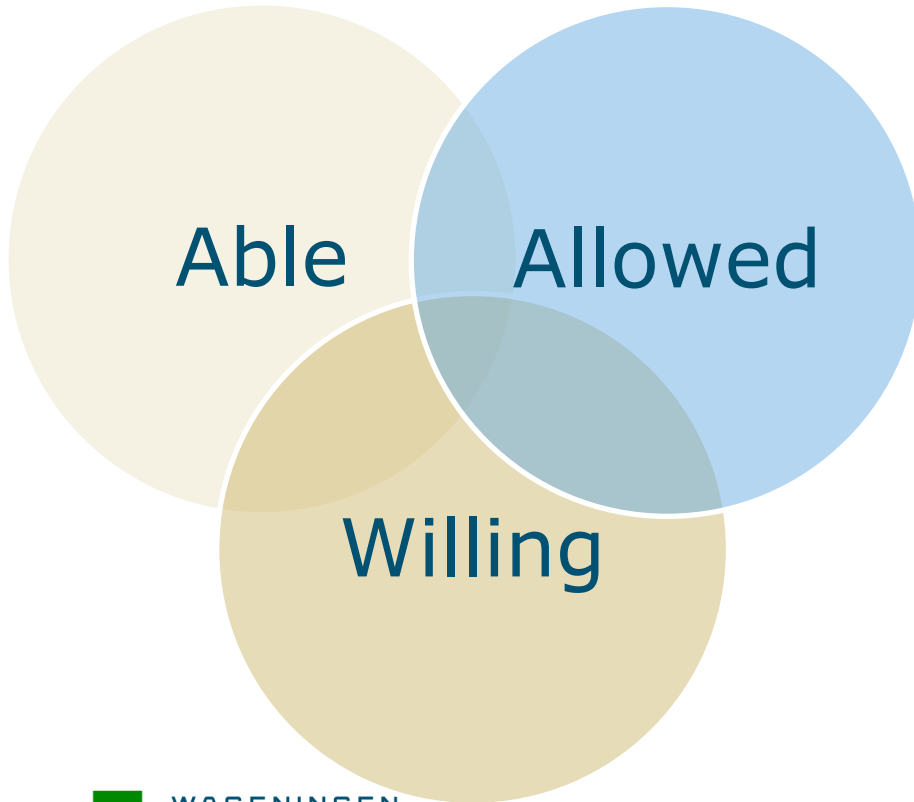
H2020 REFRESH results ([2019](#)) on feeding surplus food to omnivorous non-ruminant livestock indicate:

- 14 Mtonnes (16%) of 88 million tonnes of FW ([FUSIONS, 2016](#)) could become available to be processed into non-ruminant feed.
- Additional to the 5 million tonnes of permissible surplus such as bread already recycled into livestock feed by the former foodstuffs processing industry

	# livestock animals	Feed production	Feed consumption	Amount of FW (side flows)
Current*	166,43M	16.7 Mton	?	2811 kton
Future	Less?	Less?	Less?	Less?

* Dutch data from livestock: CBS (ref.yr. 2021), feed production: NEVEDI (ref.yr. 2020) and side flows: EUROSTAT (ref.yr. 2020)

But also considering:



- Is it legally allowed?
- Is it technologically possible? (process technology)
- Is it suitable as feed (nutritional value)
- Is it safe? (food & feed perspective)
- Is it attractive for business? (positive business model)
- Is it acceptable by consumers?
- Is it more sustainable than the current system?

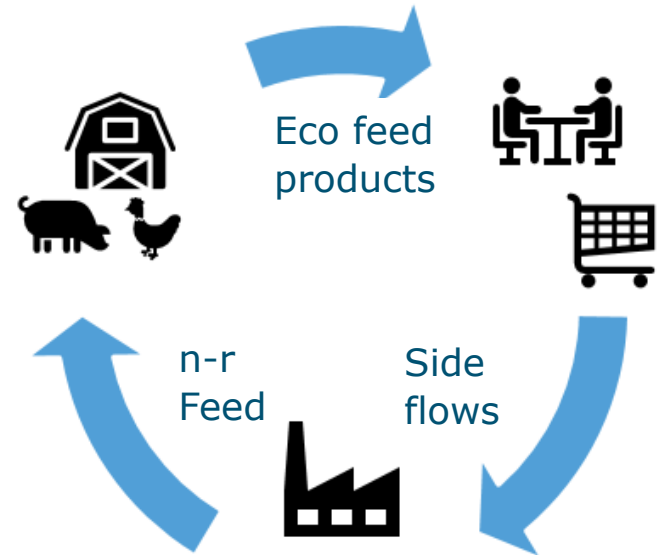
Building scientific evidence

- PPP RENEW - Residue and secondary streams for Eco-feed applications in the Netherlands, with a focus on circular food system design and consumer appreciation
- PPP Food and feed safety and valorisation of new and legally limited residual flows for animal feed
- PPP Safe insect rearing on yet to be legally authorised residual streams

PPP RENEW – circular design for Eco-feed

How to develop an integral, circular food system design by applying residual & side flows from retail and food services as feed for non-ruminant livestock, including pigs & chickens

- Economic feasibility
- Environmental/climate impact
- Consumer acceptance & business acceptance
- Sharing scientific results in the policy context



Volume of side flows is relatively small compared to total market for animal feed (NL)

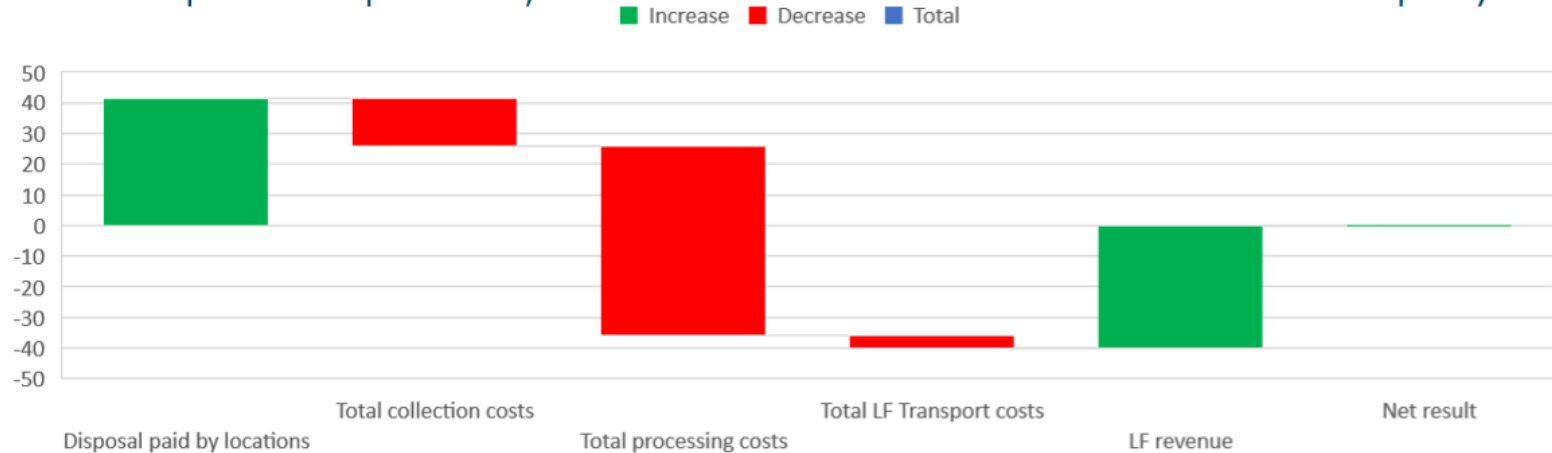
Eco-feed aims to replace (part of) 'virgin' ingredients, often imported, currently used in animal feed. RENEW explores the replacement potential of these virgin ingredients.

- 16.7Mton of animal feed production in NLs (NEVEDI, 2020)
- 51,9% (virgin) base ingredients
- **42.7% co-products** from food industry (e.g., brewer spent grains, soy hulls, potato peels)
- 5.4% other (minerals, additives, oils, fats)

The total volume of food waste in retail and food services (estimated at approx. 292,84 ktons in 2020) could replace approx. **4.1%** of total pig & poultry feed (7.098 ktons in 2021)

Production costs of Eco-feed are primarily driven by processing costs

- Figure below shows the breakdown of costs at the scale at which market-competitive pricing of feed is enough to recoup upstream costs (331 locations, 14kton swill/year)
- Total costs strongly driven by processing costs
- Calculated per ton liquid feed, collection fees and feed revenue contribute equally

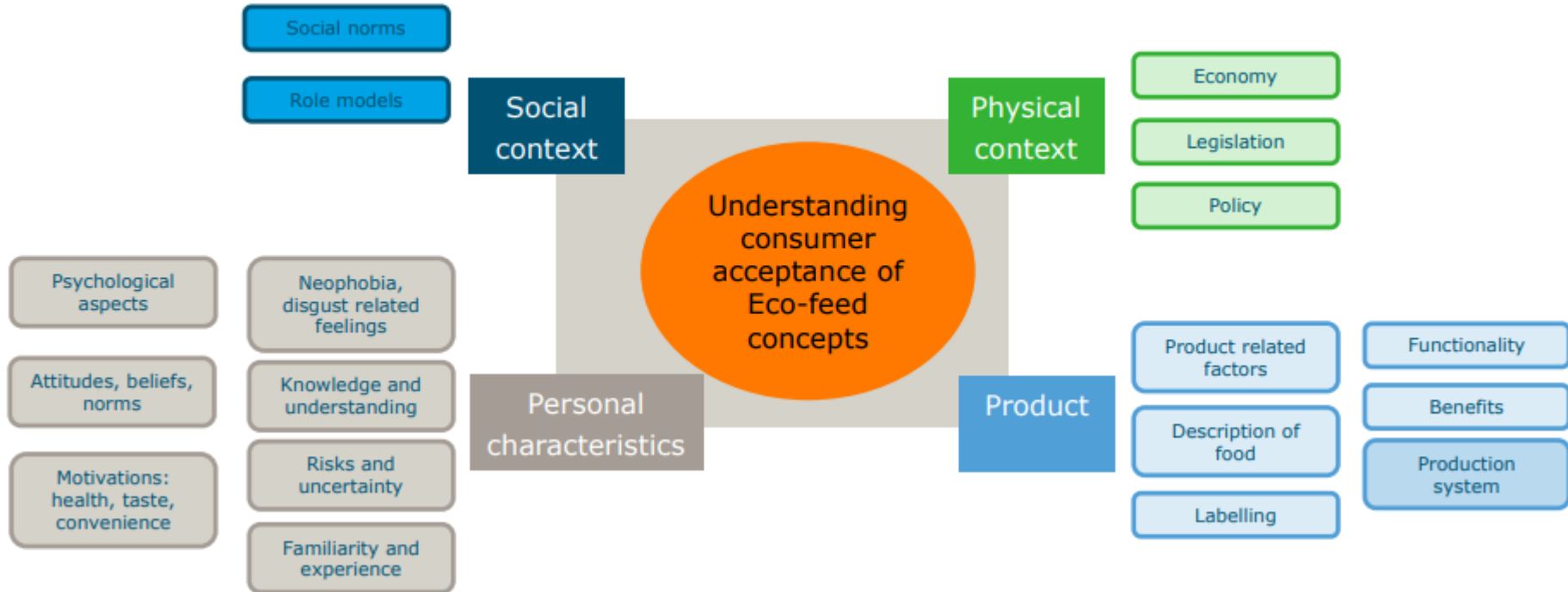


Preliminary conclusions on economic feasibility

- Significant costs of Eco-feed (relative to conventional feed) are **incurred upstream** in the chain (especially processing; collection depending on the network structure)
- We show that it is possible to produce and market Eco-feed at a **competitive price point**, using a relatively small part of the total available volume of food waste in the Netherlands (14kton of the ~292kton theoretically available per year), provided that the collection distances are not too large
- If it is not possible to produce Eco-feed at a competitive price, costs need to be included in **pricing downstream** (from farmer to ultimately the consumer)
- Next steps include expansion to other feed products, and **quantifying the environmental footprint of Eco-feed in different scenarios compared to conventional feed**: expected 2nd half 2023

Consumer acceptance: complex & complicated

Critical elements for consumer acceptance of Eco-feed include:



Associations with Eco-feed



Informing consumers about Eco-feed: Yes or No, and HOW?

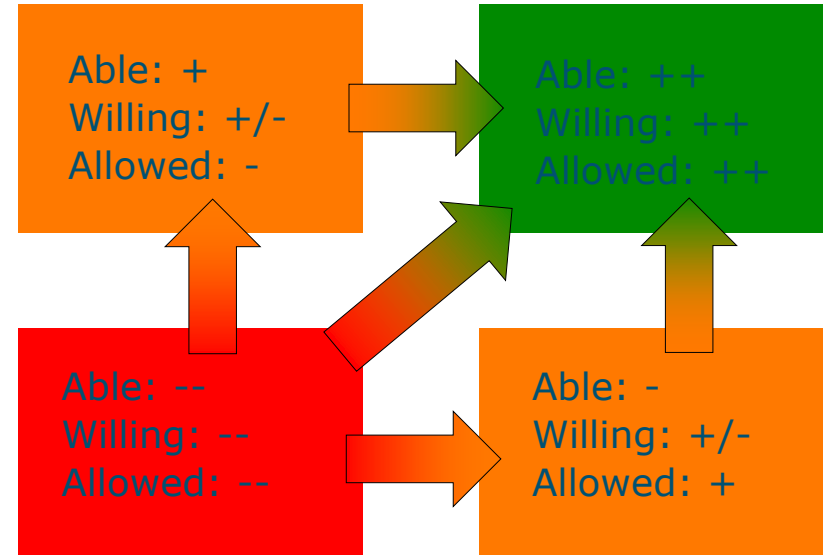
- It seems better not to inform via *a one sentence basic explanation of Eco-Feed* on the product packaging, but
 - additional information is supportive,
 - and has product specific impact: - positive for pork chops
- neutral for chicken filet
- negative for eggs.
 - Most impact on eco-attributes
- Information about Eco-Feed
 - Evidence shows, there is only limited interest from consumers
 - But differences do exist between consumers segments (both for interest and impact)
- When information is provided
 - More extensive information is better (more positive/fewer negative responses)
 - *Mitigation of food waste* most appealing sustainability theme
 - About $\frac{3}{4}$ rd of respondents respond positively, esp. on eco-attributes (Intermediate and Interested consumers)



Current research & collab opportunities

- Finalising RENEW, Feed Safety, Insect feed by (early) 2024
- Mapping out the European 'landscape' on issues and considerations across various stakeholders with regards the (stepwise) legislative changes to remove barriers in applying side flows as animal feed
- Interviews & workshops 2023-2024
- Interaction with the Platform Members is warmly welcomed!

Transition pathways



Thank you



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