



Niisen Company

KAREL VAN DER VELDEN



The Role of Livestock in Future Food Systems

Nijssen company |

Food-for-Feed-for-Food

Circular Feed | Carbon Footprint of Feed

Circular Feed | Practical Implementation





±104 FTE

Milestones

**Foundation by
Jacques Nijsen**



1938

**Specialization pig
feed**



2009

**Collaboration
unique market
concepts:
KIPSTER**



2017

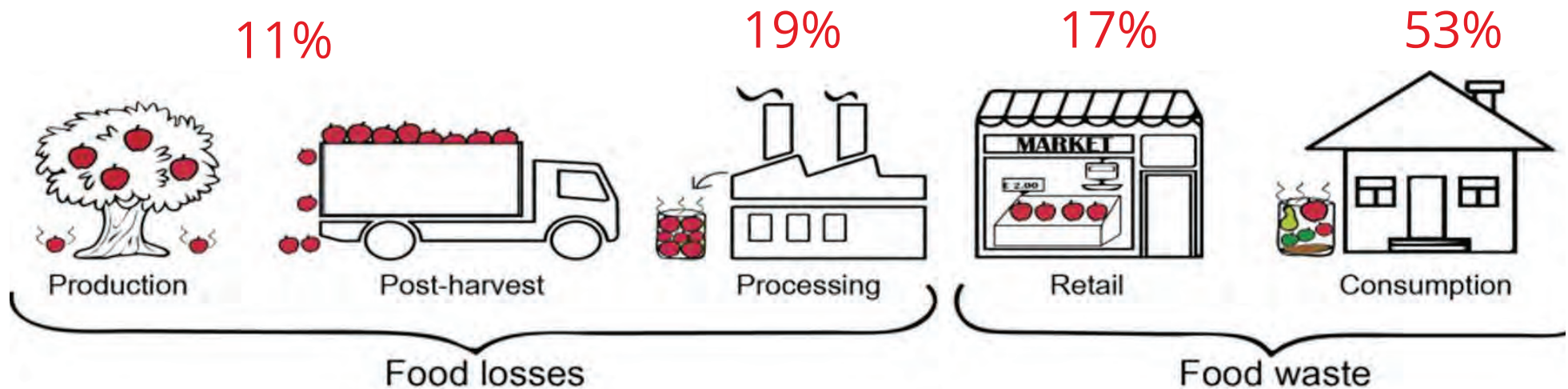
LCA feed



2019

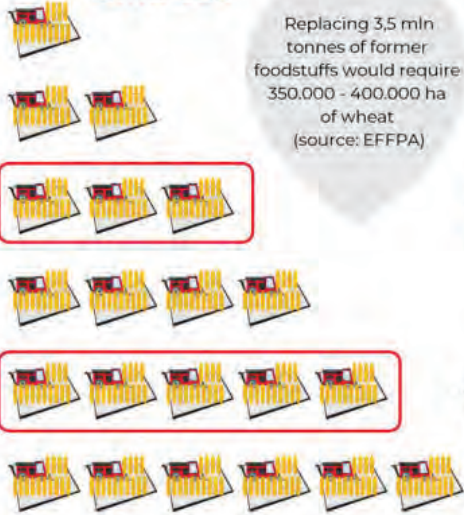
Where the story begins

Global increase of food loss and waste :
1.3 billion tonnes (33 - 40%)



Future Food Systems

Land use



CO₂-footprint

PEFCR
Blonk
WUR

FOOD RECOVERY HIERARCHY

PREVENTION

Reduce the volume of surplus food generated

FEED HUNGRY PEOPLE

Donate extra food to food banks, soup kitchens and shelters

FEED ANIMALS

Convert to nutrient-rich animal feed

ANAEROBIC DIGESTION

Process waste to produce fuel

COMPOSTING

Create soil fertilizer

INCINERATION/ LANDFILL

Last resort for disposal

MOST PREFERRED

LEAST PREFERRED

Focus Nijssen: convert former food into nutrient rich animal feed



Former Foodstuff





Foodstuff Characteristics

- Highest quality grain
- High-value fats
- Good quality of sugars
- Digestibility





Increase of Food Waste

- Increase consumer demands (single packs)
- Product must be 'perfect'
- Packaging errors
- Cutting residues
- Optical rejection
- Increase in product range
- Product development



From Former Foodstuff

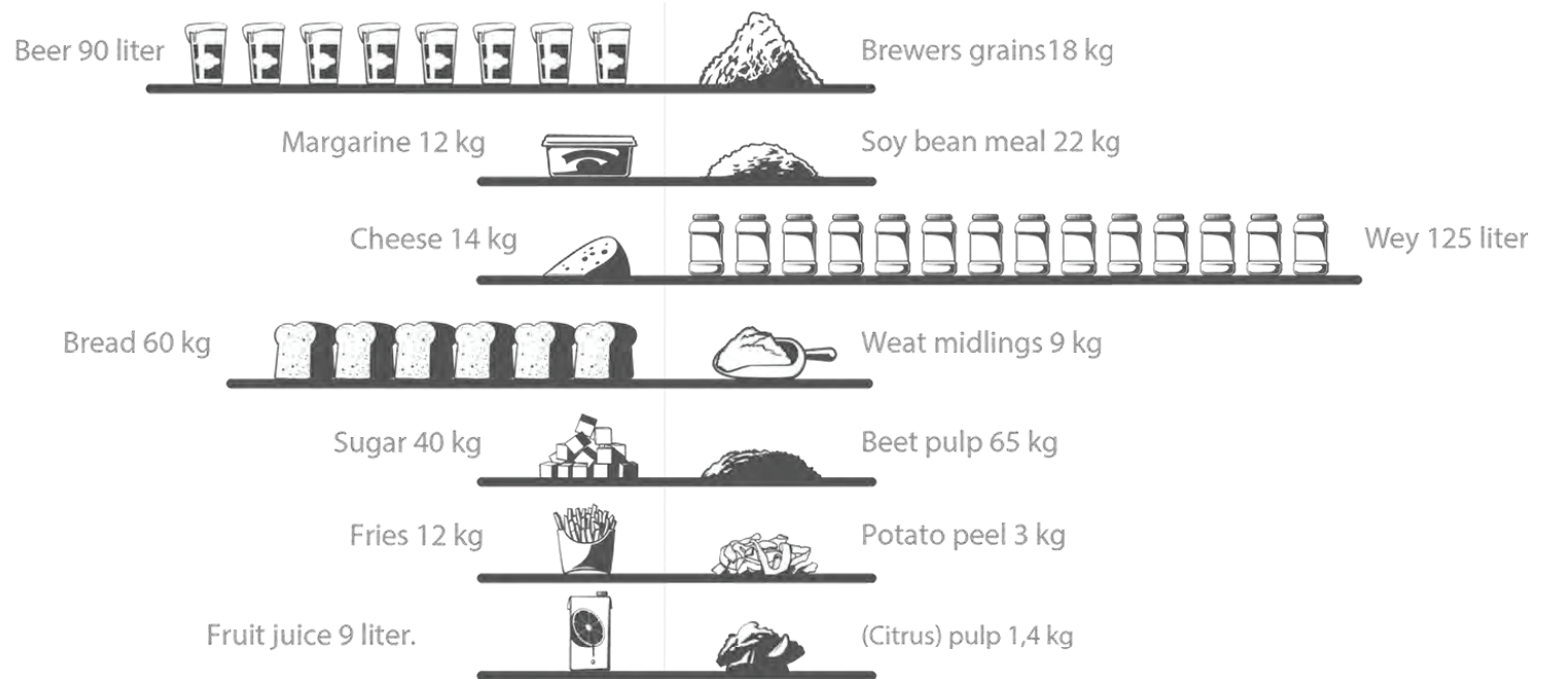




To Nutrient Rich Feed

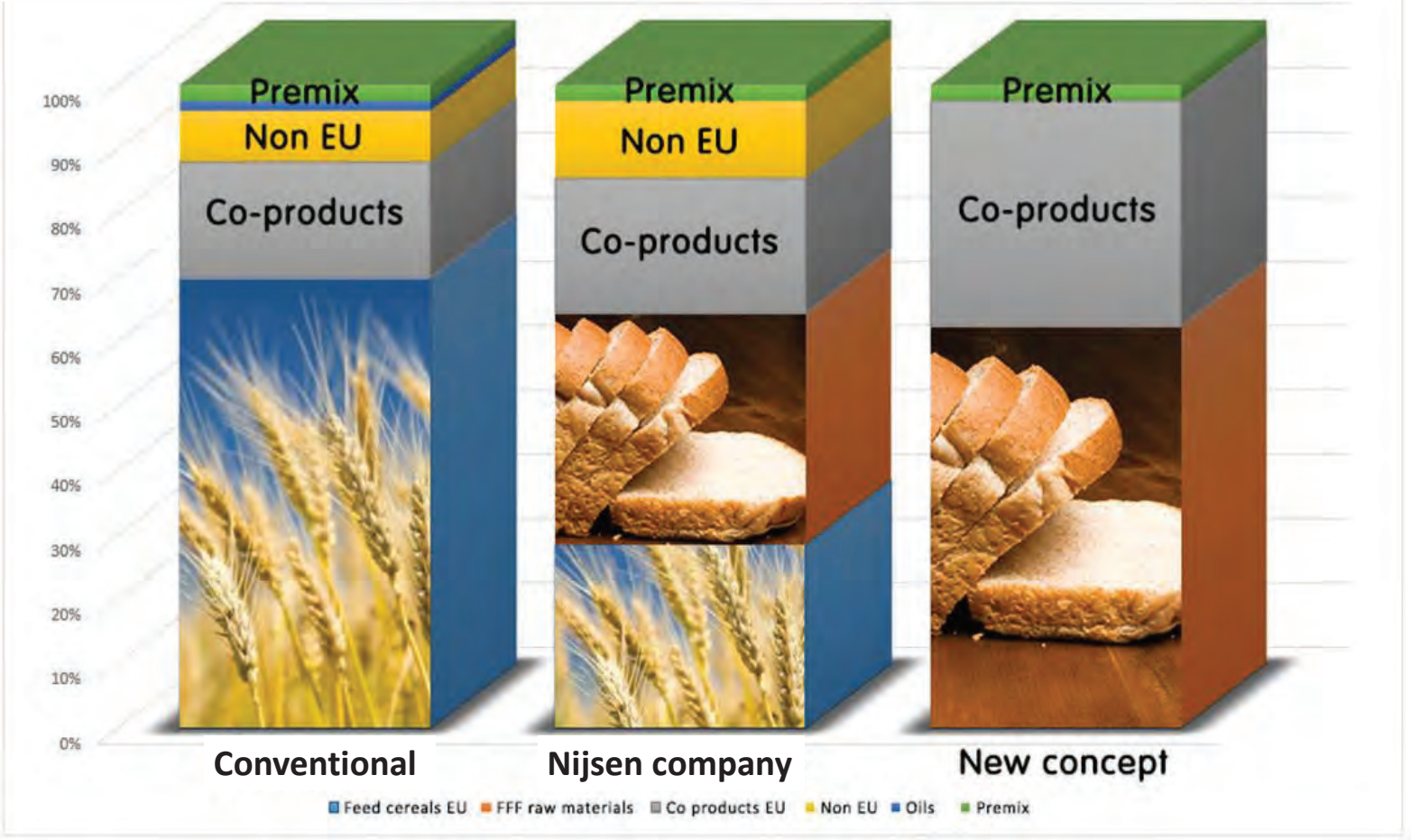
Co-products and residuals

Co-products and residuals derived from food industry
per capita (1994)



Conventional vs Circular Feed

Composition feed fattening pigs



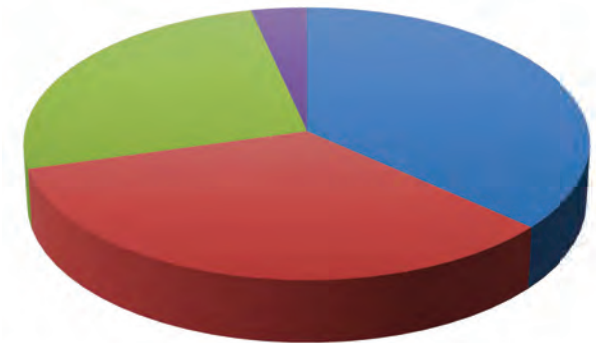
Co-products and residuals

Composition co- and byproducts Netherlands (per annum)		
Origin	%	dry matter (mln ton)
Food Industry	73.5	6,38
Former Foodstuff	2.4	0.21
Agriculture	15.6	1.35
Slaughter waste*	4.7	0.41
Household*	2.6	0.23
Supermarkets*	0.8	0.07
Out-of-home-market*	0.3	0.03
Total	100	8.68



* Not used in compound Feed

11.2 million ton Compound Feed Sold in The Netherlands in 2023**



■ Ruminant ■ Pig ■ Poultry ■ Other

** Source: Nevedi

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Circular Feed

Carbon Footprint of Feed

Circular Feed | Practical Implementation





Carbon Footprint (CFP) Data

GWP incl. LUC (CO2-eq. kg / 1000 kg, gate compound feed producer Netherlands)

Breadmix	PowerBasket	Candy Syrup	PM Kipster
57.4	94.3	74.9	59.3

Source: Environmental Footprint Food for Feed products Nijssen company 2021, Blonk consultantst

GWP incl. LUC

Wheat	Wheat Bran	SBM Brasil	SBM USA
618	289	4291	557

PEFCR

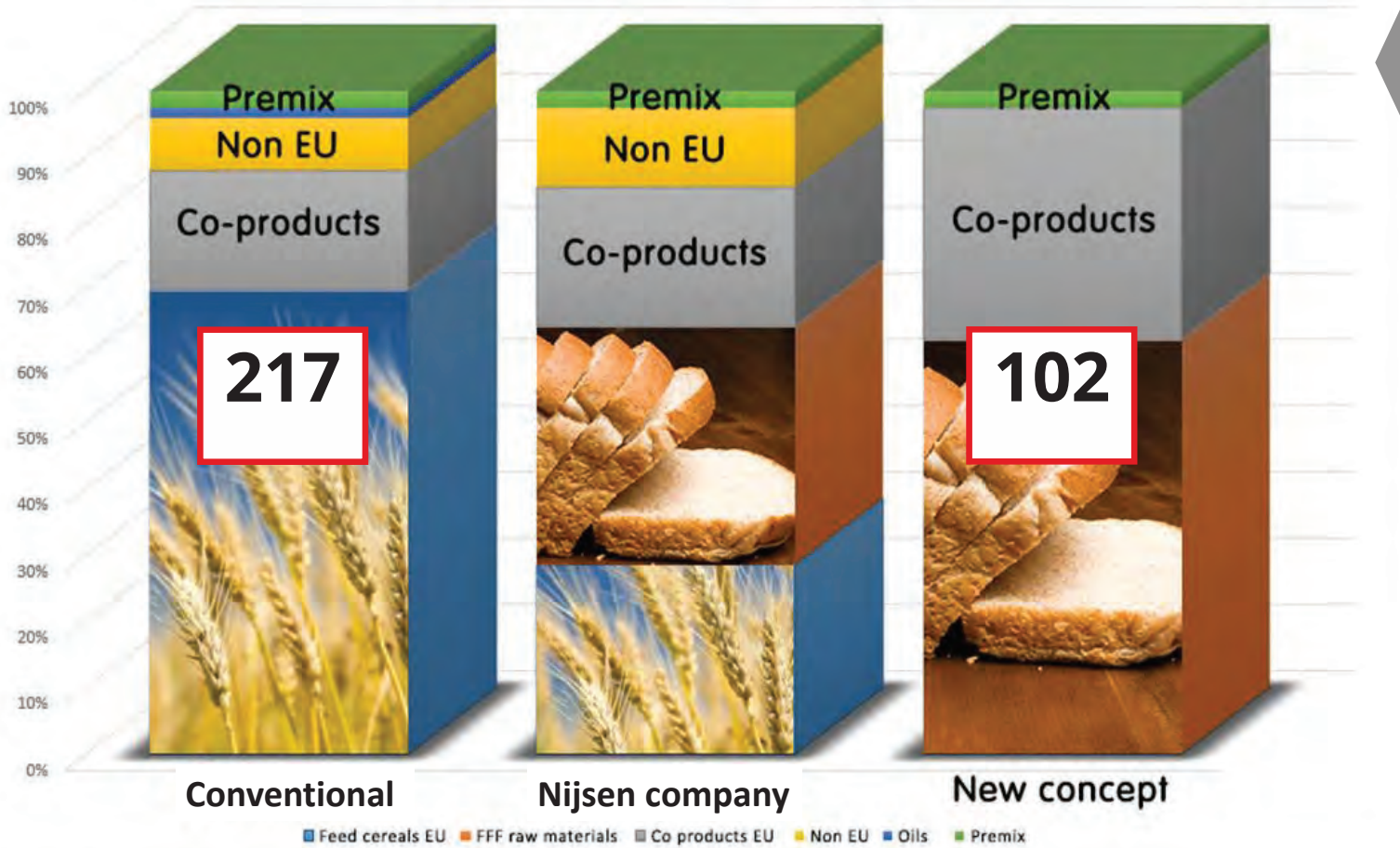
Feed for Food Producing Animals

GFLI

Global Feed LCA-Data Institute

Traditional vs Circular Feed

Composition feed fattening pigs



Impact
Circular Feed
on CPF



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Circular Feed | Carbon Footprint of Feed

Circular Feed

Practical Implementation



Practical Implementation

Bakery Products in Feed for Piglets

		FEED 1 Day 0 - 6		FEED 2 Day 7 - 27		FEED 3 Day 28 - 40	
		Control	Circular	Control	Circular	Control	Circular
C Protein	(g/kg)	162.8	160.1	175.2	176.8	170.0	175.0
C Fat	(g/kg)	54.6	65.6	41.5	61.3	42.0	53.4
C Fibre	(g/kg)	49.6	57.2	36.2	58.4	38.0	64.8
C Ash	(g/kg)	50.4	52.9	49.1	51.1	52.4	54.0



Bakkerijreststromen ter vervanging van granen in het voer voor gespeende biggen - 1

Regioleef Foodvalley - Circulair voer Regioleef

H.M. Vermees, T.A.A. Almekinders, W.A.M. Poppe en F. Veldkamp

Rapport 1507



WAGENINGEN
UNIVERSITY & RESEARCH

Practical Implementation

Bakery Products in Feed for Piglets

		FEED 1		FEED 2		FEED 3	
		Control	Circular	Control	Circular	Control	Circular
Barley	(%)	31.8	25.0	29.8	24.9	27.3	24.8
Oats	(%)	4.5	8.6	0	9.0	0	7.4
Wheat	(%)	25.1	0	25.1	0	17.4	0
Corn	(%)	0	0	7.7	0	13.2	0
SBM	(%)	4.8	3	15.4	13.5	16.9	12.6
Powerbanket	(%)	0.0	34.9	0.0	33.7	0.0	32.4
Bakery prod.	(%)	0.00	0.00	5.00	0.00	9.75	0.00
Wheat Bran	(%)	6.81	9.95	3.50	7.41	7.08	9.95
Cereals	(%)	61.4	33.6	62.6	33.9	57.9	32.2

Practical Implementation

Results

	Control	Circular	p
Weight start (kg)	8.26	7.64	0.021
Weight end (kg)	25.5	26.1	0.475
Average Daily Gain (g/p/d)	423	451	0.022
Total Feed /Pen	255	275	0.032
Average Daily Intake (g/p/d)	627	673	0.032
FCR	1.49	1.49	0.858



Conclusion Study

- Replacing cereals with 35% of Bakery Products in the feed composition has no negative effect on the technical results
- Piglets seem to prefer circular feed in the first weeks after weaning
- There were found no differences in behaviour and health between traditional and circular feed

**Practical
Implementation**

Practical Implementation

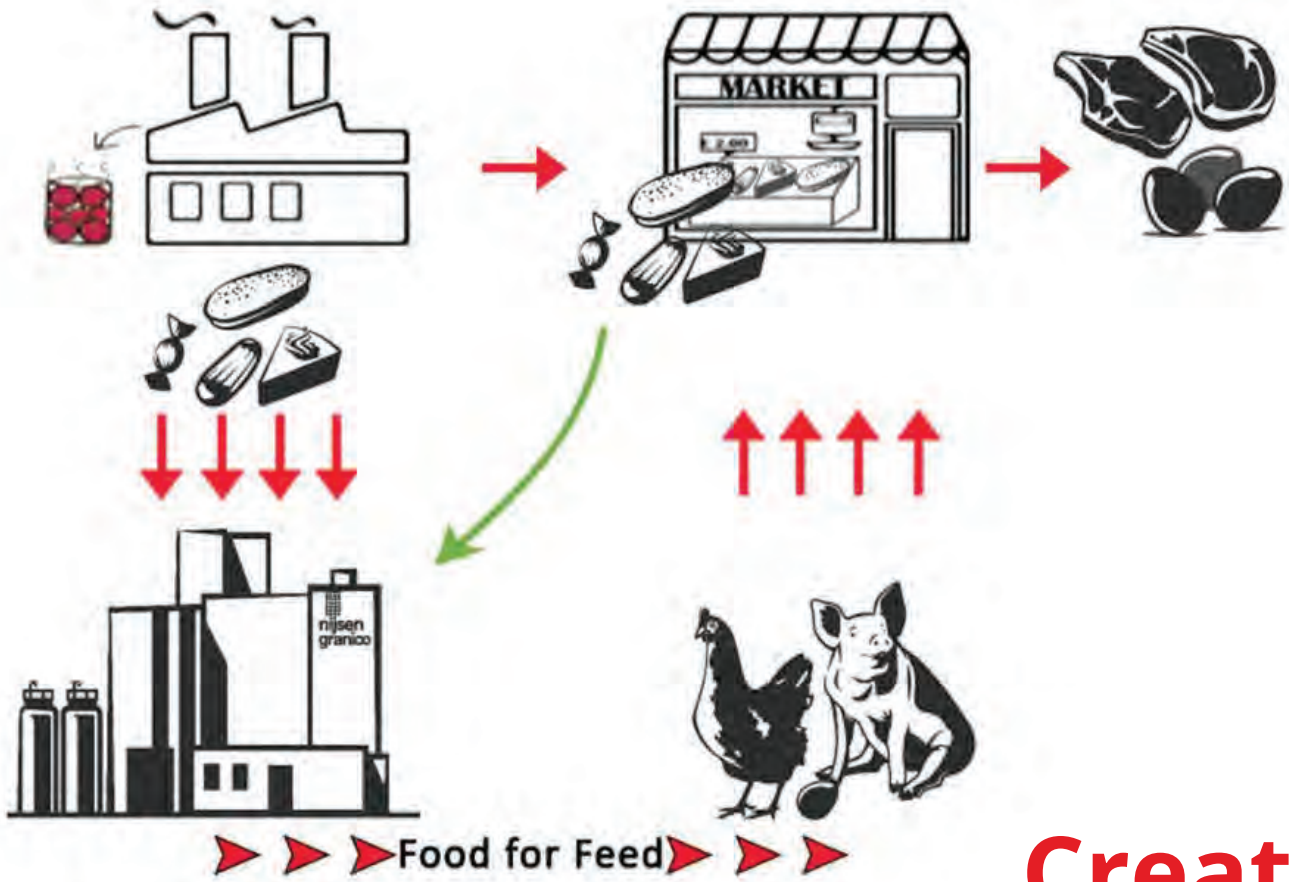
VDN trial

	Control	33% BP	66% BP	100% BP	SEM	p
# piglets	164	176	174	163		
Weaning ages (days)	26.9	26.8	26.9	27.0	1.00	0.999
ADFI (g/d)	595	582	572	561	18.8	0.326
ADG (g/d)	423	417	412	402	10.7	0.565
FCR	1.40	1.40	1.39	1.40	0.020	0.965
	Diets fed D7-D28 post-weaning; %= replacement of wheat Source: Bakery products in diets for weaned piglets					

Practical Implementation

Nijsen company **2023**

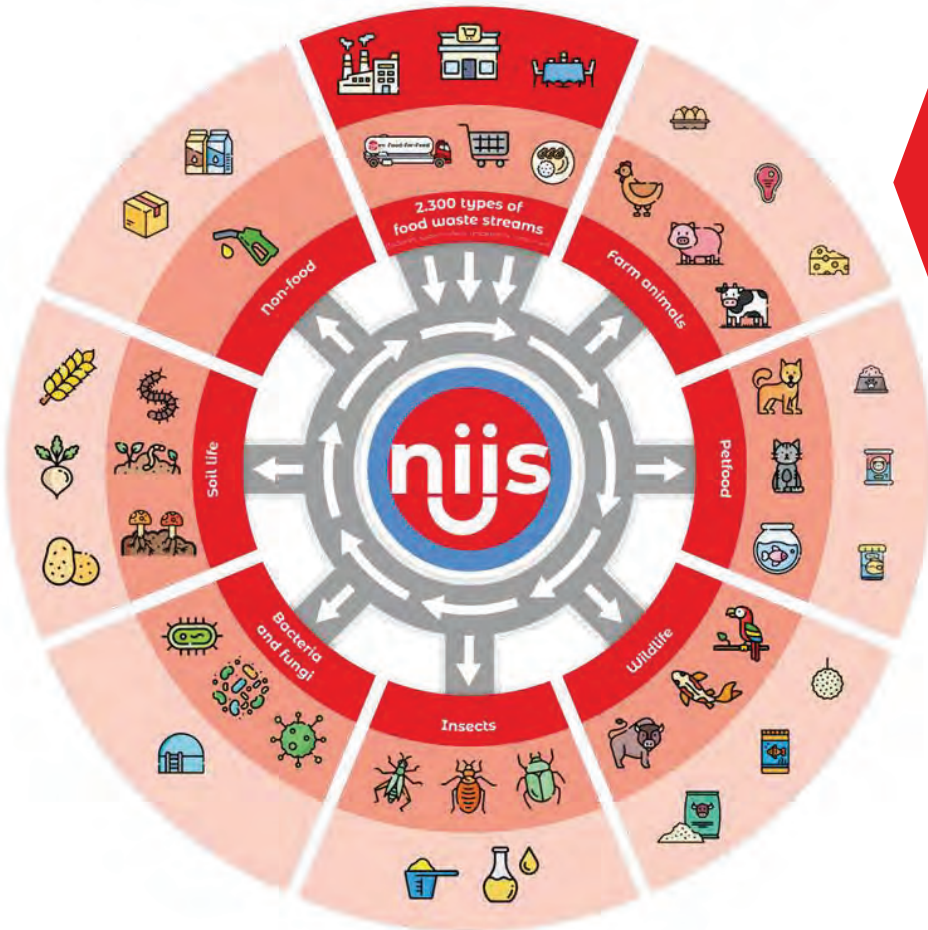
	Control	Nijsen company
# farms	56	10
# animals	1661	2253
Mortality (finishing)	2.4%	2.2%
ADFI (kg/d)	2.27	2.24
ADG (g/d)	907	945
FCR	2.5	2.37
Cost / kg gain	0.897	0.826
	Source: Nijsen company	



**“Food for Feed
for Food”**

Creating new cycles

nijs to **be cycle**



Valorisation of Residual Flows and the Role of Livestock / Animals





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THANK YOU!

