restråstoff!

Tilgjengelige blå & grønne sidestrømmer

GoBio - Er insekter vår neste fôrprodusent?
11 januar 2017

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Forsker, Nofima AS

Nofima

Turnover: 545 mNOK (2015)

Result: 22 mNOK (2015)

344 employees - 328 FTEs*

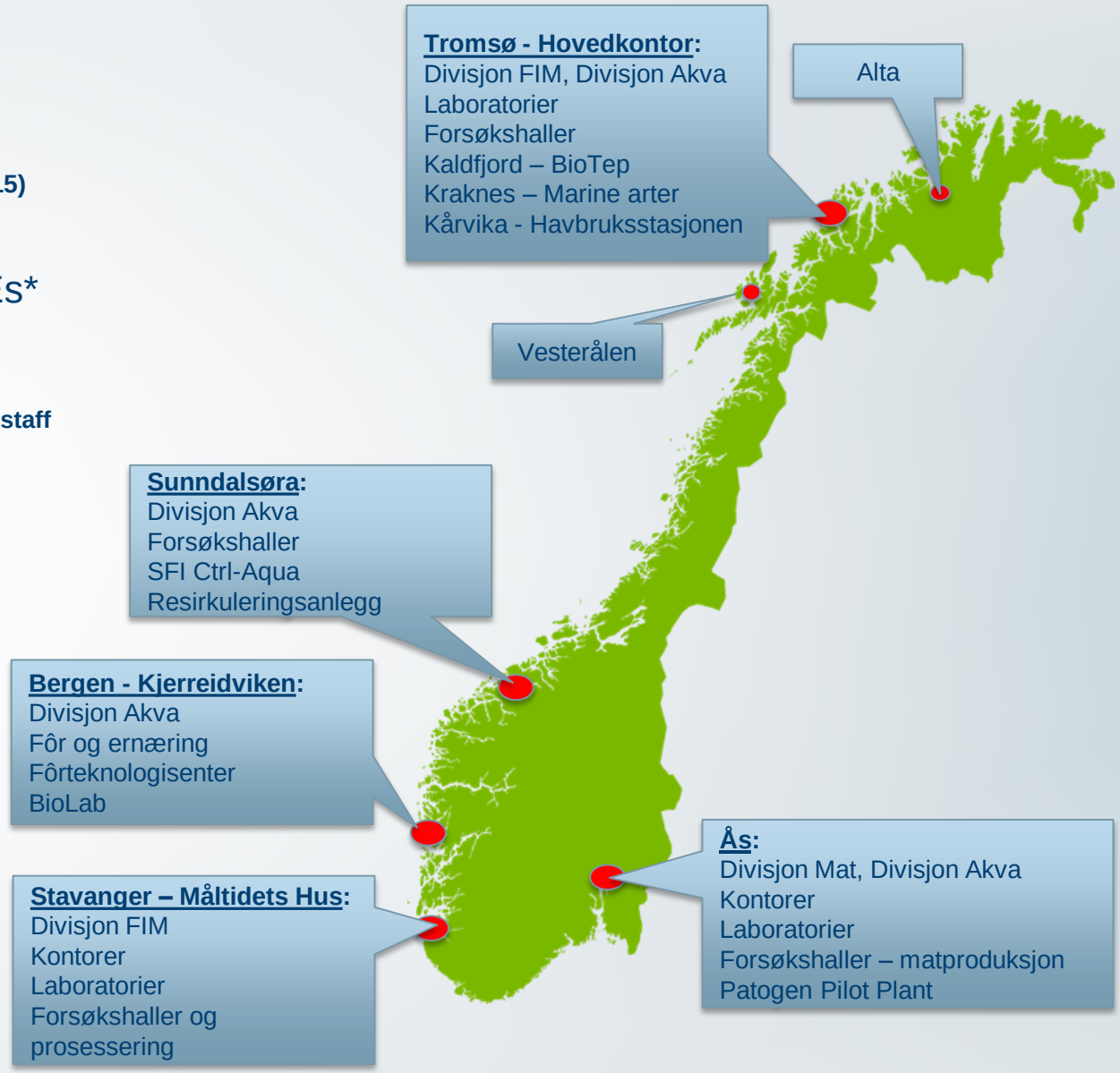
58% **42%**

271 Scientists and technical-scientific staff
149 with a PhD

155 publications (2015)
6 PhDs
>350 reports

>550 projects (2015)

*Figures are approximate

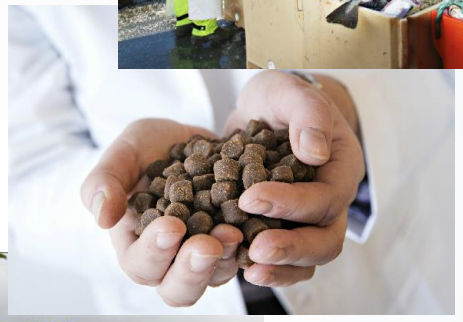


Nofima sites

Alta

Tromsø

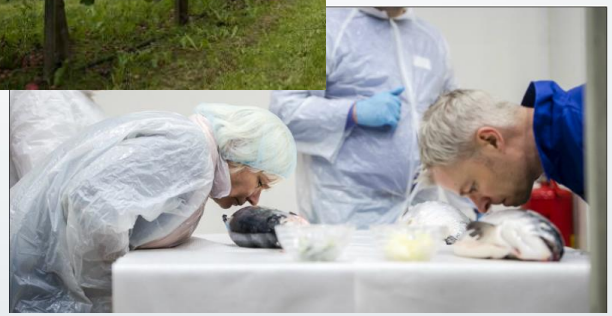
Vesterålen



Sunndalsøra

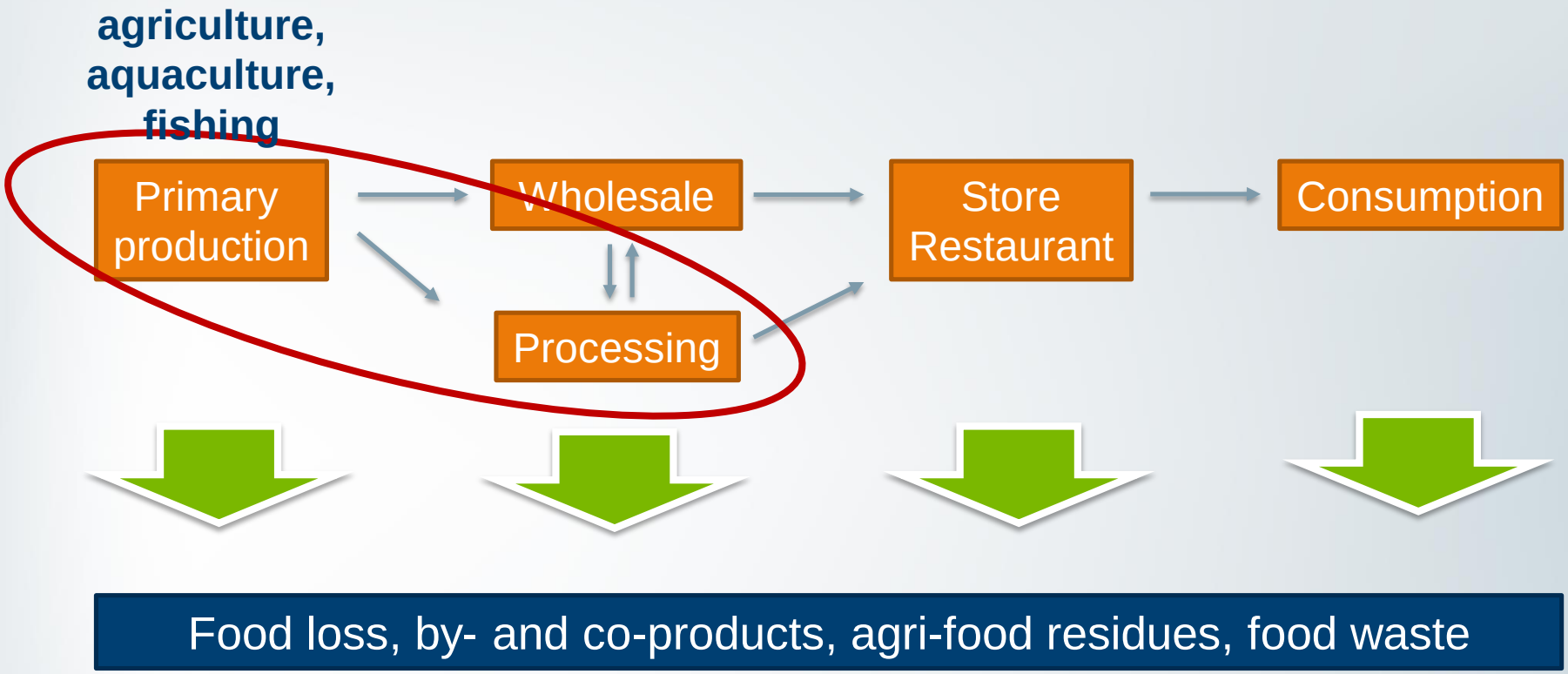
Bergen

Ås



Stavanger

Value chain – production for human consumption



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Marine sector in Norway covered by yearly report 2012-2015

Restråstoff

“ Som restråstoff defineres det som ikke er primære hovedprodukt ved anvendelse av et råstoff”

Aim

“to provide an overview of access to marine-products from Norwegian fisheries and aquaculture and provide an overview of trade flows for the use of feedstock”

Method

Statistics and interviews


SINTEF

A 27704- Åpen

Rapport

Analyse marint restråstoff, 2015

Analyse av tilgang og anvendelse for marint restråstoff i Norge

Forfatter(e)

Roger Richardsen, SINTEF Fiskeri og havbruk AS

Ragnar Nystøyl, Gunn Strandheim, Anders Marthinussen, Kontali Analyse AS

SINTEF Fiskeri og havbruk AS

Internasjonale prosjekter og rådgivning

2016-05-30

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Marine sector – total volume

Raw material: 3 440 000 ton (live weight)
By-products: 890 000 ton
Used by-products: 675 000 ton (76%)


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Rapport

Analyse marint restråstoff, 2015

Analyse av tilgang og anvendelse for marint restråstoff i Norge

Forfatter(e)
Roger Richardsen, SINTEF Fiskeri og havbruk AS
Ragnar Nystøyl, Gunn Strandheim, Anders Marthinussen, Kontali Analyse AS

Whitefish | Pelagic fish | Aquaculture | Shellfish

	Hvitfisk	Pelagisk fisk*	Havbruk	Skalldyr	Sum
Råstoffgrunnlag (levende vekt)	734 000	1 256 000	1 404 000	50 600	3 444 600
Tilgjengelig restråstoff	314 000	152 900	406 300	16 300	889 500
% vis andel restråstoff av totalt råstoffgrunnlag	43 %	12 %	29 %	32 %	26 %

Raw material (ton)

By-products (ton)

By-products (%)

**Råstoffgrunnlaget er artene sild, makrell, kolmule og lodde, dvs. de som genererer restråstoff.*

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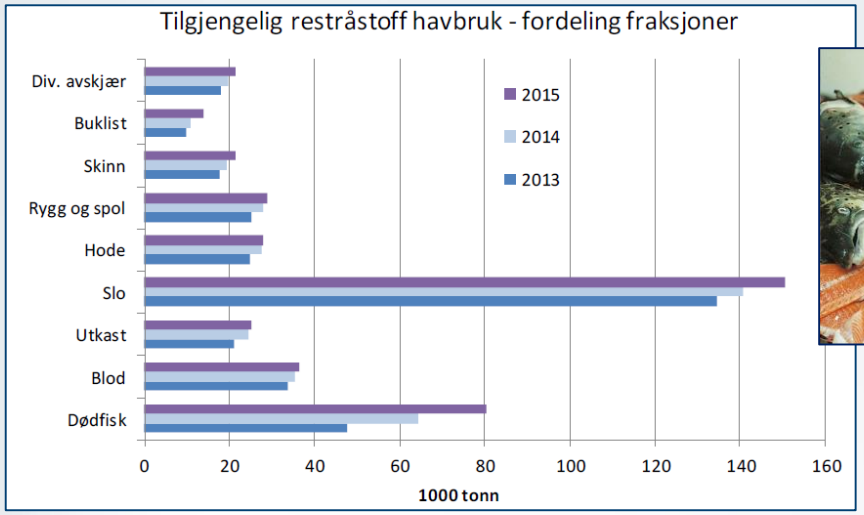
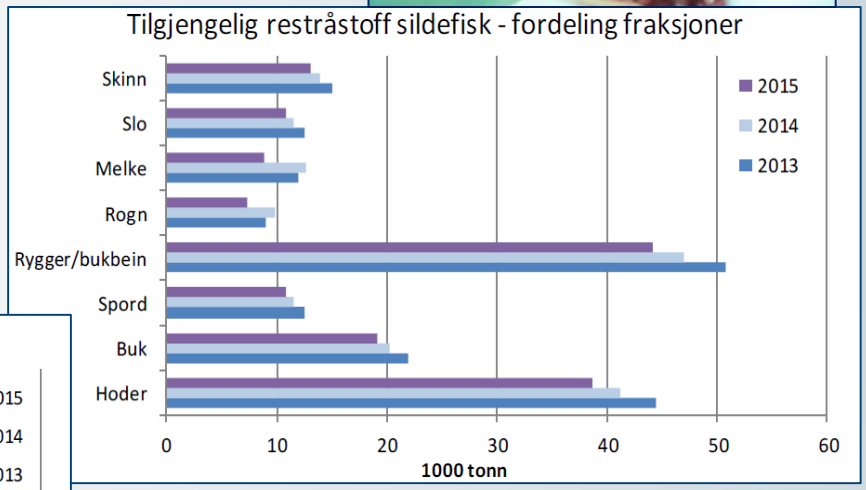
Available qualities – grouped by type/specie(-s)

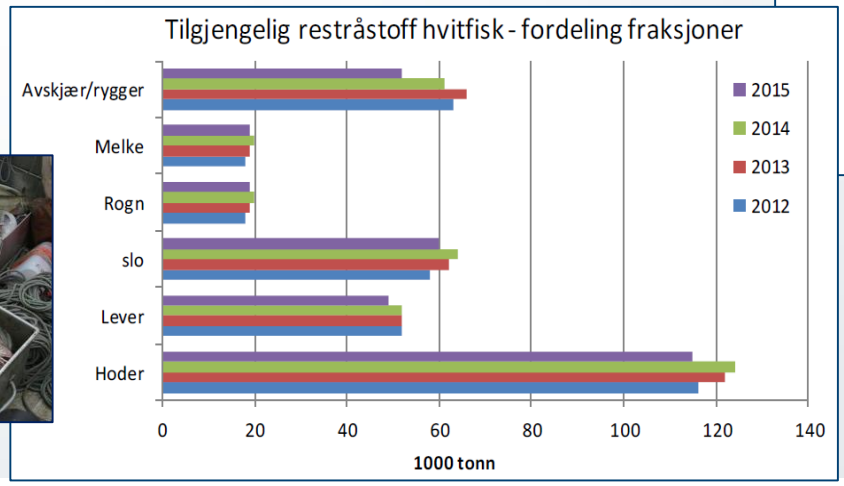


Salmon and trout



Herring

Whitefish



Richardsen et al. 2016

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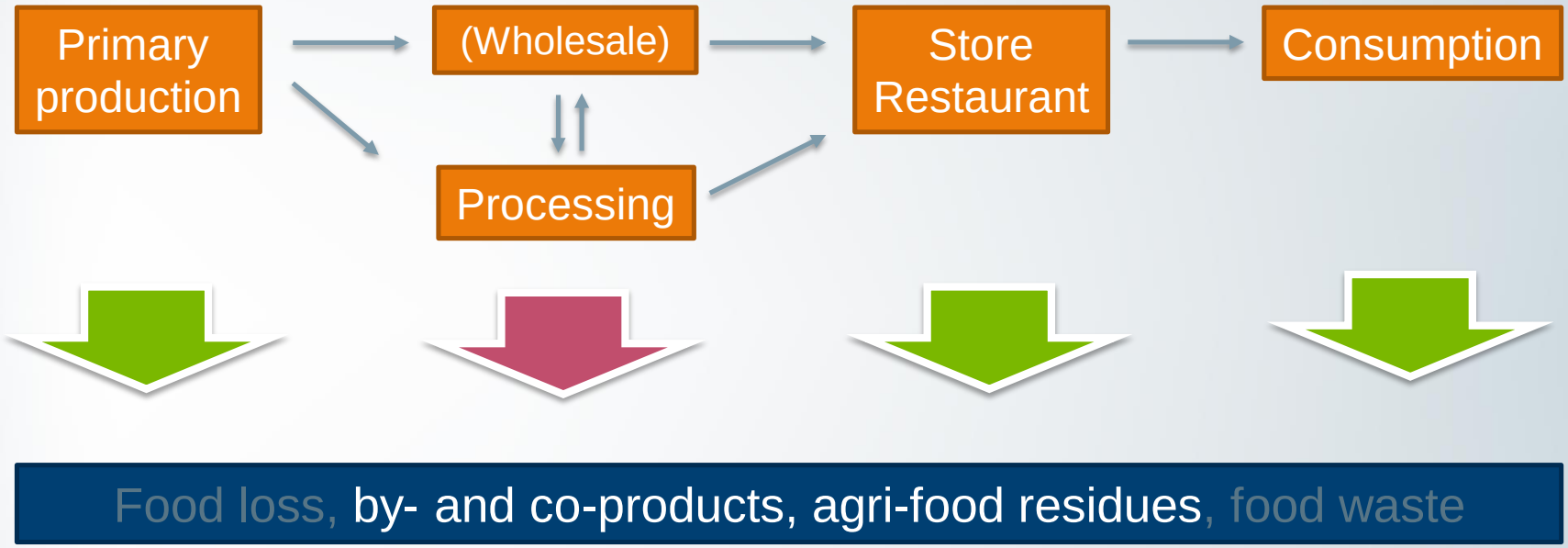
Value chain – production for human consumption



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Agri-food residues – processing step

"Restråstoff"

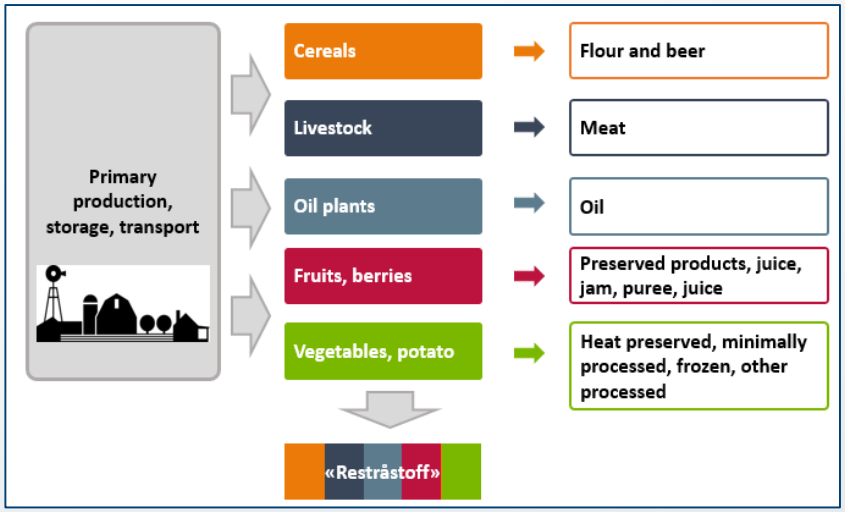
"Som restråstoff defineres det som ikke er primære hovedprodukt ved anvendelse av et råstoff"

Aim

Finding out how much agri-food residues that are produced in Norway, after the first industrial processing step

Method

Statistical info, survey and interviews



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Innovasjon Norge

Kartlegging av restråstoff fra jordbruket

Diana Lindberg
Kjersti Aaby
Grethe Iren A. Borge
John-Erik Haugen
Astrid Nilsson
Rune Rødbotten
Stefan Sahlstrøm

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Volumes - cereals and oil plants

From grains: mostly bran or hull

From breweries: brew spent grain

From oil plants: pomace

	Agri-food residue (ton)	Agri-food residue (%)
Cereals	**86 823**	
Grains	69 823	
Wheat	61 000	22
Oat	7 500	21-32
Barley	1 200	30-50
Spelt (dinkel wheat)	123	26
Brewing	17 000	31
Oil plants	**800**	

Lindberg et al 2016, Kartlegging av restråstoff fra jordbruket

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Plant-based agri-food residues – Fruits and berries

Total volume **1 600** ton residual = pomace

Challenge that large production over a short period of time and many small producers

Species	Origin	For production (ton)	Loss (%)	Agri-food residual (ton)
Apple	Mostly immediate area[2]	4700	20 – 35	1300
Blackcurrant	Norwegian	570	20	110
Pear	Immediate area	70	35	25
Raspberry	Immediate area	220	10	20
Cherry	Norwegian	85	18	15
Currants	Immediate area and import	75	15 – 20	15
Strawberry	Norwegian and import	80	10 – 20	10
Other[3]	Norwegian and import	76		15
Other[4]	mostly import			75

[3] Blueberries, rhubarb, aronia and cranberries. [4]All types fruits and berries.

Lindberg et al 2016, Kartlegging av restråstoff fra jordbruket

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Meat-based agri-food residues

Total volume: **264 245** ton (2015)

NB. Everything after slaughter that is not sold as meat is included in this definition of residuals ("restråstoff")

With many parts, traditions define what is edible/non-edible

Species	Individuals	Average weight living (kg)	Total bio mass at slaughter (ton)	Meat (ton)	Residues (ton)	Residues (%)
Pig	1 605 490	117	187 084	117 190	69 895	37
Cattle	284 201	561	159 437	63 775	95 662	60
Lamb/sheep	1 222 767	45,2	55 290	20 347	34 943	63
Chicken	63 406 246	1,77	111 912	55 366	56 546	51
Turkey	1 260 617	12,6	15 922	8 722	7 199	45

Lindberg et al 2016, Kartlegging av restråstoff fra jordbruket

Volumes - vegetables and potatoes

Very varied quality in btw. of different residuals, from food quality to dirty peelings

		Agri-food residue (ton)	Agri-food residue (%)
Total volume		**> 64 150**	
Frozen		13 000	average: 21
	Vegetables	4 000	2-25
	Potatoes	9 000*	15-25
Heat preserved		1 151	
	Vegetables	1 150	20-35
	Tomato	1	17
Minimally processed vegetables		12 000	20-25
	Carrot	7 000	
	Union	5 000	
Other processing of potatoes		38 000*	
	Heat treated potato	33 000*	25-30
	Potato chips	5 000	9
Production of potato liquor and potato flour	Wash- and process water	70–85,000 m2/y**	

* Wash- and process water not included

** dry matter content 3–40 %

Lindberg et al 2016, Kartlegging av restråstoff fra jordbruket

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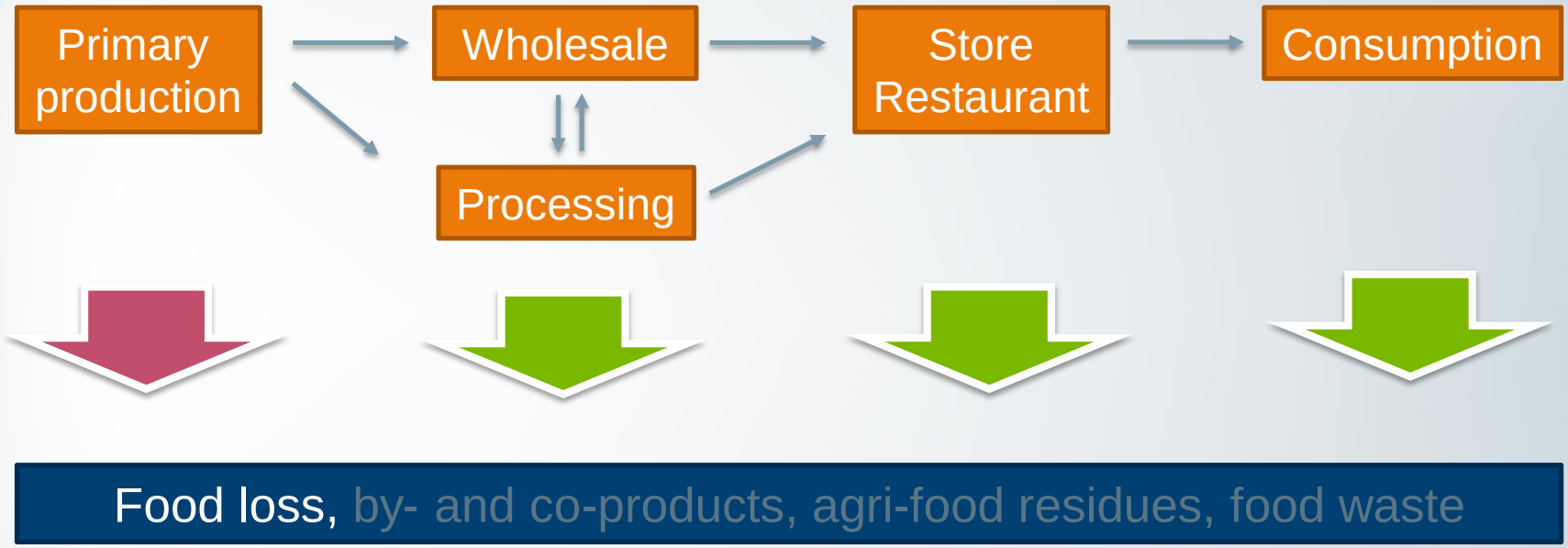
Value chain – production for human consumption



A comment on the problem with use of different methodologies in different projects…

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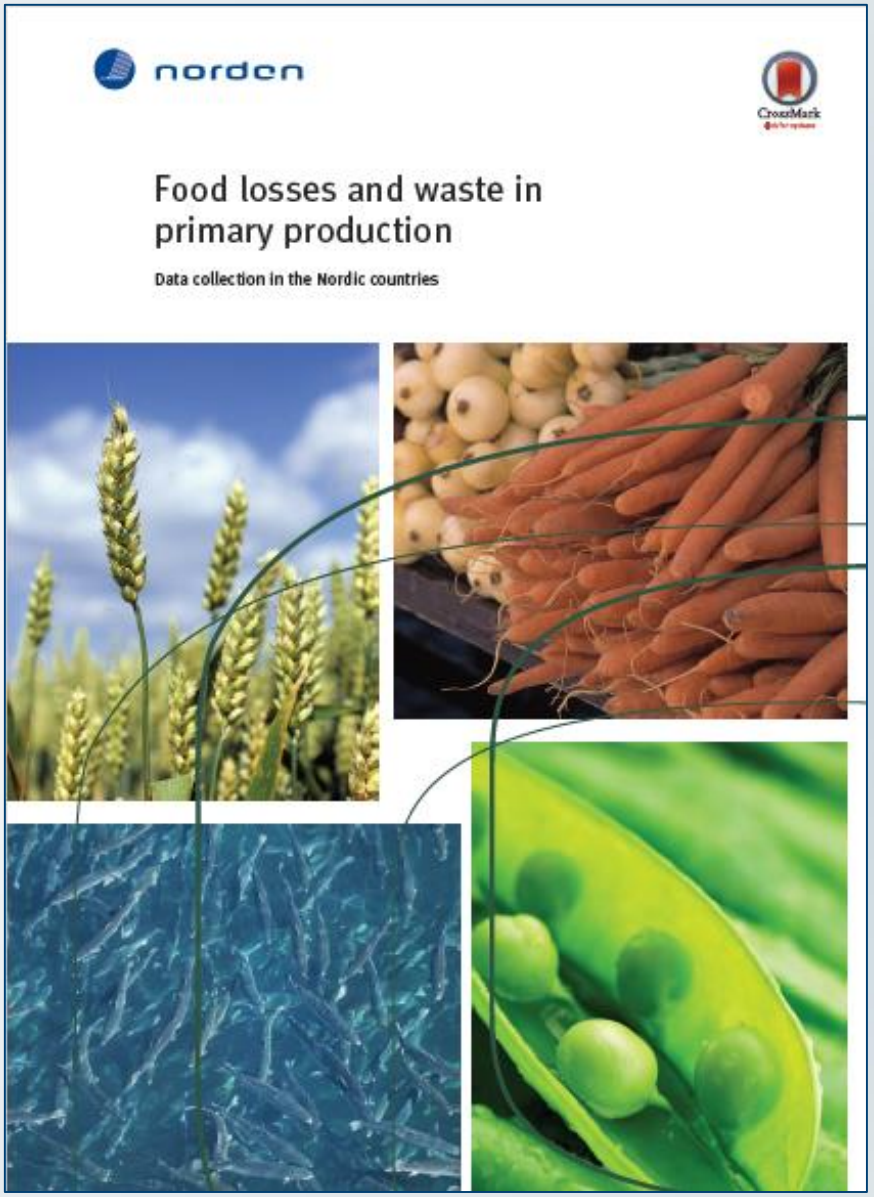
Nordic study – primary production

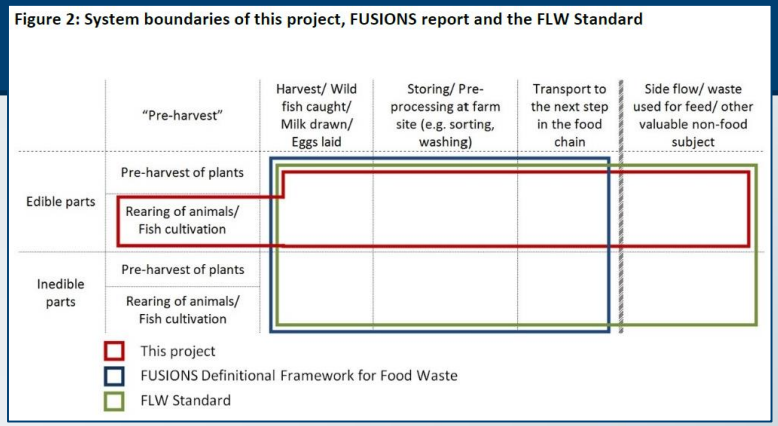
Methodology study which also resulted in volumes

One main purpose
to get an understanding of food waste in primary production,
to supplement estimates from processing, retail, restaurants and households

Important note
Waste from this part of value chain often involuntary



Nordic study – primary production



Compares three different definitions

- "Side flow" – new for study
  - Primary production intended for consumption
  - Inedible parts (peel bones) excluded
  - Includes plants (wild and cultivated), domesticated and wild animals, milk and laid eggs, caught and farmed fish. Nordic perspective
- "Food waste" as used by FUSIONS (EU project)
  - "Food production" - all production intended or expected used for consumption
  - Removed to be recovered or disposed
  - Any food or inedible part of food – all food cycle stages, EU
- "Food loss and waste" (Food Loss and Waste Accounting and Reporting Standard (FLW Standard) (WRI 2016))
  - "Food production" – food intended for consumption
  - Loss and waste exchanged for with material (edible/inedible) and destination
  - Starting from harvest; including harvest losses, animals ready for slaughter - all food cycle stages, global scale

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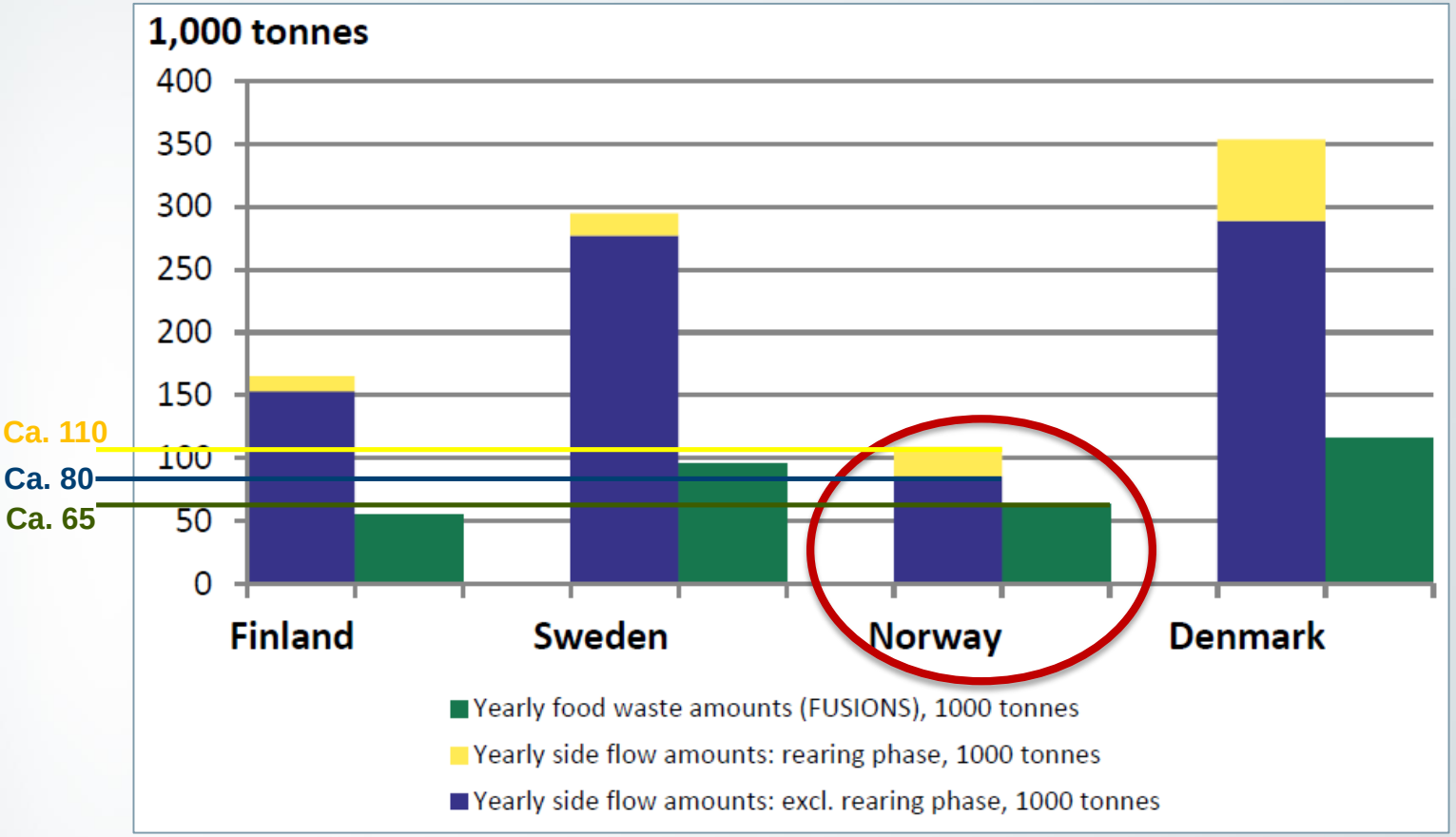
Primary production – total volumes wasted

Food losses and waste in primary production

Data collection in the Nordic countries



Note: It should be noted that the available data on side flows and food waste from primary production is scarce and there are significant uncertainties in the available data (see Subchapter 3.2). Consequently, we cannot compare countries to one another. Due to several uncertainties and simplifications, one should read the figures and standard estimates within this report as rough estimates.

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Summary

There is a lot of waste out there (and this is only a part of it

Volumes in presented reports:

- 105 000 tons from primary production
- 890 000 tons of fish waste (fisheries and aquaculture)
- 415 000 tons of agri-food waste (waste produced after harvesting or slaughter, in first processing step, in selected sectors)

Total overview of all parts of value chain is *still* missing

To avoid confusion

- Strive for finding one standard for waste reporting
- Agree on using one common terminology

Quality matters – use food grade residues for food, then for other uses

Thanks for the attention!

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