

# the *total* feed business



## Huidige en nieuwe eiwitten in diervoeding

Zwolle 8-12-2015

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WAGENINGEN UNIVERSITY

WAGENINGEN UR

**for  
farmers**  
the *total* feed business

# Inhoud

ForFarmers

Huidige stand van zaken

Vraag & Aanbod

beïnvloedende factoren

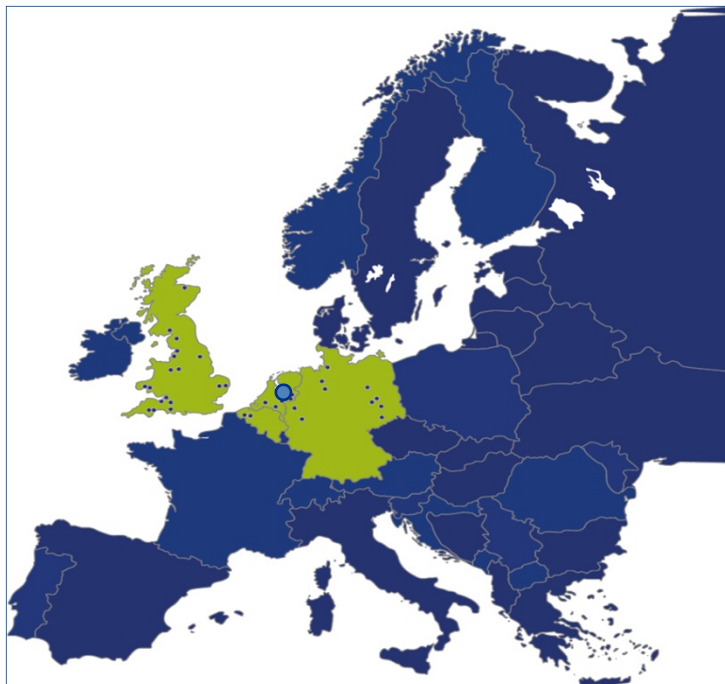
Outlook

Zal het type eiwit wat we gebruiken veranderen?

insecten eiwit

Conclusie / Take home message

# Profile ForFarmers: facts & figures 2014



#1 in Europe: Total Feed Business

Turnover € 2.3 billion

Total Feed volume : 8.9 million tonnes

> 25,000 customers (farmers)

42 production facilities in four countries

Centrally-managed R&D unit (NIC)

> 2,300 employees

## Core activities


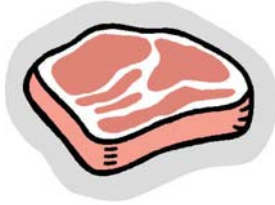








Advice on and sale and production of animal feed (compound feed, specialties, by-products and raw feed)

Sales of agricultural trade items (fertilisers, crop protection, seeds and seedlings)

## Compound feed sales volume



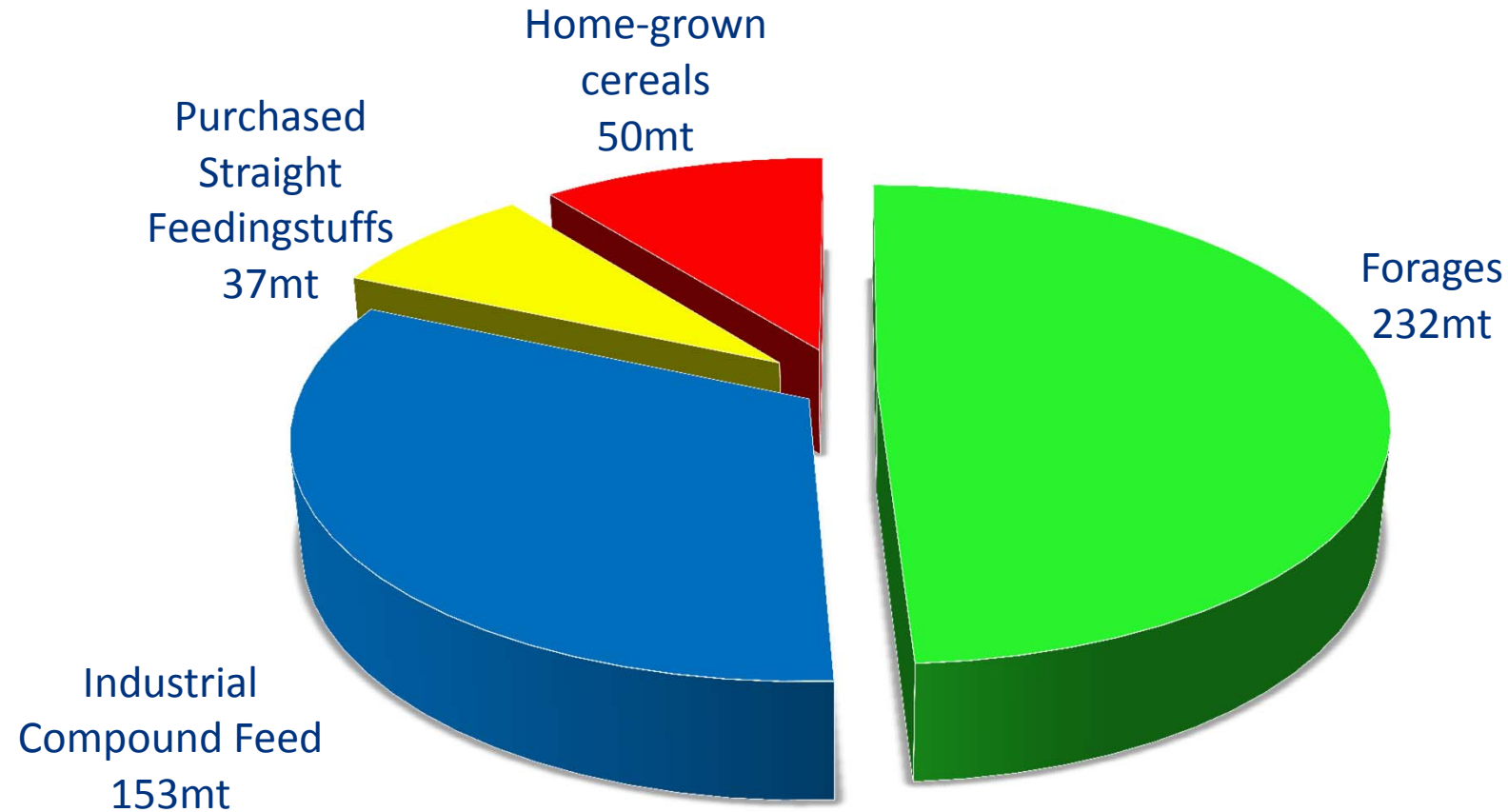
# A look at animal protein

						
NL protein consumption	42%	50%			3%	0%
Feed conversion [ds feed / kg carcass]	0,8	 4,5-8	 2,3	 1,5	2,1	Medium - good
Protein conversion [CP carcass, milk, egg / CP feed]	25-33%	 9%-24%	 19%	 37%	35%	Medium - good
Human consumable / non consumable	++	++	+	+	+	++/+++

We are upcycling protein

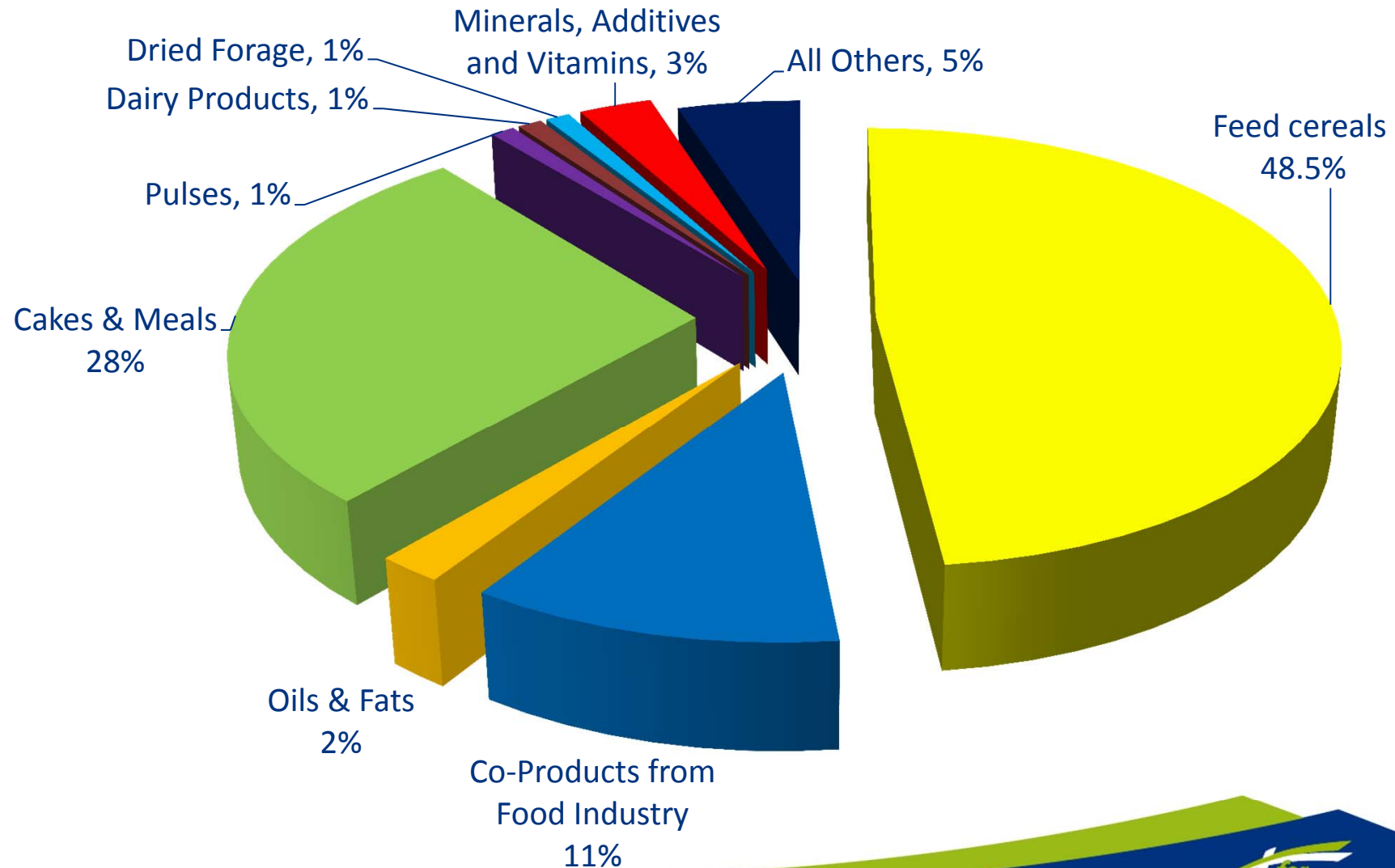
# Livestock Feed EU 27 – 472m tonnes in 2012

(Source: FEFAC-DG Agriculture, million tonnes)



# Feed Material Composition by Compound Feed Industry 2012

(Source: FEFAC)



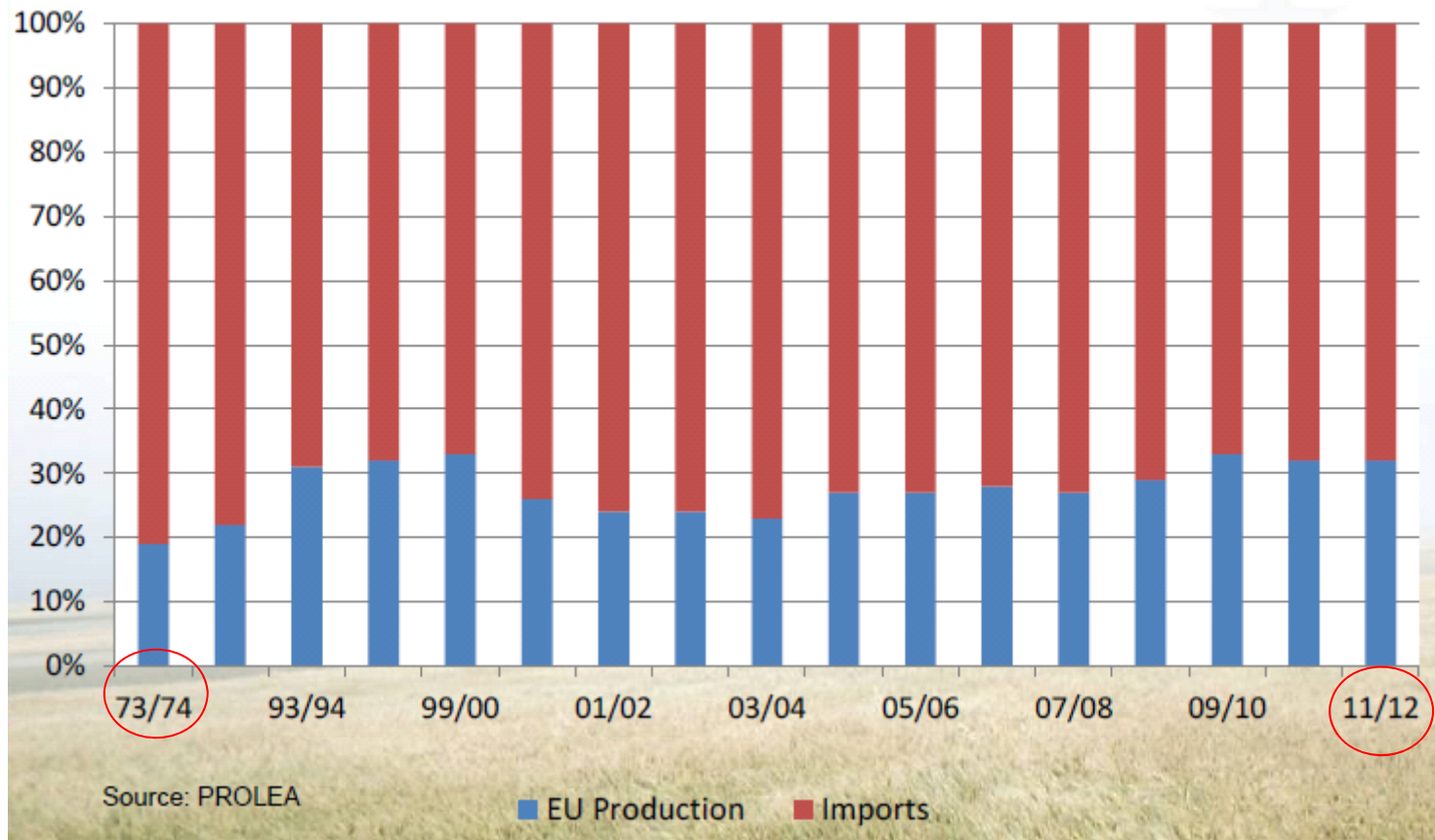
# EU 27 balance sheet protein

Raw material	Self sufficiency
Soybeans/meal	3%
Rapeseed and sunflower seed/meals	75%
Pulses	122%
Dried forages	105%
Misc. (groundnuts, linseed, cottonseed, corn gluten Feed etc)	57%
Total <b>protein rich</b> feedstuffs [Eu]	<b>32%</b>
Total protein in compound feeds [Europe]	<b>52-56%</b>
Total protein in total ration [Europe]	<b>73-76%</b>

Source: Prolea/Fefac 2011/2012 & WUR 2012-2013 (Marinus van Krimpen)



# EU import and production protein rich



More or less stable the last 40 year



# How will the future look?

Wageningen UR Livestock Research  
*Partner in livestock innovations*



Report 662

Cultivation, processing and nutritional aspects for pigs and poultry of European protein sources as alternatives for imported soybean products

February 2013



Carla ROUGOOR  
Emiel ELFERINK (CLM)

m.m.v.  
Marijn JONKER  
Jonathan MALMBERG  
Jeroen VAN DER LAAN (ECORYS)

## DE DRIJVENDE ACHTEN TER EIWIT

achtenanalyse  
productie,  
umptie en



Initial outcomes - The Quest for Protein

The protein bottleneck tightening

Food & Agri Research/ July 2014

FBI, Netherlands Environmental  
assessment Agency

## THE PROTEIN PUZZLE

The consumption and  
production of meat,  
dairy and fish in  
the European Union



# European Protein status

Increasing  
demand

Decreasing  
demand



Increasing  
supply

Decreasing  
supply

Increasing  
demand

Decreasing  
demand



## Increasing protein demand?



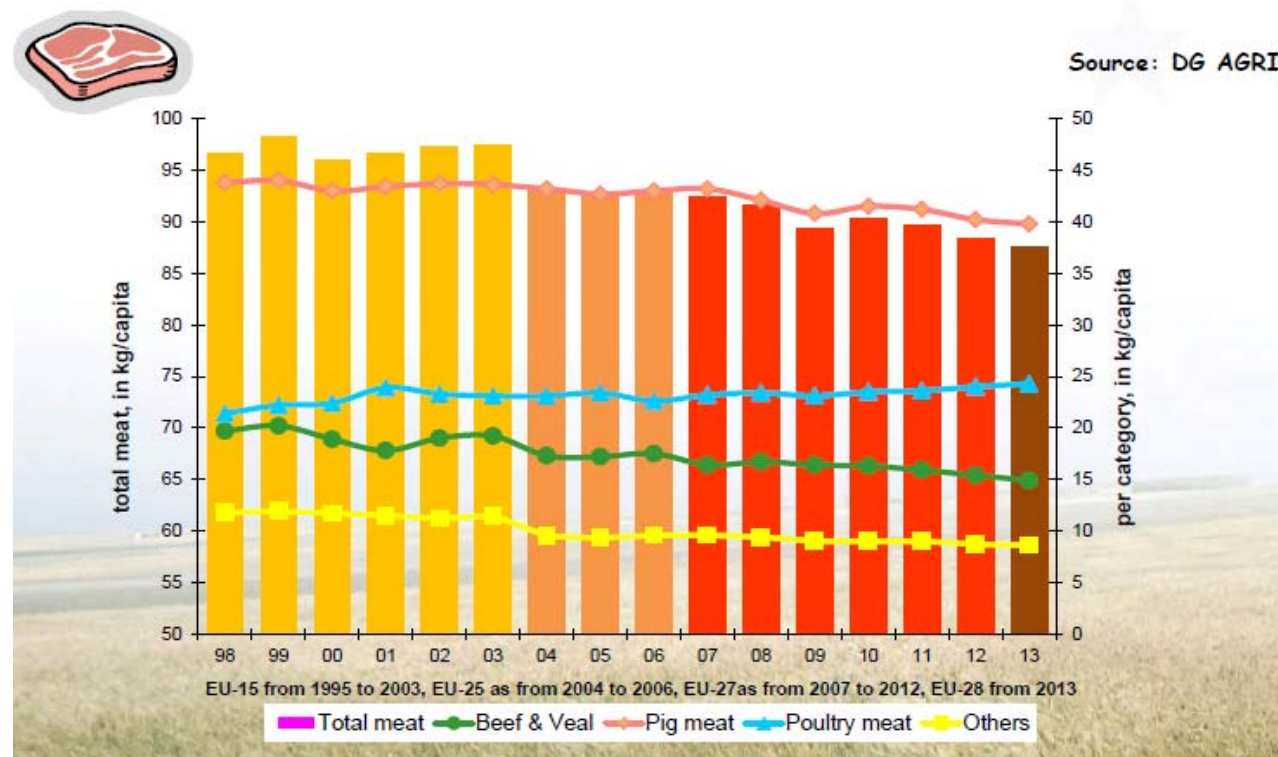
Yes



Most likely No



## Meat consumption per capita decreases



Population almost constant 510-524 million and decreasing after 2035 (Eurostat, 2011)



Increasing  
demand

Decreasing  
demand



## Meat consumption decreases:



### Sustainability

Worries on impact meat consumption

Focus on less food waste = less production



### Worries about Animal welfare

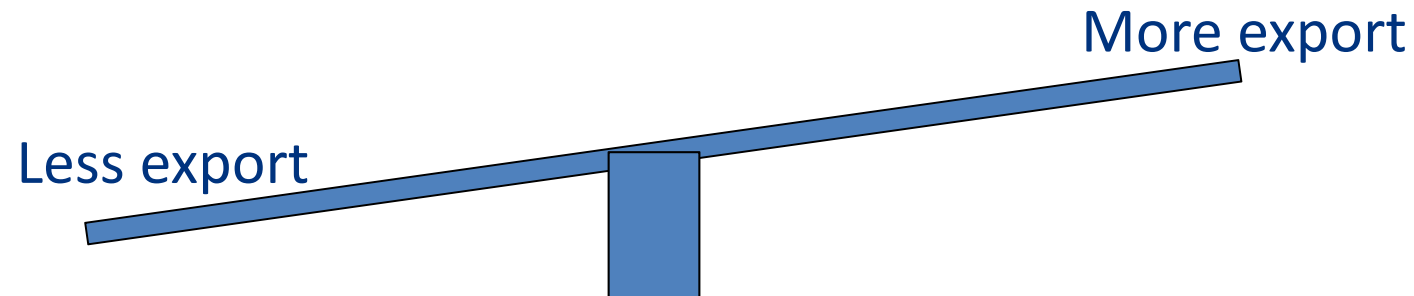
Romantic pictures <> perceived reality



### Worries about Health



## Import/export



Stricter than world standard  
welfare requirements  
environmental requirements

Global demand increase  
Quality

Pork & Poultry

Dairy

➡ Most likely less export





## Efficiency increase

### Broiler Chicken

Parameters	1940	1965	1985	2005
Body weight [kg]	1.4	1.6	1.9	2.4
Age at slaughter [days]	84	63	49	42
Feed conversion rate [-]	4.0	2.4	2.0	1.7

(Source: IFIF 2013)



## Efficiency increase

1-2% efficiency increase per year

Genetic improvements

Better housing / management

Improved feeds

- Aminoacids

- Enzymes (phytases, xylanases etc)

- Phytogenic compounds

- More advanced nutrient systems i.e.

**feed<sup>2</sup>  
milk**

Increasing demand

Decreasing demand

Increasing demand

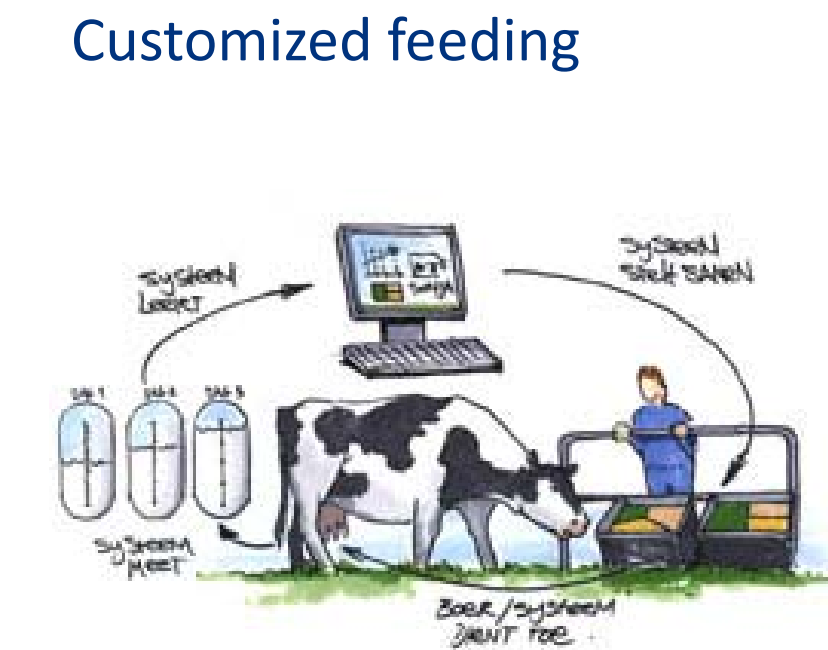
Decreasing demand



Increasing demand

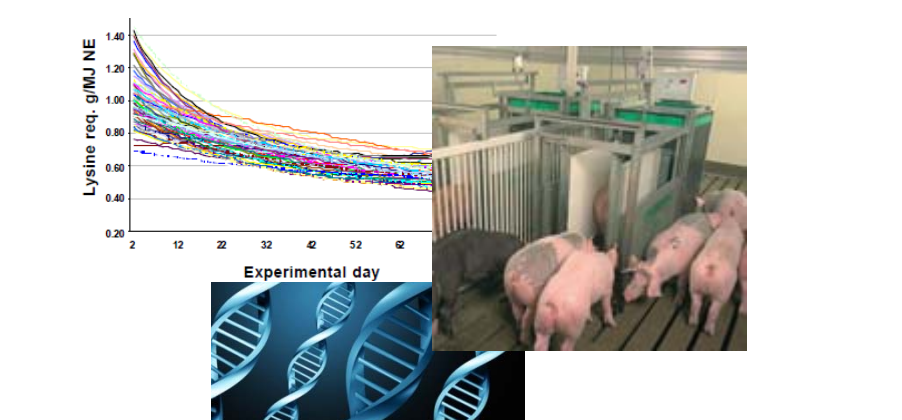
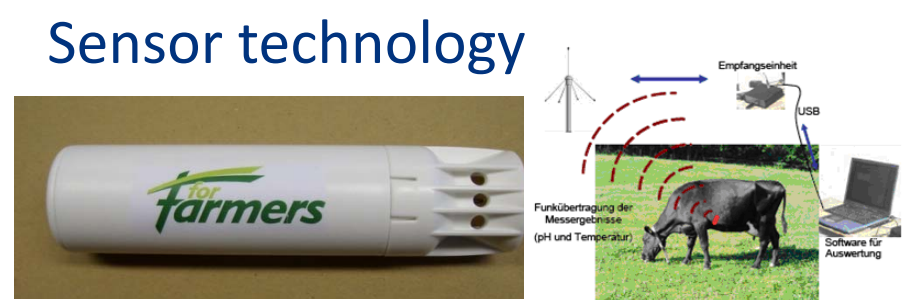
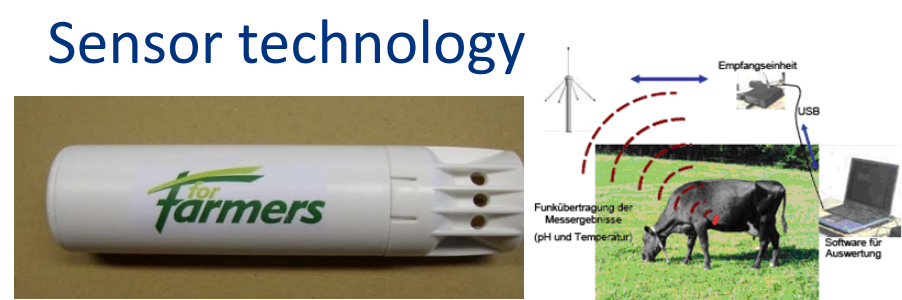
Decreasing demand

# Customized feeding



# Sensor technology

The image is a composite illustrating sensor technology in agriculture. On the left is a white, cylindrical sensor device with the 'for farmers' logo and a multi-pronged tip. On the right is a diagram showing the device's communication system: a blue double-headed arrow connects the sensor to an 'Empfängseinheit' (receiving unit) which has a USB connection to a laptop labeled 'Software für Auswertung'. Red dashed arcs represent the wireless transmission of measurement results ('Funkübertragung der Messergebnisse (pH und Temperatur)') from the sensor to the cow in the field.



eding to individual (genetic) potenti



## Efficiency decrease

### Alternative housing

Type of housing	Kg feed/ kg egg
Battery Cage (now banned in EU)	1.98
Voliere	2.14
Free Range	2.27

15% decrease

Source:ForFarmers, 2009,2013

Improved welfare is a good development,  
but has impacts on resources needed



## Efficiency decrease

### Organic

System	Swine (Feed conversion 25kg – end)
Organic	2.98
Regular	2.51

} 19% decrease

Source: Agroscoop, 2014

### Reasons:

More welfare, which again is a good thing

no amino acids

no enzymes like phytase

higher protein levels in the feed



## Efficiency decrease

Organic could be much more environmental friendly when:

Allowing the use of amino acids

Allowing the use of modern enzymes like phytase

Both are in essence natural fermentation products





# Supply

## Area and yields for major crops

	Production [million t]		Harvested Area [million ha]		Yield [tonnes/ha]	
	2005/2007	2050	2005/2007	2050	2005/2007	2050
Wheat	614	858	222	225	2.8	3.8
Maize	734	1,178	155	194	4.7	6.1
Soya beans	217	390	94	124	2.3	3.2

Source: FAO 2012

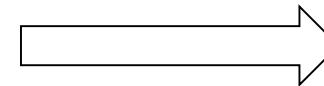


# Supply



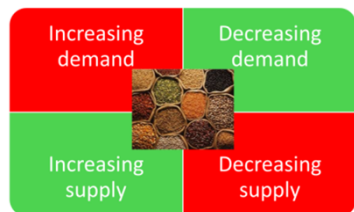
Use the  
Carbohydrates  
& Lipids

Protein



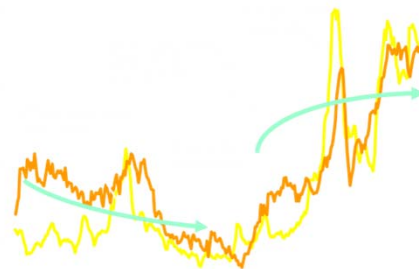
Increases of raw material ingredient price

More supply of (cheaper) protein



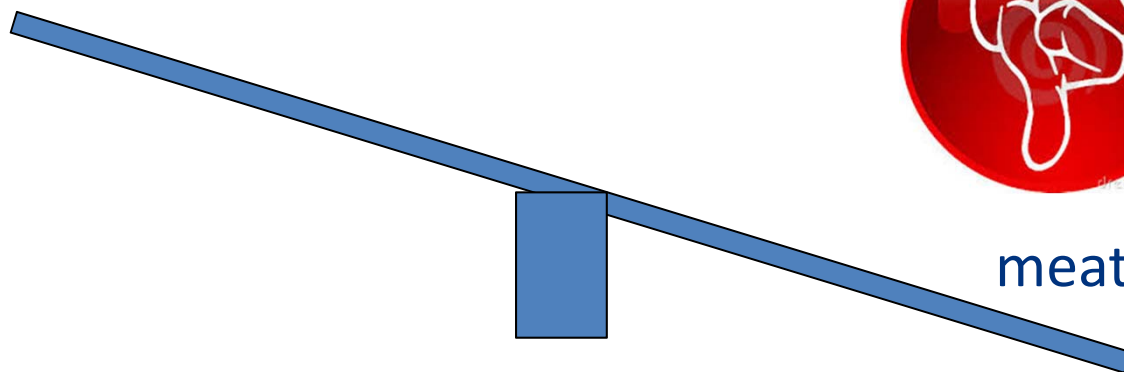
# Supply & Demand

Increased feed prices good or bad?



When imbalance between feed prices and meat/egg/ milk prices:

Feed prices

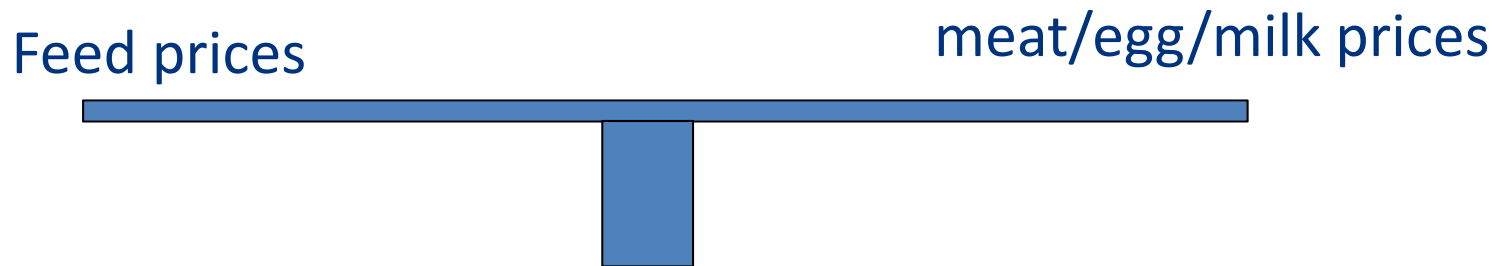


meat/egg/milk prices



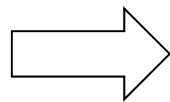
# Supply & Demand

Increased feed prices when:



Lead to:

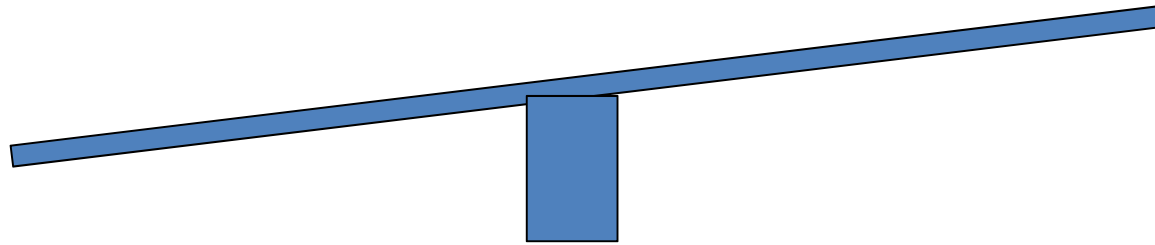
- Better feeding of the animals is more economic
- Better housing and management is more economic
- Less waste of food by consumers



Less protein needed



Overall



Less European consumption  
Less export (meat, eggs)  
More efficiency  
Increased yields own production  
Higher prices

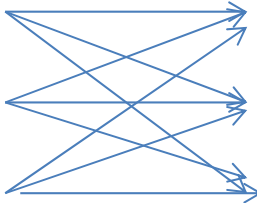
More export (Dairy)  
Less efficiency (organic, welfare)  
Decreased European acreage

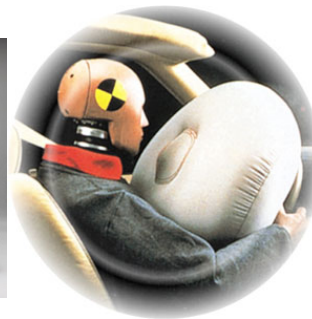
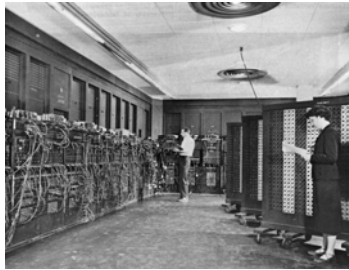
Most likely a **decrease** in European protein demand

**Will the type of proteins we use change?**



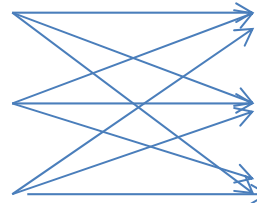
# Drivers for change

Driver		Output
Technology		Cost reduction
Legislation		Safer / cleaner
Consumer demand / acceptance		Better (Consumer benefit)



# Drivers for change – Animal protein

Driver
Technology
Legislation
Consumer demand / acceptance



Output
Cost reduction
Safer / cleaner
Better (Consumer benefit)

Was main focus

Should be more future focus



Hard to distinguish

Small % premium products and mainly on animal welfare issues

Small % can absorb additional sustainability costs

# Other protein sources?

## Legislation:

Impact EU legislation & agricultural policy

## Consumer

Is the consumer willing to pay something more and for what?

## Technology

Is new technology providing protein cheaper or better?

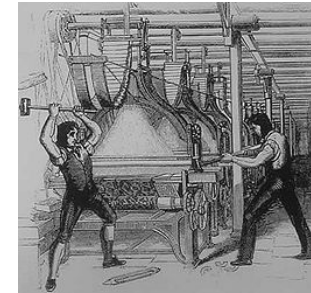
# Legislation

## EU law

Reintroduction of Processed Animal Protein

Insect protein

Novel protein law



Luddism (1812)

## Very restrictive EU GMO laws

Slows down the developments of new protein crops in Europe

## EU agriculture policy

Greening = -5% of acreage = less production

Positive incentives for EU protein production?

# Consumer

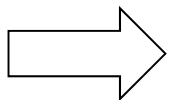
Small percentage of consumer is really informed on facts

Consumer is mainly focused on animal welfare

NGO's play a role

## Main themes

- Local
- Non-gmo
- Sustainability (i.e. certified soy)



Increase the reference protein price

# Reference protein price

The current price levels and origin of protein are mainly a reflection of technology & markets

i.e. protein is produced where it is most economic

When considering alternatives the protein price will increase

Improved technology may lower this price-gap (not a guarantee)



# Other protein sources?

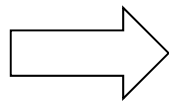
## A) More cultivation of know varieties

EU soja and other oilseeds

Legumes - peas, beans, lupins



Focus should be improving the yield under EU conditions



Breeding efforts are essential

# Other protein sources?

## B) “New” protein sources

Leaf proteins

Aquatic proteins

Insects

Largely still in research phase

Have a positive marketing effect (a story to tell)

# Leaf protein

Sugar beet leaves



Grass



- + Good amino acid profile
- Energy consumption (transport, isolation protein and drying)
- Economics

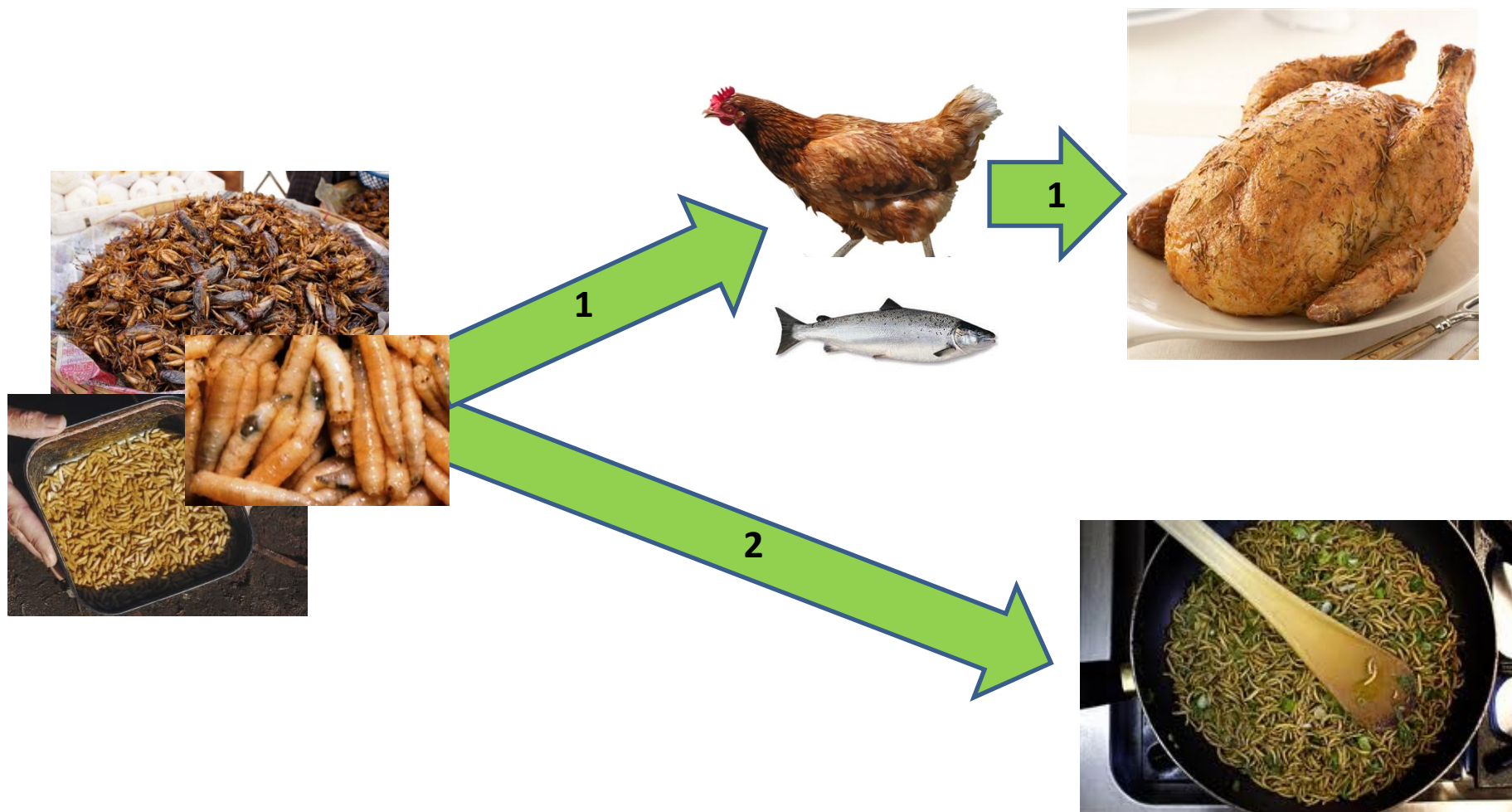
# Aquatic proteins



i.e. duckweed  
38% CP, 20-25 tons per ha  
Very efficient nutrient uptake  
Part of manure treatment  
Direct wet feeding



# Insects



# Insecten in feed

- Wetgeving – nieuwe EU directive: 8 oktober 2015

## SCIENTIFIC OPINION



ADOPTED: 5 October 2015

PUBLISHED: 8 October 2015

doi:10.2903/j.efsa.2015.4257

### **Risk profile related to production and consumption of insects as food and feed**

**EFSA Scientific Committee**

#### **Abstract**

*The present opinion has the format of a risk profile and presents potential biological and chemical*

# Insecten in feed – ministerie NL

- Vanuit de Wet dieren: Je mag geen dieren (insecten) voor productie houden, tenzij de soort voorkomt of de lijst van voor productie te houden dieren (of dat de producent voor die insectensoort een ontheffing heeft van het verbod)
- Vanuit diervoederregelgeving zijn de insecten zelf gehouden dieren en er kunnen alleen toegelaten voedermiddelen als substraat worden gebruikt
- GMP+ gecertificeerd
- Levend voeren is niet verboden, dood wel
- Oproep zelf ook goed na te denken over veiligheid ->  
(net een STW project met Rikilt, WUR en enkele industriële partners toegekend)



# Insecten

Levend voeren insectenlarven (zwarte soldaat vlieg)



<https://www.youtube.com/watch?v=TnmNE0O4QqU&feature=youtu.be>

# Levend Insecten voeren

- Kuikens zijn dol op insecten larven
- Veel meer natuurlijk pik en fourageer gedrag
- Kan prima soya of andere eiwit bronnen vervangen
- Uiteraard nutrioneel nog veel vervolg vragen
- Kan kostprijs technisch nog niet concurreren

Insteek:

Het kan!

Het mag!

Hoe onderdeel van een premium concept?

# Conclusie/ take home message


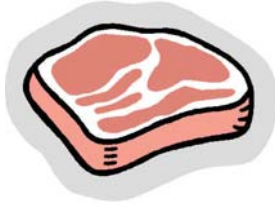








Overall gaan we iets minder eiwit in Europa gebruiken en iets meer van dat eiwit komt van binnen Europa

Geen van de “drivers for change” in type en sourcing van eiwit (consumenten, wetgeving, technology) is op dit moment erg sterk.

Start de verandering met ons te richten op:

- Premium segmenten
- De story line

# Wat is onze insecten eiwit consumptie in 2025?

						
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