

ECONOMIC ASPECTS OF ORGANIC AQUACULTURE

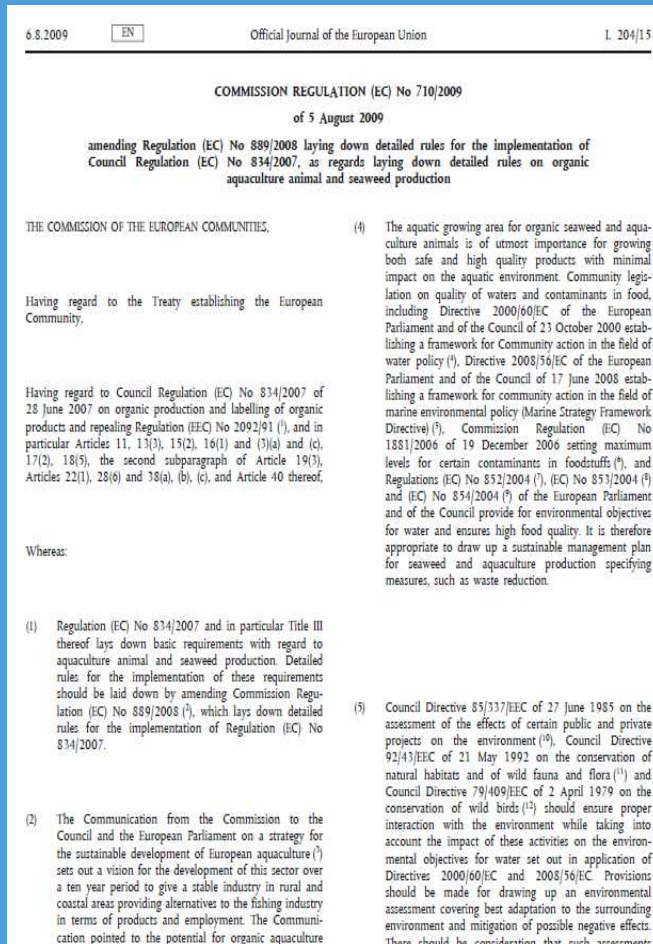
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Relevant rules for aquaculture in the regulation EU 710/2009



- Finfish, shellfish and seaweed
- Origin of animals: organic (if available)
- Husbandry: well-being, oxygen, temperature, light, stocking density, impact on local ecosystem, hormones
- Feed: origin, composition, quality, environmental impact
- Disease prevention and treatments: disinfection, parasite control, homeopathic / allopathic
- Transport

Approach farm level

Basic idea: Simulating the transition to organic aquaculture

1. Collecting reliable data of the farm setup and the cost structure of conventional aquaculture
2. Modelling the (detailed) consequences of 710/2009
3. Collecting external information (prices/quantities)
4. Calculating the production costs before and after transition
5. Comparing the differences in production costs per kg fish

Cases



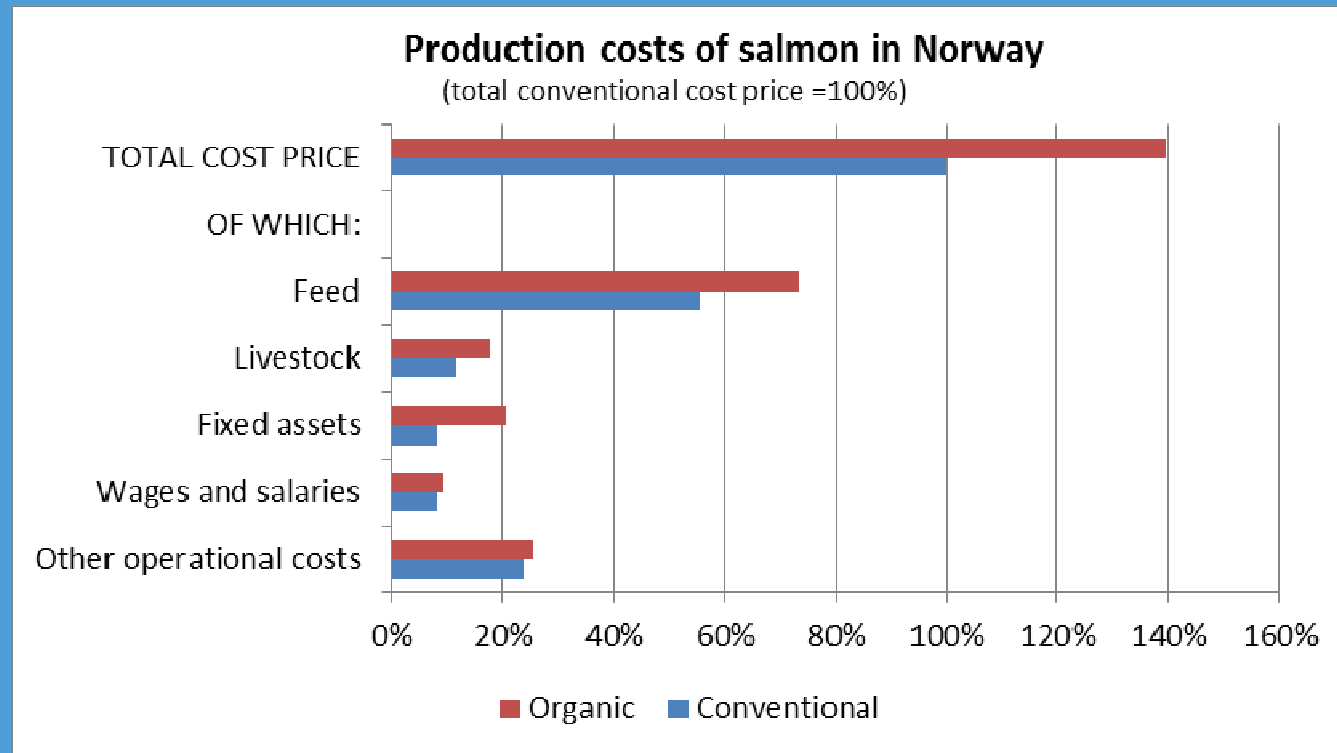
Data sources conventional aquaculture

- STEFC, 2014
 - Salmon in United Kingdom and Ireland
 - Trout in Italy, France and Denmark
 - Seabass/seabream in France, Italy and Spain
 - Carp in Romania
- Fiskeridirektoratet Norge, 2013
 - Salmon in Norway
- Landesfischereiverband Brandenburg/Berlin
 - Carp in Germany
- Turkovski and Lirski, 2013
 - Carp in Poland

Data sources price and quantity indices

- Literature (reviewed and grey)
- Interviews with field experts
- Workshops with farmers and experts
 - Density (investments due to lower density)
 - Feed (conversion rates and prices)
 - Juveniles (availability and prices)
 - Veterinarian aspects (health, mortality)
 - Labour
 - Other relevant information

Production cost effects for salmon



Production cost effects for all species and regions

		conv.	organic	difference
Salmon	Norway	2.44	3.40	+0.96 (+40%)
	Ireland	5.34	7.08	+1.74 (+33%)
	UK	3.16	3.88	+0.71 (+23%)
Trout	Denmark	2.76	3.44	+0.68 (+25%)
	France	3.54	4.24	+0.70 (+20%)
	Italy	1.90	2.23	+0.33 (+17%)
Sea bass & sea bream	France	6.27	8.10	+1.83 (+29%)
	Italy	7.44	9.91	+2.46 (+33%)
	Spain	5.52	7.81	+2.29 (+42%)
Carp	Poland	1.95	3.04	+1.09 (+56%)
	Germany	2.16	2.82	+0.66 (+31%)
	Romania	1.02	2.00	+0.98 (+95%)

Approach consumer level

Breakdown pond to plate (conventional & organic):

1. Farm prices for raw fish
2. Cost of gutting
3. Gutting losses
4. Percentage fillet of gutted fish
5. Purchase price for slaughterhouse per kg fillet
6. Costs and margins for processing
7. Purchase price for supermarket per kg fillet
8. Costs and margins for supermarket
9. VAT
10. Consumer price

Data sources breakdown

■ Literature

- Slaughtering efficiency
- VAT-rates

■ Interviews

- Margins in the chain

■ Data collection

- Consumer prices of supermarkets who sell both organically and conventionally produced fish. As far as possible comparable for product, packaging size, appearance, etc.

Consumer prices fresh/frozen salmon fillet in euro/kg

		Conventional	Organic
Albert Hein	NL	24.20	32.00
Delhaize	Be	19.70	27.00
Carrefour	Fr	20.20	34.00
Tesco	GB	21.60	33.80
Picard	Fr	22.40	34.80
Rewe	D	23.20	29.50
Jumbo	NL	22.00	30.00
Average		21.50	32.00

Breakdown salmon fillet

	Conventional		Organic	
Farmers price	€	3.90	€	5.00
Costs of gutting	€	0.60	€	0.60
Gutting loss		10%		10%
Price gutted fish	€	5.00	€	6.30
Percentage fillet		55%		55%
Price per kg fillet	€	9.10	€	11.50
Processing	€	4.90	€	6.20
Purchase price supermarket	€	14.00	€	17.70
Margin supermarket	€	6.20	€	12.80
Consumer price (excl. VAT)	€	20.20	€	30.50
VAT	€	1.30	€	1.50
Consumer price (incl. VAT)	€	21.50	€	32.00

Breakdown salmon fillet

Conclusions:

- Additional cost at farm level only explains part of the higher consumer price
- Margin for retail is most prominent factor

Comparison of conventional and organic price on farm and retail level

	Farm level	Retail level
Salmon		
frozen/fresh fillet	+30%	+50%
Smoked fillet	+30%	+45%
Trout		
frozen/fresh fillet	+30%	+30%
whole fish	+35%	+45%
Sea bass/ sea bream		
frozen/fresh fillet	+35%	+30%
whole fish	+35%	+30%
Carp		
frozen/fresh fillet	+30%	+30%
whole fish	+30%	+35%

Conclusions costs in the chain

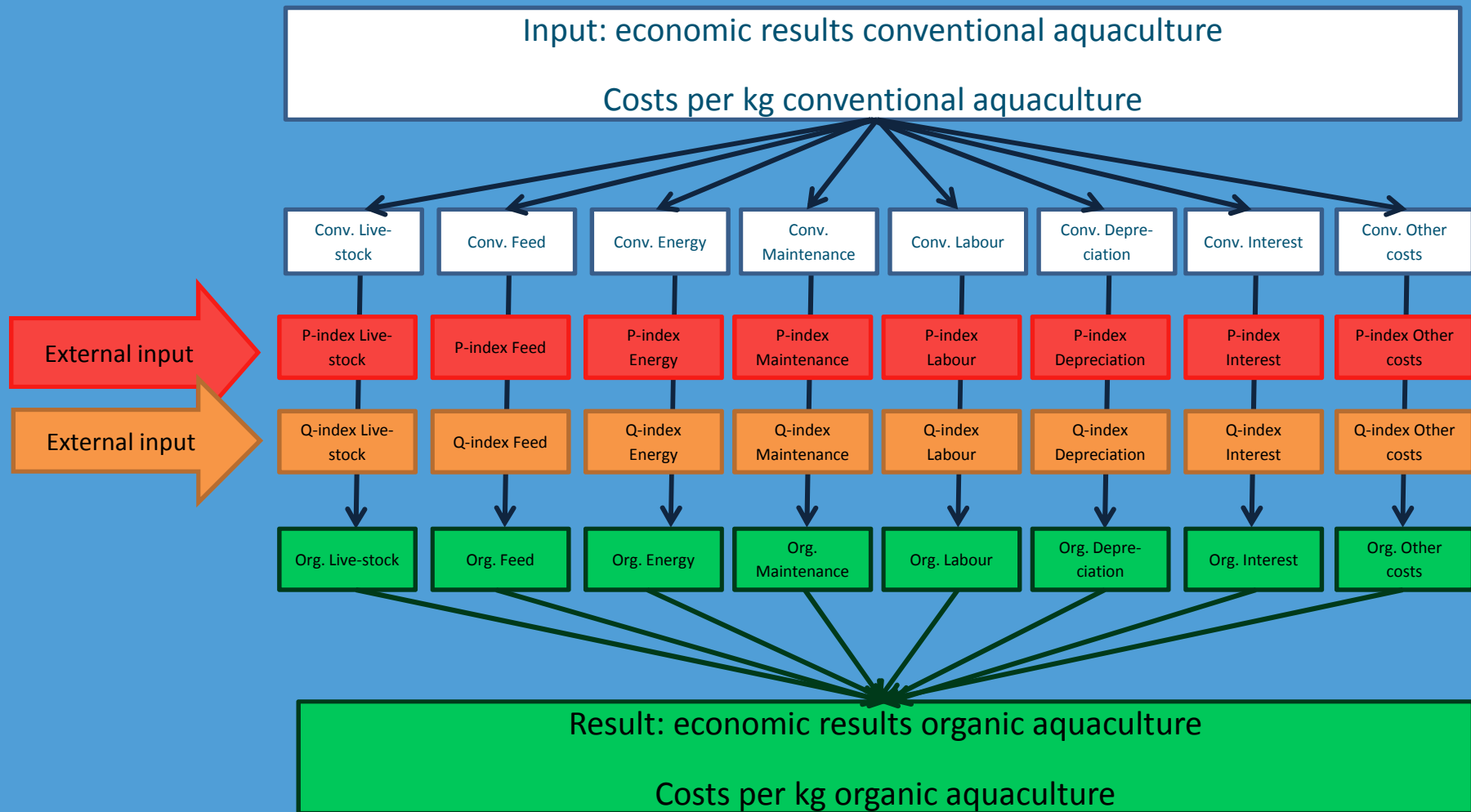
- Farmers' price organic fish +30%
- Consumer price organic fish: +30% to +50%
- Reasons for this higher margins in the chain:
 - Margins calculated relatively instead of absolutely;
 - Imbalance of demand and supply in short-term;
 - Higher retail margin needed due to lower turnover rate
 - Small volumes lead to cost disadvantage per unit;
 - Extra costs for slaughtering methods and certification are insignificant.

Thank you for
your attention

It's question time!



Technical framework of the model



Technical base of the model

$$PC_{org} = \sum_{n=1}^k PCE_{conv,n} * Q_n * P_n$$

Where:

PC = Production cost


PCE = Production cost element

Q = Quantity index

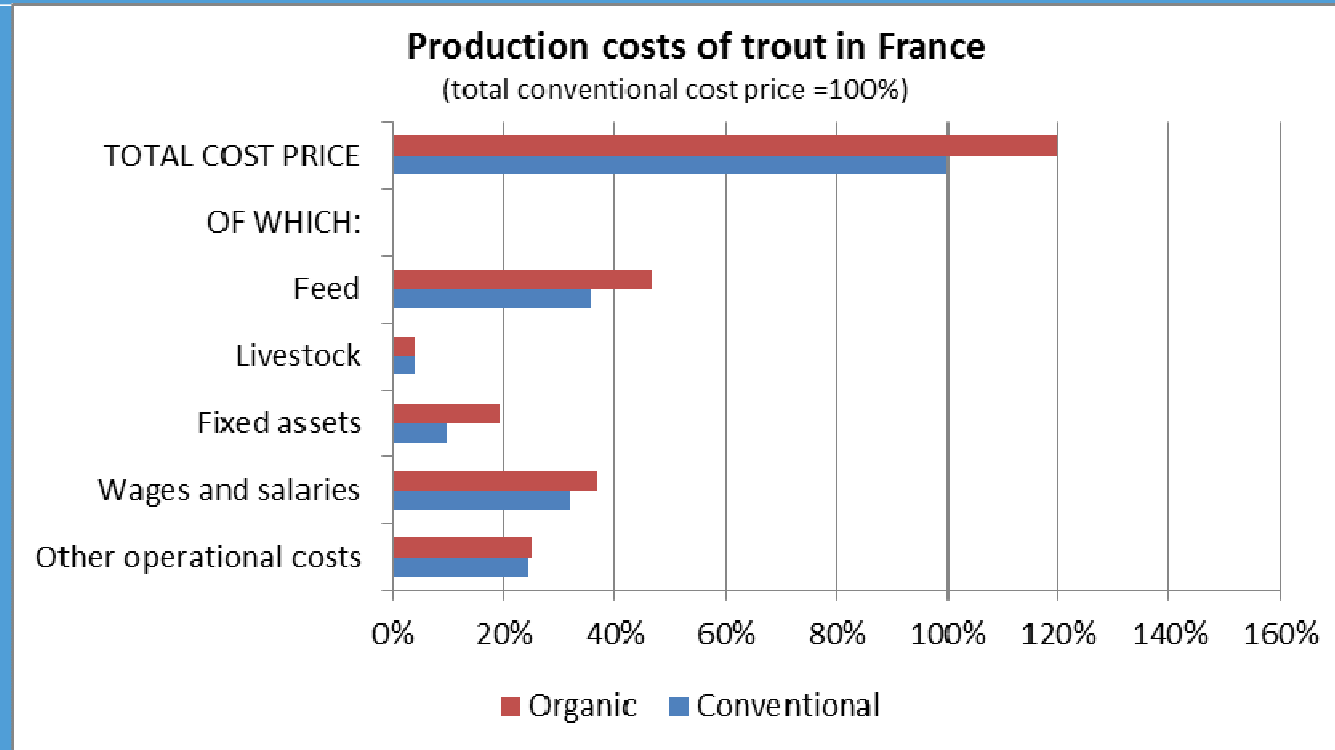
P = Price index



Background

-  Evaluation and improvements of EC Regulation no. 710/2009 based on:
 - review of the relevant available scientific knowledge
 - review of organic aquaculture production and economics
 - assessment of consumer confidence and public perception
- Work package 3.2: Farm economics and competitiveness of organic aquaculture

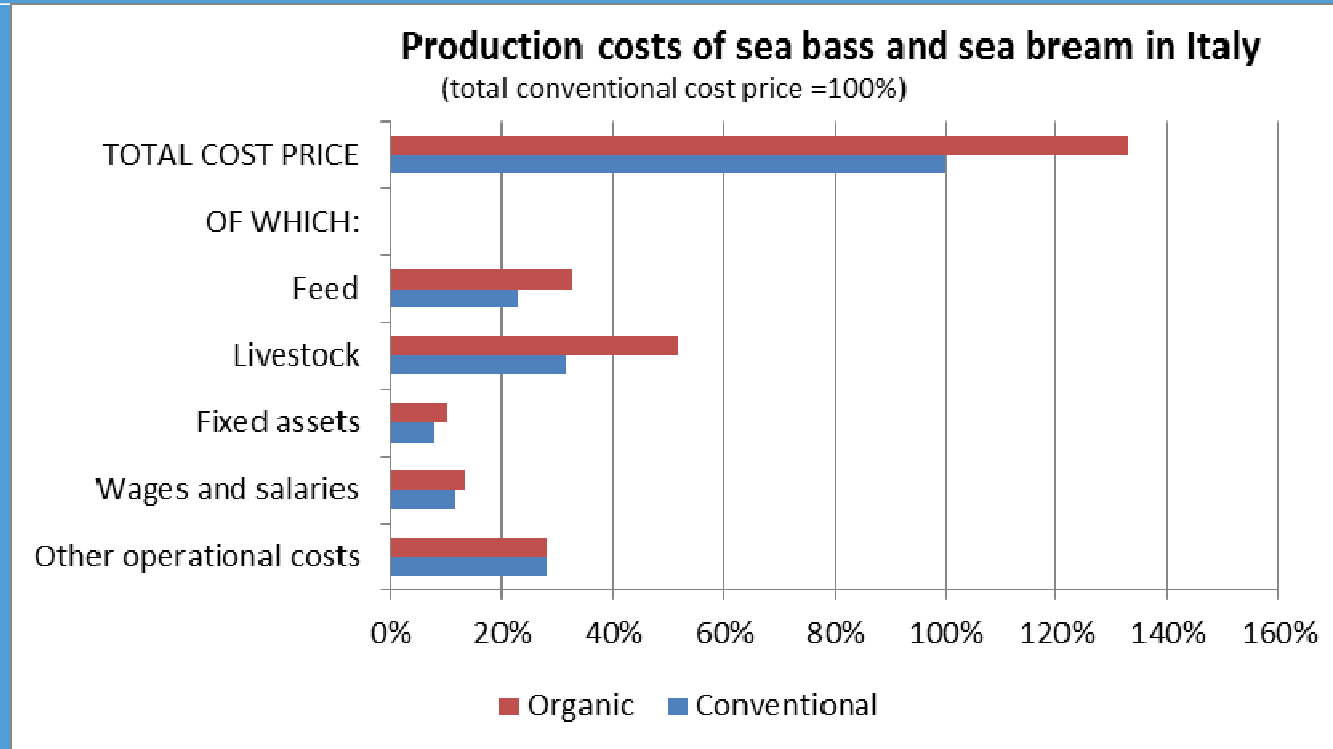
Production cost effects for trout



Conclusions:

- Production costs +21% (DK), +20% (FR), +23% (IT)
- Due to feed (1), installation (2) and labour (3)

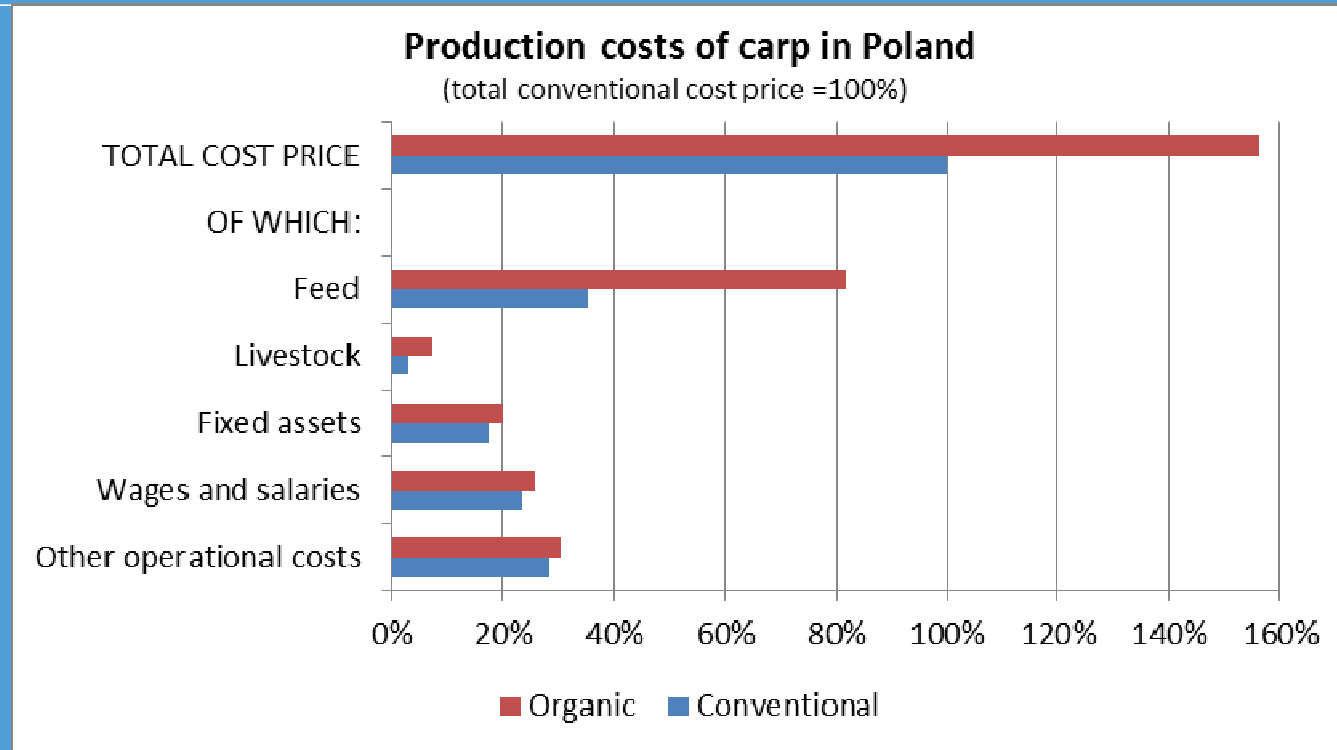
Production costs effects for sea bass/bream



Conclusions:

- Production costs +29% (FR), +33% (IT), +43% (ES)
- Due to feed (1) and juveniles (2)

Production cost effects for carp



Conclusions:

- Production costs +95% (RO), +56% (PL), +31% (DE)
- Due to feed (1) and juveniles (2)

Results salmon

(unweighted averages of Norway, United Kingdom and Ireland)

	Conventional	Organic	Difference
Livestock	0.29	0.44	0.15
Feed	1.51	1.91	0.40
Installation and machineries	0.27	0.69	0.42
Labour	0.45	0.52	0.07
Energy	0.07	0.07	0.00
Other operational costs	1.11	1.18	0.07
Financial costs	0.02	0.06	0.03
Subsidies & other income (-)	0.07	0.07	0.00
Total costs	3.65	4.79	1.14

Conclusions:

- Cost price +1.14 euro/kg (=31%)
- Due to installation (1), feed (2) and juveniles (3)

Results trout

(unweighted averages of Italy, France and Denmark)

	Conventional	Organic	Difference
Livestock	0.27	0.32	0.05
Feed	1.06	1.38	0.32
Installation and machineries	0.26	0.39	0.13
Labour	0.69	0.79	0.10
Energy	0.16	0.16	0.00
Other operational costs	0.33	0.34	0.01
Financial costs	0.10	0.19	0.09
Subsidies & other income (-)	0.14	0.26	0.12
Total costs	2.73	3.30	0.57

Conclusions:

- Cost price +0.57 euro/kg (=21%)
- Due to feed (1), installation (2) and labour (3)

Results sea bass & sea bream

(unweighted averages of France, Italy and Spain)

	Conventional	Organic	Difference
Livestock	1.27	2.06	0.79
Feed	2.19	3.29	1.10
Installation and machineries	0.50	0.69	0.19
Labour	1.11	1.27	0.17
Energy	0.19	0.19	0.00
Other operational costs	1.34	1.37	0.03
Financial costs	0.16	0.23	0.06
Subsidies & other income (-)	0.34	0.50	0.16
Total costs	6.41	8.61	2.20

Conclusions:

- Cost price +2.20 euro/kg (=34%)
- Due to feed (1) and juveniles (2)

Results carp

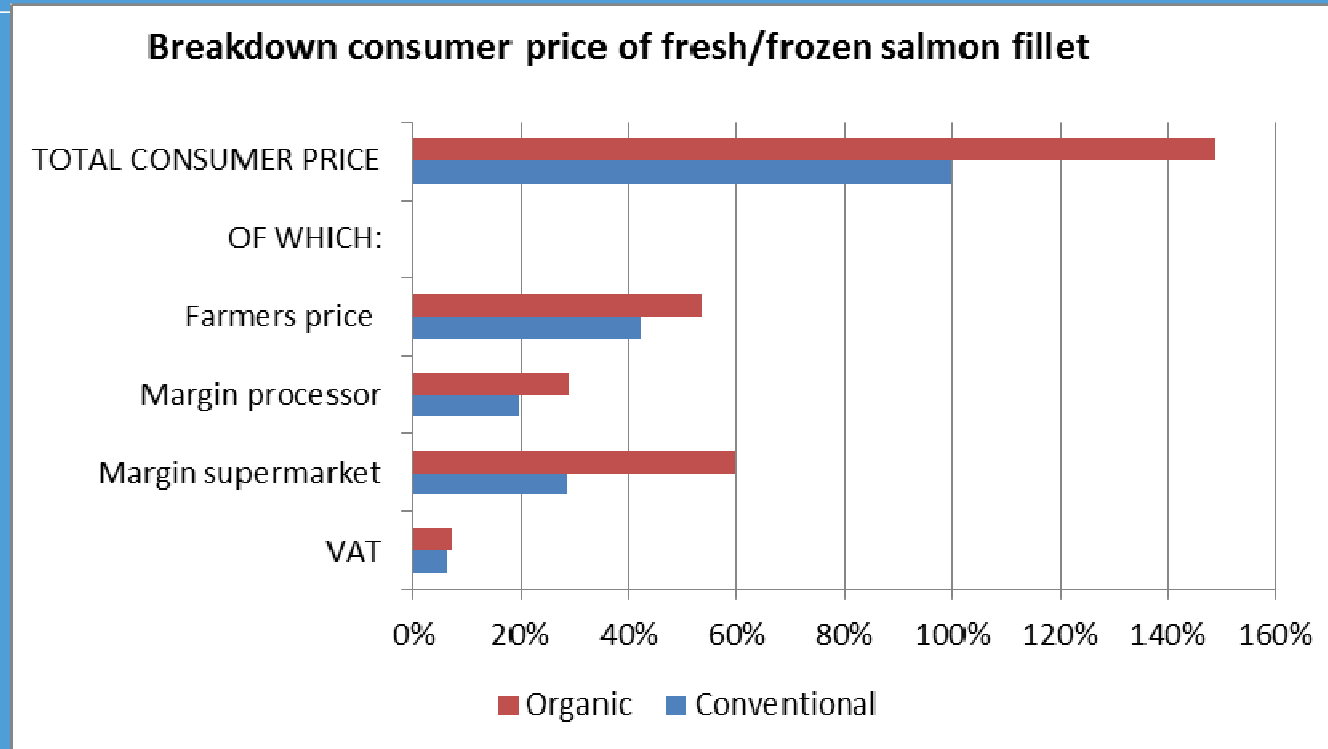
(unweighted averages of Poland, Germany and Romania)

	Conventional	Organic	Difference
Livestock	0.18	0.32	0.14
Feed	0.50	1.15	0.65
Installation and machineries	0.60	0.68	0.08
Labour	0.86	0.95	0.09
Energy	0.09	0.10	0.01
Other operational costs	0.40	0.44	0.05
Financial costs	0.05	0.06	0.01
Subsidies & other income (-)	0.98	1.09	0.11
Total costs	1.71	2.62	0.91

Conclusions:

- Cost price +0.91 euro/kg (=53%)
- Due to feed (1) and juveniles (2)

Breakdown salmon fillet



Conclusions:

- Additional cost at farm level only explains part of the higher consumer price
- Margin for retail is most prominent factor