



A world of eggs



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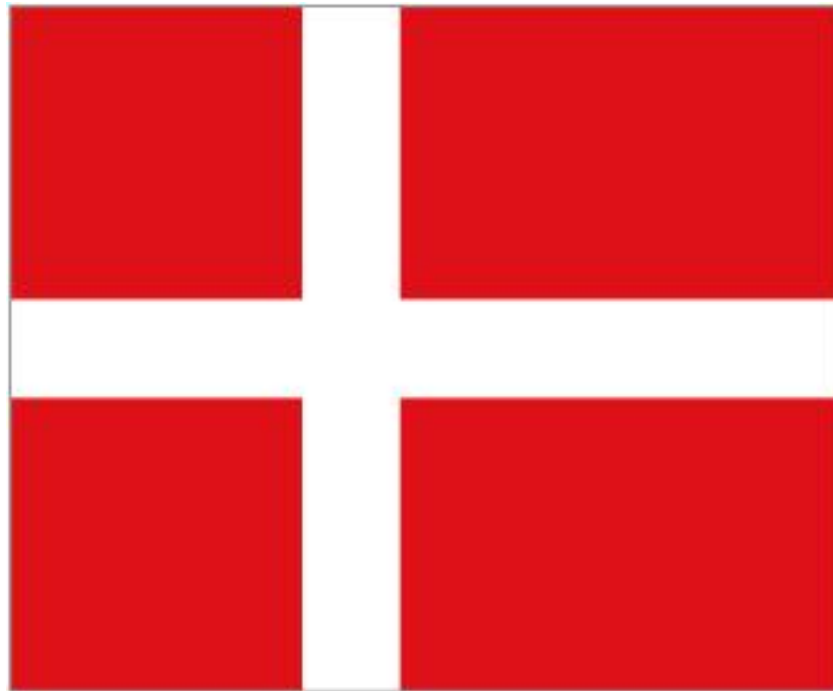
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Agenda

- Facts about Danish egg production
- Beak trimming
- Salmonella
- Sustainability
- World egg production

Danish Egg Industry



Danish Egg Industry

(No. of farms and no. of houses)

Breeding company Lohmann

(Safety production of breeding stock)

2 (2)+2 (7)

Import of day old parent flocks from France, ISA, Hisex or Babcock

Import of day old parent flocks from Germany, Lohmann

Central rearing of parents flocks

(From day old to app. 18 weeks) 6 (10)

Parents flocks

(From app. 17-18 weeks – app. 60 weeks) 9 (11)

Hatchery

(Trioava, Topæg, Østhimmerlands Fjerkræfarm, Hellevad) 4

Import of day old female chicks Hyline, from Sweden (USA) Hyline (0 in 2013)

Rearing of layers

(From day old to app. 18 weeks) 86 (144) + organic 17(27)

Egg production

(From app.18 to app. 80 weeks) 162 (217)

Spent hens slaughtered in Denmark, abroad of by Chickpulp

Packing stations (2 big ones, some medium sized and a lot of small ones)

From chicken to egg

- The day old chick comes from the hatchery to a rearing farm
 - It is reared under: Industry code for rearing
- The pullets are transported from the rearing farm to the layer farm(16-17 weeks old)
 - The eggs are produced und EU law and the GMP plan for production of shell eggs
- All houses is cleaned and disinfected before a new flock is housed
- Management to be considered:
 - Temperature control - if necessary
 - Light program
 - Access to feed and water
 - Access to perches and bedding material
 - Daily inspections
- The eggs are in a cool chain from farm to super market costumer

4 different production methods - 1



Enriched cages



Barn



Free range



Organic

4 different production methods - 2

	Enriched cages	Barn	Free range	Organic
Flock size	Max 10 hens pro cage			Max 3.000 hens in a flock
Density (hens pro m²)	Light and medium breeds: Min. 750 cm ² pro hen, of which min. 600 cm ² is usable area. The total area of the cage should be min 2.000 cm ²	9 hens pro m ² usable area. The hens must always have access to the usable area.	9 hens pro m ² usable area. The hens must always have access to the usable area.	6 hens pro m ² usable area. The hens must always have access to the usable area.
		Max 18 hens pro. m ² floor area.	Max 18 hens pro. m ² floor area.	
Max no. of levels	3	3	3	3
Access to outdoor runs	No	No	Yes - 4 m ² pro hens- min 2 meter exit hole pro 1.000 hens	Yes - 4 m ² pro hens – The width of the exit holes must be at least 4 meter pro 100 m ² floor area in the stable.
Bedding material	Appropriate amounts to let the hen express its natural behavior to dust bathe. If the hens not have constant access to the area it is not part of the usable area	Min 1/3 of the floor area and at least 250 cm ² bedded floor area pro hen	Min 1/3 of the floor area and at least 250 cm ² bedded floor area pro hen	Min 1/3 of the floor area must be firm to let the hen express its natural behavior to dust bathe. The area must be covered by dry and porous bedding material like sand, dirt, straw etc.
Natural daylight	No	No	No	Yes
Daily rhythm (dark period)	The hens must after a few days have a daily rhythm of 24 hours including a suitable and uninterrupted dark period of app. 1/3 of the day – that is 8 hours	The hens must after a few days have a daily rhythm of 24 hours including a suitable and uninterrupted dark period of app. 1/3 of the day – that is 8 hours	The hens must after a few days have a daily rhythm of 24 hours including a suitable and uninterrupted dark period of app. 1/3 of the day – that is 8 hours	The hens must have an uninterrupted dark resting period without artificial lightning of min. 8 hours
Beak trimming	No	No	No	No
Perches	Yes, 15 cm perch pro hen	Yes, 15 cm perch pro hen	Yes, 15 cm perch pro hen	Yes, 18 cm perch pro hen
Reder	1 nest pro 10 hens	1 nest pro 7 hens or if you are using common nests there must be min. 1 m ² nest area pro 120 hens.	1 nest pro 7 hens or if you are using common nests there must be min. 1 m ² nest area pro 120 hens.	1 nest pro 7 hens or if you are using common nests 120 cm ² (min.11 x11 cm) pro hen

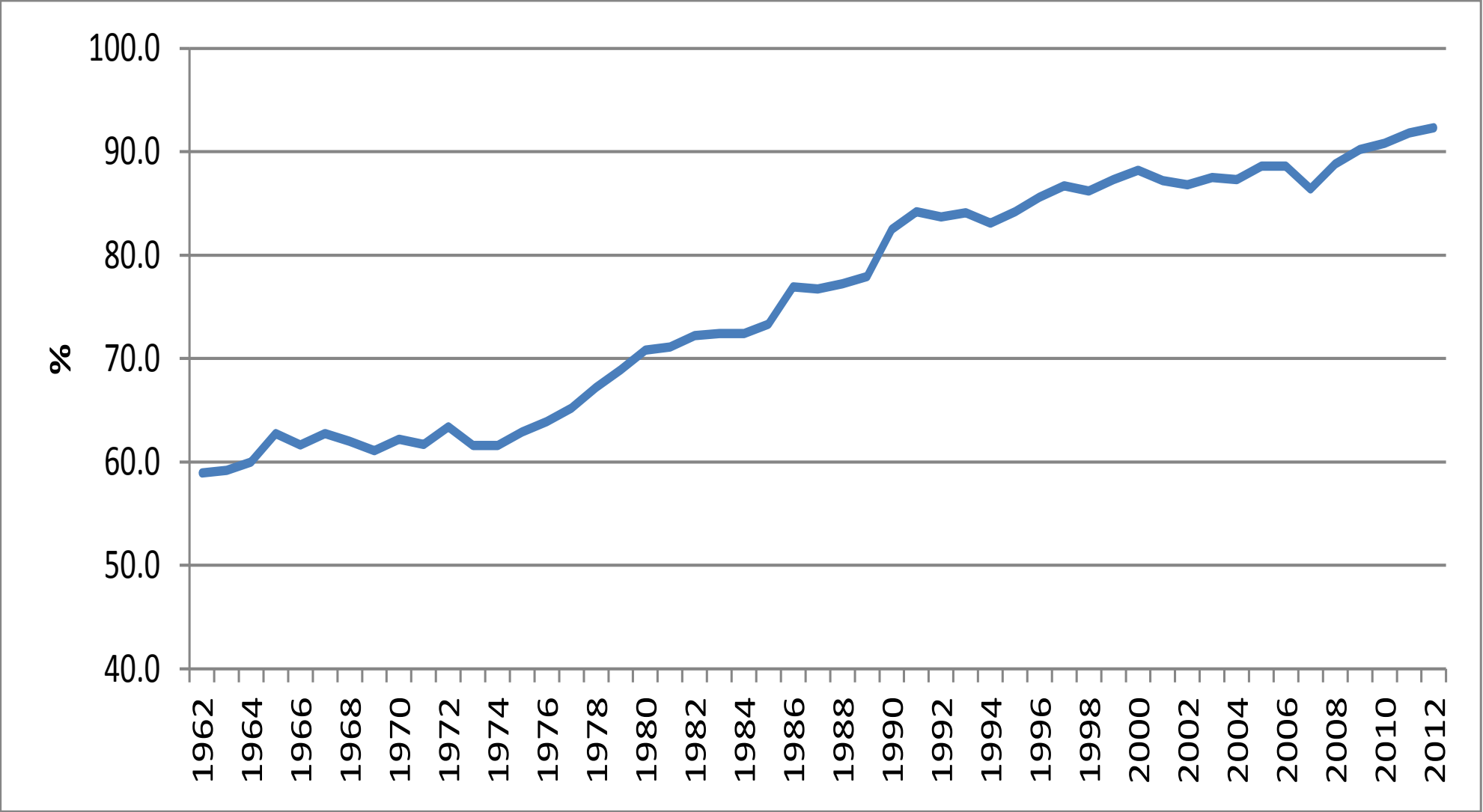
No. of egg producers_(Oct. 2013)

	Production sites	No. of hens	Share
Cage	39	1.828.200	55,4 %
Barn	47	683.100	20,7 %
Free range	18	191.400	5,8 %
Organic	66	597.300	18,1 %
Total	170	3.3 mill.	100 %

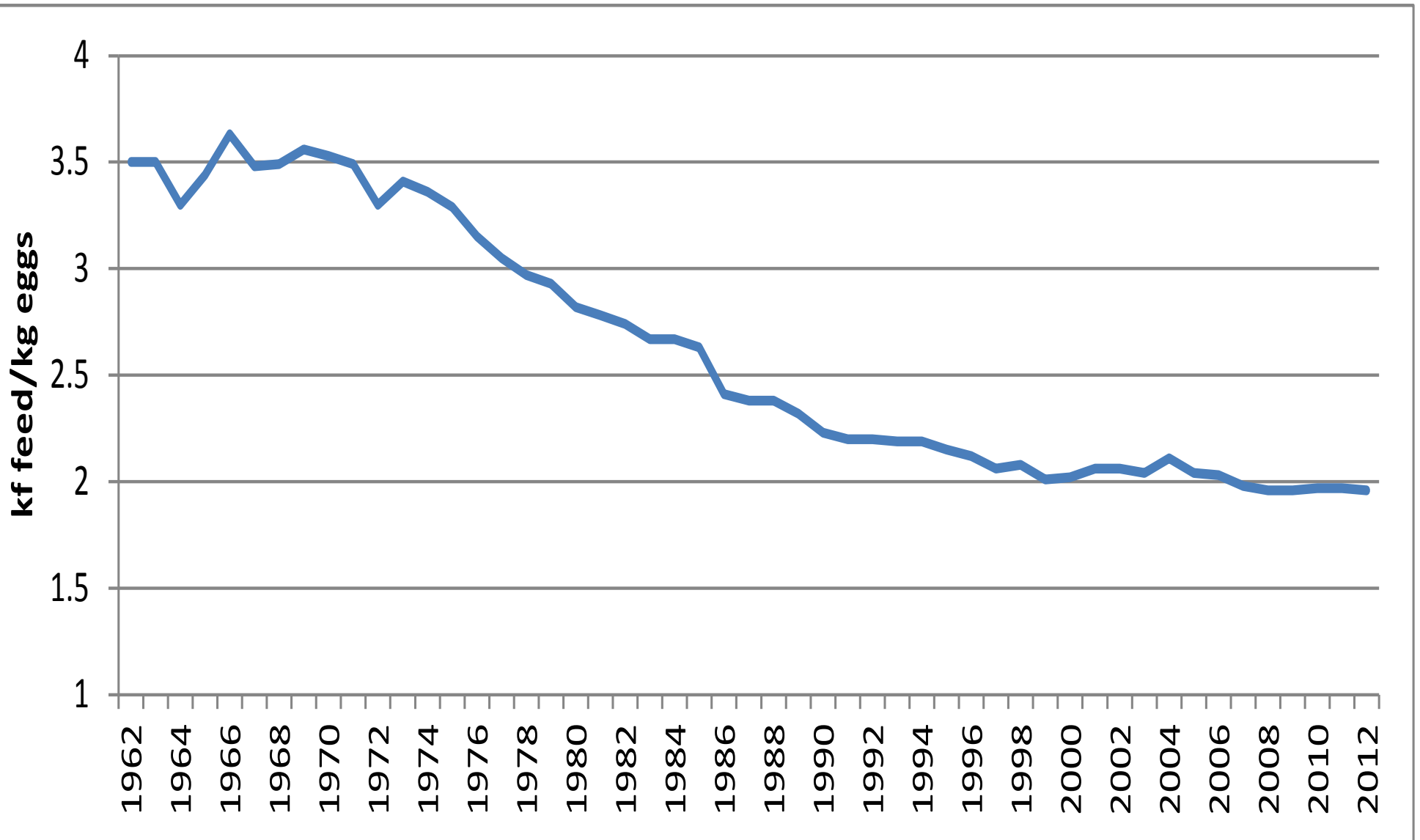
About the egg production

- Cages in Denmark max 10 hens
- Trends during the last years:
 - The demand for cage eggs is slowly decreasing
 - The demand for free range eggs is stable
 - The demand for barn eggs is increasing
 - The demand for organic eggs is increasing
 - We are seeing a demand for organic+ eggs

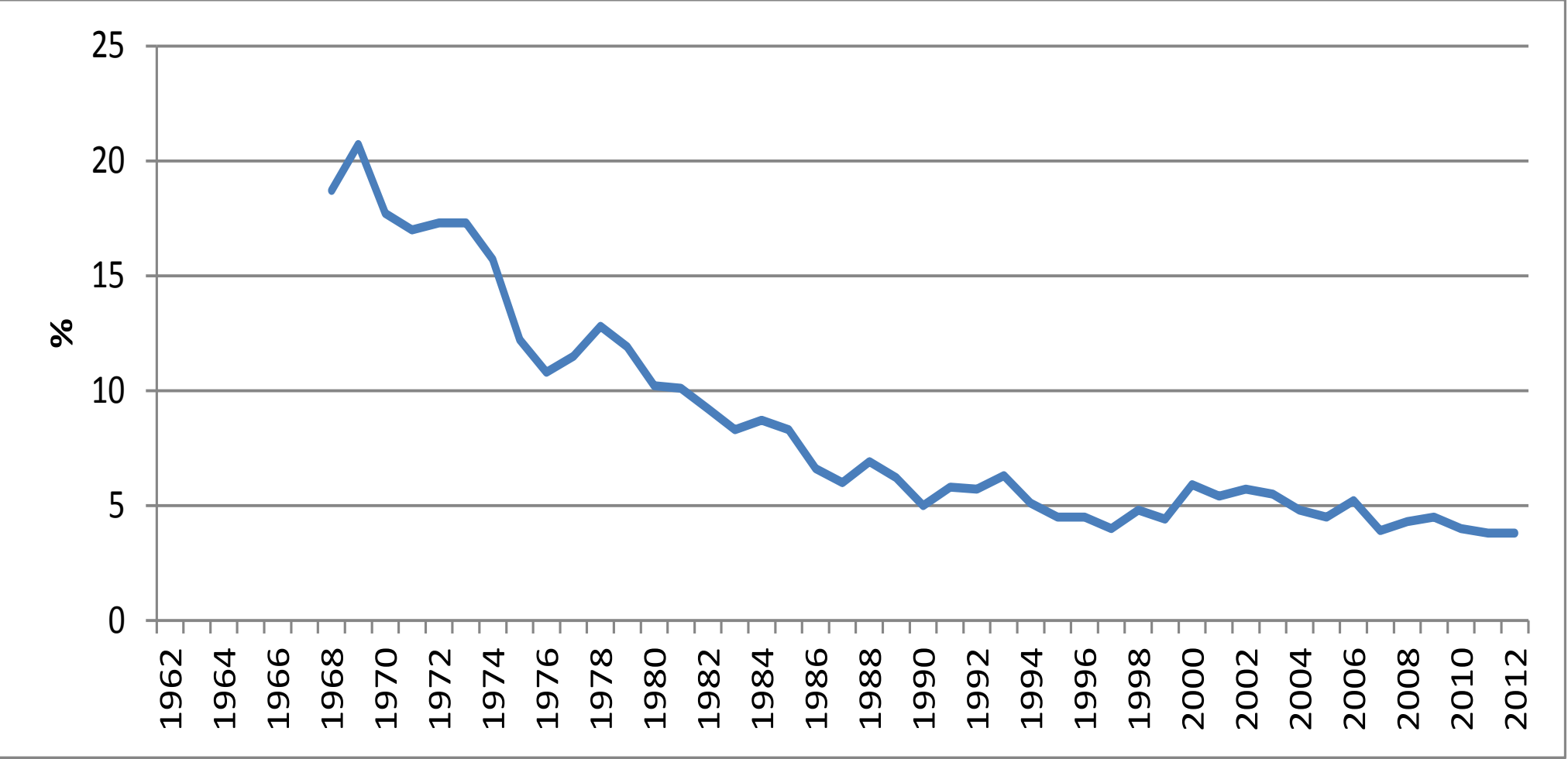
Laying percentage on farms in Denmark during the period 1962 - 2012



Feed conversion on farms in Denmark during the period 1962 - 2012



Mortality percentage on farms in Denmark during the period 1968 - 2012



Production data (2013)

	Laying period in days	kg egg/ hen placed	kg feed / kg egg	Mortality %	Mortality pro day %	No. flocks
Cage	429	24,1 0,893 (egg/day)	1,90	Ag. 3,9 Med. 3,4 Max. 13,2 Min. 2,0	Ag. 0,0092 Med. 0,0081 Max. 0,0310 Min. 0,0047	18 (total flocks = 57)
Barn	369	19,1 0,848 (egg/day)	2,37	Ag. 8,8 Med. 7,1 Max. 20,2 Min. 4,1	Ag. 0,0237 Med. 0,0208 Max. 0,0497 Min. 0,0114	8 (total flocks = 59)
Free range	360	15,9 0,811 (egg/day)	2,36	Ag. 15,6 Med. 8,8 Max. 60,4 Min. 3,6	Ag. 0,0454 Med. 0,0229 Max. 0,1798 Min. 0,0101	8 (total flocks = 20)
Organic	382	19,2 0,830 (egg/day)	2,34	Ag. 8,6 Med. 8,4 Max. 13,5 Min. 4,2	Ag. 0,0224 Med. 0,0214 Max. 0,0357 Min. 0,0104	8 (total flocks = 81)

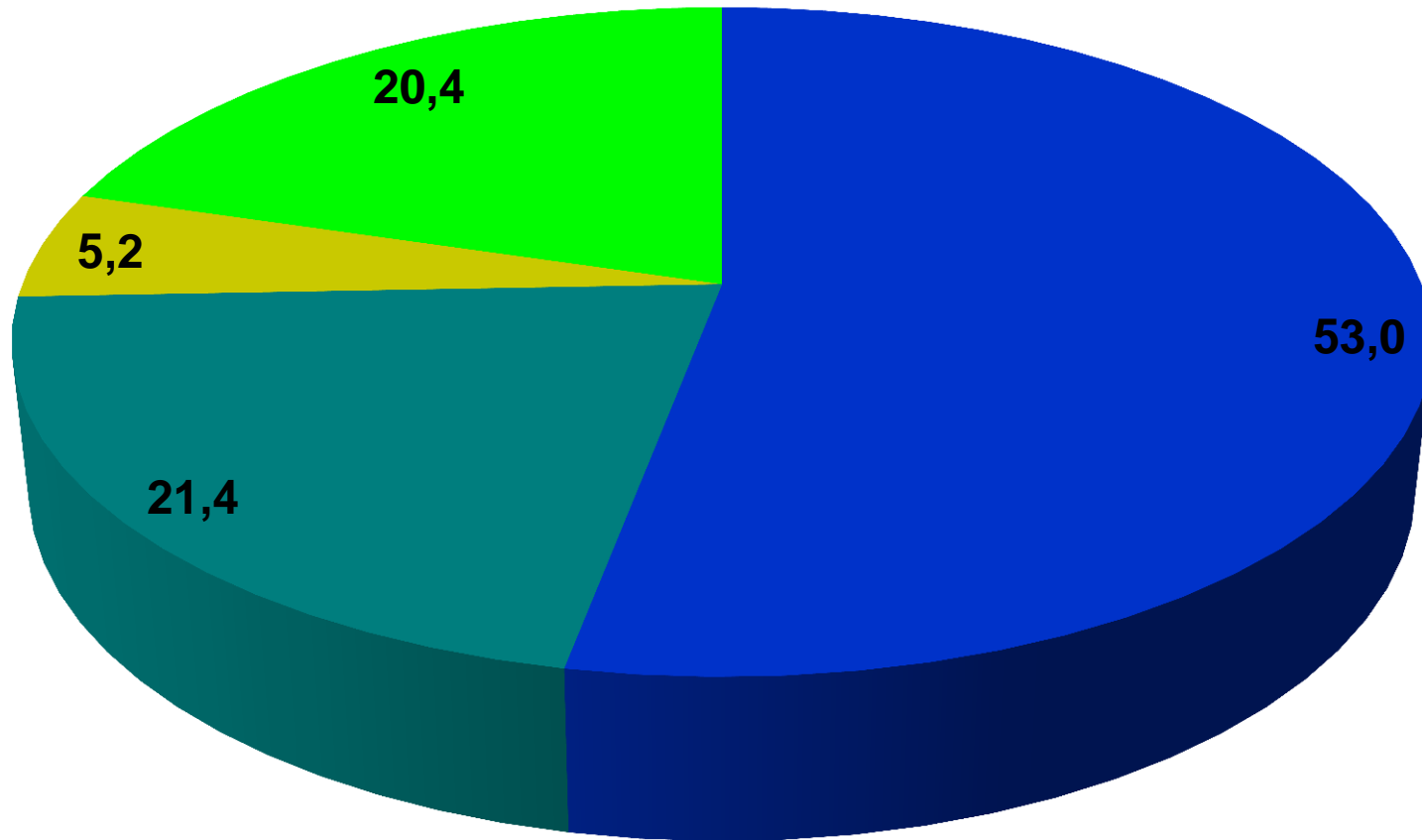
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				Max. 60,4	Max. 0,1798	
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				Med. 8,4	Med. 0,0214	
				Max. 13,5	Max. 0,0357	
				Min. 4,2	Min. 0,0104	

About the egg production data

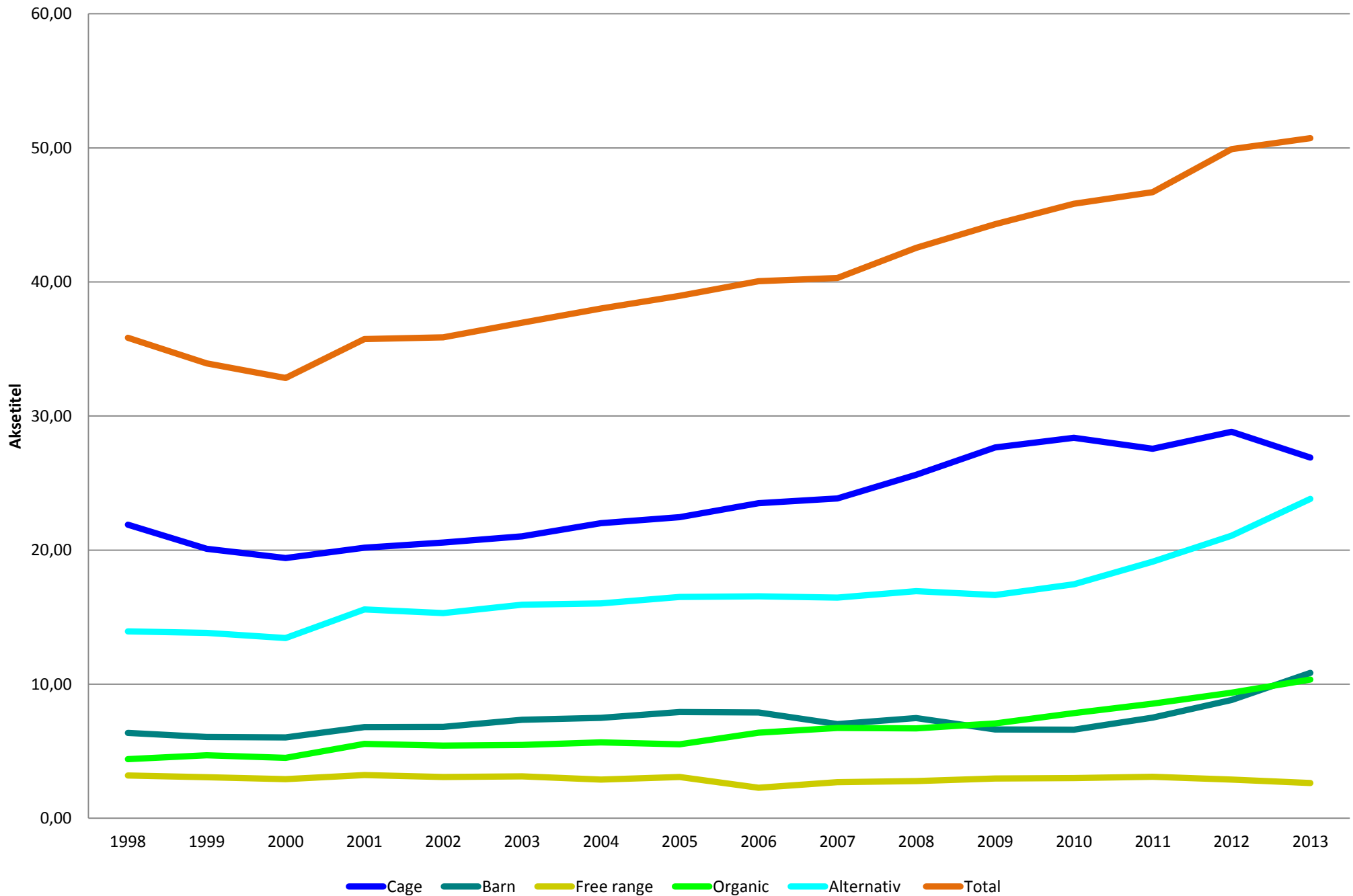
- Production data:
 - Production data from around 35 % are collected on a voluntary basis in a common system and all kind of reports can be generated about the 4 production methods. It has been running for more than 20 years.
 - In the data presented obviously misreported flocks has been discarded

Share of sales to detail and foodservice (2013)



■ Cage ■ Barn ■ Free Range ■ Organic

Sales af shell egg in Denmark - retail og foodservice (mio. kg)



What is important for the industry? - 1

- Animal welfare – 5 freedoms:
 - **Freedom from Hunger and Thirst** - by ready access to fresh water and a diet to maintain full health and vigor.
 - **Freedom from Discomfort** - by providing an appropriate environment including shelter and a comfortable resting area.
 - **Freedom from Pain, Injury or Disease** - by prevention or rapid diagnosis and treatment.
 - **Freedom to Express Normal Behavior** - by providing sufficient space, proper facilities and company of the animal's own kind.
 - **Freedom from Fear and Distress** - by ensuring conditions and treatment which avoid mental suffering.
- Beak trimming
- Feather picking / cannibalism
- Male chicks
 - App. 350-400 mill. male chicks are killed in the EU every year – app. 3 mill. in Denmark
- **Stockmanship is the key factor**

What is important for the industry? - 2

- Food safety
 - No salmonella
 - No harmful substances (dioxin, PCB's etc.)
 - No antibiotic residues
- Sustainability
 - CO₂ foot print
 - Use of resources – land, feed, water, energy
- Sales
 - Shell eggs – by far the most important
 - Egg products – increased importance in 2. world countries
 - Safe eggs to the Danish consumer
- **We produce what the consumers want**

What have we done?

- Code for reduction of salmonella in shell eggs (1990's)
- Code for production and transport of poultry feed (1990's)
- Code for caging and transporting spent hens (2003)
- Project Rearing (2008-11)
- GMP plan for production of shell eggs (2009)
- Industry code for rearing (2011)
- Ban on beak trimming of cage hens (2013)
- Projects about feather pecking (2013-2015)
- Practical hand book about feather pecking (2013)
- Ban on beak trimming of barn and free range hens(2014)
- + many projects concerning disease prevention on KU

Beak trimming



Beak trimming in the EU

- Prohibited:
 - Finland, Sweden
- Voluntary ban:
 - Austria
- Legislation pending:
 - UK, Holland, Germany
- Not on the agenda:
 - South and Eastern Europe

Beak trimming in Denmark

- Cage:
 - Beak trimming is allowed
 - From October 1st 2012 to April 30th 2013 were 67,3 % not beak trimmed, while 32,7 % was beak trimmed
 - From July 1st 2013 we voluntary stopped beak trimming of chicks for cage production
- Barn:
 - Beak trimming allowed – almost 100 % beak trimmed
 - From July 1st 2014 we voluntary stopped beak trimming of chicks for barn production
- Free range:
 - Beak trimming allowed – almost 100 % beak trimmed
 - From July 1st 2013 we voluntary stopped beak trimming of chicks for free range production
- Organic:
 - Beak trimming not allowed

58 weeks old LSL hens – not beak trimmed



58 weeks old LSL hens – not beak trimmed



25 weeks old LSL barn hen – not beak trimmed



Spent hens

- Exported to slaughterhouse in Germany for human consumption
- Killed on farm and used for pet food
- Chickpulp
 - Killed on farm and used for feed to fur animal (mink)

Spent hens – Chickpulp - 1



Spent hens – Chickpulp - 2



Spent hens – Chickpulp - 3



Spent hens – Chickpulp - 4



The fox

Spent hens – Chickpulp - 5



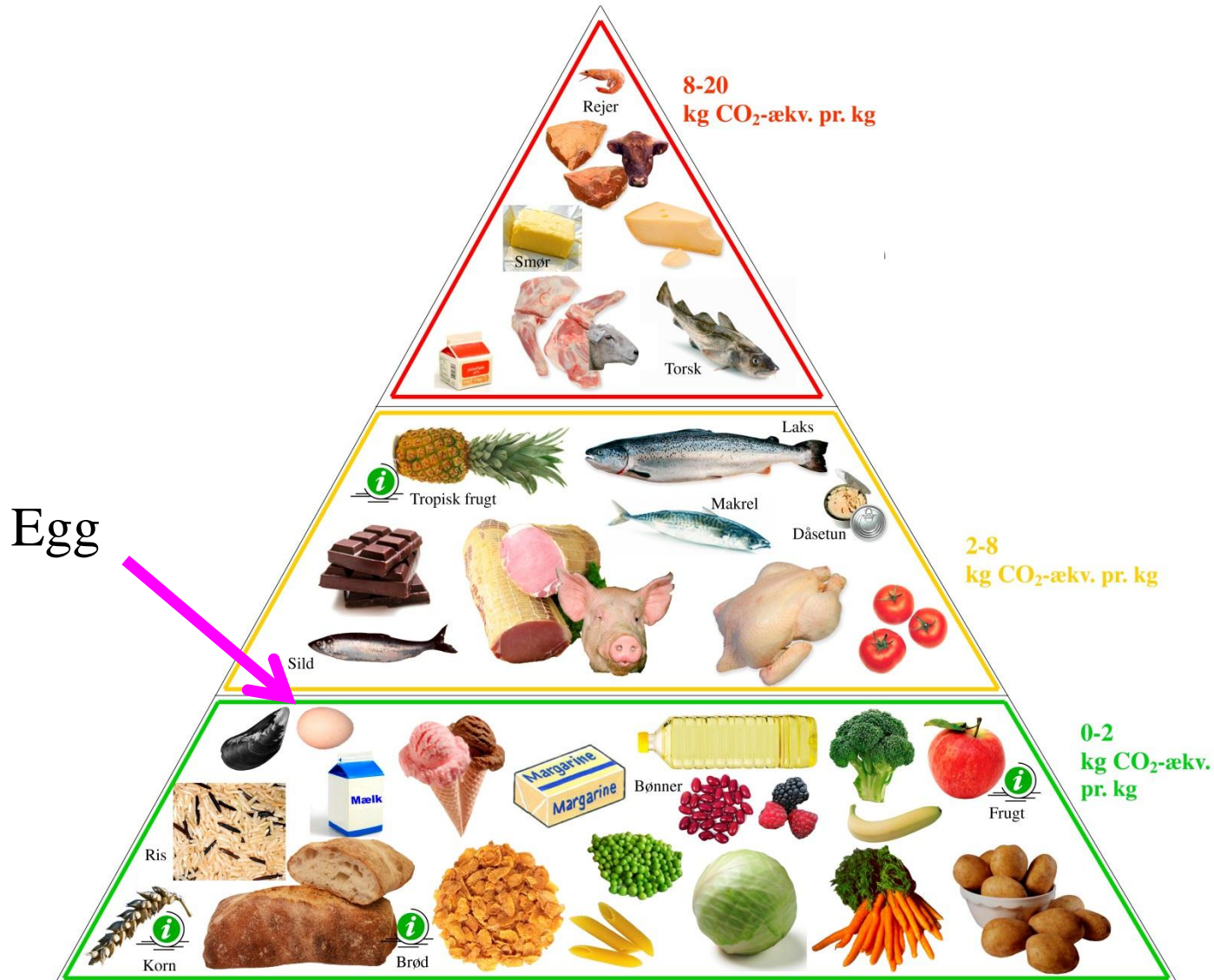
Salmonella program in eggs - 1


- In EU you test every 15 weeks bacteriologically
- Old testing program – every 9th week based on bacteriology and serology
- Results in 14 human cases in 2012 which are 14 to many

Salmonella program in eggs - 2

- From October 1st 2013 a new test program testing every 2nd week based on bacteriology
- Should give 0-1 human cases pro year

Sustainability - 1



 = Gennemsnit af fødevarergruppen

Sustainability - 2

Table 2. *The main burdens and resources used in UK animal production, scaled per tonne of meat, per 20000 eggs (about 1 tonne) or per 10m³ milk (about 1 tonne dry matter)*

Impacts and resources used	Poultry meat	Eggs	Pig meat	Beef	Milk	Sheep meat
Primary energy used, GJ	12	14	17	28	25	23
GWP ₁₀₀ , t CO ₂	4.6	5.5	6.4	16	10.6	17
Eutrophication potential, kg PO ₄ ³⁻	49	77	100	158	64	200
Acidification potential, kg SO ₂	173	306	394	471	163	380
Pesticides used, dose ha	7.7	7.7	8.8	7.1	3.5	3.0
Abiotic resource use, kg antimony	30	38	35	36	28	27
Land use	0.64	0.67	0.74	2.33	1.20	1.40

Sustainability - 3

Table 1. *Burdens of some alternative poultry meat systems, expressed per tonne of meat*

Impacts and resources used	Non-organic	Organic	Free-range (non-organic)
Primary energy used, MJ	12000	15800	14500
GWP ₁₀₀ , kg 100 year CO ₂ equivalent	4570	6680	5480
EP, kg PO ₄ ³⁻ equivalent	49	86	63
AP, kg SO ₂ equivalent	173	264	230
Pesticides used, dose ha	7.7	0.6	8.8
ARU, kg antimony equivalent	29	99	75
Land use, ha	0.64	1.40	0.73
Nitrogen losses			
NO ₃ ⁻ -N, kg	30	75	37
NH ₃ -N, kg	40	60	53
N ₂ O-N, kg	6.3	9.3	7.6

Yolk color - 1

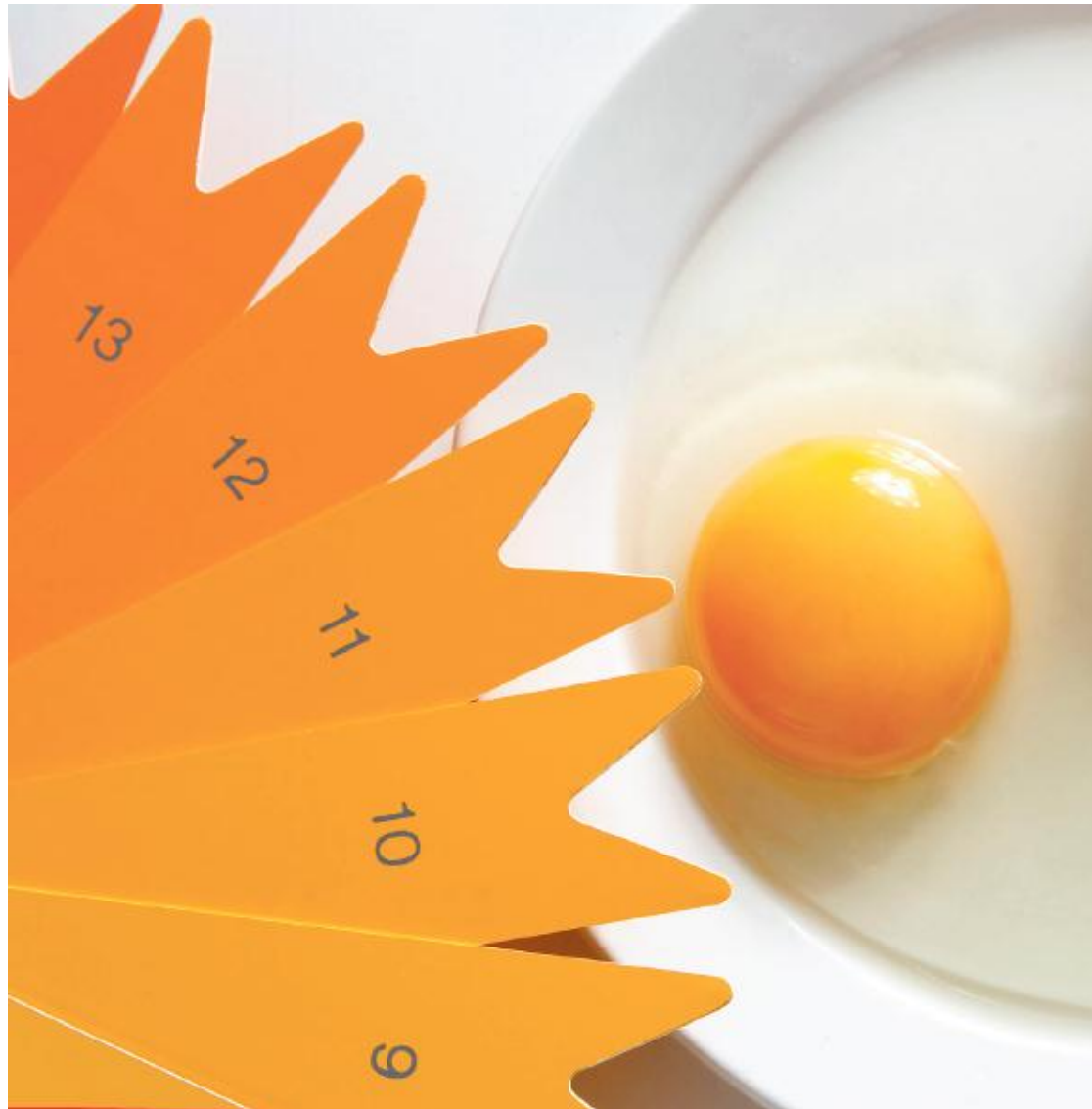
Dietary withdrawal of colorant



Dietary repletion of colorant



Yolk color - 2

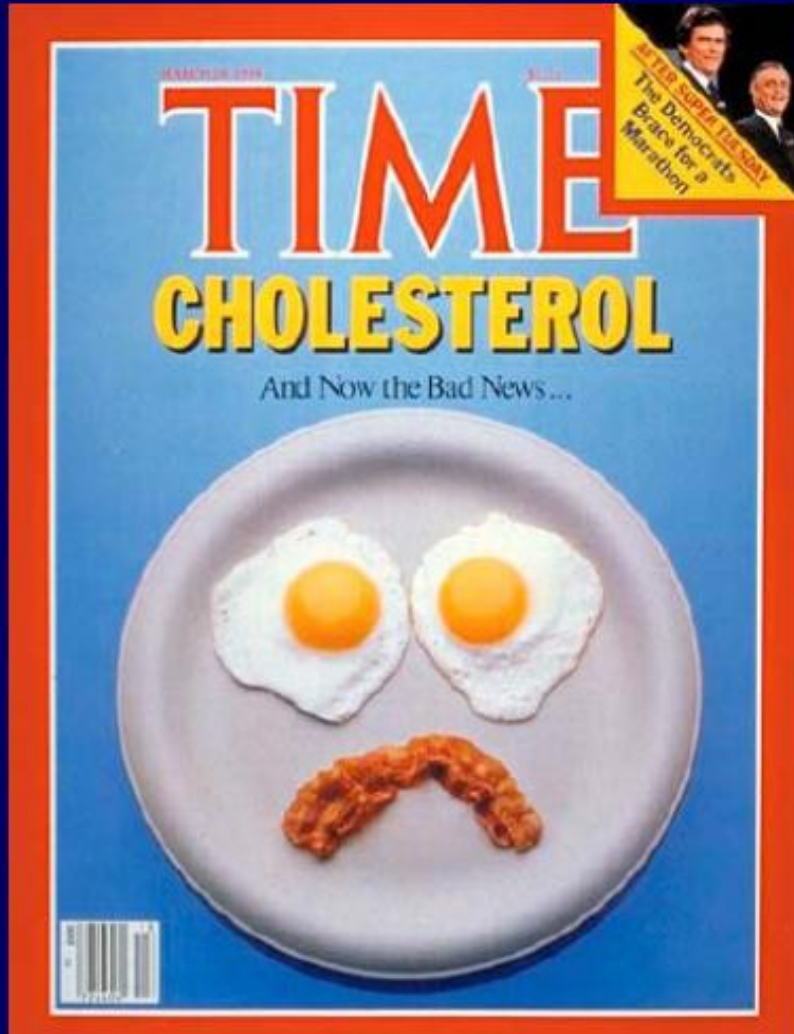


Yolk color - 3

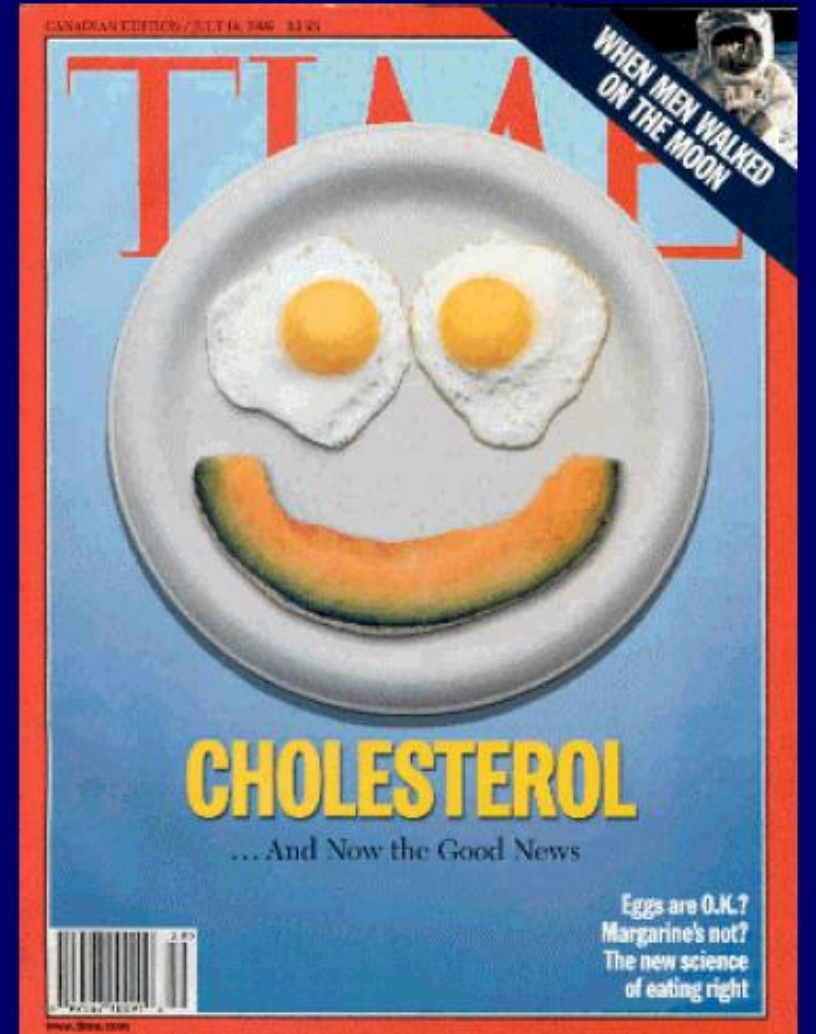
- The color comes from the feed (Carotenoids)
 - Corn
 - Grass meal
 - Paprika and / or tagetes
 - Produced in China and shipped to Europe
 - Variable – no always heat tolerant
 - Risk of dioxin
 - Nature identical substances
 - Produced in a chemical factory
 - Pure chemical product
 - Heat tolerant

Campaign: Egg as a healthy food - 1

1984



1999

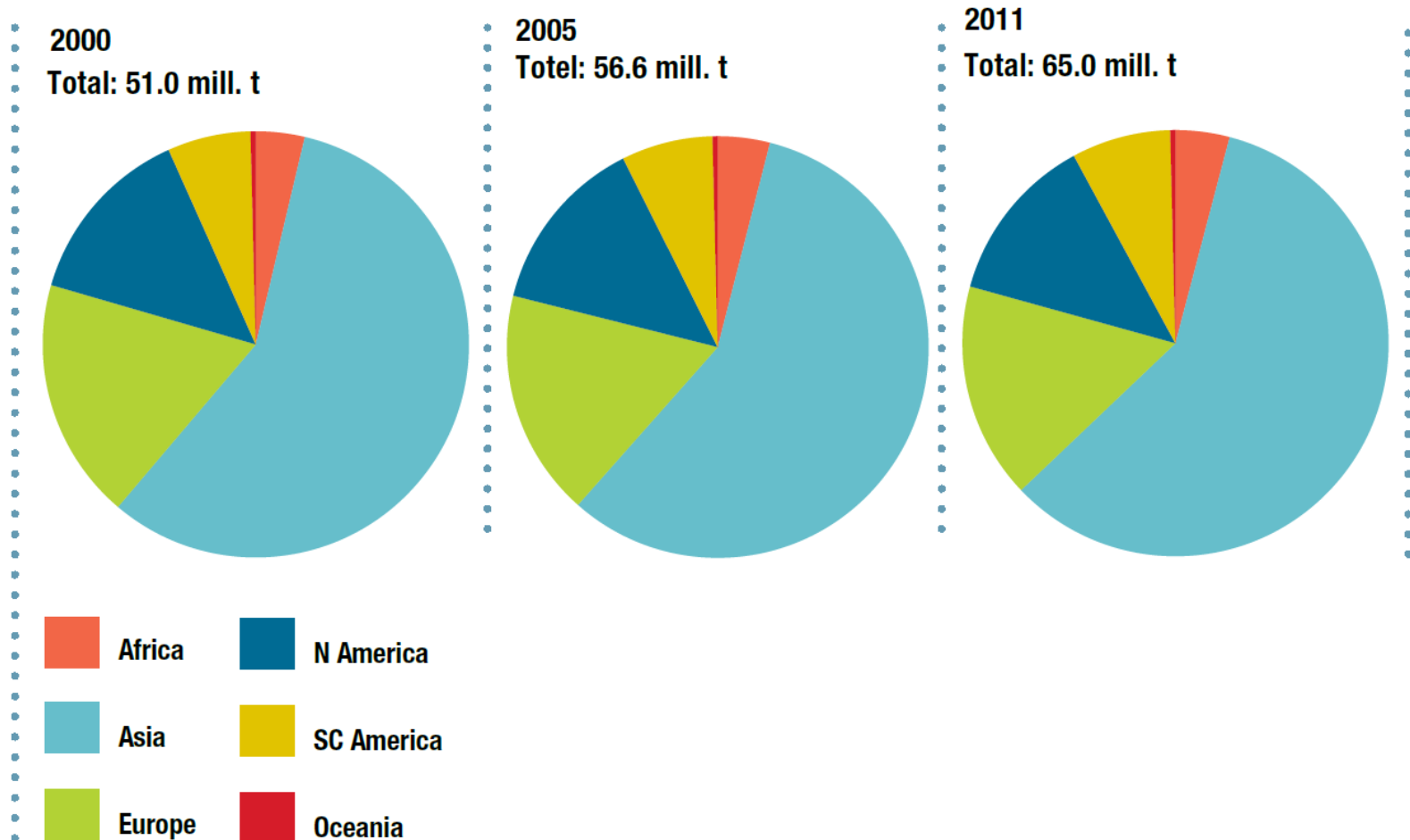


Campaign: Egg as a healthy food - 2

- Some consumers still think cholesterol is a problem
- Future aims will be around bioavailability

World Egg Production - 1

The changing contribution of the continents to global egg production in 2000 and 2011 (Source: FAO database)



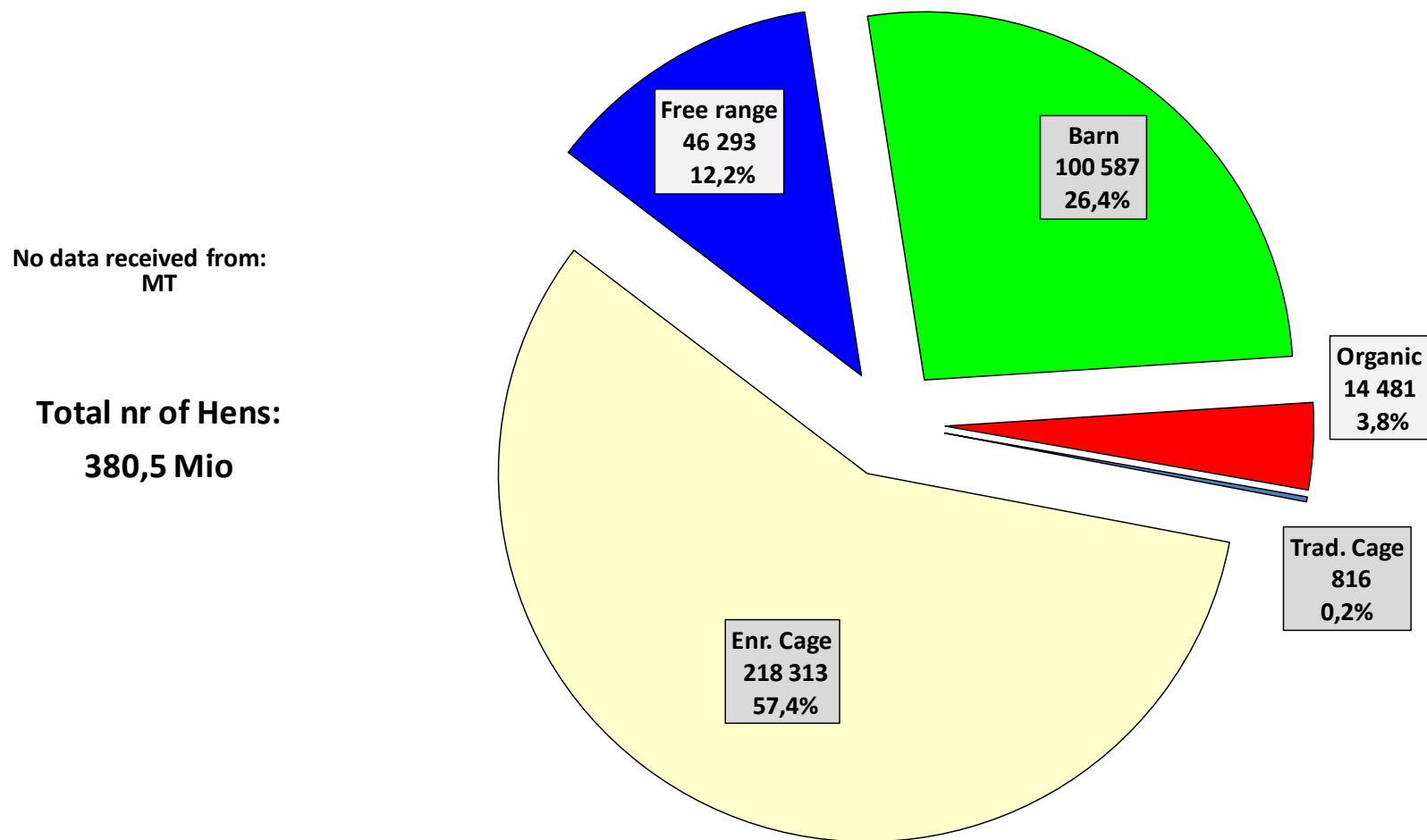
World Egg Production - 2

The development of global egg production between 2000 and 2011 by continent; data in 1,000 t
(Source: FAO database)

CONTINENT	2000	2005	2011	INCREASE (%)
Africa	1,917	2,242	2,649	38.2
Asia	29,009	32,597	38,229	31.8
Europe	9,840	9,866	10,639	12.2
N America	7,159	7,758	8,315	16.1
CS America	3,249	3,941	4,893	50.6
Oceania	199	205	278	39.7
World	51,013	*56,610	65,003	27.4

World Egg Production - 3

Number of Laying Hens 2013 by way of keeping
based on the EU Member States that communicated data (27)
Methods of production communicated accordingly to Reg. 589/2008



World Egg Production - 4



AGRI C4
M.R.

Moyenne poules pondeuses présentes par type d'élevage
Average number of laying hens

R. 589/2008, Art. 31

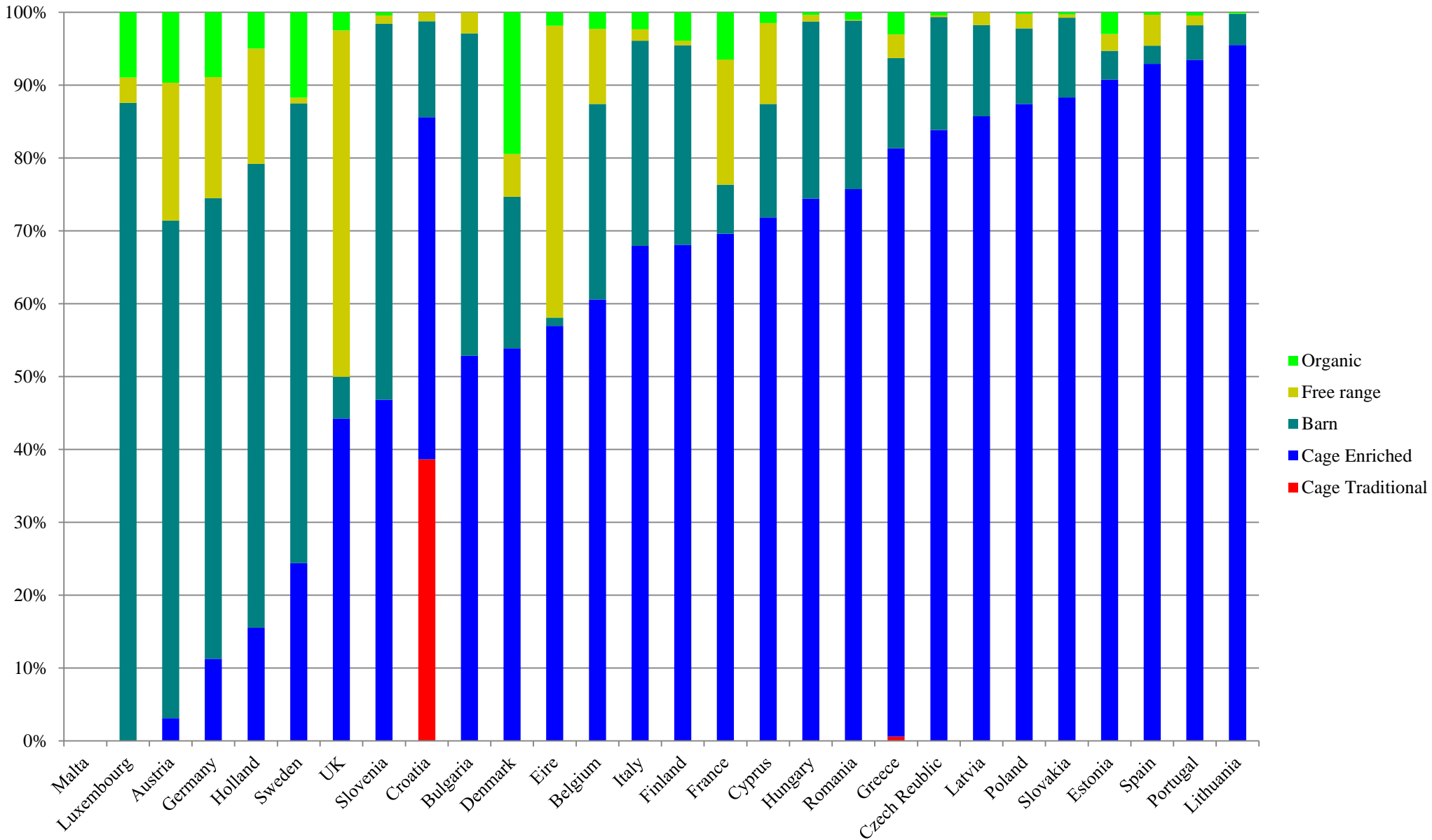
2013

05.06.2014

(NOMBRE POULES)

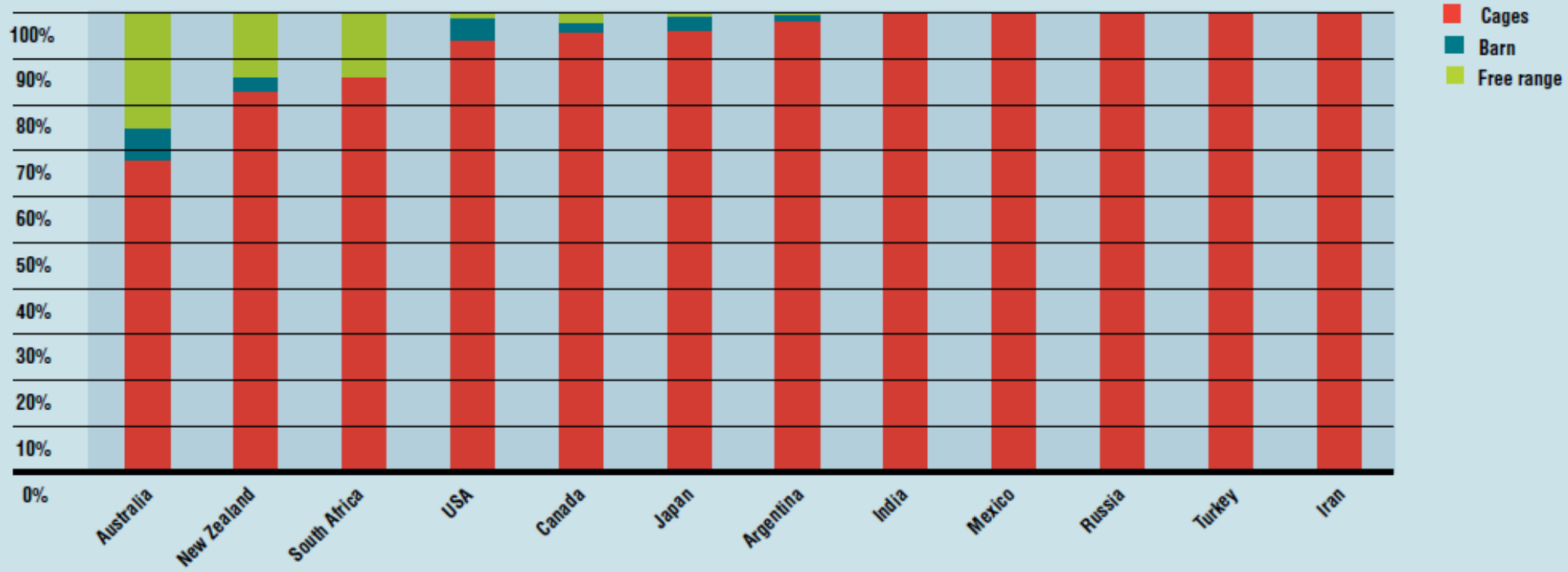
	Cage		Production alternative			Total	Total	% altern. / total	Change 13/12
	Cage : not enriched	Cage : enriched	Plein air	Sol	Biologique				
			Free range (1)	Barn (2)	Organic (0)				
(3)									
BE	0	5 114 473	869 130	2 265 741	193 053	3 327 924	8 442 397	39.4	-8.1%
BG	0	2 111 057	115 596	1 767 895	0	1 883 491	3 994 548	47.2	3.5%
CZ	0	4 663 711	11 340	862 828	25 000	899 168	5 562 879	16.2	9.5%
DK	0	1 779 580	194 158	687 482	642 565	1 524 205	3 303 785	46.1	-3.6%
DE	0	5 615 089	8 299 284	31 550 428	4 438 544	44 288 256	49 903 345	88.7	5.4%
EE	0	906 182	22 981	39 272	29 997	92 250	998 432	9.2	34.7%
EL	22 680	3 059 506	122 360	470 014	115 977	708 351	3 790 537	18.7	
ES	0	35 686 441	1 640 509	953 714	128 116	2 722 339	38 408 780	7.1	0.2%
FR	0	32 737 953	8 070 018	3 173 101	3 060 307	14 303 426	47 041 379	30.4	2.4%
HR	793 198	963 980	25 255	270 416	0	295 671	2 052 849	14.4	-25.7%
IE	0	1 610 144	1 132 584	32 367	52 102	1 217 053	2 827 197	43.0	2.3%
IT	0	40 968 685	947 268	16 982 411	1 413 306	19 342 985	60 311 670	32.1	-1.5%
CY	0	306 610	47 492	66 327	6 293	120 112	426 722	28.1	-1.8%
LV	0	2 283 794	47 220	333 685	0	380 905	2 664 699	14.3	21.5%
LT	0	2 367 069	350	106 534	4 880	111 764	2 478 833	4.5	2.0%
LU	0	0	3 600	90 200	9 230	103 030	103 030	100.0	
HU	0	4 219 766	51 360	1 378 782	21 000	1 451 142	5 670 908	25.6	-4.5%
MT						0			
NL	0	5 117 000	5 204 000	20 954 000	1 649 000	27 807 000	32 924 000	84.5	11.3%
AT	0	185 382	1 128 111	4 071 532	577 296	5 776 939	5 962 321	96.9	1.0%
PL	0	32 902 508	744 629	3 911 071	90 414	4 746 114	37 648 622	12.6	6.6%
PT	0	6 762 655	97 291	343 430	32 036	472 757	7 235 412	6.5	49.0%
RO	0	4 989 002	8 496	1 523 509	67 898	1 599 903	6 588 905	24.3	1.1%
SI	0	687 100	16 416	757 001	6 559	779 976	1 467 076	53.2	0.1%
SK	0	2 518 005	11 830	312 372	9 321	333 523	2 851 528	11.7	-20.5%
FI	0	2 826 355	24 842	1 137 303	162 711	1 324 856	4 151 211	31.9	3.0%
SE	0	1 721 690	54 625	4 449 916	826 307	5 330 848	7 052 538	75.6	0.6%
UK	0	16 208 822	17 402 514	2 095 955	919 052	20 417 521	36 626 343	55.7	2.1%
EUR 28	815 878	218 312 559	46 293 259	100 587 286	14 480 964	161 361 509	380 489 946	42.4	

World Egg Production - 5



World Egg Production - 6

Share of housing systems for layers in selected IEC countries in 2012



Egg production around the world

Cage eggs - Denmark



Egg production around the world

Cage eggs - Mexico



Egg production around the world

Cage eggs – Borneo - 1



Egg production around the world

Cage eggs – Borneo - 2



Egg production around the world

Cage eggs – Borneo - 3



Egg production around the world

Cage eggs – Columbia - 1



Egg production around the world

Barn eggs – Denmark



Egg production around the world

Barn eggs – Belgien



Egg production around the world

Barn eggs – Austria - 1



Egg production around the world

Barn eggs – Columbia - 1



Egg production around the world

Barn eggs – Columbia - 2



Egg production around the world

Free range— UK - 1



Egg production around the world

Free range— UK - 2



Egg production around the world

Organic– Denmark - 1



Egg production around the world

Organic– Denmark - 2



Egg production around the world

Organic– Denmark - 3



Egg production around the world

Organic– Denmark - 4



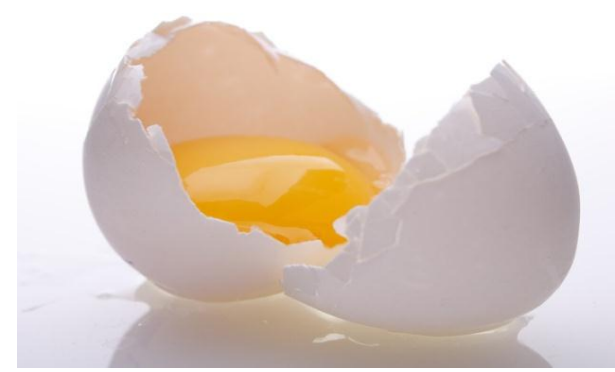
Egg production around the world

Organic– Denmark - 5



EGGS... A WORLD OF OPPORTUNITIES





Thank you for your attention

