

# Bathing water results 2008 – Denmark

## 1. Introduction

This report gives a general overview of bathing water quality in Denmark during the 2008 bathing season. Denmark reported under the Directive 2006/7/EC.

During the transition period, samples of Intestinal enterococci and Escherichia coli are reported under the Directive 2006/7/EC, but assessment is done according to the assessment rules of Directive 76/160/EEC. For the conversion of reported parameters under Directive 2006/7/EC, Article 13.3 of the Directive 2006/7/EC foresees that the parameter Escherichia coli, reported under Directive 2006/7/EC, is assumed to be equivalent to the parameter Faecal coliforms of Directive 76/160/EEC. The parameter Intestinal enterococci reported under Directive 2006/7/EC is assumed to be equivalent to the parameter Faecal streptococci. This means that the parameters Intestinal enterococci and Escherichia coli are evaluated according to the guide and mandatory standards defined in the Annex to Directive 76/160/EEC for the parameters Faecal streptococci and Faecal coliforms respectively.

The results are classified in the following categories:

- Compliant with the mandatory value of the Directive 76/160/EEC for Escherichia coli and not compliant with the guide value of the Directive 76/160/EEC for Intestinal enterococci (class CI)
- Compliant with the mandatory value of the Directive 76/160/EEC for Escherichia coli and the more stringent guide values for the Escherichia coli and Intestinal enterococci (class CG)
- Not compliant with the mandatory value of the Directive 76/160/EEC for Escherichia coli (class NC)
- Banned (temporarily closed) or closed throughout the season (class B)

## 2. Length of bathing season and number of bathing waters

For all bathing waters the bathing season lasted free months, from 1 June to 1 September 2008.

A total of 1,260 bathing waters were reported in Denmark during the 2008 bathing season, of which 1,145 were coastal bathing waters and 115 freshwater bathing waters on lakes. Three freshwater bathing waters were not monitored.

With 1,260 bathing waters Denmark accounts for about 5.9% of the reported bathing waters of the European Union.

The evolution of the reported number of bathing waters since monitoring of the water quality began under the Directive 76/160/EEC and Directive 2006/7/EC is presented in Table 1. The number of coastal bathing waters decreased since the start of the reporting from 1,189 in 1991 to 1,145 in 2008. There were 13 less coastal bathing waters in 2008 than in the previous year. The number of freshwater bathing waters remained rather stable and decreased from 117 in 1991 to 115 in 2008. There were two more freshwater bathing waters in 2008 than in the previous year. In total, six new bathing waters were added to the list compared to the previous year and 15 were de-listed.

## 3. Results of bathing water quality

The results of the bathing water quality in Denmark for the period 1991-2007 as reported in 2008 report and for the bathing season of 2008 are presented in Figure 1.

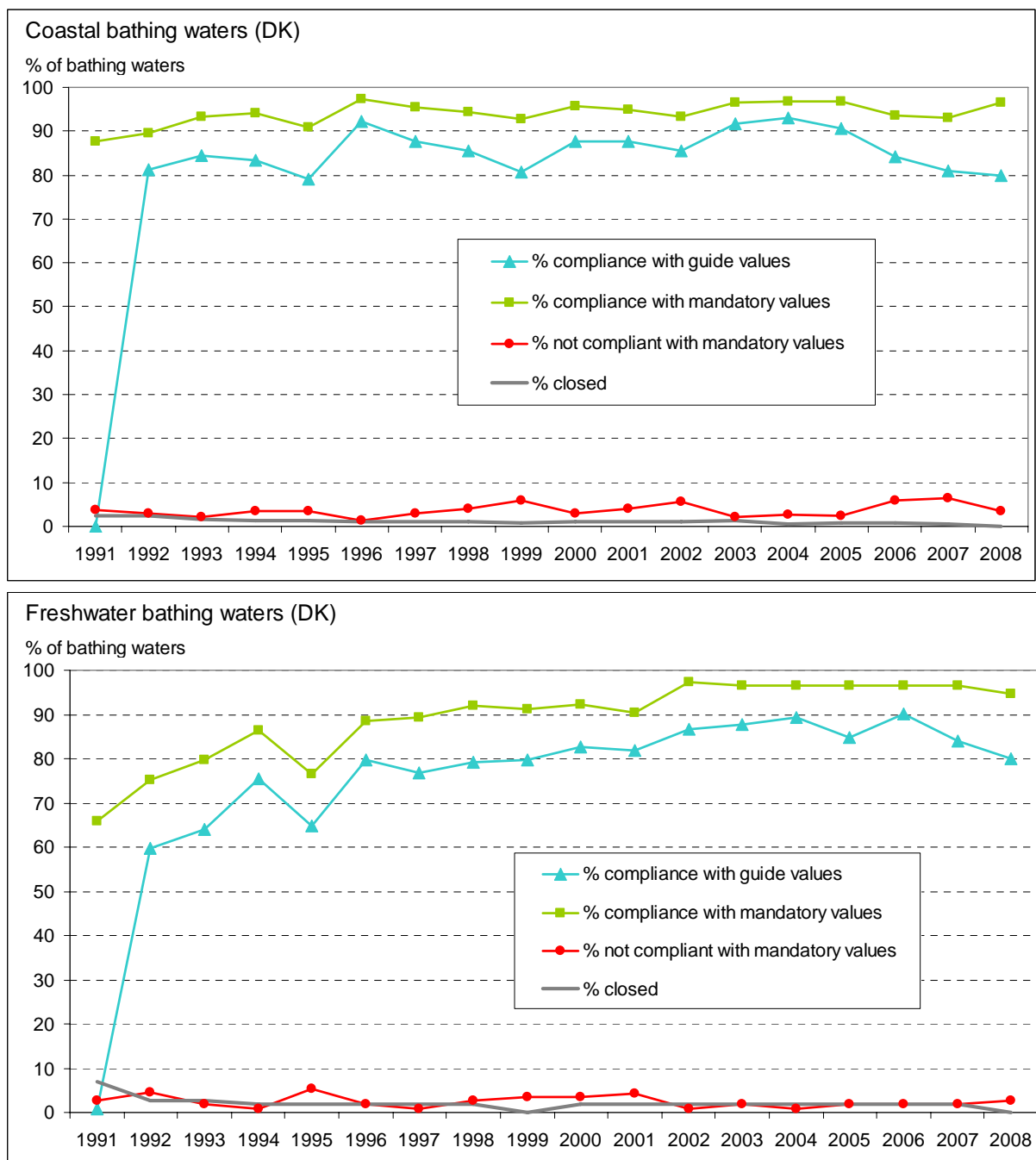
The graphs show, for coastal and freshwater bathing waters separately:

- The percentage of bathing waters that comply with the guide values (class CG, blue line),
- The percentage of bathing waters that comply with the mandatory values (class CI, green line)
- The percentage of bathing waters that do not comply with the mandatory values (class NC, red line)
- The percentage of bathing waters that are banned (temporarily closed) or closed throughout the season (class B, grey line)

Table 1 and Table 2 show the same information in absolute numbers and in percentages separately for coastal and freshwater bathing waters. Table 3 shows the bathing water quality results for 2008 season in Denmark for all bathing waters.

Map 1 shows the location of the reported bathing waters in Denmark. The location of the bathing waters is based on the geographic coordinates reported by the Danish authorities.

**Figure 1: Results of bathing water quality in Denmark from 1991 to 2008**



**Table 1: Results of bathing water quality in Denmark from 1991 to 2008 as absolute numbers**

	Year	Total number of bathing waters	Compliance with guide values	Compliance with mandatory values	Not compliant	Banned/closed throughout the season
		<b>DK</b>				
Coastal bathing waters	1991	1189	0	1042	44	29
	1992	1172	953	1051	33	27
	1993	1179	996	1100	25	20
	1994	1189	991	1120	40	17
	1995	1187	940	1078	40	15
	1996	1195	1103	1162	15	14
	1997	1194	1046	1140	35	13
	1998	1194	1022	1126	49	12
	1999	1176	950	1090	70	11
	2000	1161	1018	1112	33	11
	2001	1159	1015	1101	46	12
	2002	1154	986	1077	64	13
	2003	1141	1045	1100	26	14
	2004	1136	1056	1100	30	6
	2005	1145	1039	1109	27	8
	2006	1146	965	1071	67	8
2007	1158	937	1076	73	6	
2008	1145	914	1104	41	0	
Fresh water bathing waters	1991	117	1	77	3	8
	1992	109	65	82	5	3
	1993	108	69	86	2	3
	1994	110	83	95	1	2
	1995	111	72	85	6	2
	1996	113	90	100	2	2
	1997	112	86	100	1	2
	1998	111	88	102	3	2
	1999	114	91	104	4	0
	2000	115	95	106	4	2
	2001	115	94	104	5	2
	2002	113	98	110	1	2
	2003	114	100	110	2	2
	2004	112	100	108	1	2
	2005	112	95	108	2	2
	2006	112	101	108	2	2
2007	113	95	109	2	2	
2008	115	92	109	3	0	

Note: Bathing waters which were insufficiently sampled or not sampled according to the Bathing Water Directive were not included in this table. Therefore, in some cases, the sum of the different categories will not be equal to the total number of bathing waters.

**Table 2: Results of bathing water quality in Denmark from 1991 to 2008 as percentages**

	Year	% total number of bathing waters	% compliance with guide values	% compliance with mandatory values	% not compliant	% banned/closed throughout the season
		<b>DK</b>				
Coastal bathing waters	1991	1189	0.0	87.6	3.7	2.4
	1992	1172	81.3	89.7	2.8	2.3
	1993	1179	84.5	93.3	2.1	1.7
	1994	1189	83.3	94.2	3.4	1.4
	1995	1187	79.2	90.8	3.4	1.3
	1996	1195	92.3	97.2	1.3	1.2
	1997	1194	87.6	95.5	2.9	1.1
	1998	1194	85.6	94.3	4.1	1.0
	1999	1176	80.8	92.7	6.0	0.9
	2000	1161	87.7	95.8	2.8	0.9
	2001	1159	87.6	95.0	4.0	1.0
	2002	1154	85.4	93.3	5.5	1.1
	2003	1141	91.6	96.4	2.3	1.2
	2004	1136	93.0	96.8	2.6	0.5
	2005	1145	90.7	96.9	2.4	0.7
	2006	1146	84.2	93.5	5.8	0.7
2007	1158	80.9	92.9	6.3	0.5	
2008	1145	79.8	96.4	3.6	0.0	
Fresh water bathing waters	1991	117	0.9	65.8	2.6	6.8
	1992	109	59.6	75.2	4.6	2.8
	1993	108	63.9	79.6	1.9	2.8
	1994	110	75.5	86.4	0.9	1.8
	1995	111	64.9	76.6	5.4	1.8
	1996	113	79.6	88.5	1.8	1.8
	1997	112	76.8	89.3	0.9	1.8
	1998	111	79.3	91.9	2.7	1.8
	1999	114	79.8	91.2	3.5	0.0
	2000	115	82.6	92.2	3.5	1.7
	2001	115	81.7	90.4	4.3	1.7
	2002	113	86.7	97.3	0.9	1.8
	2003	114	87.7	96.5	1.8	1.8
	2004	112	89.3	96.4	0.9	1.8
	2005	112	84.8	96.4	1.8	1.8
	2006	112	90.2	96.4	1.8	1.8
2007	113	84.1	96.5	1.8	1.8	
2008	115	80.0	94.8	2.6	0.0	

Note: Bathing waters which were insufficiently sampled or not sampled according to the Bathing Water Directive are not included in this table. Therefore, in some cases, the sum of the percentages is not equal to 100%.

**Table 3: Results of bathing water quality for all bathing waters in Denmark in 2008**

		<b>DK</b>				
		Total number of bathing waters	Compliance with guide values	Compliance with mandatory values	Not compliant	Banned/closed throughout the season
Bathing Waters	2008	1260	1006	1213	44	0

Note: Bathing waters which were not sampled according to the Bathing Water Directive were not included in this table. Therefore the sum of the different categories is not equal to the total number of bathing waters.

## **4. Development of bathing water quality**

### **Coastal bathing waters**

In Denmark, 96.4% of all coastal bathing waters (1104) met the mandatory water quality in 2008. The percentage of compliance to mandatory values is larger for 3.5% compared to the previous year. 79.8% of the bathing waters (914) met the more stringent guide values. This is a slight decrease compared to the previous year, when 80.9% of the bathing waters (937) met the guide values. The percentage of non-compliant bathing waters with the mandatory values decreased from 6.3% (73) to 3.6% (41 bathing waters). Since the start of reporting in 1991, this is the first time that no coastal bathing water had to be closed during the season.

From 1991 Denmark, as most of the Members States at that time, had to take measures to improve the overall water quality. These measures resulted in the improving water quality as can be seen in the increasing compliance results from 1992 onwards. Since then, we see a fairly stable overall bathing water quality.

### **Freshwater bathing waters**

94.8% of all freshwater bathing waters (109) met the mandatory water quality in 2008. This is a decrease compared to the previous year (- 1.7%). The rate of compliance with the guide values also decreased by 4.1%, reaching 80% of the bathing waters (92). The rate of compliance with the mandatory value for *Escherichia coli* exceeds the rate of compliance with more stringent guide values by 14.8%, which is almost the same as for the coastal bathing waters. The number of non-compliant bathing waters with the mandatory values increased from two (1.8%) to three bathing waters (2.6%). No freshwater bathing water had to be closed during the season.

Overall there was no major change in the situation for the freshwater bathing water quality in Denmark lately. As for the coastal bathing waters, measures were taken to improve inland water quality of rivers and lakes from 1991 onward. We see an overall increase in the water quality, but it took Denmark till the 2002 bathing season to reach a constant level of non compliant freshwater bathing waters below 2%. The mandatory water quality was met in more than 90% of the bathing waters since 1998 and since 2002 in over 96% of the bathing waters. In 2008, the percentage of bathing waters that met the mandatory value, however, decreased below 96% and the percentage of non compliant bathing waters increased above 2%. The number of bathing waters compliant with the more stringent guide values is fluctuating between 80% and 90% of all the bathing waters since 1999. Since 1994, two bathing waters were closed during the season (1.7-1.8%), except for the 1999 and 2008 season.

## **5. General information as provided by the Danish authorities**

The bathing water season in Denmark runs from June 1 to September 1. Sampling generally starts one month before the start of the bathing season. Samplings for the evaluation of the bathing water are taken at places that are normally used for bathing, including areas, which are reserved specifically for bathing in accordance with regional and local planning. Moreover, samples must to the extent required be taken to demarcate known pollution sources, e.g. harbours, sewage discharges and mouth of rivers.

During the inspection the parameters coloration, mineral oils, surface-active substances and phenols have been checked. The analytical methods used to assess the compliance with the Directive are based on membrane filtration and are the EN/ISO methods (9301-1 and 7899-2).

### ***Bans***

In Denmark bathing is prohibited when pollution cannot be reduced to a level which is acceptable from the point of view of public health. Furthermore is the bathing water deemed not to be acceptable from the point of view of public health if the water does not comply with the microbiological parameters in three successive bathing seasons. This means that bathing is prohibited unless the pollution can be eliminated before the next bathing season starts.

### *Waste water treatment*

In 1987 the Danish Parliament agreed on an Action plan for the aquatic environment. For wastewater treatment plans, tertiary treatment was demanded for all plants bigger than 5,000 person equivalents (PE). The extension of the treatment plans to tertiary treatment was finalised in 1995. Today all treatment plants above 5,000 PE have tertiary treatment and the discharge from these plants has no impact on the bathing water quality. Industrial discharges are mainly connected to the public tertiary wastewater treatment plants and only a minor number of industries have a direct discharge to the aquatic environment. The few direct discharges of treated industrial wastewater have no impact on the bathing water quality.

In 1997 a national plan for improvement of untreated discharge of waste water from scattered settlement was agreed. In 2004 it was estimated that 90,000 estates/household should have improved treatment. Of these around 15 - 20,000 have been improved. It is expected that 90,000 of the households in the countryside that are not connected to public wastewater treatment will have to improve the wastewater treatment facilities. The action plan will contribute to improvement of the general water quality in rivers, lakes and coastal waters and thereby also contribute to improvements of the bathing water quality.

This action plan will in the near future contribute to improvements of the general quality in rivers, lake and coastal waters and thereby also contribute to improvements of the bathing water quality.

## **6. More information on bathing water quality in the European Union**

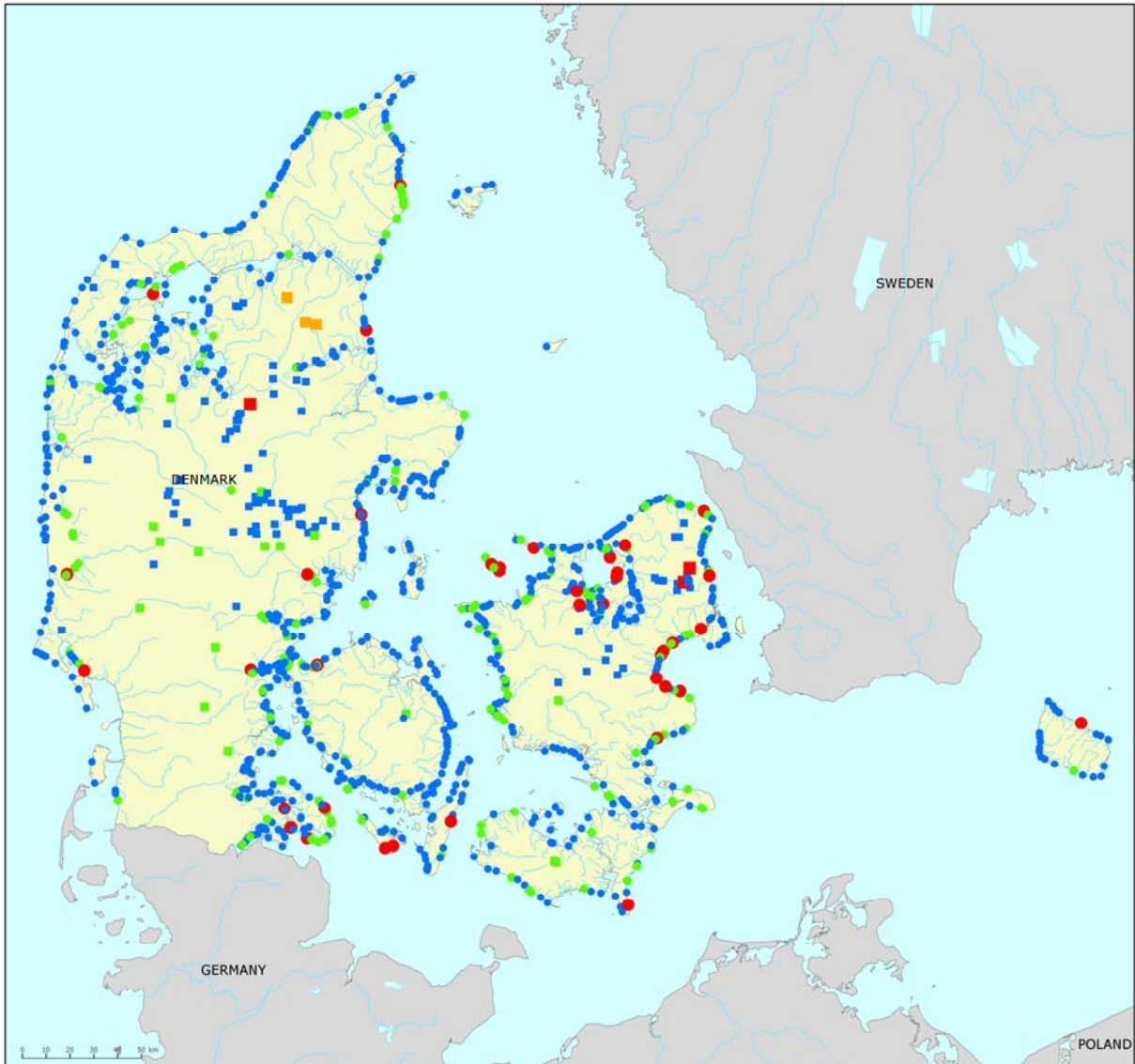
More information on bathing water quality in the European Member States, including the reports for 27 Member States and the EU summary report, can be found on the bathing water quality website ([http://ec.europa.eu/environment/water/water-bathing/index\\_en.html](http://ec.europa.eu/environment/water/water-bathing/index_en.html)).

By 2015, Member States will have to comply with the stricter and more ambitious requirements laid out in the new Bathing Water Directive (Directive 2006/7/EC). This Directive requires more effective monitoring and management of bathing waters, greater public participation and improved information. More information on the new Directive can be found on the bathing water quality website and on <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:064:0037:0051:EN:PDF>.

Cyprus, Denmark, Estonia, Finland, Germany, Hungary, Latvia, Lithuania, Slovakia, Spain and Sweden started to report according to more stringent new requirements in 2008 bathing season, while Luxembourg already started in 2007 bathing season.

WISE - Water Information System for Europe ([www.water.europa.eu](http://www.water.europa.eu)) is a gateway to all water related information. Among other water related data, information on individual bathing water quality can be found in the WISE Map viewer and WISE Data viewer through interactive maps and graphs (<http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water>).

**Map 1: Bathing waters reported during the 2008 bathing season in Denmark**



Bathing water quality			No data
<b>Bathing waters on rivers</b>	<b>Bathing waters on lakes</b>	<b>Coastal/transitional bathing waters</b>	☐ No data
▲ Compliant with guide values	■ Compliant with guide values	● Compliant with guide values	☐ Outside data coverage (data available, not presented on the map)
▲ Compliant with mandatory values	■ Compliant with mandatory values	● Compliant with mandatory values	
▲ Closed*	■ Closed*	● Closed*	
▲ Insufficiently sampled or not sampled	■ Insufficiently sampled or not sampled	● Insufficiently sampled or not sampled	
▲ Not compliant with mandatory values	■ Not compliant with mandatory values	● Not compliant with mandatory values	

Note: \* banned (temporarily closed) or closed throughout the season  
 More data on bathing water quality on: <http://www.eea.europa.eu/themes/water/mapviewers/bathing>  
 Source: National boundaries: GISCO  
 Large rivers and lakes: EEA, WFD Article 3  
 Bathing waters data and coordinates: Danish authorities