

Aquaculture 2007

This series consists mainly of primary statistics, statistics from statistical accounting systems and results of special censuses and surveys, for reference and documentation purposes. Presentation is basically in the form of tables, figures and necessary information about data, collection and processing methods, and concepts and definitions. In addition, a short overview of the main results is given. The series also includes Statistical Yearbook of Norway

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Preface

This publication is mainly a documentation of the statistics on aquaculture. In addition, some main results are presented.

Previous editions of this publication also comprised statistics from several data sources. This publication is only based on data from statistical questionnaires filled in by the farmers themselves and collected by the Directorate of Fisheries.

The statistics are published yearly. Preliminary figures are published about 8 months after end of the reference year, and final figures are available about 16 months after end of the reference year. On country level, the difference between preliminary and final figures is limited.

The publication has been prepared by Jardbjørg Aas Jenssen and Trond A. Steinset. Ole Osvald Moss, Head of Division for Primary Industry Statistics, is responsible for the publication.

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1. About the statistics

1.1. Purpose and history

The purpose of the statistics is to publish relevant information and statistics on the development in Norwegian aquaculture (until 2006 the statistics was named Fish farming).

Statistics on fish farming have been composed since 1971. In the two first years, the task was carried out by Statistics Norway. Since then data collection has been conducted by the Directorate of Fisheries. Statistics Norway has always been responsible for preparing and publishing the final statistics.

The figures are comparable over time, but the statistics comprise more details today than in 1971, when the data collection was carried out for the first time. From 1989, statistics on shellfish and other fish species than salmon and trout were included.

Users and applications

The main statistic users are public administrations, different organisations, scientists, students, media and the fish farmers themselves. Foreign organisations are also users of the statistics. The statistics are important as a database for analyses of future development. The material is also used in analyses and economical estimations internally in Statistics Norway.

The data material is used to fulfil Norway's international obligations to report to a number of international organisations as FAO, Eurostat and OECD. The Directorate of Fisheries are responsible for these reports.

1.2. Statistics production

Population

The statistics covers the following types of licence to farm fish and/or shellfish:

- Fish for food, parent fish and FoU (Research and Education). Salmon, rainbow trout and trout
- Fry/fingerling. Salmon, rainbow trout and trout
- Fish for food and fry/fingerling combined. Other fish species than salmon, rainbow trout and trout
- Shellfish

Final figures contain information from all the licences running. Preliminary figures contain information from the majority of all the licences and calculated values from a small number of licences that still has not been reported.

The statistics emphasize salmon and rainbow trout. Other species are trout, char/migratory char, cod, halibut, mackerel, eel, saithe (pollock) and turbot. Figures on char, cod and halibut are published solely, while the remaining species are added up and published as *other fish species*. Farming of these species concerns both commercially farmed fish and feeding of wild caught fish. Relevant species of shellfish are blue mussel, common scallop, oyster, common cockle, horse mussel and lobster. Figures on blue mussel, common scallop and oyster are published solely, while the remaining shellfish species are added up and published as *other species*.

Data sources

- The Directorate of Fisheries' annual questionnaires sent to all the holders of a licence to farm fish and/or shellfish
- The aquaculture register in Brønnøysund
- Register for biomass control in the Directorate of Fisheries

Sampling

Complete survey addressing all holders of a licence (per January the year after the reference-year) to farm fish and/or shellfish.

<i>Collection of data</i>	<p>The Directorate of Fisheries annually sends out a questionnaire to the licences, meaning those listed in the aquaculture register as of January after the reference year. In accordance to Norwegian legislation, the licences are under obligation to answer the questionnaires.</p> <p>To relieve the response burden for companies with several licences, they have as from 2001 only been required to fill inn <i>one</i> questionnaire for each type of licence. Companies running licences in several counties still have to fill in separate questionnaires for each county.</p> <p>The different questionnaires are:</p> <ul style="list-style-type: none"> • Fish for food, parent fish and FoU (Research and Education). Salmon, rainbow trout and trout • Fry/fingerling. Salmon, rainbow trout and trout • Fish for food. Other fish species than salmon, rainbow trout and trout • Fry/fingerling. Other fish species than salmon, rainbow trout and trout • Shellfish <p>Each questionnaire has its own guidelines for filling in. The deadline for returning the questionnaires is in March, after the reference year, depending on the type of licence.</p> <p>Statistics Norway is co-operating with the Directorate of Fisheries and comment on the content of the questionnaires. The Directorate of Fisheries are responsible for sending out, collecting and editing the questionnaires.</p>
<i>Control and revision</i>	<p>Up to and including 1992, Statistics Norway carried out quality control and correction of data. Since then the Directorate of Fisheries has taken over this work. In addition, they have the professional responsibility of the bulk of the quality controls.</p> <p>The Directorate of Fisheries collects controls the data both manually and electronically. For each type of questionnaire there has been prepared a list, which contains absolute and possible errors. These lists are constructed on the basis of professional skills and evaluations. On some occasions, when doubts arise, the respondents are contacted.</p> <p>The salmon and rainbow trout stocks per 1 January and 31 December and the supplies of salmon and rainbow trout during the year come from the Register for biomass control. The stock data are controlled by the companies themselves.</p> <p>In Statistics Norway the data are controlled once more previous to the production of tables and the preparation of the publication. The Directorate of Fisheries is consulted if any changes take place.</p>
<i>Estimation</i>	<p>Data is presented as total numbers, percentage and average.</p>
<i>Definitions of the main concepts and variables</i>	<h3>1.3. Concepts, variables and classifications</h3> <p><i>Aquaculture</i> Production of aquatic organisms. Production is any measures taken to enhance living organisms' weight, size, number, characteristic or quality.</p> <p><i>Licence for aquaculture</i> A permission to farm fish, shellfish or molluscs in accordance to Norwegian legislation (Aquaculture Act). A permission gives the right for a certain type of production of a certain type of species in a certain extent at one or several stated localities.</p>

Operating licence

A licence is considered in operation if there has been production of fish, roe or fry on the licence during the reference year.

Fish for food

Adult fish produced to be consumed. Production of parent fish and fingerling are not included.

Parent fish

Fish that is used to produce roe and milt in artificial fecundation.

FoU-licence, aquaculture

A licence for aquaculture given for the purpose of experiments, research or instructions.

Fingerling production

Production of roe, fry or smolt with a view to transferring to other localities.

Smolt

The name of the fish that is ready to enter the sea. At this time it changes in shape and colour and becomes shiny.

Value

Value-added tax is not included in the tables. The value is current value. The value is first-hand value, except of export and import value. The first hand value corresponds to the value of sold slaughtered fish unrefined fresh or frozen. The value of fish further processed in own plants is included.

Quantity

Quantity is quoted as round weight, except of exported and imported quantity, which is quoted as product weight.

Round weight

The weight of the fish before it is gutted. Fish that is delivered gutted is converted into round weight. At the moment, the conversion factor for fish gutted with head is 1.125 and for fish gutted and decapitated 1.2857.

Loss in aquaculture

Loss of fish during production. The loss is given as the number of fish by cause.

Dead fish

Number of dead fish taken out of the net cages. The dead can be caused by disease, injury and wound without any further specification.

Discarding when slaughtered

The number of fish discarded when slaughtered because of sexual maturity and defects.

Escaping

The number of fish escaped from the fish farms.

Other

The number of fish lost because of predators, theft and other reasons.

Error in counting

The number of fish adjusted in accordance with original supply.

1.4. Sources of error and uncertainty

Measurement and processing errors

Statistical data might contain errors. The data from the farmers are of varying quality. In all likelihood the most important error is that some respondents might have given faulty or wrong information.

The routines of revision imply several controls revealing possible and absolute errors. The possible errors are revealed when the variables are outside intervals constructed on the basis of professional assessment. If such intervals are constructed wrongly or/and with bias in any sense, compared to the reality, it will certainly depreciate the quality of the statistics.

Non-response errors

Licences with no stocks at the end of the year, and/or licences that were not registered with the Directorate of Fisheries' Register for biomass control, are assumed not to be running the following year.

When the preliminary figures are due to be published, there are usually data missing from a small number of companies that still have not reported. This is corrected with an estimation based on previous year's production for these companies and information in the Register for biomass control. Six months after the end of the reference period, the coverage in the survey is about 95 per cent for both fish for food-production and hatcheries (salmon, rainbow trout and trout). When corrected with estimated figures for those licences not reported, this survey represents all licences running in the period of reference. The Directorate of Fisheries therefore concludes that the data material qualitatively can be presented as preliminary statistics.

1.5. Comparability and coherence

Comparability over time and space

Statistics on sales for food in 1991 were not published because of unreliable data.

Coherence with other statistics

The statistics are published as Today's statistics on SSB's websites and in the Statbank.

The Directorate of Fisheries publishes preliminary figures in Statistikk for akvakultur. These statistics are based on the same questionnaires as the statistics published by Statistics Norway.

The information from the questionnaires regarding labour input and production are also utilized in The Directorate of Fisheries' survey "Lønnsomhetsundersøkelse for akvakultur, laks og regnbueørret".

1.6. Main results

For the fish farming industry the total quantity of fish for sale increased by 18.4 per cent from 2006 to 2007. A total of 838 858 tonnes were sold in 2007. The value of fish sold decreased by 0.4 per cent.

Compared with 2006 the sales of salmon increased by 18.2 per cent, and reached 744 220 tonnes. This results in a sales value of NOK 15.5 billion, which is 0.5 per cent less than in 2006. The average price per kilo fell from 24.7 to 20.8 in 2007.

The sales of trout also increased in 2007. The total quantity was 78 000 tonnes, which is 23.5 per cent more than in 2006. The first hand value was close to NOK 1.6 billion, which is 1.6 per cent less than in 2006. The average price per kilo fell from NOK 25.20 in 2006 to NOK 20.00 in 2007.

For other species the changes in quantity from 2006 to 2007 were small for cod, whereas for halibut the sales were doubled. The average prices fell from NOK 23.60 to NOK 22.30 per kilo for cod and from NOK 60.00 to NOK 49.50 per kilo for halibut.

Employment up

Number of people employed in aquaculture industry totalled 4 665 in 2007. 80 per cent of them worked with salmon and trout farming. The employment increased by 4.4 per cent from 2006.

Lost and wasted fish

In 2007, the loss/wastage for all species was 9.0 per cent, compared with 8.4 per cent in 2006. For salmon a small increase in the number reported as lost/wastage from 7.8 to 8.7 per cent was recorded.

1.7. Availability

Publications and other links

- [Aquaculture](#)
- [StatBank](#)

Final results: http://www.ssb.no/fiskeri_havbruk_en/

More tables in StatBank:

[03227: Fish farming. Stock and loss of live fish for food. Salmon and trout. \(C\) \(1986 - 2007\)](#)

[03214: Fish farming. Number of workers and labour input. \(C\) \(1986 - 2007\)](#)

[03143: Fish farming. Sales of slaughtered fish for food. Salmon and trout. \(C\) \(1971 - 2007\)](#)

[03291: Fish farming. Acquisitions and sales of fixed assets. \(1 000 NOK\). \(C\) \(1988 - 2007\)](#)

Microdata Microdata are stored in Statistics Norway.

1. Sales of slaughtered fish for food. Quantity, by fish species and county. 2007. Tonnes

	Total	Salmon	Trout	Char/ migratory char	Cod	Halibut	Other fish species
1997	367 115	332 581	33 295	350	304	¹ 113	472
1998	410 449	360 806	48 431	190	199	¹ 290	534
1999	476 291	425 154	48 692	498	157	451	1 340
2000	490 278	440 061	48 778	282	170	562	425
2001	508 497	435 119	71 764	317	535	377	385
2002	548 718	462 495	83 559	319	1 258	424	663
2003	582 587	509 544	68 931	272	2 185	426	1 229
2004	633 110	563 914	63 401	324	3 165	648	1 658
2005	656 894	586 512	58 875	352	7 409	1 197	2 549
2006	708 558	629 888	62 703	897	11 087	1 185	2 798
2007	838 856	744 220	77 465	395	11 104	2 307	3 365
2007							
Rogaland	58 405	54 390	147	-	2 058	1 810	-
Hordaland	139 201	108 787	30 238	74	92	-	10
Sogn og Fjordane	80 932	63 887	14 564	-	2 481	-	-
Møre og Romsdal	113 290	88 311	18 371	-	3 296	187	3 125
Sør-Trøndelag	99 163	97 891	1 098	41	133	-	-
Nord-Trøndelag	73 637	73 633	:	:	:	4	-
Nordland	155 156	143 166	9 193	339	2 244	214	-
Troms Romsa	84 548	82 434	1 780	14	320	-	-
Finnmark Finnmark	22 733	20 208	2 030	:	495	-	-
Remaining counties	11 791	11 513	44	1	3	-	230

¹ Numbers from the Directorate of Fisheries.

2. Sales of slaughtered fish for food. Value¹, by fish species and county. 2007. NOK 1 000

	Total	Salmon	Trout	Char/ migratory char	Cod	Halibut	Other fish species
1997	7 435 176	6 768 841	628 956	15 237	4 355	² 8 680	9 108
1998	8 632 536	7 606 646	988 851	7 846	3 325	² 19 095	6 773
1999	10 442 271	9 110 631	1 263 197	15 085	3 005	28 906	21 446
2000	12 143 421	10 907 028	1 172 049	9 504	3 409	39 659	11 772
2001	9 143 472	7 899 536	1 175 654	12 448	12 162	28 389	15 283
2002	9 221 956	7 736 691	1 394 290	12 255	30 011	30 323	18 387
2003	9 602 812	8 257 473	1 229 415	10 563	51 587	28 952	24 822
2004	11 314 218	9 862 190	1 286 990	13 351	72 187	43 580	35 920
2005	13 727 056	12 178 945	1 256 251	16 140	157 261	73 402	45 057
2006	17 586 772	15 575 590	1 578 776	33 290	261 377	71 151	66 588
2007	17 509 073	15 496 270	1 553 311	16 344	247 826	114 195	81 127
2007							
Rogaland	1 214 389	1 091 337	2 641	-	36 408	83 993	10
Hordaland	2 823 216	2 221 282	594 396	-	1 645	5 790	103
Sogn og Fjordane	1 846 984	1 500 809	283 173	-	63 002	-	-
Møre og Romsdal	2 584 238	2 025 351	417 567	-	67 272	12 926	61 122
Sør-Trøndelag	2 027 328	2 002 821	19 294	2 029	3 184	-	-
Nord-Trøndelag	1 418 283	1 418 076	:			207	-
Nordland	3 073 460	2 831 559	160 091	13 291	57 246	11 273	-
Troms Romsa	1 819 530	1 775 302	36 152	987	7 083	6	-
Finnmark Finnmark	487 690	437 923	37 907	:	11 860	-	-
Remaining counties	213 955	191 810	2 090	37	126	-	19 892

¹ Sold unrefined fresh or frozen. Included value of fish further processed in own plants. ² Numbers from the Directorate of Fisheries.

3. Number of licenses running, workers and labour input, by type of production and county. Salmon and trout. 2007

	Total		Production of fish for food			Hatcheries and/or fingerling production ¹			
	Number of licences running	Number of persons	1 000 man-hours	Number of licences	Number of persons	1 000 man-hours	Number of licences running	Number of persons	1 000 man-hours
1997	1 035	3 719	5 115	769	2 670	3 739	266	1 049	1 376
1998	1 025	3 557	4 869	768	2 527	3 548	257	1 030	1 320
1999	1 041	3 589	5 111	799	2 517	3 735	242	1 072	1 376
2000	1 065	3 631	4 998	817	2 565	3 658	248	1 066	1 341
2001	1 065	3 673	5 032	822	2 631	3 680	243	1 042	1 352
2002	1 093	3 431	4 977	850	2 384	3 569	243	1 047	1 408
2003	1 113	3 293	4 609	870	2 317	3 354	243	976	1 255
2004	1 146	3 129	4 319	926	2 275	3 159	220	854	1 160
2005	1 137	3 054	4 296	917	2 181	3 157	220	873	1 139
2006	1 136	3 445	4 843	909	2 480	3 599	227	965	1 244
2007	1 157	3 738	5 074	929	2 537	3 626	228	1 201	1 448
2007									
Rogaland	87	326	383	69	205	255	18	121	128
Hordaland	215	802	954	160	514	638	55	288	316
Sogn og Fjordane	104	255	341	82	156	242	22	99	99
Møre og Romsdal	149	477	686	114	276	426	35	201	260
Sør-Trøndelag	103	337	541	83	236	408	20	101	133
Nord-Trøndelag	82	276	419	66	173	277	16	103	142
Nordland	186	661	891	152	473	662	34	188	229
Troms Romsa	101	358	524	90	305	440	11	53	84
Finnmark Finnmark	81	168	251	79	152	219	2	16	32
Remaining counties	49	78	84	34	47	59	15	31	25

¹ Comprises licences with production of fish for food, of which 6 units in 1992, 26 units in 1993, 4 units in 1994, 1 unit in 1995, 4 units in 1997, 4 units in 1998, 5 units in 1999, 1 unit in 2000, 1 unit in 2001, 8 unit in 2002, 10 units in 2003, 6 units in 2004, 8 units in 2005, 4 units in 2006 and 13 units in 2007 also had some production for planting in watercourses.

4. Number of licences running, workers and labour input, by type of production and county. Other fish species than salmon and trout. 2007

	Number of licences running	Total		Production of fish for food			Hatcheries and/or fingerling production		
		Number of persons	1 000 man- hours	Number of persons	1 000 man-hours	Number of persons	1 000 man-hours		
1997	156	307	171	264	122	43	48		
1998	162	297	207	237	127	60	81		
1999	199	350	221	291	149	59	72		
2000	200	400	262	299	150	101	112		
2001	240	464	359	313	181	151	178		
2002	322	577	575	350	282	227	293		
2003	354	606	651	406	356	200	295		
2004	321	590	587	438	376	152	211		
2005	322	616	663	466	438	150	225		
2006	316	545	628	444	470	101	158		
2007	264	516	647	346	422	170	225		
2007									
Rogaland	24	39	50	27	36	12	14		
Hordaland	30	68	84	45	43	23	41		
Sogn og Fjordane	25	50	67	34	43	16	24		
Møre og Romsdal	45	103	126	63	80	40	46		
Sør-Trøndelag	7	14	15	12	12	2	3		
Nord-Trøndelag	12	27	31	20	18	7	13		
Nordland	87	127	177	92	132	35	45		
Troms Romsa	9	58	72	25	34	33	38		
Finnmark Finnmark	15	11	20	10	18	1	2		
Remaining counties	10	23	15	18	6	5	9		

5. Stock of live fish for food, by species of fish and county. All fish species. 2007. 1 000 pieces

Fish species	Stock per 1 January	Supplies	Delivered for sale	Loss	Stock per 31 December	Loss in per cent ¹
All fish species	285 720	252 013	169 188	48 375	320 173	9.0
Salmon	233 289	206 980	138 823	38 487	262 959	8.7
Trout	32 918	26 038	20 152	4 172	34 634	7.1
Other fish species	19 513	18 995	10 213	5 716	22 580	14.8
Rogaland						
All fish species	23 163	18 381	13 459	5 473	22 611	13.2
Salmon	20 054	16 224	10 767	4 153	21 357	11.4
Trout	96	25	38	9	73	7.8
Other fish species	3 013	2 132	2 654	1 311	1 181	25.5
Hordaland						
All fish species	51 789	49 000	32 750	11 373	56 666	11.3
Salmon	39 009	37 565	22 096	9 225	45 253	12.0
Trout	11 341	9 635	8 507	1 729	10 740	8.2
Other fish species	1 439	1 800	2 147	419	673	12.9
Sogn og Fjordane						
All fish species	28 647	20 490	16 033	4 258	28 847	8.7
Salmon	20 409	15 137	12 027	3 157	20 362	8.9
Trout	5 967	4 075	3 227	798	6 017	7.9
Other fish species	2 271	1 278	779	303	2 468	8.5
Møre og Romsdal						
All fish species	42 584	36 406	25 339	8 027	45 627	10.2
Salmon	30 630	27 109	18 064	5 644	34 032	9.8
Trout	6 366	4 679	4 810	541	5 695	4.9
Other fish species	5 588	4 618	2 465	1 842	5 900	18.0
Sør-Trøndelag						
All fish species	29 102	24 580	19 016	2 959	31 708	5.5
Salmon	28 254	24 402	18 677	2 911	31 068	5.5
Trout	578	42	277	33	311	5.3
Other fish species	270	136	62	15	329	3.6
Nord-Trøndelag						
All fish species	21 875	16 984	10 877	1 512	22 233	3.9
Salmon	20 695	15 592	13 243	1 826	21 218	5.0
Trout	:	:	:	:	:	:
Other fish species	1 180	:	219	426	535	36.1
Nordland						
All fish species	47 317	47 242	27 532	7 020	60 008	7.4
Salmon	37 851	36 312	23 736	5 232	45 195	7.1
Trout	5 753	3 675	2 347	660	6 421	7.0
Other fish species	3 713	7 255	1 449	1 128	8 392	10.3
Troms Roma						
All fish species	26 498	26 148	15 199	4 791	32 658	9.1
Salmon	24 187	23 666	14 609	4 423	28 821	9.2
Trout	1 321	1 238	475	264	1 821	10.3
Other fish species	990	1 244	115	104	2 016	4.6
Finnmark Finnmark						
All fish species	10 102	7 925	4 978	1 159	10 111	6.4
Salmon	7 846	8 196	3 491	1 585	10 967	9.9
Trout	1 475	2 592	391	134	3 543	3.3
Other fish species	781	364	182	146	817	12.8
Remaining counties						
All fish species	4 643	3 020	2 334	357	4 973	4.7
Salmon	4 354	2 777	2 113	331	4 688	4.6
Trout	21	77	81	3	15	3.5
Other fish species	268	166	140	23	270	5.4

¹ Loss in per cent of stock per 1 January + supplies during the year.

6. Sales of shellfish, by fish species. 2000-2007.Tonnes and NOK 1000

	Quantity					Value				
	Total	Blue mussels	Great Atlantic scallops	Flat and cupped oysters	Other species	Total	Blue mussels	Great Atlantic scallops	Flat and cupped oysters	Other species
2000	897	851	38	8	..	8 295	5 340	1 018	486	1 451
2001	944	920	22	2	..	9 191	7 451	663	102	975
2002	2 582	2 557	5	2	18	16 107	15 096	133	128	750
2003	1 834	1 829	1	2	2	9 571	9 189	26	139	217
2004	3 817	3 747	46	3	21	21 144	16 145	2 160	180	2 659
2005	4 904	4 885	3	2	14	23 791	20 479	15	190	2 972
2006	3 749	3 714	4	1	30	21 691	15 292	76	294	6 029
2007	2 700	2 660	6	4	30	25 713	19 622	165	454	5 472