

AGRICULTURE AND FISHERIES

THEME 5 - 22/2001

FISHERIES

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Manuscript completed on: 2.10. 2001 ISSN 1562-1340 Catalogue number: KS-NN-01-022-EN-I © European Communities, 2001

European aquaculture, 1999

David Cross

Large increases in aquaculture production since 1970.

In the 30 years since 1970 world aquaculture production has increased from 3.5 million tonnes to 42.8 million tonnes - 13-fold increase. The greater part of this increase has been in Asia (from 2.8 million tonnes in 1970 to 38.9 million tonnes in 1999) and indeed in one country, China (1.3 million tonnes in 1970 to 30.0 million tonnes in 1999).

By comparison EU's aquaculture production is small, yet increasing (Figure 1). In 1970 the production was 417 000 tonnes and it has risen four-fold to 1.3 million tonnes in 1999. However, due to the great increase in aquaculture in Asia, the EU's share of the world production has fallen from 12% in 1970 to 3% in 1999.

Production in the other two EEA countries, Iceland and Norway, has increased enormously from a very low production of under 10 000 tonnes throughout the 1970's to a production of 470 000 tonnes in 1999 - the increase being almost solely due to the development of salmonid culture in those two countries.

The increase in aquaculture production in the EU candidate countries* has been relatively modest. There has been a little over a two-fold increase from 68 000 tonnes in 1970 to 150 000 tonnes in 1999.

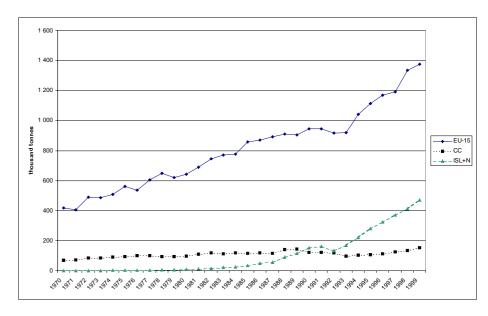


Figure 1: Aquaculture production in Europe, 1970-99

^{*} See Methodological Notes for the list of EU candidate countries

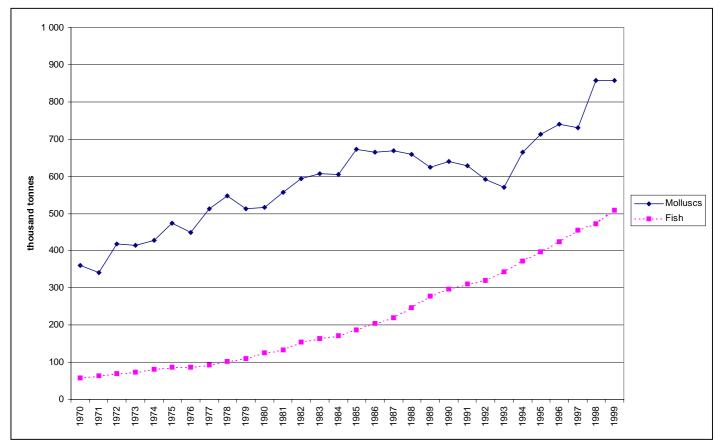


Figure 2: EU production of molluscs and fish, 1970-99

Mussels and oysters are prominent in EU aquaculture.

Molluscs accounted for 63% or 857 841 tonnes of the EU aquaculture production in 1999. The EU's three largest aquaculture producers, Spain (321 143 tonnes in 1999), France (267 638 tonnes) and Italy (249 368), depend heavily on the culture of bivalve molluscs such as mussels and oysters (Table 1). Indeed this group of products accounted for 86%, 76% and 72% respectively of the total production of these countries in 1999.

Over the period 1970-99 the general trend in the production of molluscs was upward (Figure 2), from 360 605 tonnes in 1970 to 857 841 tonnes in 1999. However there was a nine-year period from 1985 to 1993 when the production was steady or declining.

The major molluscan species cultured in the EU is the blue mussel (*Mytilus edulis*), with a production in 1999 of 479 167 tonnes. Production of this species increased relatively steadily from 281 800 tonnes in 1970 to 441 693 in 1987 but then went into a sharp decline to 255 772 tonnes in 1993. Subsequently production has risen to its highest value of around 480 000 tonnes in the last two years. In 1999 Spain was responsible for 261 969 tonnes (55%) but appreciable quantities were also produced by the Netherlands (100 800 tonnes), France (51 600 tonnes) and Germany (37 912 tonnes).

The production of a related species, the Mediterranean mussel (*Mytilus galloprovincialis*), is currently second in importance. In 1999 157 812 tonnes were produced: 130 000 tonnes or 82% in Italy. Over the 30-year period 1970-99 the EU production increased ten-fold from 15 754 tonnes in 1970 to its present level.

Next in importance is the production of the Pacific cupped oyster (*Crassostrea gigas*). In 1999 France was responsible for 134 800 tonnes or 94% of the total EU production of 142 730 tonnes. In the 17 years from 1970 the EU production rose by a lille over 100 000 tonnes to reach 145 470 tonnes in 1986. Howver, since that time production has remained at about that same level.





3-alpha	Species	EU-15	Α	В	D	DK	Е	F	FI	GR	I	IRL	NL	Р	S	UK
identifier																
	Total	1 374 302	3 070	846	73 567	42 653	321 143	267 638	15 449	79 265	249 368	43 856	108 785	7 799	6 064	154 800
	Fish	512 875	3 067	846	35 528	42 649	44 904	63 996	15 449	62 335	66 350	20 340	4 771	3 640	5 101	143 899
	Crustaceans	251	3	-	-	-	139	82	-	-	18	-	-	-	9	-
	Molluscs	858 117	-	-	38 039	4	276 100	203 500	-	16 930	180 000	23 516	104 014	4 159	954	10 901
							,									
TRR	Rainbow trout - Salmo gairdneri	227 932	2 097	300	25 027	39 729	30 000	44 498	15 307	1 968	44 000	2 175	39	1 221	4 458	17 113
SAL	Atlantic salmon - Salmo salar	146 258	-	-	-	-	618	870	-	8	-	18 076	-	-	-	126 686
SBG	Gilthead seabream - Sparus aurata	47 097	-	-	-	-	6 117	1 110	-	32 837	5 700	-	-	1 333	-	-
BSS	Seabass - Dicentrarchus labrax	36 209	-	-	1	-	1 227	3 148	-	23 935	7 200	-	-	698	-	-
FCP	Common carp - Cyprinus carpio	17 649	595	100	10 500	-	-	5 655	-	99	700	-	-	-	-	-
ELE	European eel - Anguilla anguilla	10 269	-	125	-	2 700	383	42	-	310	3 200	25	3 228	3	253	-
TUR	Turbot - Psetta maxima	4 093	-	-	-	-	2 849	858	-	-	-	8	-	378	-	-
MUF	Flathead grey mullet - Mugil cephalus	3 430	-	-	-	-	-	-	-	430	3 000	-	-	-	-	-
TUN	Tunas nei - Thunnini	3 347	-	-	-	-	3 347	-	-	-	-	-	-	-	-	-
GLS	Gracilaria spp - Gracilaria spp	3 000	-	-	-	-	-	-	-	-	3 000	-	-	-	-	-
FRO	Roach - Rutilus rutilus	2 500	-	-	-	-	-	2 500	-	-	-	-	-	-	-	-
TRS	Sea trout - Salmo trutta	2 436	104	120	-	220	-	1 868	28	-	-	-	-	-	4	92
MZZ	Marine fishes nei - Osteichthyes	2 042	-	-	-	-	-	-	-	2 041	-	-	-	1	-	-
FRF	Freshwater fishes nei - Osteichthyes	1 667	8	-	-	-	-	11	48	600	1 000	-	-	-	-	-
CLZ	North African catfish - Clarias lazera	1 504	-	-	-	-	-	-	-	-	-	-	1 504	-	-	-
FTE	Tench - Tinca tinca	1 376	15	-	-	-	161	1 200	-	-	-	-	-	-	-	-
MUS	Blue mussel - Mytilus edulis	479 167	-	-	37 912	-	261 969	51 600	-	-	-	16 111	100 800	286	954	9 535
MSM	Mediterranean mussel - Mytilus galloprovincialis	157 812	-	-	-	-	-	10 900	-	16 912	130 000	-	-	-	-	-
OYG	Pacific cupped oyster - Crassostrea gigas	142 730	-	-	85	-	681	134 800	-	-	-	6 555	-	377	-	232
TPS	Grooved carpetshell nei - Tapes spp	50 000	-	-	-	-	-	-	-	-	50 000	-	-	-	-	-
OYF	European flat oyster - Ostrea edulis	6 443	-	-	-	-	3 348	2 300	-	2	-	696	86	-	-	11
COC	Common cockle - Cardium edule	5 169	-	-	42	-	3 713	1 300	-	-	-	-	-	71	-	43
CTG	Grooved carpet shell - Tapes decussatus	4 418	-	-	-	-	1 052	500	-	-	-	-	-	2 866	-	-
OYC	Cupped oysters nei - Crassostrea spp	4 079	-	-	-	-	41	-	-	-	-	-	3 128	-	-	910
CLJ	Japanese(=Manila)clam - Venerupis japonica	2 776	-	-	-	-	1 826	800	-	-	-	121	-	-	-	29
CTS	Carpet shell - Tapes pullastra	2 330	-	-	-	-	2 330	-	-	-	-	-	-	-	-	-

Table 1: Aquaculture production in EU Member States, 1999 (tonnes)

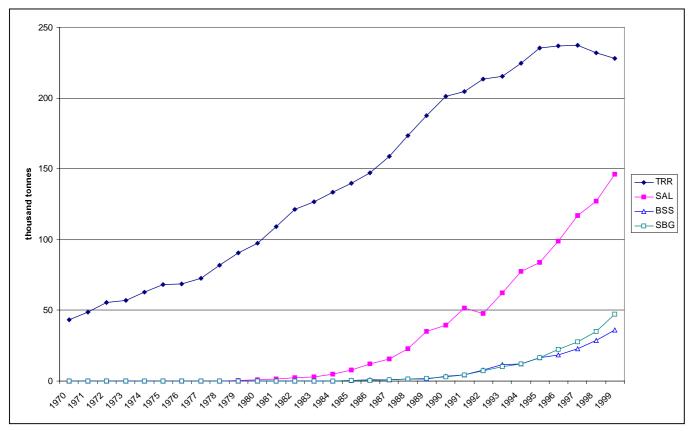


Figure 3: Major fish species farmed in the EU, 1970-99

Salmonids to the fore in EU fish farming

Two species, both salmonids - the Rainbow trout (Salmo gairdneri) and the Atlantic salmon (Salmo salar) - , accounted for 73% of the fish farmed in the EU in 1999.

The rainbow trout is unique in EU aquaculture in being farmed in all the Member States. Indeed, seven EU countries - France (44 498 tonnes), Italy (44 000 tonnes), Denmark (39 729 tonnes), Germany (25 027 tonnes), the UK (17 113 tonnes) and Finland (15 307 tonnes) - make significant contributions to the EU production of 227 932 tonnes in 1999. Figure 3 shows that the current level of production results from a rapid and cointinious increase in production from 43 191 tonnes in 1970. Only in the two most recent years has production faltered somewhat.

The farming of Atlantic salmon in the EU is predominently carried out in the UK (126 686 tonnes in 1999) and Ireland (18 076 tonnes): together they accounted for 99% of the 146 258 tonnes produced in 1999. Figure 3 shows that production of this species started in the early 1980's, following the success of the Norwegian experiences in farming the species, and that production has increased rapidly since that time.

Two more recent additions to the species farmed in the EU are the gilthead seabream (*Sparus aurata*) and the European seabass (*Dicentrarchus labrax*). Production started in the mid-1980s and has increased rapidly to give 47 097 tonnes of gilthead seabream and 36 209 tonnes of seabass in 1999. The production is concentrated in Greece but smaller quantities are produced in Spain, France, Italy and Portugal.

The success of Norwegian salmon farming.

Aquaculture in Iceland and Norway, the non-EU members of the EEA, is almost exclusively limited to the production of fish. The only non-fish species produced is very limited quantities (701 tonnes in 1999) of the blue mussel (*Mytilus edulis*) in Norway (Table 2).



3-alpha	Species	ISL	N
identifier			
	Total	3 897	466 035
	Fish	3 889	465 334
	Crustaceans	-	-
	Molluscs	8	701
SAL	Atlantic salmon - Salmo salar	2 900	418 758
TRR	Rainbow trout - Salmo gairdneri	73	45 276
ACH	Arctic char - Salvelinus alpinus	888	-
MUS	Blue mussel - Mytilus edulis	-	701
CHR	Chars nei - Salvelinus spp	-	483
BSS	Seabass - Dicentrarchus labrax	15	-
HAL	Atlantic halibut - Hippoglossus hippoglossus	13	-

Table 2: Aquaculture production in Iceland and Norway, 1999 (tonnes)

One of the great success stories in fish farming is that of the Norwegian farming of the Atlantic salmon (*Salmo salar*). It started in the early 1980's and has increased rapidly to give a production in 1999 of 418 758 tonnes. A measure of this success is the fact that in 1970 less than 1% of the total Atlantic salmon production (from capture fisheries and aquaculture) came from aquaculture. In 1999 the production of Atlantic salmon from fish farms (with Norway in the lead, followed by the UK and Chile) now accounts for over 99% of the total production.

The second species of importance in the aquaculture of these two countries is the rainbow trout (*Salmo gairdneri*). Until the 1994 production of this species (mainly in Norway) was less than 10 000 tons but from that year the production has increased rapidly to reach the 1999 level of 45 276 tonnes.

The chars, reported by Norway as Chars n.e.i (*Salvelinus* spp) and by Iceland as the Arctic char (*Salvelinus* alpinus), are the only other fish farmed in the two countries on anything other than a small scale. The production of these species was 1 371 tonnes in 1999. Production 10 years previously was only 50 tonnes but it has increased in a fairly regular manner since that time.

Freshwater fish culture important in EU candidate countries.

The outstanding feature of fish farming in the EU candidate countries is the importance of freshwater fish (Table 3). Only two of the top 12 species in terms of the 1999 production are reared in sea-water - the gilthead seabream (*Sparus aurata*) and seabasses (*Dicentrarchus* spp). Of the remaining 10 fish species, all are freshwater species and 6 are of the carp family (*Cyprinidae*). The cyprinid production in 1999 was 64 752 tonnes, 43% of the total aquaculture production.

The single most important species is the Common carp (*Cyprinus carpio*) with a production of 54 188 tonnes in 1999. It is farmed in all the candidate countries except the island states of Cyprus and Malta but Poland (21 368 tonnes), the Czech Republic (16 448 tonnes) and Hungary (8 158 tonnes) made the largest contributions to the total.

Trouts, reported as trouts n.e.i (*Salmo* spp) or more specifically as the rainbow trout (*Salmo gairdneri*), made the next largest contribution (55 113 tonnes) to the total as a group. They were widely farmed throughout the candidate countries but Turkey (38 570 tonnes) and Poland (11 069 tonnes) made the largest contributions.

The two marine species, - the gilthead seabream (*Sparus aurata*) and seabasses (*Dicentrarchus* spp), were reared almost exclusively in Turkey. The production, which started in the mid-1980s, reached a total of 25 938 tonnes in the candidate countries as a whole and 23 000 tonnes in Turkey alone in 1999.

As a group of countries, the total production from aquaculture increased fairly regularly from 67 549 tonnes in 1970 to143 178 tonnes in 1989, only to decrease sharply in the following four years to 96 569 and then increase sharply again to the 1999 level of 152 031 tonnes. (Figure 4). However the performance of individual countries has been very variable.

Turkey's performance is remarkable because aquaculture had shown only a modest increase from 400 tonnes to 4354 tonnes in the 20 years from 1970-1989 but in the following 10 years increased rapidly to reach 63 000 tonnes on 1999. By contrast Romania's production increased fairly regularly from 18 850 tonnes in 1970 to 50 680 tonnes in 1988, then only to decrease to 8 998 tonnes in 1999.



Table 3: Aquaculture production in EU candidate countries in 1999 (tonnes)



The situation on Poland was between the two, with production increasing reasonably uniformly from 9 833 tonnes in 1970 to 33 711 tonnes in 1999.

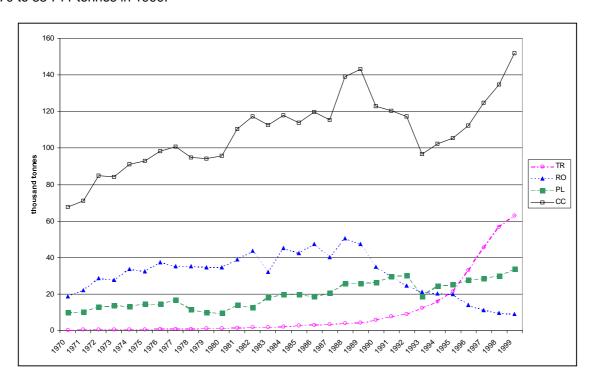


Figure 4: Aquaculture production in selected EU candidate countries, 1970-99.

ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

Aquaculture production data are submitted to Eurostat by the national authorities of the EEA countries under the terms of Council Regulation (EC) no 788/96. Equivalent data for the EU candidate countries and for years prior to the entry into force of the EU legislation were submitted by the national authorities to FAO on the Fishstat AQ questionnaire. However this questionnaire only came into use for the submission of the data for 1984 onwards and Eurostat is indebted to FAO for its work in separating the aquaculture production data from the national data on the Statlant questionnaires. These questionnaires are primarily intended for the submission of catch statistics but, until relatively recently, aquaculture production was included.

The data are expressed in the live weight equivalent of the production. Thus, for example, the volume of the production of mussels and oysters includes the weight of the shell.

The EU data includes the production of all the 15 current Member States even for periods prior to their accession to the EU. The data for Germany for all the period covered by this report include the production of the New Länder (that is, former German Democratic Republic).

The EU Candidate Countries are:

Bulgaria (BG) Cyprus (CY) Czech Republic (CZ)
Estonia (EE) Hungary (HU) Latvia (LV)
Lithuania (LT) Malta (MT) Poland (PL)
Romania (RO) Sloval Republic (SK) Slovenia (SI)
Turkey (TR)

Data for all these countries are not available for the whole of the period covered by this report (1970-99). Data for Estonia, Latvia and Lithuania are not available prior to 1988 and data for Slovenia are unavailable before 1992. However aquaculture production in these countries is not large and the omission of these data is unlikely to affect significantly the calculation of the total for the candidate countries. Data for Czechslovakia have been included in the calculation of the candidate country total for the period 1970-92. Separate data for the Czech Republic and the Slovak Republic were used thereafter.



Further information:

Reference publications

Databases

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