

PART 2: EUR-6 NC (CYPRUS, THE CZECH REPUBLIC, ESTONIA, HUNGARY, POLAND, AND SLOVENIA)

CYPRUS

Cyprus is a small Mediterranean island with approximately 739 000 inhabitants and although the country represents a rather small market in European terms, national consumption of fisheries products has increased over recent years. Fish production is mainly derived from the inshore and the trawl fishery as well as from aquaculture (PIO, 2003). In terms of employment, the fishery sector represented 970 full time and 5 000 part time fishermen in 1995 (FAO, 1998b).

Production: captures, aquaculture and commodities 1989-1998

Total production increased from 2 600 tonnes in 1989 to 3 700 tonnes in 1998. Aquaculture represented approximately 30 percent of this total volume.

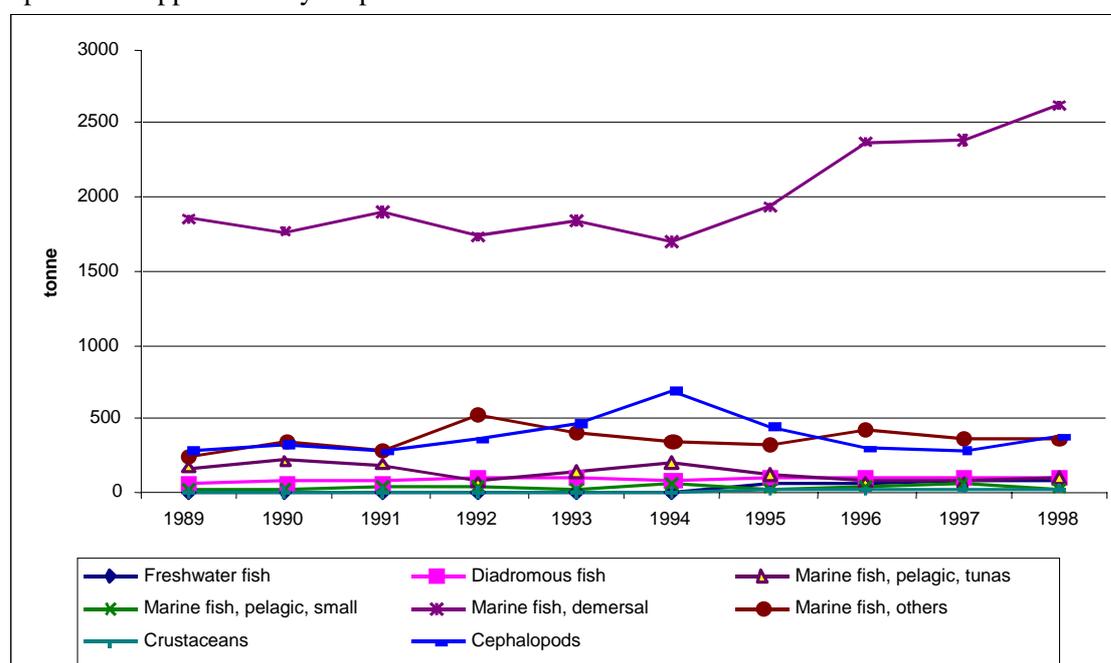


Figure 73: Cyprus - Capture and aquaculture production 1989-1998

Captures

Landings were quite consistent during the 1990s and in 1998 total national landings reached 2 500 tonnes. The main species included picarels, bogue and red mullet for demersal species, and swordfish for pelagic species.

Table 392: Cyprus - Captures by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	0	0	0	0	0	5	65	64	70	70	27
Marine fish, pelagic, tunas	169	219	190	73	138	200	122	75	71	95	135
Marine fish, pelagic, small	26	27	32	34	25	63	28	52	56	20	36
Marine fish, demersal	1828	1714	1835	1676	1672	1493	1597	1714	1538	1568	1664
Marine fish, others	252	342	284	516	405	339	322	425	363	359	361
Crustaceans	5	1	2	2	1	3	2	5	2	4	3
Cephalopods	280	316	276	361	462	692	453	301	288	374	380
Total gp of species	2560	2619	2619	2662	2703	2795	2589	2636	2388	2490	2606

Source: database

Aquaculture

Aquaculture enjoyed a period of significant expansion in Cyprus during the 1990s and total output increased from 80 tonnes in 1989 to about 1 200 tonnes in 1998. In 1996 the production of market size fish reached around 700 tonnes valued at about £3 million. In addition, 6.7 million marine fish fry were produced in 1996, out of which about 3 million, valued at about £500 000, were exported (PIO, 2003). In 1998, there were five private commercial rainbow trout farms on land-based installations in the Troodos Mountains, producing around a hundred tons. As for marine aquaculture, there were three private commercial marine fish hatcheries in operation, as well as eight private commercial offshore cage farms, mainly for fattening sea bream (*Sparus aurata*) and sea bass (*Discentrarchus labrax*). A land-based shrimp farm for *Penaeus indicus* and *Penaeus japonicus* was also established in that year (FAO, 1998b). Aquaculture is being promoted by the government, which acknowledges its potential for increasing local fish supply. Freshwater aquaculture (trout culture) is limited by the scarcity of suitable water, while marine aquaculture has excellent potential for development.

Table 393: Cyprus - Aquaculture by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Diadromous fish	56	73	67	94	92	81	98	105	105	100	87
Marine fish, demersal	26	52	60	61	167	207	337	659	841	1053	346
Crustaceans	0	0	0	0	0	2	6	12	22	25	7
Total gp of species	82	125	127	155	259	290	441	776	968	1178	440

Source: database

Commodities production

Food use commodities production

There is no processing industry on the island, hence production is mostly sold fresh. Demersal species are the most popular and involve gilthead seabream, picarels, bogue, seabass and red mullet. Cephalopod production also consists mostly of fresh products, mainly octopus and cuttlefish.

Table 394: Cyprus - FU Commodities Production by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	383	388	342	427	566	920	549	360	344	443	472
Fish, fresh/chilled	2259	2356	2404	2390	2396	2165	2481	3052	3012	3225	2574
Total FU Production	2642	2744	2746	2817	2962	3085	3030	3412	3356	3668	3046

Source: database

Table 395: Cyprus - FU Commodities Production by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Diadromous fish	77	90	83	111	113	108	119	125	125	118	107
Marine fish, demersal	1837	1847	1968	1669	1786	1606	1972	2419	2453	2682	2024
Marine fish, others	345	420	352	610	497	451	390	508	434	425	443
Cephalopods	383	388	342	427	566	920	549	360	344	443	472
Total FU Production	2642	2744	2746	2817	2962	3085	3030	3412	3356	3668	3046

Source: database

Non-food use commodities production

Cyprus does not produce any non-food use commodities.

Non-food use: trade and net supply 1989-1998

The majority of domestic production is used for human consumption and so the industry for non-food use is mainly supplied by imports.

Non-food use imports

Cypriot imports of non-food use commodities have been fairly constant at a level of around 8 500 tonnes during the past decade. Imports mostly consisted of small pelagic species.

Table 396: Cyprus - NFU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Flour, meal unfit for human cons.	6575	7917	7696	8881	8408	9064	9450	8774	8721	8651	8414
Total NFU Imports	6575	7920	7785	8881	8408	9064	9503	8777	8721	8768	8440

Source: database

Table 397: Cyprus - NFU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	6571	7912	7687	8867	8395	9014	9374	8680	8591	8398	8349
Marine fish, others	1	7	93	8	6	22	98	19	24	258	54
Aquatic animals	2	1	5	6	7	27	31	78	106	112	38
Total NFU Imports	6575	7920	7785	8881	8408	9064	9503	8777	8721	8768	8440

Source: database

Non-food use exports

Non-food use exports have never reached a significant volume and were quite erratic between 1989 and 1998.

Table 398: Cyprus - NFU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Flour, meal unfit for human cons.	0	24	0	0	120	0	28	48	0	0	22
Total NFU Exports	0	24	0	0	120	0	28	48	0	0	22

Source: database

Table 399: Cyprus - NFU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	0	24	0	0	120	0	28	48	0	0	22
Total NFU Export	0	24	0	0	120	0	28	48	0	0	22

Source: database

Non-food use net supply

With exports negligible and production non-existent, non-food use net supply is equal to the level of imports. So on average the net supply was around 8 400 tonnes during 1989 and 1998.

Table 400: Cyprus - NFU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98	
Fish/marine mammal, fat, oil		0	3	88	0	0	0	53	3	0	117	26
Flour, meal unfit for human consumption	6575	7893	7696	8881	8288	9064	9422	8726	8721	8651	8392	
Total NFU net supply	6575	7896	7785	8881	8288	9064	9476	8729	8721	8768	8418	

Source: database

Table 401: Cyprus - NFU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, pelagic, small	6571	7888	7687	8867	8275	9014	9347	8632	8591	8398	8327
Marine fish, others	1	7	93	8	6	22	98	19	24	258	54
Aquatic animals	2	1	5	6	7	27	31	78	106	112	38
NFU net supply	6575	7896	7785	8881	8288	9064	9476	8729	8721	8768	8418

Source: database

Market for human consumption**Trade**

Between 1989 and 1998, the country imported an average of 12 000 tonnes annually and exported an average of 500 tonnes annually. In 1995, imports of fish products were valued at approximately US\$ 40 million and exports reached US\$ 2.4 million (FAO, 1998b).

Food use imports

On average, with nearly 4 000 t, the main food use import in Cyprus is prepared/preserved fish and quantities were increasing constantly on the period considered. In 1998, 3 000 tonnes of canned tuna represented around 50 percent of the prepared/preserved commodities. Second in importance, with a volume of 3 000 tonnes, are the cephalopods, followed by frozen fish with 2 000 tonnes.

Table 402: Cyprus - FU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	2395	2660	2428	3307	2277	3099	2959	3369	3149	3871	2951
Crus., mol. & other aquatic inv., prepared	62	34	55	58	42	65	67	33	82	61	56
Crustaceans	411	440	530	682	674	717	827	677	673	814	645
Fish, cured	218	355	289	316	219	270	192	137	217	152	237
Fish, fillets	1137	980	858	1375	1613	1661	2167	1639	1690	1871	1499
Fish, fresh/chilled	336	505	631	889	631	676	765	215	139	185	497
Fish, frozen	2271	2141	2421	2451	2311	1854	2021	1988	2105	1955	2152
Molluscs	15	14	28	53	85	87	142	116	196	142	88
Prepared/preserved fish	2733	2566	2751	3593	3697	3718	5141	4006	4304	5596	3810
Total FU Imports	9577	9694	9993	12725	11548	12147	14282	12181	12556	14647	11935

Source: database

In 1998, the main species imported into Cyprus were tunas with 2 800 tonnes for large pelagic species and mackerel for small pelagic species. Atlantic redfish (700 tonnes), seabream and cod represented the bulk of demersal species, while salmon was the main important species for diadromous fish. Cephalopods imports consisted mainly of squid (2 500 tonnes) and octopus (1 000 tonnes).

Table 403: Cyprus - FU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	21	46	47	79	24	39	111	23	34	27	45
Diadromous fish	716	650	525	504	626	350	398	320	249	273	461
Marine fish, pelagic, tunas	1176	1000	1255	1679	1447	1874	2834	1859	1949	3007	1808
Marine fish, pelagic, small	1172	1207	1068	1553	1754	1468	1471	1227	1426	1252	1360
Marine fish, demersal	2461	2125	2406	3230	2760	2842	3325	2823	2652	2547	2717
Marine fish, others	1148	1518	1650	1578	1859	1605	2148	1735	2146	2652	1804
Crustaceans	411	440	530	682	674	717	827	677	673	814	645
Molluscs	77	48	84	111	127	152	209	149	278	203	144
Cephalopods	2395	2660	2428	3307	2277	3099	2959	3369	3149	3871	2951
Total FU Imports	9577	9694	9993	12725	11548	12147	14282	12181	12556	14647	11935

Source: database

Food use exports

Cyprus's annual exports varied slightly around a level of 500 tonnes between 1989 and 1998. They consisted mostly of prepared/preserved commodities (canned products) and the main species exported included tunas and mackerels.

Table 404: Cyprus - FU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	0	0	0	133	12	66	91	119	43	96	56
Crustaceans	0	0	6	0	8	8	11	3	9	32	8
Fish, fillets	0	0	112	174	77	30	59	50	80	89	67
Fish, fresh/chilled	11	12	18	0	207	97	46	41	46	148	63
Fish, frozen	0	0	0	106	90	85	62	30	30	73	47
Prepared/preserved fish	3	0	793	34	930	84	153	217	89	36	234
Total FU Exports	14	12	929	446	1324	369	422	459	296	473	474

Source: database

Table 405: Cyprus - FU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	11	12	18	0	15	15	30	12	32	25	17
Diadromous fish	0	0	0	7	8	2	7	2	5	36	7
Marine fish, pelagic, tunas	0	0	773	27	12	135	141	182	68	34	137
Marine fish, pelagic, small	3	0	6	0	919	2	21	0	20	2	97
Marine fish, demersal	0	0	94	112	322	141	73	64	52	162	102
Marine fish, others	0	0	32	167	29	2	48	78	66	86	51
Crustaceans	0	0	6	0	8	8	11	3	9	32	8
Cephalopods	0	0	0	133	12	66	91	119	43	96	56
Total FU Export	14	12	929	446	1324	369	422	459	296	473	474

Source: database

Food use net supply and consumption

The average food use net supply was around 15 000 tonnes between 1989 and 1998. Prepared/preserved fish, cephalopods and fresh fish are the most important commodities of the net supply. Fresh fish consumption seemed to be fairly stable while prepared/preserved products were clearly on the increase.

Table 406: Cyprus - FU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Cephalopods	2779	3047	2770	3602	2832	3953	3417	3610	3450	4218	3368
Crus., mol. & other aquatic inv., prepared	62	34	55	58	42	65	67	33	82	61	56
Crustaceans	411	440	525	682	666	709	815	674	663	783	637
Fish, cured	218	355	289	316	219	270	192	137	217	152	237
Fish, fillets	1137	980	746	1201	1537	1632	2108	1589	1611	1782	1432
Fish, fresh/chilled	2583	2849	3017	3279	2819	2744	3200	3226	3106	3262	3009
Fish, frozen	2271	2141	2421	2345	2220	1769	1960	1958	2076	1882	2104
Molluscs	15	14	28	53	85	87	142	116	196	142	88
Prepared/preserved fish	2730	2566	1958	3559	2766	3635	4988	3790	4215	5560	3576
Total FU net supply	12205	12426	11810	15096	13186	14862	16889	15133	15616	17842	14507

Source: database

Table 407: Cyprus - FU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	10	34	29	79	8	25	81	12	2	2	28
Diadromous fish	793	740	609	609	731	456	510	443	370	355	562
Marine fish, pelagic, tunas	1176	1000	482	1652	1436	1740	2693	1677	1881	2973	1671
Marine fish, pelagic, small	1169	1207	1062	1553	835	1467	1450	1227	1405	1250	1262
Marine fish, demersal	4297	3972	4280	4787	4224	4308	5223	5177	5052	5067	4639
Marine fish, others	1493	1937	1970	2022	2327	2054	2491	2165	2513	2990	2196
Crustaceans	411	440	525	682	666	709	815	674	663	783	637
Molluscs	77	48	84	111	127	152	209	149	278	203	144
Cephalopods	2779	3047	2770	3602	2832	3953	3417	3610	3450	4218	3368

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
FU net supply	12205	12426	11810	15096	13186	14862	16889	15133	15616	17842	14507

Source: database

Consumption annually is about 22 kg per capita. Fish represented approximately 8 percent of the consumption of animal proteins per day in 1997 (FAO, 1999b). This represents a marked increase since 1980 when 8 kg of fisheries products were consumed per capita (FAO, 1999b). Still, the estimation of the per capita rate could be somewhat misleading as considerable quantities of fish are absorbed by the flourishing tourist industry. In 1994, for example, Cyprus hosted about 2 M tourists, about 3 times the size of the local population. It is then fair to assume the Cypriot per capita consumption could be somewhat overestimated (Stephanou, 1996).

As regards aquaculture products, Cypriots prefer the taste of marine fish to trout, which is sold to a great extent smoked and is absorbed by the tourist industry. Also there exists a distinct preference for seabream over seabass, which is the prevailing preference in the Eastern Mediterranean.

As regards imported fresh marine fish, the Mediterranean species are preferred by the consumers, although exotic species from the Gulf countries are sold extensively in the fish shops, mainly due to their low price. During 1994, 55 percent of the imported fresh Mediterranean fish were common seabream and common dentex. Also, 71 percent of the fish quantities imported from the Gulf were species that were disposed of in Cyprus as common dentex and common seabream.

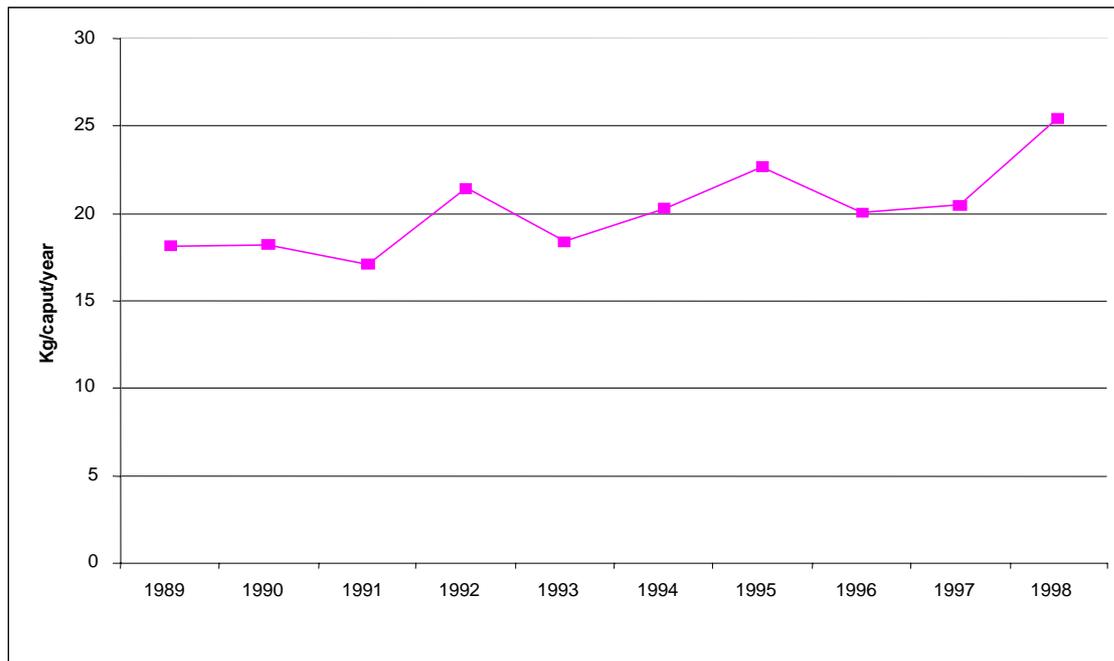


Figure 74: Fish consumption per capita per year in Cyprus 1989-1998

The main species consumed in 1998 were tunas for large pelagic species; common squid, octopus and cuttlefish for cephalopods; seabream, cod, redfish and bogue for demersal species; picarel and mackerel for small pelagic species.

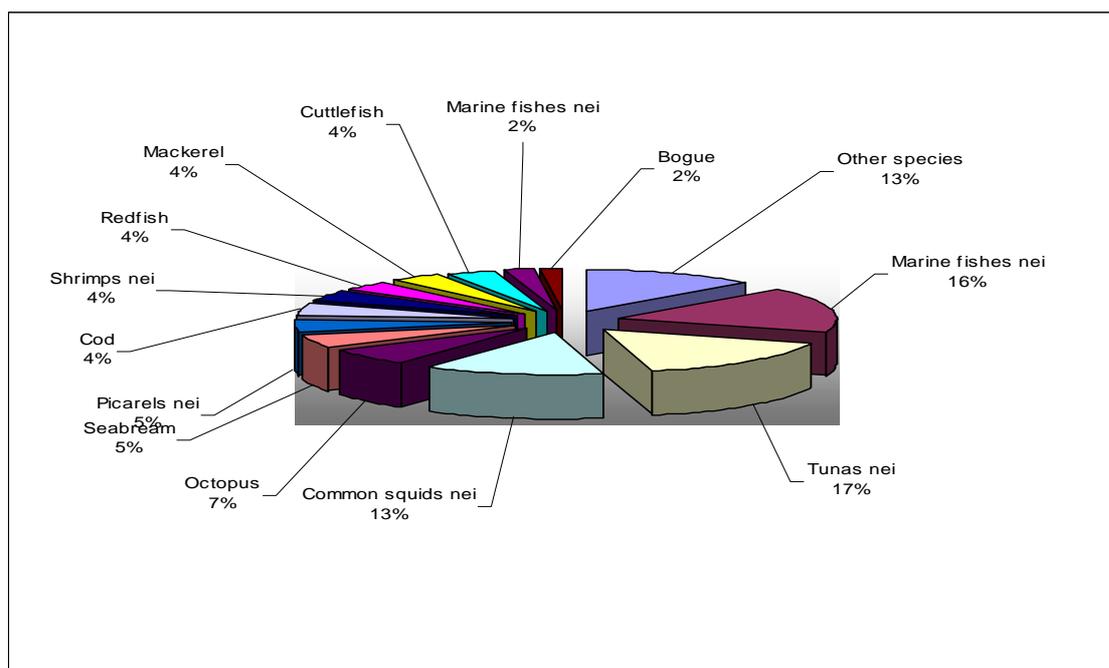


Figure 75: Cyprus - Main species consumed in 1998

Assumptions for projection 2005-2030 and main results

Consumption trends for the OECD group of products form the basis of the model's assumptions (see methodology in Part 1 of the study). Further assumptions regarding production, imports and exports and the need for fish in Cyprus between 2005 and 2030 take into account and extrapolate previous trends.

Consumption assumptions for Cyprus for the period 2005-2030 forecast were:

- A large increase in prepared/preserved fish (100 percent) and molluscs (50 percent).
- A small increase of 5 percent in fresh/chilled fish and fillets products.
- A decrease in cured fish consumption (-10 percent).
- A stagnation in frozen fish, prepared crustaceans and molluscs, cephalopods and crustaceans.

Whereas apparent consumption will increase during the period considered, consumption per capita will decrease from 25 kg per capita per year to 23 kg per capita per year by 2030. This decrease is due to several factors.

First, Cyprus will experience tremendous demographic expansion during the period considered (+50 percent) and it is believed that supply will have difficulties to keep up with demand, which could result in higher prices.

Also, per capita consumption levels were believed to be overestimated during the last decade as tourists might have accounted for up to 10 percent of per capita seafood consumption (Stephanou, 1996). In this sense, demographic expansion will result in the diminution of the impact of the tourist consumption as it will be spread out over a larger population.

Third, demand also will be slightly decreasing due to changing lifestyles and habits of the Cypriot consumer, with younger generations eating less fish than before. Convenience seafood use however is increasing, at the expense of frozen and fresh seafood.

Table 408: Cyprus - Assumption for projection

OECD group	94-98% annual %	Prod % 99-30	T Imp % 99-30	T Exp % 99-30	T Cons 99-30	T Prod % Annual	% Imp Annual	% Exp% Annual	Cons % Annual
Cephalopods	3%	1%	0%	0%	0%	0%	0.0%	0.0%	0.0%
Crus., mol. & other aquatic inv., prepared	-8%	-2%	0%	0%	0%	0%	0.0%		0.0%
Crustaceans	8%	2%	0%	0%	0%	0%	0.0%	0.0%	0.0%
Fish, cured	-60%	-12%	0%	-11%	0%	-10%	-0.3%	0.0%	-0.3%
Fish, fillets	7%	1%	0%	5%	0%	5%	0.2%	0.0%	0.2%
Fish, fresh/chilled	34%	7%	0%	100%	0%	5%	0.0%	2.2%	0.0%
Fish, frozen	5%	1%	0%	0%	0%	0%	0.0%	0.0%	0.0%
Molluscs	46%	9%	0%	50%	0%	50%	1.3%		1.3%
Prepared/preserved fish	40%	8%	0%	99%	0%	100%	2.2%	0.0%	2.2%
Fish/marine mammal, fat, oil	1218%	244%	0%	0%	0%		0.0%		0.0%
Flour, meal unfit for hum. Cons.	-6%	-1%	0%	0%	0%		0.0%	0.0%	0.0%

Source: database

Capture fisheries are not expected to grow, but aquaculture production will increase. This will not be sufficient to provide any surplus for exports, which will remain stable, while imports will increase to satisfy the growing domestic demand, mostly due to demographic expansion.

Table 409: Cyprus - Main results for projection

Nature	Average 94-98	2005	2010	2015	2020	2025	2030
Exports FU (t live wt)	404	473	473	473	473	473	473
Imports FU (t live wt)	13162	15616	16401	17274	18244	19322	20521
Production FU (t live wt)	3310	3668	3668	3668	3668	3668	3668
Fish supply FU (t live wt)	16069	18811	19596	20469	21439	22517	23716
Population (X1000)	739	761	808	858	913	969	1029
Per caput supply (kg/h)	22	25	24	24	23	23	23
Production NFU (t live wt)							
Imports NFU (t live wt)	8966	8768	8768	8768	8768	8768	8768
Exports NFU (t live wt)	15	0	0	0	0	0	0
Net supply NFU (t live wt)	8951	8768	8768	8768	8768	8768	8768
Aquaculture (t live wt)	731	1387	1564	1770	2012	2298	2639
Capture (t live wt)	2580	2580	2580	2580	2580	2580	2580
Production total (t live wt)	3310	3966	4143	4350	4592	4878	5218

Source: database

Food use net supply and human consumption 2005-2030

Food use net supply will increase during the period considered to reach 24 000 tonnes by 2030. Most of the increase will be due to a 100 percent rise in consumption of prepared/preserved commodities. Molluscs experience 50 percent growth but volumes remain low at around 200 tonnes. Fish fillets and fresh fish net supply also increase but at a much lower level.

Table 410: Cyprus - FU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	Ave. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	3730	4218	4218	4218	4218	4218	4218
Crus., mol. & other aquatic inv., prepared	62	61	61	61	61	61	61
Crustaceans	729	783	783	783	783	783	783
Fish, cured	194	149	147	144	142	139	137
Fish, fillets	1744	1802	1816	1831	1846	1861	1875
Fish, fresh/chilled	3108	3292	3317	3344	3375	3409	3447
Fish, frozen	1929	1882	1882	1882	1882	1882	1882
Molluscs	137	155	165	176	187	200	213
Prepared/preserved fish	4437	6469	7207	8030	8945	9965	11100
Total FU net supply	16069	18811	19596	20469	21439	22517	23716

Source: database

Table 411: Cyprus - FU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	24	6	10	14	18	23	29
Diadromous fish	427	371	383	397	412	430	449
Marine fish, pelagic, tunas	2193	3443	3825	4250	4724	5251	5838
Marine fish, pelagic, small	1360	1392	1507	1636	1780	1940	2118
Marine fish, demersal	4965	5154	5223	5300	5384	5478	5581
Marine fish, others	2443	3228	3420	3634	3870	4134	4426
Crustaceans	729	783	783	783	783	783	783
Molluscs	198	216	226	237	249	261	274
Cephalopods	3730	4218	4218	4218	4218	4218	4218
FU net supply	16069	18811	19596	20469	21439	22517	23716

Source: database

Further expansion of the local market for aquaculture products is expected with the improvement-expansion of the marketing channels and the distribution systems used. It is anticipated that the prevailing new dietary habits and the increase in the standard of living of Cypriots will result in an increase of apparent fish consumption in the future. The production of fresh marine fish from aquaculture could contribute to such a development provided that it reaches the consumer at reasonable prices. Efforts have been made to expand further the local market for aquaculture products. This includes publicity campaigns undertaken by the Government through the Department of Fisheries as well as by the producers themselves. The latter are expected to increase their publicity campaigns with the increase of their production (Stephanou, 1996).

Still, as the growth rate of the population on the period 2005-2030 is higher (47 percent) than the growth of the net supply (33 percent), consumption per capita will decrease from 25 kg per capita per year in 2005 to 23 kg per capita per year in 2030. So apparent consumption is increasing in Cyprus, but not by an extent large enough to offset the influence of the demographic expansion.

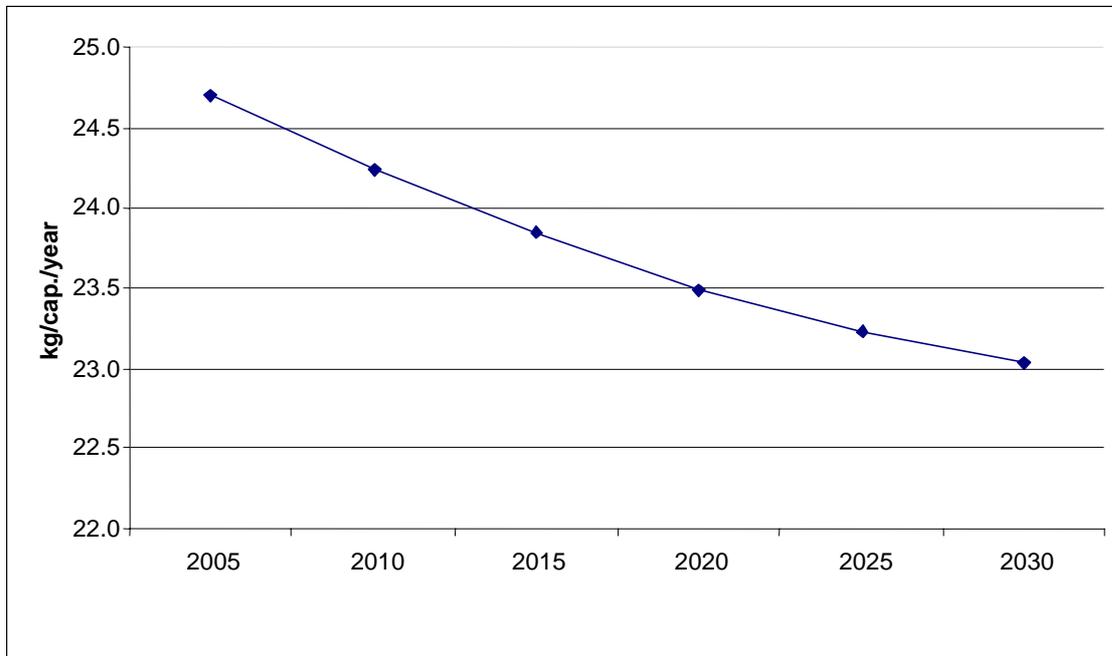


Figure 76: Fish consumption per capita per year in Cyprus 2005-2030

Tuna remains the main species consumed in Cyprus an increase its share to 24 percent of the market. All cephalopods (squid, octopus and cuttlefish) diminish, as well as most of the demersal species (such as picarel, sea bream and redfish), except for cod whose share remains stable. Shrimps diminish while mackerel increases slightly.

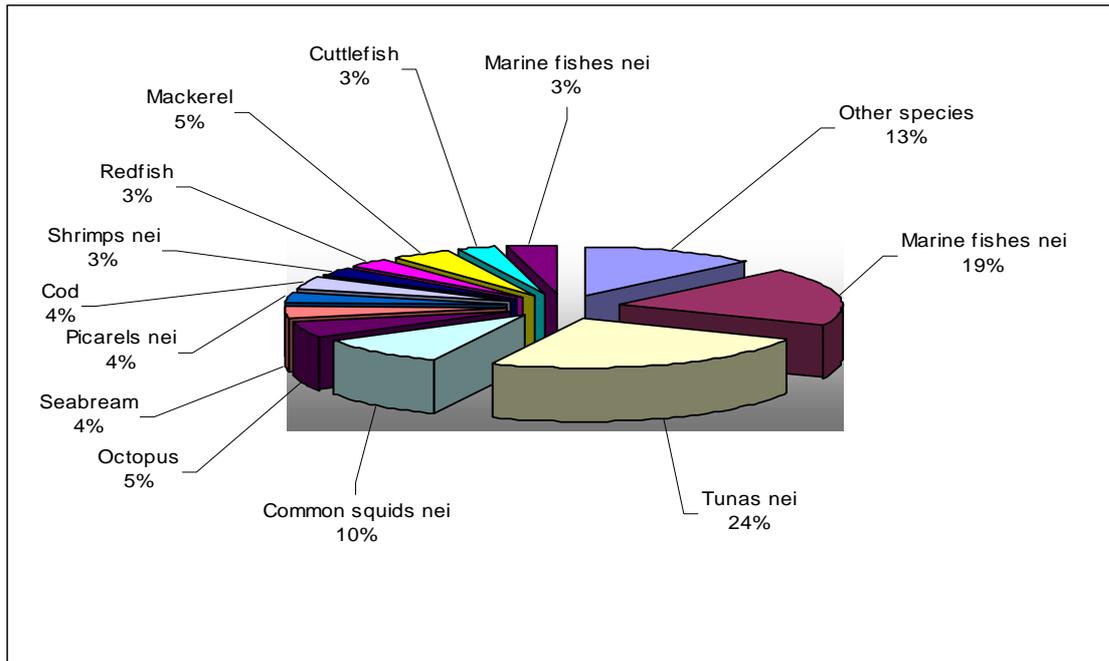


Figure 77: Cyprus - Main species consumed in 2030

Non-food use net supply 2005-2030

Non-food use net supply will not experience any change and will remain stable at around 8 800 tonnes.

Production 2005-2030

Capture and aquaculture

Aquaculture is being promoted by the government, which acknowledges its potential for increasing local fish supply. Freshwater aquaculture (trout culture) is limited by the scarcity of suitable water, while marine aquaculture has excellent potentials for development (Stephanou, 1996).

Cyprus is trying to diversify the species produced by marine aquaculture with the production of fish like the sharpnout bream (*Puntazzo punfazzo*), while experiments continue for the mass production of species like the common seabream (*Pagrus pagrus*), the common dentex (*Dentex dentex*), the axillary seabream (*Paaellus acarne*), the marbled spinefoot (*Siaanus rivulatus*) etc. The diversification aims at improving the market potentials of aquaculture fish by increasing their variety and replacing some quantities of seabream and seabass with other good quality fish (Stephanou, 1996).

During the period 2005-2030, marine aquaculture will experience the largest increase in the aquaculture sector, mostly by intensifying its efforts on sea bream and sea bass and introducing the new species mentioned above. In the meantime, inland aquaculture will still slightly increase its production of rainbow trout, while shrimp production will continue to expand. Total aquaculture production will reach 2 600 tonnes by 2030.

Table 412: Cyprus - Aquaculture by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Diadromous fish	98	148	197	261	346	458	607
Marine fish, demersal	619	1210	1335	1474	1628	1797	1984
Crustaceans	13	29	32	35	39	43	47
Total gp of species	731	1387	1564	1770	2012	2298	2639

Source: database

Table 413: Cyprus - Total production by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	55	55	55	55	55	55	55
Diadromous fish	98	148	197	261	346	458	607
Marine fish, pelagic, tunas	113	113	113	113	113	113	113
Marine fish, pelagic, small	44	44	44	44	44	44	44
Marine fish, demersal	2201	2792	2917	3056	3210	3379	3566
Marine fish, others	362	362	362	362	362	362	362
Crustaceans	17	32	35	38	42	46	50
Cephalopods	422	422	422	422	422	422	422
Total gp of species	3310	3966	4143	4350	4592	4878	5218

Source: database

Commodities

Commodities production will not develop and will remain at 4 000 tonnes of fresh fish.

Trade 2005-2030

Imports

Food use commodities imports will increase to reach 21 000 tonnes by 2030. Prepared/preserved products (pelagic and demersal canned) will increase and account for 50 percent of all imports at the end of the period. Cephalopods and frozen fish imports do not rise and will represent respectively 20 percent and 10 percent of imports in 2030.

Table 414: Cyprus - FU Commodities Imports by OECD group of products 2005-2030 (t live weight)

Gp of commodities	Av. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	3289	3871	3871	3871	3871	3871	3871
Crus., mol. & other aquatic inv., prepared	62	61	61	61	61	61	61
Crustaceans	742	814	814	814	814	814	814
Fish, cured	194	149	147	144	142	139	137
Fish, fillets	1806	1891	1905	1920	1934	1949	1964
Fish, fresh/chilled	396	215	239	267	297	331	369
Fish, frozen	1985	1955	1955	1955	1955	1955	1955
Molluscs	137	155	165	176	187	200	213
Prepared/preserved fish	4553	6505	7244	8066	8982	10001	11136
Total FU Imports	13162	15616	16401	17274	18244	19322	20521

Source: database

The main species affected by the increase in imports will be tuna and mackerel for pelagic species and cod for demersal species.

Table 415: Cyprus - FU Commodities Imports by FAO group of species 2005-2030 (t live weight)

Gp Species	Av. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	47	31	35	39	43	48	54
Diadromous fish	318	289	301	315	330	348	367
Marine fish, pelagic, tunas	2305	3477	3859	4284	4758	5285	5872
Marine fish, pelagic, small	1369	1394	1510	1638	1782	1942	2120
Marine fish, demersal	2838	2633	2703	2780	2864	2958	3061
Marine fish, others	2057	2889	3082	3295	3532	3795	4087

Gp Species	Av. 94-98	2005	2010	2015	2020	2025	2030
Crustaceans	742	814	814	814	814	814	814
Molluscs	198	216	226	237	249	261	274
Cephalopods	3289	3871	3871	3871	3871	3871	3871
Total FU Imports	13162	15616	16401	17274	18244	19322	20521

Source: database

Exports

There will be no significant change in exports during the period of the projection. Exports will remain around their 1998 level of around 500 tonnes.

CZECH REPUBLIC

The Czech Republic is a landlocked country with approximately 10 million inhabitants. Although there are few natural lakes for fisheries production, there are 36 000 hectares of running water and lake and pond building has been encouraged to increase the total volume of freshwater in the country. Fish cultivation has been actively carried out since the twelfth century. As a landlocked country, aquaculture provides the major share of national production but operations vary in their intensity and may incorporate other traditional activities such as goose, duck and chicken rearing. There has been little or no expansion or investment within the industry in the last seven years and although several farms are experimenting with the cultivation of new species such as tench, it is expected that aquaculture will continue to be based on semi-intensive operations in ponds of variable quality. Uncertainty resulting from the country's political past has restricted investment into the sector and has constrained the development of supporting industries and sub-sectors (GLOBEFISH, 1993). The net supply of fisheries products is strongly dependant on imports of marine species even though there is an important and established national market for carp.

Production: captures, aquaculture and commodities 1989-1998

Total production was 21 000 tonnes in 1998 and aquaculture production represented approximately 85 percent of this volume.

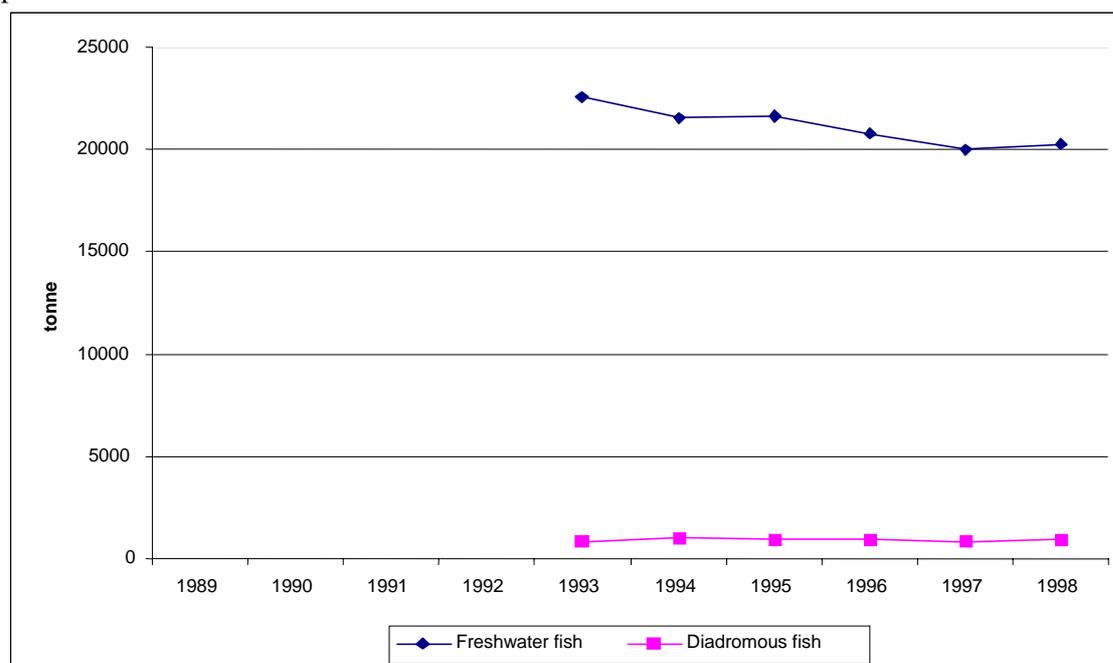


Figure 78: Czech Republic - Capture and aquaculture production 1989-1998

Captures

As a landlocked country, Czech capture fisheries are limited to a few freshwater species. Carp landings dominate inland fisheries and represented 3 800 tonnes of the total production in 1998.

Table 416: Czech Republic - Captures by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	na	na	na	na	3039	3820	3789	3382	3174	3792	2100
Diadromous fish	na	na	na	na	139	134	137	138	143	157	85
Total gp of species	na	na	na	na	3178	3954	3926	3520	3317	3949	2184

Source: database

Aquaculture

Common carp accounts for the major part of Czech aquaculture production. In 1996, it represented 85 percent of the 18 000 tonnes total production. Pond culture technology is advanced enough to balance such factors as intensification, profitability and conservation of the environment (Anon., 1998c). Fish outputs are achieved through a better utilisation of natural pond foods rather than artificial feeding (FAO, 1999f). In the late 1990s there were approximately 23 000 operating units representing 52 000 hectares of ponds in the country and cultivating fish on an intensive or semi-intensive basis. About 70 percent of total aquaculture production originates from Southern Bohemia (Rudiger, 1998).

Table 417: Czech Republic - Aquaculture by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	na	na	na	na	19513	17778	17888	17378	16839	16471	17645
Diadromous fish	na	na	na	na	727	872	783	819	718	759	780
Total gp of species	na	na	na	na	20240	18650	18671	18197	17557	17230	18424

Source: database

Commodities production

Food use commodities production

The fish processing industry has grown in recent years to become one of the most profitable agrobusiness sectors in the Czech Republic (Rudiger, 1994). There were 25 fish processing plants in 1999, but they worked at full capacity only during December to meet the Christmas season demand for fish products (FAO, 1999f).

The share of cured fish products (mostly dried and salted or smoked freshwater fish) has declined since 1993 but remains the leading commodity produced in the country. Prepared/preserved fish products (canned marine fish) and fish fillets have increased in recent years, while fresh fish production remained constant. Carp is the main species used in the processing industry and is produced in very varied forms (Anon., 2001a).

Table 418: Czech Republic - FU Commodities Production by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish, cured	na	na	na	na	20117	17121	16795	15499	14837	12396	16128
Fish, fillets	na	na	na	na	0	0	470	1482	1413	2196	927
Fish, fresh/chilled	na	na	na	na	10928	13542	10987	12122	10432	10321	11389
Prepared/preserved fish	na	na	na	na	3301	5483	5332	4735	4624	6587	5010
Total FU Production	na	na	na	na	34346	36146	33584	33839	31306	31500	33454

Source: database

Table 419: Czech Republic - FU Commodities Production by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	na	na	31045	30663	28252	29104	26682	24913	28443
Marine fish, others	na	na	na	na	3301	5483	5332	4735	4624	6587	5010
Total FU Production	na	na	na	na	34346	36146	33584	33839	31306	31500	33454

Source: database

Non-food use commodities production

There is no local non-food use industry as all domestic fish production is intended for the food use market.

Non-food use: trade and net supply 1989-1998

Between 1993 and 1998, the average volume of imports was 23 000 tonnes and the average volume of exports was 200 tonnes.

Non-food use imports

Imports of non-food use products have decreased in recent years and amounted to 16 000 tonnes in 1998. They mostly consisted of small pelagic species.

Table 420: Czech Republic - NFU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish/marine mammal, fat, oil	na	na	na	na	3365	3001	2101	1547	698	376	1848
Flour, meal unfit for human cons.	na	na	na	na	20959	21324	24749	21530	20463	15237	20710
Total NFU Imports	na	na	na	na	24324	24325	26850	23077	21161	15613	22558

Source: database

Table 421: Czech Republic - NFU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	na	na	na	na	20959	21324	24656	19273	18526	14854	19932
Marine fish, others	na	na	na	na	3365	3001	2101	3661	2492	613	2539
Aquatic animals	na	na	na	na	0	0	92	143	143	147	88
Total NFU Imports	na	na	na	na	24324	24325	26850	23077	21161	15613	22558

Source: database

Non-food use exports

With no domestic production, exports mainly consist of re-exportation and are very limited.

Table 422: Czech Republic - NFU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Flour, meal unfit for human cons.	na	na	na	na	151	19	129	156	382	296	189
Total NFU Exports	na	na	na	na	151	19	129	156	382	296	189

Source: database

Table 423: Czech Republic - NFU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	na	na	na	na	151	19	20	16	262	206	112
Marine fish, others	na	na	na	na	0	0	24	31	13	15	14
Aquatic animals	na	na	na	na	0	0	85	109	108	74	63
Total NFU Export	na	na	na	na	151	19	129	156	382	296	189

Source: database

Non-food use net supply

Non-food use net supply is mainly fuelled by imports, as domestic production is nonexistent. As exports are very limited, the pattern of Czech non-food use net supply is very similar to the pattern of non-food use imports.

Table 424: Czech Republic - NFU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Fish/marine mammal, fat, oil	na	na	na	na	3365	3001	2101	1547	698	376	1848
Flour, meal unfit for human consumption	na	na	na	na	20808	21305	24620	21374	20081	14941	20521
Total NFU net supply	na	na	na	na	24173	24306	26721	22922	20779	15317	22370

Source: database

Table 425: Czech Republic - NFU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, pelagic, small	na	na	na	na	20808	21305	24636	19258	18264	14647	19820
Marine fish, others	na	na	na	na	3365	3001	2077	3630	2480	597	2525
Aquatic animals	na	na	na	na	0	0	8	34	35	73	25
NFU net supply	na	na	na	na	24173	24306	26721	22922	20779	15317	22370

Source: database

Market for human consumption

Trade

Between 1993 and 1998, the country imported approximately 74 000 tonnes annually and exported around 13 000 tonnes of fishery products. The trade deficit is much more important in value than in volume as Czech food use imports amounted to CZK 2.8 billion in 1997 while exports accounted only for CZK 200 million (OECD, 2000).

Food use imports

The bulk of Czech food use commodities imports was made of prepared/preserved products. Most of it consisted of marine fish in the form of canned products, fish meat or fillets coated in batter. Fish fillets and frozen fish imports rank second and third respectively. Imported value added products such as breaded portions of hake or whole fillets were sourced from Germany, Norway, the Netherlands, Belgium, Spain and the UK (Wolgast, 1998).

Table 426: Czech Republic - FU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	na	na	na	na	17	31	50	52	66	80	49
Crus., mol. & other aquatic inv., prepared	na	na	na	na	54	39	118	174	198	175	126
Crustaceans	na	na	na	na	186	192	183	290	310	350	252
Fish, cured	na	na	na	na	1186	1136	1594	812	713	813	1042
Fish, fillets	na	na	na	na	10767	24023	22699	29942	24959	22192	22430
Fish, fresh/chilled	na	na	na	na	1515	1470	919	1189	1370	1476	1323
Fish, frozen	na	na	na	na	19913	23918	20572	21906	19583	14669	20094
Molluscs	na	na	na	na	45	143	89	56	56	57	74
Prepared/preserved fish	na	na	na	na	21421	25670	27444	30413	33573	35131	28942
Total FU Imports	na	na	na	na	55103	76622	73668	84835	80828	74944	74333

Source: database

Regarding species, marine fish dominate, especially pilchards or mackerels for small pelagic species, and cod, pollock, hake and haddock for demersal species. Freshwater fish imports are limited, as domestic production covers most of the demand, and consist mostly of trout and pike-perch, imported from Italy, Denmark, Spain and Bulgaria (Rudiger, 1998).

Table 427: Czech Republic - FU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	na	na	153	654	227	698	440	416	431
Diadromous fish	na	na	na	na	555	788	1211	1713	1759	1722	1291
Marine fish, pelagic, tunas	na	na	na	na	582	767	977	2973	2723	3081	1851
Marine fish, pelagic, small	na	na	na	na	28254	30230	25705	37344	31083	25948	29761
Marine fish, demersal	na	na	na	na	516	1631	1567	22397	26064	22157	12389
Marine fish, others	na	na	na	na	24741	42147	43541	19138	18129	20957	28109
Crustaceans	na	na	na	na	186	192	183	290	310	350	252
Molluscs	na	na	na	na	99	182	207	177	141	155	160
Cephalopods	na	na	na	na	17	31	50	52	66	80	49
Aquatic animals	na	na	na	na	0	0	0	54	112	77	41
Total FU Imports	na	na	na	na	55103	76622	73668	84835	80828	74944	74333

Source: database

Food use exports

Exports mainly consist of the main Czech product, carp, which is exported fresh and unprocessed, and even often as live fish. Prepared/preserved exports (canned products) are clearly decreasing with only 400 tonnes in 1998, compared with 2 400 tonnes at the beginning of the period.

Table 428: Czech Republic - FU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish, cured	na	na	na	na	15	18	88	185	168	2	79
Fish, fillets	na	na	na	na	92	662	1118	1586	880	975	886
Fish, fresh/chilled	na	na	na	na	10375	13887	10971	10945	8876	10546	10933
Fish, frozen	na	na	na	na	302	241	135	214	171	241	217
Molluscs	na	na	na	na	41	96	15	40	1	2	33
Prepared/preserved fish	na	na	na	na	2439	1444	1514	1447	541	378	1294
Total FU Exports	na	na	na	na	13263	16349	13841	14417	10637	12144	13442

Source: database

Table 429: Czech Republic - FU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	na	na	10073	13548	10153	10612	8633	10342	10560
Diadromous fish	na	na	na	na	71	197	320	401	221	228	240
Marine fish, pelagic, tunas	na	na	na	na	43	66	74	146	96	44	78
Marine fish, pelagic, small	na	na	na	na	909	387	400	845	221	119	480
Marine fish, demersal	na	na	na	na	0	0	0	1384	541	799	454
Marine fish, others	na	na	na	na	2127	2055	2879	988	925	610	1597
Molluscs	na	na	na	na	41	96	15	40	1	2	33
Total FU Export	na	na	na	na	13263	16349	13841	14417	10637	12144	13442

Source: database

Food use net supply and consumption

Between 1993 and 1998 the net supply of fish products was around 94 000 tonnes annually. Prepared/preserved products are increasing and represent the leading commodity of the net supply with 32 000 tonnes annually on average. Fish fillets rank second with 23 000 tonnes followed by frozen products and cured fish, whose shares have been decreasing in the past few years.

Table 430: Czech Republic - FU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Cephalopods	na	na	na	na	17	31	50	52	66	80	49
Crus., mol. & other aquatic inv., prepared	na	na	na	na	54	39	118	174	198	175	126
Crustaceans	na	na	na	na	186	192	183	290	310	350	252
Fish, cured	na	na	na	na	21288	18239	18300	16127	15383	13207	17091
Fish, fillets	na	na	na	na	10675	23361	22051	29839	25491	23413	22472
Fish, fresh/chilled	na	na	na	na	2068	1125	935	2366	2926	1251	1779
Fish, frozen	na	na	na	na	19611	23677	20437	21692	19412	14428	19876
Molluscs	na	na	na	na	4	46	74	16	55	55	42
Prepared/preserved fish	na	na	na	na	22283	29709	31262	33702	37656	41340	32659
Total FU net supply	na	na	na	na	76185	96419	93411	104257	101496	94300	94345
Cephalopods	na	na	na	na	17	31	50	52	66	80	49

Source: database

Marine fish species such as herring, mackerel, cod, pollock and haddock represent around 75 percent of the Czech food use net supply. Freshwater fish (20 percent of the net supply) consist mostly of carp species.

Table 431: Czech Republic - FU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	na	na	na	na	21125	17769	18325	19190	18489	14987	18314
Diadromous fish	na	na	na	na	483	591	891	1312	1538	1494	1052
Marine fish, pelagic, tunas	na	na	na	na	539	701	903	2827	2627	3038	1773
Marine fish, pelagic, small	na	na	na	na	27346	29843	25306	36499	30862	25829	29281

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, demersal	na	na	na	na	516	1631	1567	21013	25523	21358	11935
Marine fish, others	na	na	na	na	25914	45575	45994	22885	21828	26934	31522
Crustaceans	na	na	na	na	186	192	183	290	310	350	252
Molluscs	na	na	na	na	58	86	192	136	140	153	127
Cephalopods	na	na	na	na	17	31	50	52	66	80	49
Aquatic animals	na	na	na	na	0	0	0	54	112	77	41
FU net supply	na	na	na	na	76185	96419	93411	104257	101496	94300	94345

Source: database

Annual consumption of live weight product per capita was about 9 kg in 1997 with fish representing approximately 6 percent of the total consumption of animal protein (FAO, 1999b). However, consumption varies greatly between regions. There is relatively higher consumption of fish in the southern part of Bohemia, a region well known for carp farming, while in the north and east of the country consumption does not exceed 0.5 kg/person/year. Moreover, according to traditional eating habits, the bulk of the total freshwater fish production (mostly carp) is consumed during Christmas and Easter (FAO, 1999g).

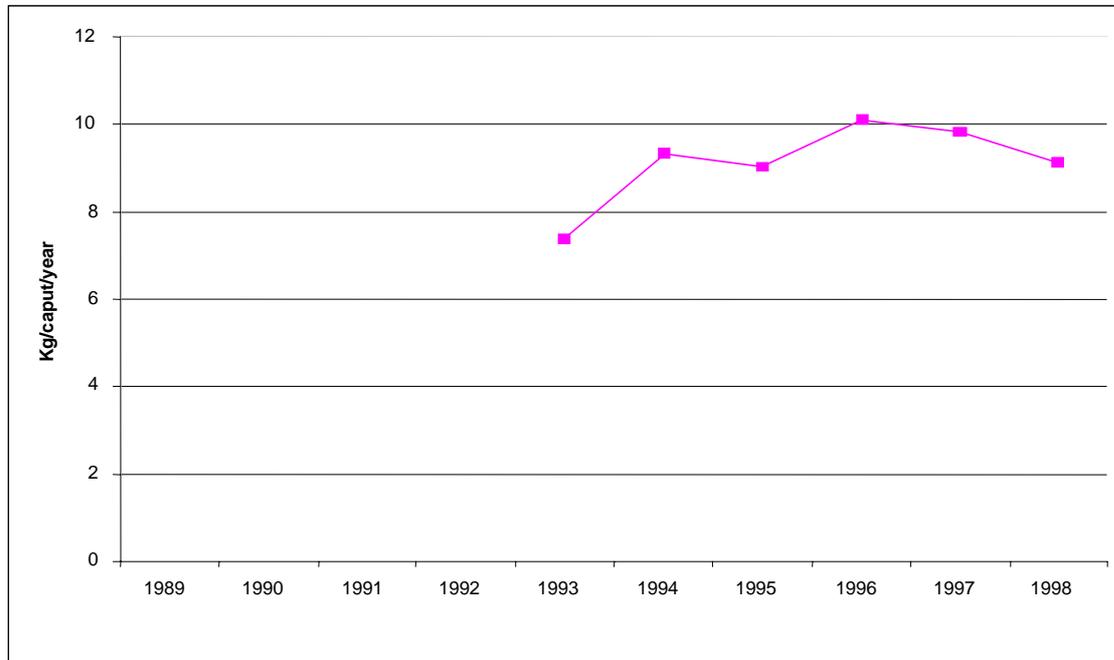


Figure 79: Fish consumption per capita per year in the Czech Republic 1989-1998

In general, the proportion of freshwater processed fish (chilled or frozen carp steaks and carp fillets) in the market is still very low and suggests national conservatism in eating habits and price competition from both marine fish and poultry. The general preference is to buy live carp for slaughter and preparation in the home. The proportion of freshwater processed fish in the form of frozen or chilled halves, steaks and fillets is still very low and does not reflect the changes in lifestyle and consumption habits. Price competition from both marine fish and poultry, a shortage of new products and the lack of value added products, underdeveloped sales channels and a shortage of capital investment are among the reasons for the low volumes of freshwater processed fish (Choeborska, 2002a and 2002b).

On a more general trend, it seems likely that strict hygiene and sanitary requirements deter many traders and merchants from selling fish and fisheries products and encourage sales of less perishable goods. Retailers and distributors are aware that the handling of fresh or chilled fish also calls for considerable capital investment in expensive cooling equipment, ice makers, etc. . However, sales of marine fish marketed in the form of frozen and chilled products have gradually increased over recent years thanks to specialist departments in supermarkets and fishmongers.

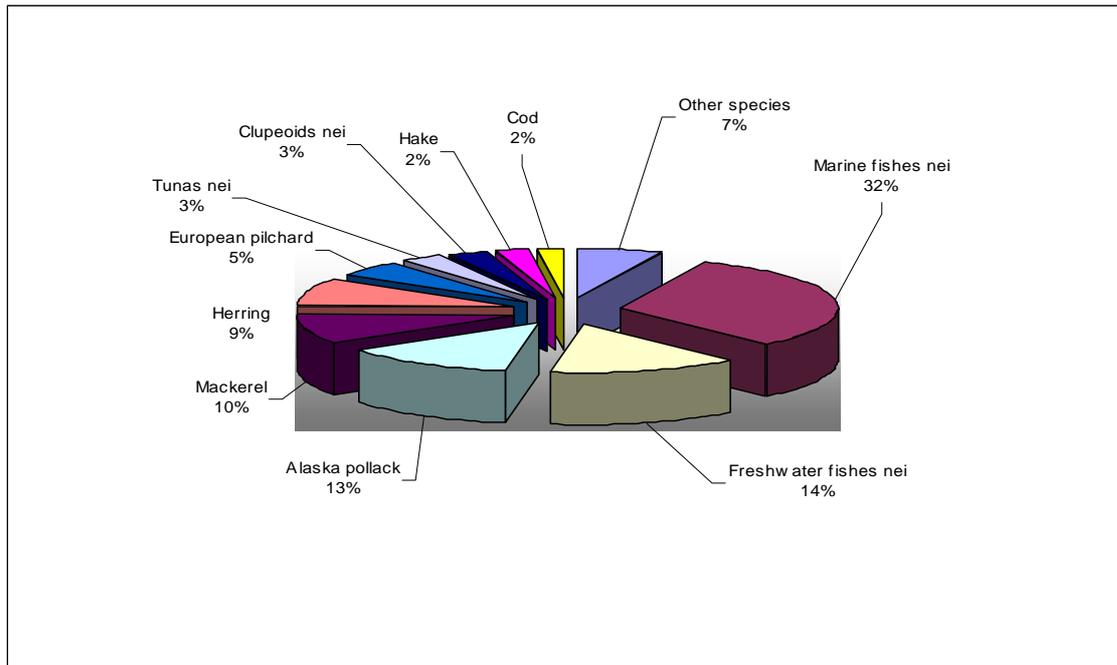


Figure 80: Czech Republic - Main species consumed in 1998

Assumptions for projection 2005-2030

Consumption trends for the OECD group of products form the basis of the model's assumptions (see methodology in Part 1 of the study). Further assumptions regarding production, imports and exports and the need for fish in the Czech Republic between 2005 and 2030 take into account and extrapolate previous trends.

For the Czech Republic, the main consumption trends for the period 2005-2030 assume:

- An important increase in the demand for prepared molluscs and crustaceans (200 percent), a 100 percent rise in cephalopods, prepared/preserved products and raw crustaceans and molluscs.
- A smaller increase in fresh fish (50 percent).
- A stagnation in the demand for fish fillets and a small decrease in cured fish consumption (-5 percent).
- Large increases in imports of prepared molluscs and crustaceans, cephalopods, prepared/preserved products and raw crustaceans and molluscs to cope with the increasing domestic demand, and to a lesser extent in fresh fish.
- A large decrease in cured fish imports.

The main feature affecting consumption in the Czech Republic will be development in the economy, which has already lead to an increase in the demand for both standard as well as value added products (Wolgast, 1998). This is reflected in these assumptions by the overall increase in fish consumption, and more specifically by the higher demand for value added products such as prepared/preserved molluscs and prepared molluscs and crustaceans. A trend toward new types of food and more exotic products, especially among young consumers, is also identified through the increase in demand for molluscs, cephalopods and crustaceans (Chotěborská, 2002a).

Furthermore, overall consumption will be positively affected by the increasing share of Western supermarket chains in seafood distribution as this will increase availability and diversity of seafood products on the Czech market (Chotěborská, 2002a).

Another feature of the Czech market likely to increase fish consumption is the trend toward healthier eating, particularly in urban areas (Chotěborská, 2002b).

Table 432: Czech Republic - Assumptions for projection

OECD group	94-98%	annual %	Prod % 99-30	T Imp % 99-30	T Exp % 99-30	T Cons 99-30	T Prod Annual	% Imp Annual	% Exp Annual	Cons % Annual
Cephalopods	97%	19%	0%	100%	0%	100%		2.2%		2.2%
Crus., mol. & other aquatic inv., prepared	151%	30%	0%	200%	0%	200%		3.5%		3.5%
Crustaceans	62%	12%	0%	100%	0%	100%		2.2%		2.2%
Fish, cured	-58%	-12%	0%	-300%	0%	-5%	0.0%	-4.4%	0.0%	-0.1%
Fish, fillets	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0.0%	0.0%
Fish, fresh/chilled	25%	5%	5%	42%	0%	50%		1.1%	0.0%	1.3%
Fish, frozen	-48%	-10%	0%	-11%	0%	-10%		-0.3%	0.0%	-0.3%
Molluscs	135%	27%	0%	96%	0%	100%		2.1%	0.0%	2.2%
Prepared/preserved fish	33%	7%	0%	118%	0%	100%	0.0%	2.5%	0.0%	2.2%
Fish/marine mammal, fat, oil	-206%	-41%	0%	0%	0%			0.0%	0.0%	0.0%
Flour, meal unfit for hum. Cons.	-36%	-7%	0%	0%	0%			0.0%	0.0%	0.0%

Source: database

Aquaculture production will increase while capture fisheries will remain stable. This increase in production will be swallowed by the national market, not leaving any surplus for exports, which will remain stable. The growing national demand will require an increase in fish imports, especially marine species.

Table 433: Czech Republic - Main results for projection

Nature	Average 94-98	2005	2010	2015	2020	2025	2030
Exports FU (t live wt)		13478	12144	12144	12144	12144	12144
Imports FU (t live wt)		78179	81166	86404	92389	99210	106966
Production FU (t live wt)		33275	31500	31500	31500	31500	31500
Fish supply FU (t live wt)		97977	100521	105760	111745	118565	126322
Population (X1000)		10314	10335	10361	10386	10412	10438
Per caput supply (kg/h)		9	10	10	11	11	12
Production NFU (t live wt)							
Imports NFU (t live wt)		22205	15613	15613	15613	15613	15613
Exports NFU (t live wt)		196	296	296	296	296	296
Net supply NFU (t live wt)		22009	15317	15317	15317	15317	15317
Aquaculture (t live wt)		18061	19792	21852	24126	26637	29410
Capture (t live wt)		3733	3733	3733	3733	3733	3733
Production total (t live wt)		21794	23525	25585	27859	30370	33143

Source: database

Food use net supply and human consumption 2005-2030

Food use net supply will increase due to a rise in imports as domestic commodities production and exports remain stable. Therefore, the Czech food use net supply pattern will reflect the import pattern with prepared/preserved products being the main commodity and increasing, while frozen products are decreasing. Cephalopods and crustaceans are on the increase and fish fillets remain stable. Czech food use net supply will reach 135 000 tonnes by 2030.

Table 434: Czech Republic - FU net supply by OECD group of commodities 2005-2030 (t live weight)

Gp of commodities	Ave. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	56	93	104	116	129	144	161
Crus., mol. & other aquatic inv., prepared	141	223	264	314	373	442	525
Crustaceans	265	408	454	506	564	629	700
Fish, cured	16251	12986	12866	12771	12694	12633	12585

Gp of commodities	Ave. 94-98	2005	2010	2015	2020	2025	2030
Fish, fillets	24831	23413	23413	23413	23413	23413	23413
Fish, fresh/chilled	1721	1369	1459	1553	1654	1759	1871
Fish, frozen	19929	14096	13863	13635	13409	13188	12970
Molluscs	49	64	71	79	88	98	109
Prepared/preserved fish	34734	47870	53265	59358	66241	74014	82795
Total FU net supply	97977	100521	105760	111745	118565	126322	135130

Source: database

Table 435: Czech Republic - FU net supply by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	17752	15018	15041	15066	15093	15120	15150
Diadromous fish	1165	1545	1590	1642	1701	1768	1843
Marine fish, pelagic, tunas	2019	3559	3990	4477	5027	5648	6349
Marine fish, pelagic, small	29668	27429	28804	30397	32233	34342	36756
Marine fish, demersal	14218	22313	23104	23998	25010	26153	27446
Marine fish, others	32643	29870	32337	35149	38347	41977	46090
Crustaceans	265	408	454	506	564	629	700
Molluscs	141	188	219	255	297	346	403
Cephalopods	56	93	104	116	129	144	161
Aquatic animals	49	98	116	138	164	195	231
FU net supply	97977	100521	105760	111745	118565	126322	135130

Source: database

As the growth rate of the net supply (43 percent) will be higher than the growth rate of the population (2 percent) during the period 1998/2030, annual consumption per capita will increase from 10 kg/c/yr to 13 kg.

Czech consumers, especially young and urban ones, are getting used to new types of food including seafood, which explains the growing consumption of prepared/preserved products, cephalopods and crustaceans that were previously unavailable in the Czech market. In addition, the growing availability of fish (along with various cookbooks) in the retail chains (especially hypermarkets) and a stronger Czech currency will contribute to the increasing demand for fish (Chotěborská, 2002b). There is also a trend toward healthier eating, particularly in urban areas, and of substitution of typically heavy Czech cuisine by lighter international cuisine that is likely to increase fish consumption (Chotěborská, 2002b).

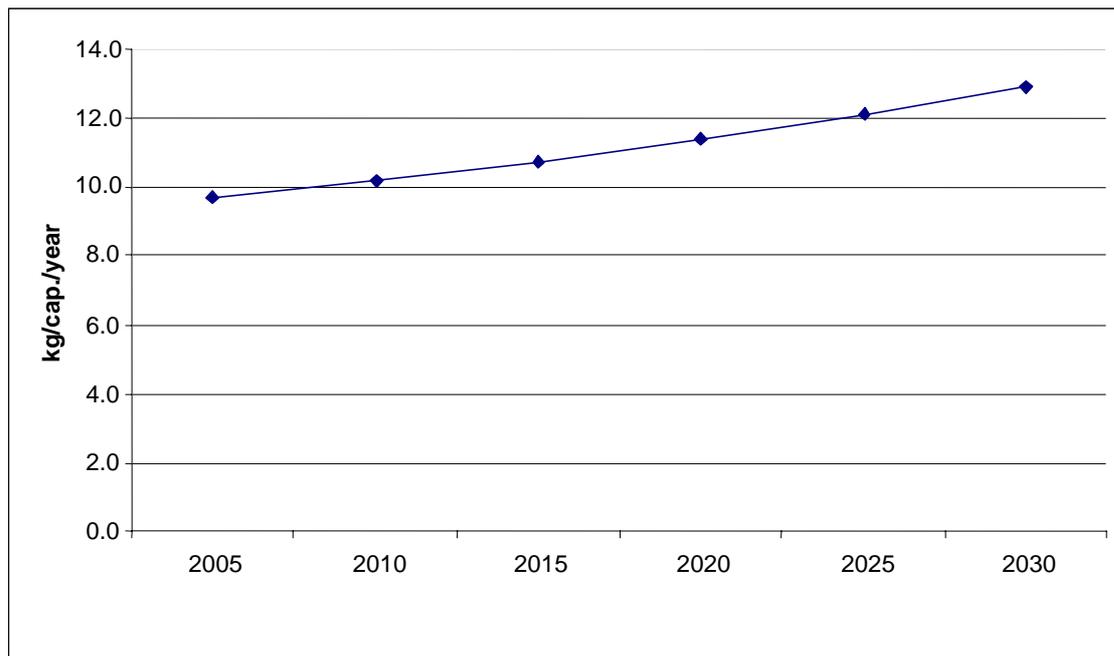
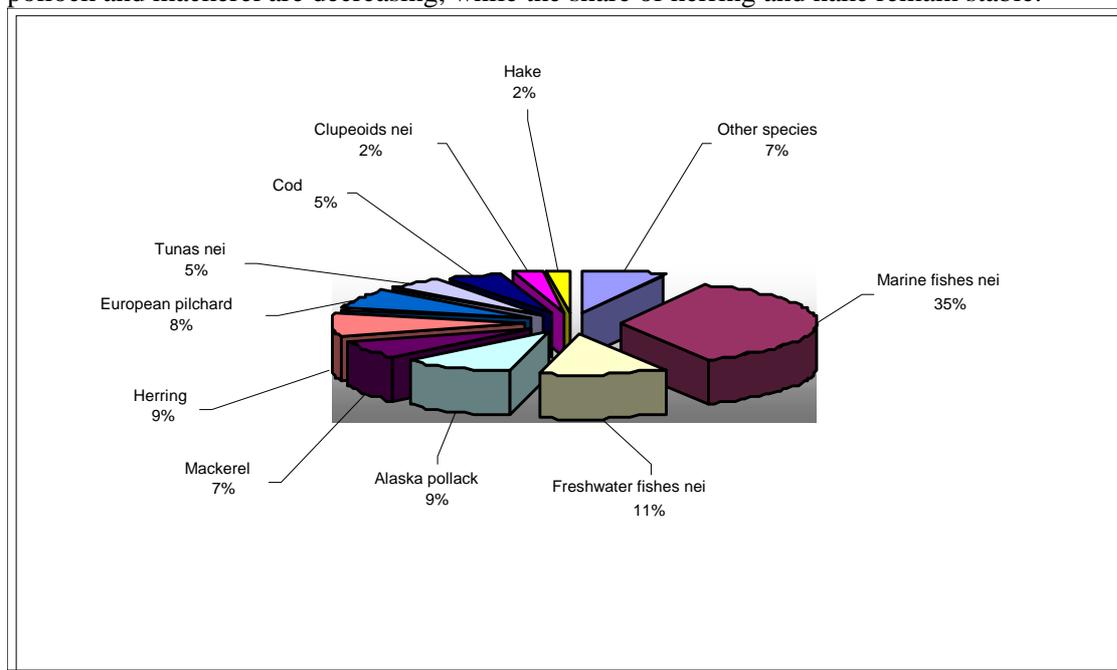


Figure 81: Fish consumption per capita per year in the Czech Republic 2005-2030

As a general trend freshwater species loose ground to marine species. Tunas, pilchards and clupeoids, as species being used in the prepared/preserved products, are on the increase and so is cod. Alaska pollock and mackerel are decreasing, while the share of herring and hake remain stable.

**Figure 82: Czech Republic - Main species consumed in 2030**

Non-food use net supply 2005-2030

Non-food use net supply will remain as it was in 1998 (15 000 tonnes), as domestic production, imports and exports of non-food use commodities will not vary.

Production 2005-2030

Capture and aquaculture

In 1999, the two major obstacles to development of fish farming in the Czech Republic were reported to be the shortage of funds and the still poorly developed domestic market (Eurofish, 2003). As these two difficulties will be gradually phased out with the access to the EU, the Czech Republic will be able to capitalize on its reputation for high quality aquaculture products to expand its production from 20 000 tonnes in 2005 to 30 000 tonnes by 2030.

Table 436: Czech Republic - Aquaculture by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish Total	17271	18920	20889	23063	25464	28114	31040
Diadromous fish Total	790	872	963	1063	1173	1296	1430
Total	18061	19792	21852	24126	26637	29410	32471

Source: database

Total production will increase to 36 000 tonnes by 2003 thanks to the aquaculture sector as capture fisheries will not rise. Concerning species, production of both carp and trout will increase, with the former remaining the most common freshwater fish produced in the Czech Republic.

Table 437: Czech Republic - Total production by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	20862	22511	24481	26655	29055	31706	34632
Diadromous fish	932	1014	1104	1205	1315	1437	1572

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Total	21794	23525	25585	27859	30370	33143	36204

Source: database

Commodities

No significant change in commodities production is expected and output from Czech processing factories will remain at its 1998 level of around 32 000 tonnes.

Trade 2005-2030

Imports

Food use commodities imports will increase to reach around 120 000 tonnes in 2030. Prepared/preserved products increase their share and represent more than 60 percent of all imports, mostly because of the growing demand for these commodities in the domestic market (see below). They consist of canned product, fish meat and fillets coated in batter. Frozen fish products are decreasing while fish fillets remain stable. Crustacean and cephalopods are the two commodities with the biggest increase during the period but quantities are still limited.

Table 438: Czech Republic - FU Commodities Imports by OECD group of products 2005-2030 (t live weight)

Gp of commodities	Ave. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	56	93	104	116	129	144	161
Crus., mol. & other aquatic inv., prepared	141	223	264	314	373	442	525
Crustaceans	265	408	454	506	564	629	700
Fish, cured	1014	592	472	376	300	239	191
Fish, fillets	24763	22192	22192	22192	22192	22192	22192
Fish, fresh/chilled	1285	1594	1684	1779	1879	1985	2096
Fish, frozen	20130	14337	14104	13875	13650	13429	13211
Molluscs	80	66	73	81	91	101	112
Prepared/preserved fish	30446	41661	47056	53149	60032	67805	76586
Total FU Imports	78179	81166	86404	92389	99210	106966	115774

Source: database

The main imported species are mackerel, pilchard and herring for the small pelagic species; hake, haddock and cod for the demersal species; octopus and cuttlefish for cephalopods; and mussels for molluscs.

Table 439: Czech Republic - FU Commodities Imports by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	487	447	470	495	522	549	579
Diadromous fish	1439	1773	1818	1869	1929	1996	2071
Marine fish, pelagic, tunas	2104	3603	4034	4521	5071	5692	6393
Marine fish, pelagic, small	30062	27548	28923	30516	32353	34461	36875
Marine fish, demersal	14763	23112	23903	24797	25809	26952	28245
Marine fish, others	28782	23893	26360	29172	32371	36000	40114
Crustaceans	265	408	454	506	564	629	700
Molluscs	172	191	221	257	299	348	406
Cephalopods	56	93	104	116	129	144	161
Aquatic animals	49	98	116	138	164	195	231
Total FU Imports	78179	81166	86404	92389	99210	106966	115774

Source: database

Exports

Exports will remain stable at their 1998 level of around 12 000 tonnes.

ESTONIA

Traditionally fisheries constituted an important component of the Estonian economy and today it has become a valuable export industry by virtue of its high production, particularly due to its significant processing sector. The fisheries sector provides an important economic role as a major provider of employment in many isolated areas and the canning industry, in particular, continues to prosper. For the sector to sustain this level of activity, however, investments in its infrastructure will be needed. The development of new markets and value added products is another priority. Estonia is the smallest of the Baltic States and has a population of approximately 1.5 million inhabitants.

Production: captures, aquaculture and commodities 1989-1998

There has been a marked decline in Estonian production from 368 000 tonnes in 1990 to 122 000 tonnes in 1997 (Aps *et al.*, 1997). The share of aquaculture in total production is negligible and represented less than 1 percent in 1998.

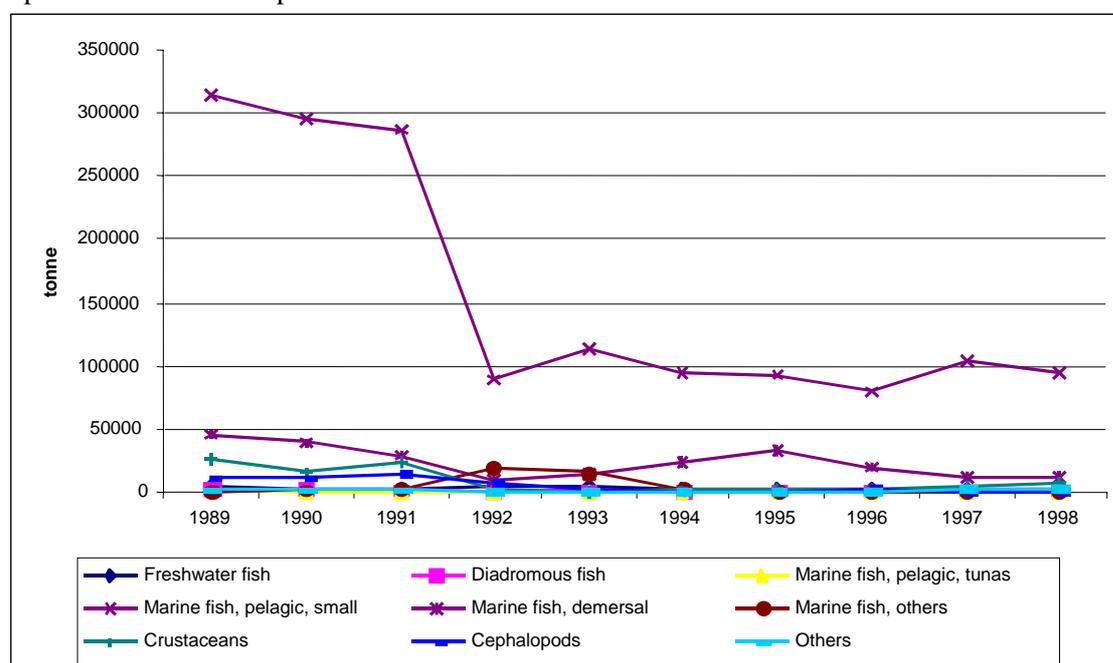


Figure 83: Estonia - Capture and aquaculture production 1989-1998

Captures

Falling production during the 1990s was mostly due to the sharp decline of the distant water fleet, which shrank from 75 vessels in 1990 to 31 vessels in 1996. Estonia's distant water fleet still accounts for about 60 percent of national production and the principal species targeted are blue whiting, Atlantic redfish, Atlantic mackerel and shrimp (Aps, 1996). Another Estonian fleet operates in the Baltic Sea and predominantly targets herring, sprat and cod. The catches of this fleet have, in part, compensated for the general decline in production of the distant water fleet, as its production increased from 42 000 tonnes in 1993 to approximately 71 000 tonnes in 1996 (European Parliament, 1998).

Table 440: Estonia - Captures by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	3213	2148	1924	4839	3803	2843	2813	3155	3108	3319	3117
Diadromous fish	2330	2113	348	161	662	323	816	665	552	1590	956
Marine fish, pelagic, tunas	859	276	542	1	0	0	0	0	0	0	168
Marine fish, pelagic, small	314473	293986	286598	88347	112982	93783	93194	78930	104010	94379	156068
Marine fish, demersal	45049	38769	28756	9586	13174	23420	32766	19877	10929	11723	23405

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, others	617	1566	2402	19493	15240	2260	60	174	23	497	4233
Crustaceans	25688	15876	23600	2352	0	1051	2379	3220	4991	7206	8636
Cephalopods	11309	11732	13386	6568	1314	0	0	2425	0	0	4673
Others	1392	1216	908	0	0	411	548	163	2444	2880	996
Total gp of species	404930	367682	358464	131347	147175	124091	132576	108609	126057	121594	202253

Source: database

Catches of freshwater fish such as European perch, pike-perch, spurling and freshwater bream accounted for approximately 2 400 tonnes in 1996 and mainly originated from the Lake Peipsi-pihkva and, to a lesser degree, the Lake Võrstjärv.

Aquaculture

During Soviet period (1944-1991) fish farming developed rapidly starting at the end of 60-s and reached its peak in the early nineties. Estonia is a northern country where the growing season is short (3-4 months) and where water temperature is an important limiting factor for fish farming. Therefore the heated effluent waters of the electric power plants were successfully used to prolong the growth period. Collapse of the socialist system caused decline in fish farming production, mainly because of the cessation of fish rearing in heated waters of electric power stations (Paaver, 2000).

The main species cultivated are the common carp and rainbow trout but new species such as crayfish and sturgeon are being farmed as producers make direct links with Western markets (Aps *et al.*, 1997). The majority of production occurs in ponds and tanks but fish cages are also operated in some of areas.

Table 441: Estonia - Aquaculture by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	405	385	420	234	33	136	30	61	28	23	176
Diadromous fish	827	551	917	459	289	278	278	194	227	237	426
Total gp of species	1232	936	1337	693	322	414	308	255	255	260	601

Source: database

Commodities production

Production of fish and seafood is the fourth largest sector in the food industry after the production of milk products, beverages, meat and meat products. The canning industry produces mostly for the Eastern market while fish fast food producers target both Eastern and Western markets. Fish fillets and delicatessen products based on imported and local fish are aimed at the Western market and quick frozen Baltic herring and sprat are sold in the East (Eurofish, 2003).

Food use commodities production

Food use commodities production was around 140 000 tonnes during the period 1993/1998. The main commodities produced in Estonia were prepared/preserved products (mostly canned pelagic) with 60 000 tonnes annually, followed by frozen fish and cured fish with respectively 50 000 tonnes and 12 000 tonnes on average.

Table 442: Estonia - FU Commodities Production by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Crustaceans	na	na	na	na	14	103	148	126	159	79	105
Fish, cured	na	na	na	na	1421	11432	6930	11076	20688	18571	11686
Fish, fillets	na	na	na	na	430	834	0	0	823	1800	648
Fish, fresh/chilled	na	na	na	na	17899	5643	1387	1614	1446	3421	5235
Fish, frozen	na	na	na	na	83245	79273	57346	42559	25665	36645	54122

Prepared/preserved fish	na	na	na	na	50036	56825	57651	66458	81454	69752	63696
Total FU Production	na	na	na	na	153044	154110	123462	121833	130235	130269	135492

Source: database

Table 443: Estonia - FU Commodities Production by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Diadromous fish	na	na	na	na	1546	1789	398	351	303	890	879
Marine fish, pelagic, small	na	na	na	na	36661	60309	59965	53319	66534	78112	59150
Marine fish, demersal	na	na	na	na	1289	1207	448	170	164	314	599
Marine fish, others	na	na	na	na	113534	90702	62504	67866	63075	50874	74759
Crustaceans	na	na	na	na	14	103	148	126	159	79	105
Total FU Production	na	na	na	na	153044	154110	123462	121833	130235	130269	135492

Source: database

Non-food use commodities production

Non-food use commodities production is limited in Estonia and averaged 4 000 tonnes annually between 1993 and 1998.

Table 444: Estonia - NFU Commodities Production by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Flour, meal unfit for human cons.	na	na	na	na	6791	2958	5296	3756	2870	3454	4187
Total NFU Production	na	na	na	na	6791	2958	5296	3756	2870	3454	4187

Source: database

Table 445: Estonia - NFU Commodities Production by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	na	na	na	na	6791	2958	5296	3756	2870	3454	4187
Total NFU Production	na	na	na	na	6791	2958	5296	3756	2870	3454	4187

Source: database

Non-food use: trade and net supply 1989-1998

Non-food use imports

Non-food use imports were decreasing to the 1990s and reached 1 500 tonnes in 1998.

Table 446: Estonia - NFU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish/marine mammal, fat, oil	na	na	na	na	128	329	98	97	54	64	128
Flour, meal unfit for human cons.	na	na	na	na	1156	767	9961	2219	3713	1404	3203
Total NFU Imports	na	na	na	na	1284	1096	10059	2316	3767	1469	3332

Source: database

Table 447: Estonia - NFU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	na	na	na	na	1156	767	9961	2219	3713	914	3122
Marine fish, others	na	na	na	na	128	103	98	97	54	554	172
Aquatic mammals	na	na	na	na	0	226	0	0	0	0	38
Total NFU Imports	na	na	na	na	1284	1096	10059	2316	3767	1469	3332

Source: database

Non-food use exports

As non food use imports and production were decreasing, the surplus available for exports shrank. Therefore non-food use exports decreased from 10 000 tonnes in 1995 to 2 000 tonnes in 1998.

Table 448: Estonia - NFU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish/marine mammal, fat, oil	na	na	na	na	115	62	89	72	24	21	64

Flour, meal unfit for human cons.	na	na	na	na	3260	2168	10504	3672	3218	2185	4168
Total NFU Exports	na	na	na	na	3375	2230	10592	3744	3242	2206	4232

Source: database

Table 449: Estonia - NFU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, pelagic, small	Na	na	na	na	3260	2168	10504	3672	3218	1938	4127
Marine fish, others	Na	na	na	na	115	62	89	72	24	268	105
Total NFU Export	Na	na	na	na	3375	2230	10592	3744	3242	2206	4232

Source: database

Non-food use net supply

Non-food use net supply presents quite an erratic pattern over the period 1993-1998.

Table 450: Estonia - NFU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Fish/marine mammal, fat, oil	na	na	na	na	13	268	9	25	30	43	65
Flour, meal unfit for human consumption	na	na	na	na	4686	1556	4754	2302	3364	2673	3223
Total NFU net supply	na	na	na	na	4700	1824	4763	2327	3394	2716	3287

Source: database

Table 451: Estonia - NFU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, pelagic, small	na	na	na	na	4686	1556	4754	2302	3364	2430	3182
Marine fish, others	na	na	na	na	13	41	9	25	30	286	67
Aquatic mammals	na	na	na	na	0	226	0	0	0	0	38
NFU net supply	na	na	na	na	4700	1824	4763	2327	3394	2716	3287

Source: database

Market for human consumption

Trade

Estonia imports a substantial quantity of fish to supply the national fish processing industry and for subsequent export. Imported products consist of a wide range of fish, crustaceans, molluscs and other aquatic invertebrates (European Parliament, 1998). Between 1993 and 1998, 41 000 tonnes of products were imported annually on average, while exports amounted to 140 000 t. In terms of value, 1997 imports accounted for US\$21.4 million whereas exports amounted to US\$100 million (FAO, 1998c). The loss of the market to the former Soviet Union and the complete collapse of the system of raw material supply meant that in 1993 only 23 percent of total production was utilised and that the major share of the catch had to be sold on the domestic market (Anon., 1998a). However, since 1995 the industry began to show some signs of recovery and production volumes and exports started to increase as processing equipment and facilities were modernised and new technology installed (Aps *et al.*, 1997). The fisheries sector in Estonia has been proactive in seeking new sources of raw product and locating new, foreign markets for its products since regaining its independence in 1991. Exports consist mainly of canned fish, preserved fish and, to a lesser degree, frozen fish. Facilities within the processing sector are now quite modern, having been installed over the last five years, and it is expected that further effort will be directed to developing new products and securing additional markets in the near future (FAO, 1998c).

The fishery sector has become an important exports industry for the Estonian economy, providing the greatest share in the value of food exports. Estonia can boast a network of well-located ports for landing, exporting and importing fish and fishery products. Most of the ports (Port Veere on Saaremaa Island, Port Lehtma on Hiiumaa Island, Port Dirhami close to Haapsalu town, Port Pärnu and Port Miiduranna in Tallinn) are located in the immediate vicinity of good fishing grounds as well as fish processing and freezing facilities (Eurofish, 2003).

Food use imports

Norway, Russia, the Netherlands and Sweden accounted for more than 50 percent of Estonian imports in 1996 (Aps *et al.*, 1997). The value of imports was around \$US 21 million for the same year (FAO, 1998c). Frozen fish, with 28 000 tonnes on average annually, represent 70 percent of Estonian exports. Prepared/preserved products and fresh fish represent 15 percent and 10 percent respectively.

Table 452: Estonia - FU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Crus., mol. & other aquatic inv., prepared	na	na	na	na	1	3	32	53	29	31	25
Crustaceans	na	na	na	na	471	629	1533	395	374	290	615
Fish, cured	na	na	na	na	292	1974	897	1339	1400	1497	1233
Fish, fillets	na	na	na	na	580	208	4107	765	1526	4864	2008
Fish, fresh/chilled	na	na	na	na	453	1276	4705	5536	6125	6237	4055
Fish, frozen	na	na	na	na	4009	13831	15822	19079	57216	55977	27656
Prepared/preserved fish	na	na	na	na	1168	8841	3095	4281	8417	10277	6013
Total FU Imports	na	na	na	na	6974	26762	30192	31447	75087	79173	41606

Source: database

The main species imported into Estonia are herring, mackerel, pilchard for small pelagic species; hake and cod for demersal species; and shrimps for crustaceans.

Table 453: Estonia - FU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	na	na	12	43	3	1	2	1	10
Diadromous fish	na	na	na	na	3	349	331	1097	1215	1453	741
Marine fish, pelagic, tunas	na	na	na	na	25	179	481	647	200	4293	971
Marine fish, pelagic, small	na	na	na	na	2167	15154	19200	21328	50285	51618	26625
Marine fish, demersal	na	na	na	na	0	148	246	1271	1071	2072	801
Marine fish, others	na	na	na	na	4294	10256	8366	6655	21910	19414	11816
Crustaceans	na	na	na	na	471	629	1533	395	374	290	615
Molluscs	na	na	na	na	1	3	32	53	29	31	25
Total FU Imports	na	na	na	na	6974	26762	30192	31447	75087	79173	41606

Source: database

Food use exports

Between 1993 and 1998, Estonia exported on average 140 000 tonnes of fish annually. In terms of value, Estonian seafood exports represented \$US100 million in 1996 (FAO, 1998c). Estonia's main trading partners are Russia, the Netherlands, Denmark and the Ukraine, which together account for around 75 percent of all exports by volume. The main export destinations for the shrimps are Iceland, Norway, Japan and Canada (Eurofish, 2003). With 63 000 tonnes exported annually on average, prepared/preserved commodities (canned small pelagic species) represent 45 percent of total exports. Frozen fish products came second with 54 000 tonnes (40 percent of the exports).

Table 454: Estonia - FU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Crustaceans	na	na	na	na	33	347	306	264	254	125	221
Fish, cured	na	na	na	na	1147	6150	6621	10238	20389	18208	10459
Fish, fillets	na	na	na	na	434	896	894	669	953	2085	989
Fish, fresh/chilled	na	na	na	na	9300	5963	4521	6203	7418	8430	6973
Fish, frozen	na	na	na	na	35782	60306	58512	41765	59378	80471	56036
Prepared/preserved fish	na	na	na	na	45125	52191	57094	69220	89828	79462	65487
Total FU Production	na	na	na	na	91822	125853	127948	128360	178220	188781	140164

Source: database

The majority of exports by volume are comprised of small pelagic species, such as herring and pilchard.

Table 455: Estonia - FU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	na	na	10	17	2	0	1	0	5
Diadromous fish	na	na	na	na	1295	2034	453	626	461	1115	997
Marine fish, pelagic, tunas	na	na	na	na	25	25	146	503	187	151	173
Marine fish, pelagic, small	na	na	na	na	37143	71044	77361	68746	113655	123287	81873
Marine fish, demersal	na	na	na	na	1181	1227	562	960	836	1214	997
Marine fish, others	na	na	na	na	52135	51159	49118	57260	62825	62889	55898
Crustaceans	na	na	na	na	33	347	306	264	254	125	221
Total FU Export	na	na	na	na	91822	125853	127948	128360	178220	188781	140164

Source: database

Food use net supply and consumption

During the period 1993-1998 the net supply of fisheries products was on average 37 000 tonnes annually. Domestic consumption decreased in Estonia over the last decade from 70 000 tonnes in 1993 to 20 000 tonnes in 1998. The reason for this decreased consumption was the rise in the price of fish and the change in the fish product range – cheaper species (perch, sprat, Baltic herring) were replaced by more expensive ones (salmon, trout) (Simm and Jenson, 2000).

Table 456: Estonia - FU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Crus., mol. & other aquatic inv., prepared	na	na	na	na	1	3	32	53	29	31	25
Crustaceans	na	na	na	na	453	385	1376	257	280	244	499
Fish, cured	na	na	na	na	565	7255	1206	2177	1699	1860	2461
Fish, fillets	na	na	na	na	575	146	3213	96	1396	4579	1668
Fish, fresh/chilled	na	na	na	na	9052	955	1572	946	153	1228	2318
Fish, frozen	na	na	na	na	51471	32798	14656	19872	23503	12152	25742
Prepared/preserved fish	na	na	na	na	6078	13476	3652	1518	44	566	4222
Total FU net supply	na	na	na	na	68196	55019	25706	24921	27102	20660	36934

Source: database

Table 457: Estonia - FU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	na	na	2	26	1	1	1	1	5
Diadromous fish	na	na	na	na	254	104	276	821	1057	1228	623
Marine fish, pelagic, tunas	na	na	na	na	0	154	335	145	13	4142	798
Marine fish, pelagic, small	na	na	na	na	1685	4420	1803	5901	3164	6443	3903
Marine fish, demersal	na	na	na	na	108	128	132	481	399	1173	403
Marine fish, others	na	na	na	na	65693	49798	21753	17261	22159	7399	30677
Crustaceans	na	na	na	na	453	385	1376	257	280	244	499
Molluscs	na	na	na	na	1	3	32	53	29	31	25
FU net supply	na	na	na	na	68196	55019	25706	24921	27102	20660	36934

Source: database

As the net supply has been decreasing fast since 1993, annual consumption per capita has decreased from 45 kg per capita per year in 1993 to 15 kg per capita per year in 1998.

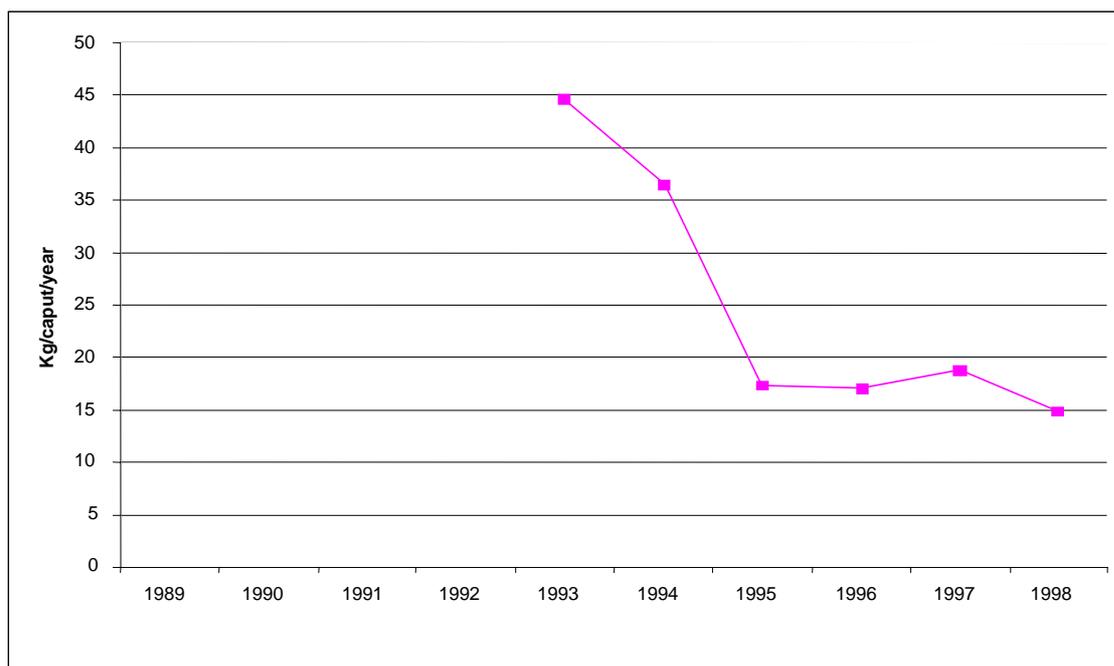


Figure 84: Fish consumption per capita per year in Estonia 1989-1998

In the local food markets fish is appreciated as a high quality and fairly priced item. It is sold either in marketplaces, especially fresh fish or at supermarkets and specialist retailers. There are no developed or institutionalised distribution channels within Estonia (Aps *et al.*, 1997).

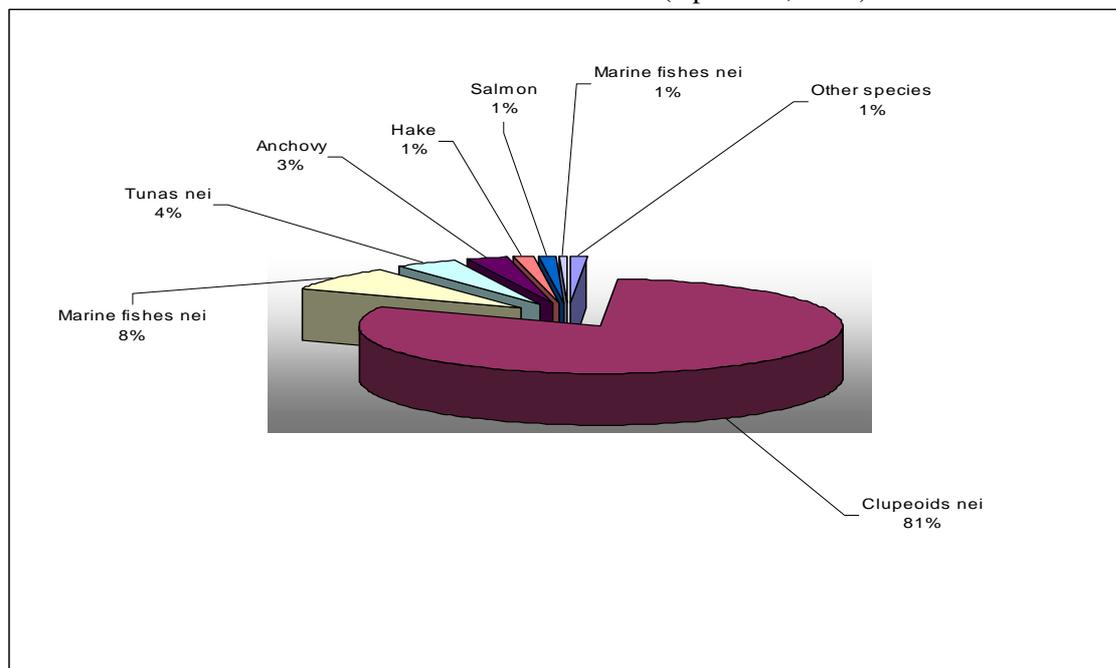


Figure 85: Estonia - Main species consumed in 1998

Assumptions for projection 2005-2030 and main results

Consumption trends for the OECD group of products form the basis of the model's assumptions (see methodology in Part 1 of the study). Further assumptions regarding production, imports and exports and the need for fish in Estonia between 2005 and 2030 take into account and extrapolate previous trends.

In Estonia, the main consumption trends for the period 2005-2030 assume:

- A large increase of the demand for prepared/preserved products (200 percent) as well as a 100 percent rise in fresh fish, fish fillets and prepared molluscs and crustaceans.
- An important decrease (50 percent) in frozen fish consumption, and a lesser one in crustaceans and cured fish products (20 percent and 25 percent respectively).
- Large increases in imports of prepared molluscs and crustaceans and fish fillets while imported volume of cured fish and raw crustaceans decrease.

The shift from lower value species (frozen small pelagic) towards higher value species (salmon, demersal) observed at the end of the last decade (Simm and Jenson, 2000), will continue. Consumers will eat less fish but of better quality. This is reflected by an increase in the demand for fresh fish, fish fillets, crustaceans and prepared/preserved products and a decrease in frozen and cured fish.

Apparent consumption will be decreasing at first as consumption volumes of higher valued products will not be sufficient enough to offset the diminishing consumption of lower value products. But once economic development of the country will have allowed for volumes to pick up (2010), apparent consumption will be increasing again. Still, as the net supply will be increasing slower than the population growth rate, consumption per capita will diminish to settle slightly below 14 kg per capita per year by 2030.

Apparent consumption will benefit from the growth of tourism, the spread of supermarkets throughout the country and the increased consumer purchasing power, as was already reported at the beginning of this century (Andersone, 2002a).

Table 458: Estonia - Assumptions for projection

OECD group	94-98% annual %	Prod % 99-30	T Imp % 99-30	T Exp % 99-30	T Cons % 99-30	T Prod % Annual	% Imp Annual	% Exp Annual	Cons % Annual
Cephalopods									
Crus., mol. & other aquatic inv., prepared	223%	45%	0%	100%	0%	100%	0.0%	2.2%	2.2%
Crustaceans	-46%	-9%	0%	-20%	0%	-20%	0.0%	-0.6%	-0.6%
Fish, cured	-101%	-20%	0%	-45%	0%	-25%	0.0%	-1.2%	0.0%
Fish, fillets	319%	64%	0%	94%	0%	100%	0.0%	2.1%	0.0%
Fish, fresh/chilled	56%	11%	0%	20%	0%	100%	0.0%	0.6%	0.0%
Fish, frozen	-133%	-27%	0%	-12%	0%	-50%	0.0%	-0.4%	0.0%
Fish/marine mammal, fat, oil	-116%	-23%	0%	0%	0%		0.0%	0.0%	0.0%
Flour, meal unfit for hum. Cons.	35%	7%	0%	0%	0%		0.0%	0.0%	0.0%
Molluscs									
Prepared/preserved fish	59%	12%	0%	11%	0%	200%	0.0%	0.3%	0.0%

Source: database

Estonian production will remain stable, as there is no scope for expansion in the aquaculture sector. Imports will increase to answer a slight increase in the domestic consumption mostly triggered by the demographic expansion.

Table 459: Estonia - Main results for projection

Nature	Average 94-98	2005	2010	2015	2020	2025	2030
Exports FU (t live wt)	149832	188781	188781	188781	188781	188781	188781
Imports FU (t live wt)	48532	78919	78846	78870	78999	79239	79600
Production FU (t live wt)	131982	130269	130269	130269	130269	130269	130269
Fish supply FU (t live wt)	30682	20407	20334	20358	20487	20727	21088
Population (X1000)	1461	1428	1448	1468	1489	1510	1531
Per caput supply (kg/h)	21	14	14	14	14	14	14
Production NFU (t live wt)	3667	3454	3454	3454	3454	3454	3454
Imports NFU (t live wt)	3741	1469	1469	1469	1469	1469	1469
Exports NFU (t live wt)	4403	2206	2206	2206	2206	2206	2206
Net supply NFU (t live wt)	3005	2716	2716	2716	2716	2716	2716
Aquaculture (t live wt)	298	260	260	260	260	260	260
Capture (t live wt)	122585	122585	122585	122585	122585	122585	122585
Production total (t live wt)	122884	122845	122845	122845	122845	122845	122845

Source: database

Food use net supply and human consumption 2005-2030

Food use net supply will only be affected by the rise in imports, as exports and production will remain constant. As a consequence, its pattern will follow the pattern of imports, i.e. increase in consumption of prepared/preserved products (canned pelagic), fresh fish and fish fillets and decrease in demand for frozen fish and crustaceans imports.

Table 460: Estonia - FU net supply by OECD group of commodities 2005-2030 (t live weight)

Gp of commodities	Ave. 94-98	2005	2010	2015	2020	2025	2030
Crus., mol. & other aquatic inv., prepared	30	36	40	45	50	56	62
Crustaceans	508	233	225	217	210	202	195
Fish, cured	2840	1742	1664	1589	1519	1454	1391
Fish, fillets	1886	5338	5951	6632	7386	8223	9152
Fish, fresh/chilled	971	1478	1663	1853	2049	2250	2457
Fish, frozen	20596	10776	9814	8870	7941	7030	6134
Prepared/preserved fish	3851	804	977	1152	1331	1512	1697
Total FU net supply	30682	20407	20334	20358	20487	20727	21088

Source: database

Table 461: Estonia - FU net supply by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	6	1	1	1	1	1	1
Diadromous fish	697	1215	1207	1200	1193	1188	1183
Marine fish, pelagic, tunas	958	4041	3971	3901	3833	3767	3701
Marine fish, pelagic, small	4346	5615	5048	4500	3972	3463	2973
Marine fish, demersal	462	1133	1105	1078	1052	1027	1002
Marine fish, others	23674	8133	8737	9415	10175	11023	11970
Crustaceans	508	233	225	217	210	202	195
Molluscs	30	36	40	45	50	56	62
FU net supply	30682	20407	20334	20358	20487	20727	21088

Source: database

As the population growth rate is bigger than the growth rate of the net supply, respectively 9 percent and 2 percent during the period considered, consumption per capita will slightly decrease from above 14 kg per capita per year to below 14 kg per capita per year.

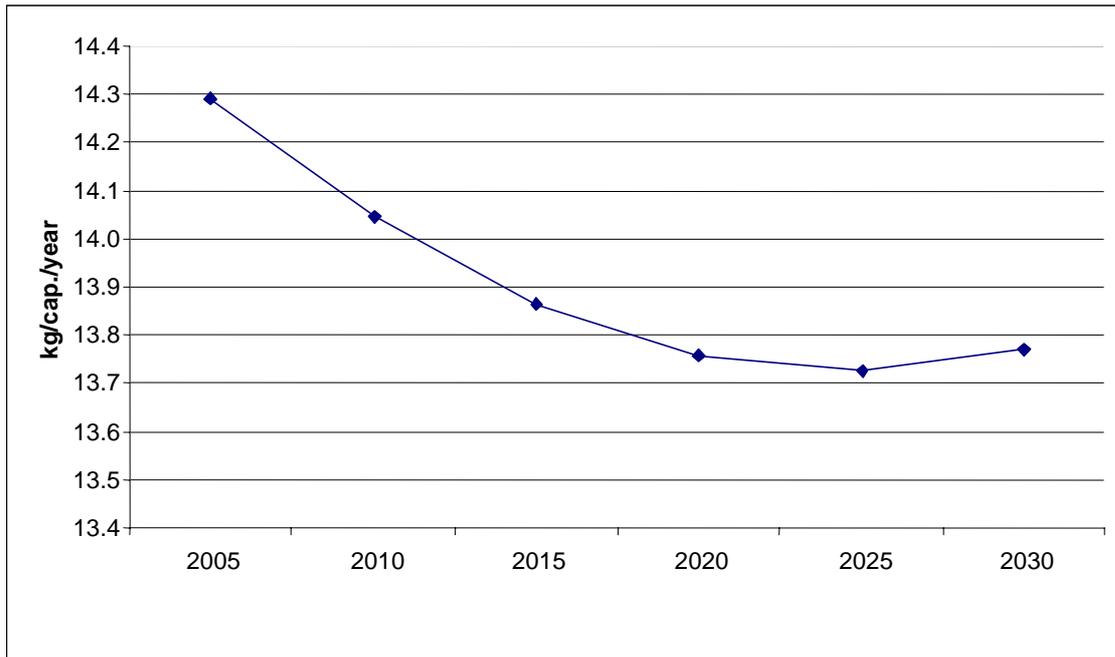


Figure 86: Fish consumption per capita per year in Estonia 2005-2030

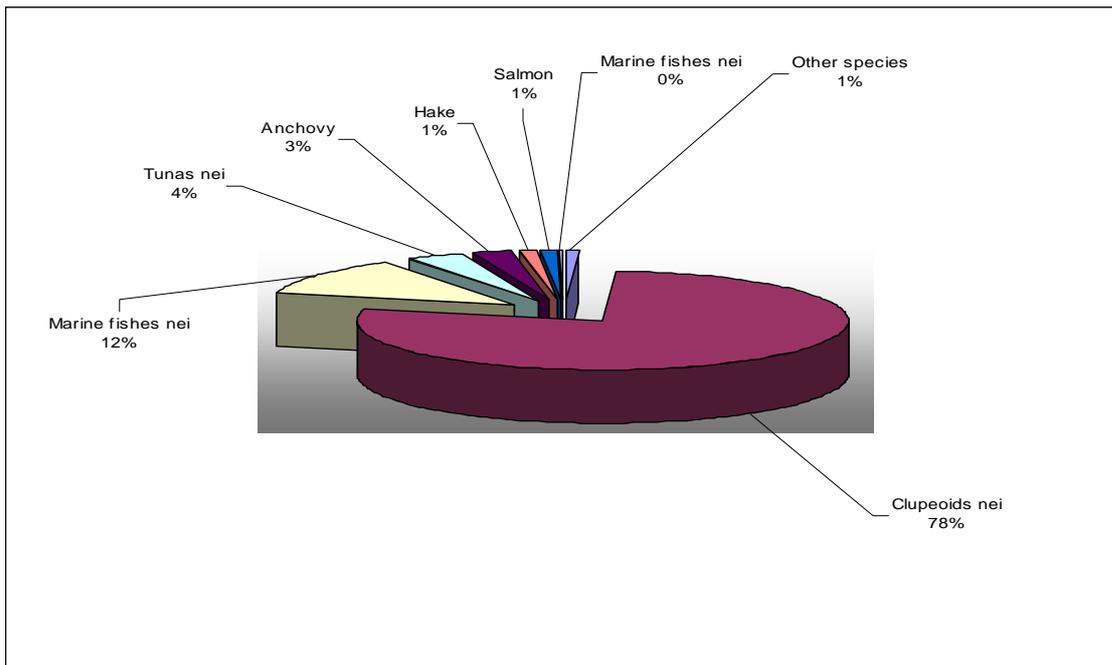


Figure 87: Estonia - Main species consumed in 2030

Non-food use net supply 2005-2030

No significant changes will be experienced in the non-food use sector during the period considered. Net supply will stay around 3 000 tonnes.

Production 2005-2030

Capture and aquaculture

Neither capture nor aquaculture production will increase, as capture production is assumed to remain constant and as Estonia does not dispose of favourable environmental conditions for aquaculture development. Total production will remain at its 1998 level of 123 000 tonnes.

Commodities

Commodities production will not increase. By 2030, Estonia will be producing 130 000 tonnes of food use commodities, as in 1998.

Trade 2005-2030

Imports

Food use commodities imports will increase slightly to answer an increased domestic demand for prepared/preserved products (canned pelagic), fresh fish and fish fillets. This will be compensated by a fall in frozen fish and crustaceans imports.

Table 462: Estonia - FU Commodities Imports by OECD group of products 2005-2030 (t live weight)

Gp of commodities	Av. 94-98	2005	2010	2015	2020	2025	2030
Crus., mol. & other aquatic inv., prepared	30	36	40	45	50	56	62
Crustaceans	644	278	270	263	255	248	241
Fish, cured	1421	1379	1300	1226	1156	1090	1028
Fish, fillets	2294	5623	6237	6917	7672	8509	9437
Fish, fresh/chilled	4776	6488	6673	6863	7058	7259	7466
Fish, frozen	32385	54601	53640	52695	51767	50855	49959
Prepared/preserved fish	6982	10514	10687	10862	11041	11223	11407
Total FU Imports	48532	78919	78846	78870	78999	79239	79600

Source: database

Table 463: Estonia - FU Commodities Imports by FAO group of species 2005-2030 (t live weight)

Gp Species	Av. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	10	1	1	1	1	1	1
Diadromous fish	889	1441	1432	1425	1419	1413	1408
Marine fish, pelagic, tunas	1160	4192	4122	4052	3985	3918	3853
Marine fish, pelagic, small	31517	50790	50223	49675	49147	48638	48148
Marine fish, demersal	962	2033	2005	1978	1952	1927	1902
Marine fish, others	13320	20148	20752	21430	22190	23038	23985
Crustaceans	644	278	270	263	255	248	241
Molluscs	30	36	40	45	50	56	62
Total FU Imports	48532	78919	78846	78870	78999	79239	79600

Source: database

Exports

The level of exports will not increase and will remain around 190 000 tonnes annually, as in 1998. Still, one has to remember that these assumptions consider exports only as a surplus emanating from the domestic production and therefore do not take the problem of re-exportation into consideration. If re-exports were to be considered it is realistic to expect exports to grow, especially with the prospect of the European Union enlargement that represents new market opportunities for Estonia.

HUNGARY

As a landlocked nation, Hungary depends entirely on imports and inland freshwater fish production to meet its fisheries requirements. There are approximately 140 000 hectares of natural waters in Hungary and 2 000 hectares of water bodies such as ox-bow lakes, gravel pits and small reservoirs have been converted to intensive fish cultivation. Hungary's long association with pond-rearing derives, in part, from very favourable climatic and geographic characteristics. Recent privatisation and ongoing investment should ensure that aquaculture remains the main activity within the nation's fishery sectors. With a population of approximately 10 million people, there is a large domestic market for freshwater fish and aquaculture continues to supply a traditional demand for common carp. However, it is expected that the industry will diversify in the near future and expand production to higher value species such as European and African catfish and sturgeon.

Production: captures, aquaculture and commodities 1989-1998

In 1998 Hungarian production was 17 400 tonnes, representing a fall of nearly 50 percent since 1990. Aquaculture represents significant production, accounting for about 60 percent of total production in 1998. It is likely that any future increase in total production will be derived from the aquaculture sector, either through extending the area available for aquaculture activities or by increasing the yields per unit (GLOBEFISH, 1993).

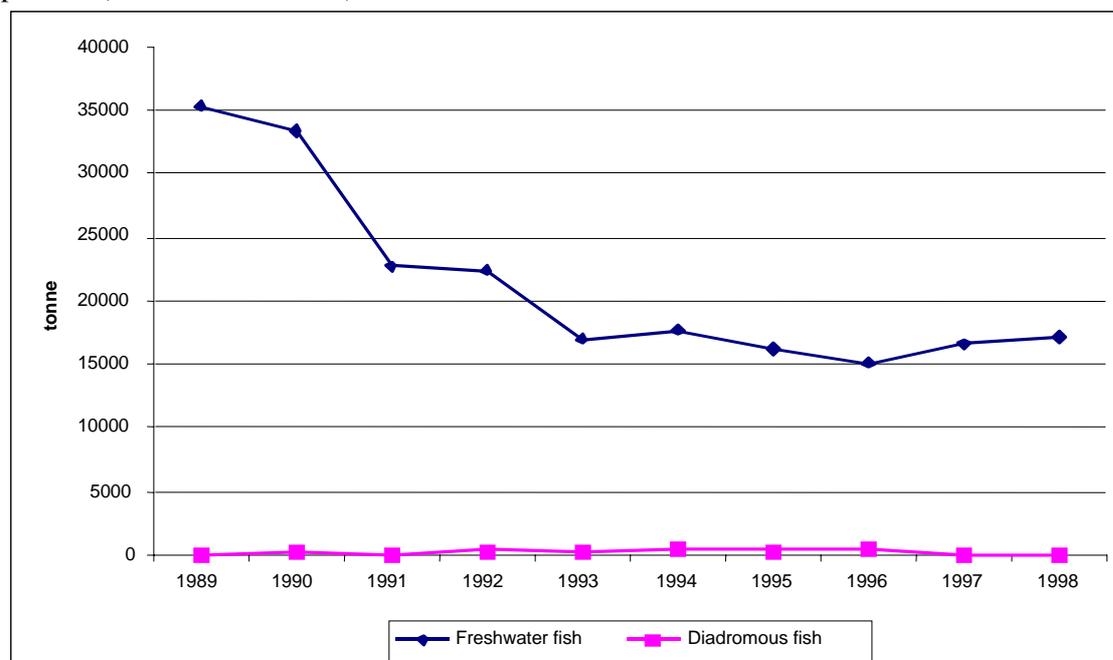


Figure 88: Hungary - Capture and aquaculture production 1989-1998

Captures

Hungary has an ancient tradition of freshwater fishing and in 1998 freshwater catches were approximately 7 000 tonnes. The main target species are carp and, to a lesser degree, bream, pike-perch, pike, European catfish, asp and wels (GLOBEFISH, 1993).

Table 464: Hungary - Captures by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	14969	16071	8314	8248	7623	7806	6903	7027	7282	6990	9123
Diadromous fish	0	151	126	421	263	501	411	579	124	182	276
Total gp of species	14969	16222	8440	8669	7886	8307	7314	7606	7406	7172	9399

Source: database

Aquaculture

Aquaculture recorded a fall during the 1990s as production decreased from 20 000 tonnes in 1989 to 10 000 tonnes in 1998. In the past, almost all ponds were managed either by state-owned farms or agricultural co-operatives but during the 1990s the ownership structure of farms changed and most were privatised. However, this privatisation brought with it some operational difficulties resulting from technical and financial problems and a resultant fall in production. The largest volume of cultivated production is made up by the common carp but there is also some production of rainbow trout, catfish and eel (FAO, 1996c).

Table 465: Hungary - Aquaculture by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	20317	17340	14348	14187	9489	9889	9355	8073	9321	10210	12253
Diadromous fish	185	159	9	4	3	6	5	4	10	9	39
Total gp of species	20502	17499	14357	14191	9492	9895	9360	8077	9331	10219	12292

Source: database

Commodities production

Food use commodities production has been stable in the past few years at a level of about 21 000 tonnes. Frozen fish is the main commodity produced in Hungary, followed by prepared/preserved products and fresh fish. Most of the production is composed of freshwater fish like carp.

Food use commodities production

Table 466: Hungary - FU Commodities Production by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish, fresh/chilled	na	na	3424	2344	2323	2765	2654	2654	2589	3453	2776
Fish, frozen	na	na	17098	17145	12413	10112	10421	9802	11158	9908	12257
Prepared/preserved fish	na	na	5699	5715	4965	8090	6253	5881	5579	7483	6208
Total FU Production	na	na	26221	25204	19701	20967	19328	18337	19326	20844	21241

Source: database

Table 467: Hungary - FU Commodities Production by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	20522	19489	14736	12877	13075	12456	13747	13361	15033
Marine fish, others	na	na	5699	5715	4965	8090	6253	5881	5579	7483	6208
Total FU Production	na	na	26221	25204	19701	20967	19328	18337	19326	20844	21241

Source: database

Non-food use commodities production

There is no industry for non-food use commodities in Hungary.

Non-food use: trade and net supply 1989-1998

The majority of domestic production is used for human consumption and therefore the industry for non-food use is mainly supplied by imports. From 1989 to 1998, the average volume of imports was 45 000 tonnes annually and the volume of exports was around 1 000 tonnes.

Non-food use imports

Table 468: Hungary - NFU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish/marine mammal, fat, oil	na	Na	265	858	1186	834	1264	600	0	381	673
Flour, meal unfit for human cons.	na	Na	33911	37294	37831	51654	58586	44708	42408	45125	43940
Total NFU Imports	na	Na	34176	38152	39017	52488	59850	45308	42408	45506	44613

Source: database

Table 469: Hungary - NFU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	na	na	33859	37294	37831	49780	58486	44540	42184	44820	43599

Marine fish, others	na	na	265	858	1186	2636	1352	687	134	580	962
Aquatic animals	na	na	52	0	0	73	12	81	90	107	52
Total NFU Imports	na	na	34176	38152	39017	52488	59850	45308	42408	45506	44613

Source: database

Non-food use exports

Non-food use exports are very limited and have experienced an erratic pattern during the last decade. As there is no domestic production, all exports consist of re-exportation.

Table 470: Hungary - NFU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Flour, meal unfit for human cons.	na	Na	6	56	78	1522	667	16	1404	3204	869
Total NFU Exports	na	Na	6	56	78	1522	667	16	1404	3204	869

Source: database

Table 471: Hungary - NFU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, pelagic, small	na	na	6	56	78	1454	269	0	1390	3167	803
Marine fish, others	na	na	0	0	0	35	389	0	0	22	56
Aquatic animals	na	na	0	0	0	33	9	16	14	15	11
Total NFU Export	na	na	6	56	78	1522	667	16	1404	3204	869

Source: database

Non-food use net supply

The pattern of the non-food use supply mostly follows the pattern of imports, as domestic production is nonexistent and exports are limited to small amounts of re-exportation.

Table 472: Hungary - NFU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Fish/marine mammal, fat, oil	na	na	265	858	1186	834	1264	600	0	381	673
Flour, meal unfit for human consumption	na	na	33905	37237	37753	50132	57919	44692	41004	41921	43070
Total NFU net supply	na	na	34170	38095	38939	50966	59183	45292	41004	42302	43744

Source: database

Table 473: Hungary - NFU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, pelagic, small	na	na	33853	37237	37753	48325	58217	44540	40794	41653	42797
Marine fish, others	na	na	265	858	1186	2601	963	687	134	557	906
Aquatic animals	na	na	52	0	0	40	3	65	76	92	41
NFU net supply	na	na	34170	38095	38939	50966	59183	45292	41004	42302	43744

Source: database

Market for human consumption

Trade

Between 1991 and 1998 Hungary imported annually an average of 21 000 tonnes of fisheries products, comprised mainly of frozen, marine fish. During the same period, fisheries annual exports were 3 000 t, mainly of fresh fish produced by the inland fishery. In terms of value, imports amounted to US\$42.7 million in 1995, while exports represented US\$7.2 million (FAO, 1996c). During the same year, Italy, Germany and Belgium were the main importers of Hungarian fish, accounting for 2 700 tonnes of live fish. These countries also imported small volumes of live eel and a wide range of species categorised as "other live fish" (FAO, 1996c).

Food use imports

Hungarian imports increased during the past decade from 17 000 tonnes in 1991 to 26 000 tonnes in 1998. Prepared/preserved commodities (canned marine fish and fish meat) are on average the major

Hungarian food use import, with 9 000 tonnes annually. Fish fillets and frozen fish come second with 5 500 tonnes and 5 000 tonnes respectively. The main species consist of small pelagic species such as herring, pilchard and mackerel.

Table 474: Hungary - FU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	na	na	0	2	5	2	6	21	74	39	19
Crus., mol. & other aquatic inv., prepared	na	na	4	29	67	121	63	65	64	138	69
Crustaceans	na	na	216	133	121	65	52	102	119	191	125
Fish, cured	na	na	19	81	61	18	13	12	35	51	36
Fish, fillets	na	na	2914	3755	4722	6613	7040	5248	6742	6652	5461
Fish, fresh/chilled	na	na	502	2310	2906	1176	1248	1206	1362	987	1462
Fish, frozen	na	na	1709	3902	4683	5679	4362	5238	5196	6211	4622
Molluscs	na	na	23	57	72	87	78	69	296	151	104
Prepared/preserved fish	na	na	12010	5914	5661	8447	8006	8009	9954	11964	8746
Total FU Imports	na	na	17398	16182	18300	22207	20867	19971	23842	26384	20644

Source: database

Table 475: Hungary - FU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	483	2007	2832	797	473	567	494	51	963
Diadromous fish	na	na	113	220	175	555	1772	395	446	443	515
Marine fish, pelagic, tunas	na	na	41	173	266	390	207	208	448	732	308
Marine fish, pelagic, small	na	na	3348	3452	3278	4712	6023	6207	6437	8425	5235
Marine fish, demersal	na	na	12	123	231	151	614	2577	2076	3950	1217
Marine fish, others	na	na	13158	9987	11252	15327	11580	9759	13387	12264	12089
Crustaceans	na	na	216	133	121	65	52	102	119	191	125
Molluscs	na	na	23	64	29	69	61	134	360	289	129
Cephalopods	na	na	0	2	5	2	6	21	74	39	19
Aquatic animals	na	na	4	22	111	139	80	0	0	0	44
Total FU Imports	na	na	17398	16182	18300	22207	20867	19971	23842	26384	20644

Source: database

Food use exports

As domestic production is very limited and re-exportations are unusual, Hungarian food use exports annually amounted to 3 000 tonnes on average between 1991 and 1998. The main Hungarian exports consisted of fresh fish; mostly carp exported live to Germany, Italy and Belgium.

Table 476: Hungary - FU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Crus., mol. & other aquatic inv., prepared	na	na	na	na	0	0	2	0	0	0	0
Crustaceans	na	na	89	79	5	6	13	0	0	0	24
Fish, fillets	na	na	0	0	5	1	1	0	0	44	6
Fish, fresh/chilled	na	na	2801	2107	1692	2761	2947	3247	2796	4209	2820
Fish, frozen	na	na	692	147	10	224	99	32	0	48	157
Molluscs	na	na	2	22	7	20	41	21	56	105	34
Prepared/preserved fish	na	na	18	28	30	39	15	16	101	95	43
Total FU Exports	na	na	3601	2383	1750	3051	3119	3316	2953	4501	3084

Source: database

Table 477: Hungary - FU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	3454	2076	1672	2651	2624	2966	2485	3949	2735
Diadromous fish	na	na	38	95	31	163	405	281	103	165	160
Marine fish, pelagic, small	na	na	7	26	25	21	8	0	0	0	11

Marine fish, others	na	na	11	85	10	190	25	48	309	283	120
Crustaceans	na	na	89	79	5	6	13	0	0	0	24
Molluscs	na	na	2	2	6	19	41	21	56	105	32
Aquatic animals	na	na	0	20	1	1	2	0	0	0	3
Total FU Export	na	na	3601	2383	1750	3051	3119	3316	2953	4501	3084

Source: database

Food use net supply and consumption

Fish consumption in Hungary is quite low by European standards but has increased four-fold since 1950. Between 1991 and 1998, the net supply was 39 000 tonnes annually. Frozen fish was usually the main commodity of the net supply during the past decade with 17 000 tonnes annually, but in 1998 prepared/preserved products (canned pelagic and fish meat) became the leading commodity consumed in Hungary with 19 000 tonnes. For the same year frozen fish consumption was 16 000 tonnes. Fish fillets came next with 7 000 tonnes.

Table 478: Hungary - FU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Cephalopods	na	na	0	2	5	2	6	21	74	39	19
Crus., mol. & other aquatic inv., prepared	na	na	4	29	67	121	61	65	64	138	69
Crustaceans	na	na	127	54	116	59	38	102	119	191	101
Fish, cured	na	na	19	81	61	18	13	12	35	51	36
Fish, fillets	na	na	2914	3755	4717	6612	7039	5248	6742	6608	5454
Fish, fresh/chilled	na	na	1126	2547	3537	1180	955	613	1155	231	1418
Fish, frozen	na	na	18115	20899	17086	15567	14684	15007	16354	16071	16723
Molluscs	na	na	21	35	65	66	36	48	240	45	70
Prepared/preserved fish	na	na	17691	11601	10596	16498	14243	13874	15432	19352	14911
Total FU net supply	na	na	40017	39003	36251	40123	37076	34992	40215	42727	38800

Source: database

Table 479: Hungary - FU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	na	na	17550	19420	15897	11023	10925	10057	11756	9464	13262
Diadromous fish	na	na	75	124	144	393	1367	114	343	278	355
Marine fish, pelagic, tunas	na	na	41	173	266	390	207	208	448	732	308
Marine fish, pelagic, small	na	na	3341	3426	3253	4691	6015	6207	6437	8425	5224
Marine fish, demersal	na	na	12	123	231	151	614	2577	2076	3950	1217
Marine fish, others	na	na	18846	15616	16206	23227	17808	15591	18657	19464	18177
Crustaceans	na	na	127	54	116	59	38	102	119	191	101
Molluscs	na	na	21	62	22	49	20	113	304	183	97
Cephalopods	na	na	0	2	5	2	6	21	74	39	19
Aquatic animals	na	na	4	2	110	138	77	0	0	0	41
FU net supply	na	na	40017	39003	36251	40123	37076	34992	40215	42727	38800

Source: database

For 1997 consumption per capita was 4 kg, while fish accounted for approximately 3 percent of the total animal protein consumed daily (FAO, 1999b). Consumption varies regionally within Hungary, with the highest level in the southern part of the country around the Danube and Tisza River, and consumption varies seasonally, with the traditional Christmas market now joined by a second peak in demand during the summer tourist season (FAO, 1996c).

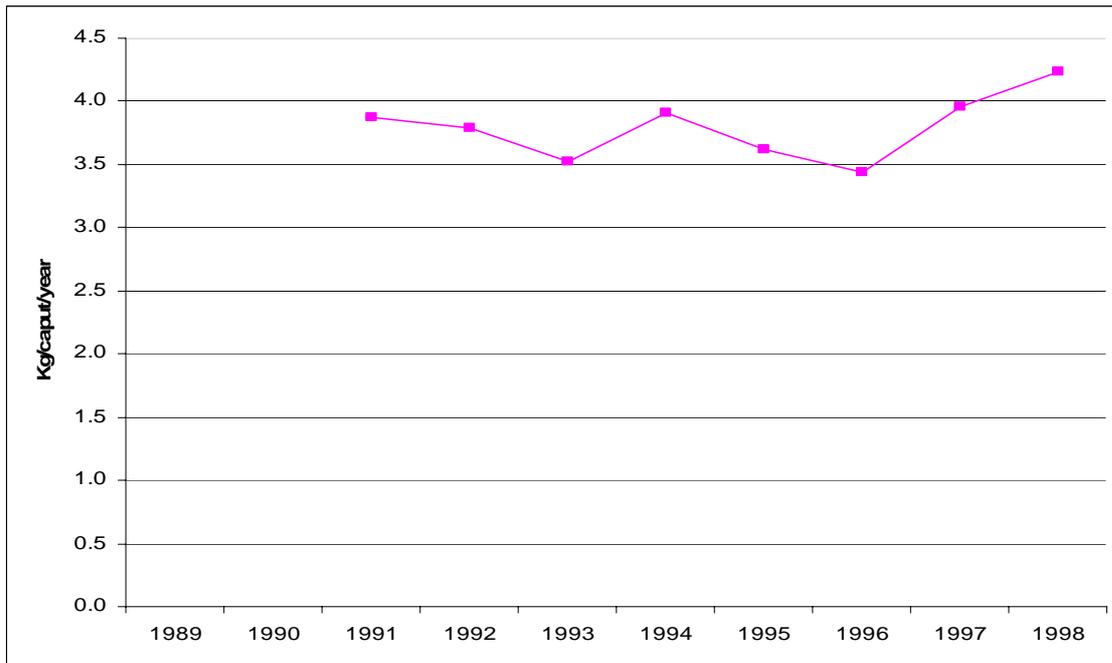


Figure 89: Fish consumption per capita per year in Hungary 1989-1998

In recent years, the technical and production problems initially encountered by the aquaculture industry during the process of privatisation have had some effects on prices and sales. Production costs for common carp, for instance, rose quite steeply in 1997 and resulted in price increases at the retailer. Sales of carp fell by 30 percent that year as consumers switched to farmed catfish, available at similar price but considered superior in quality (Rudiger, 1998).

Finally, government bodies have the responsibility and remit to promote fisheries products in Hungary. The Game and Fishery Department of the Ministry of Agriculture is responsible for all aspects of the fisheries sector while the Fishery Product Board co-ordinates marketing. One of the stated aims of the government is to increase consumption of fish and raise its status within the national diet whilst encouraging product diversification and increased output to cater for increased demand, particularly in tourist areas (European Parliament, 1998).

The main species consumed in Hungary are carps, catfish, pike-perch and eel for the freshwater fish, while herring, pilchards, hake and tuna are the most important marine fish.

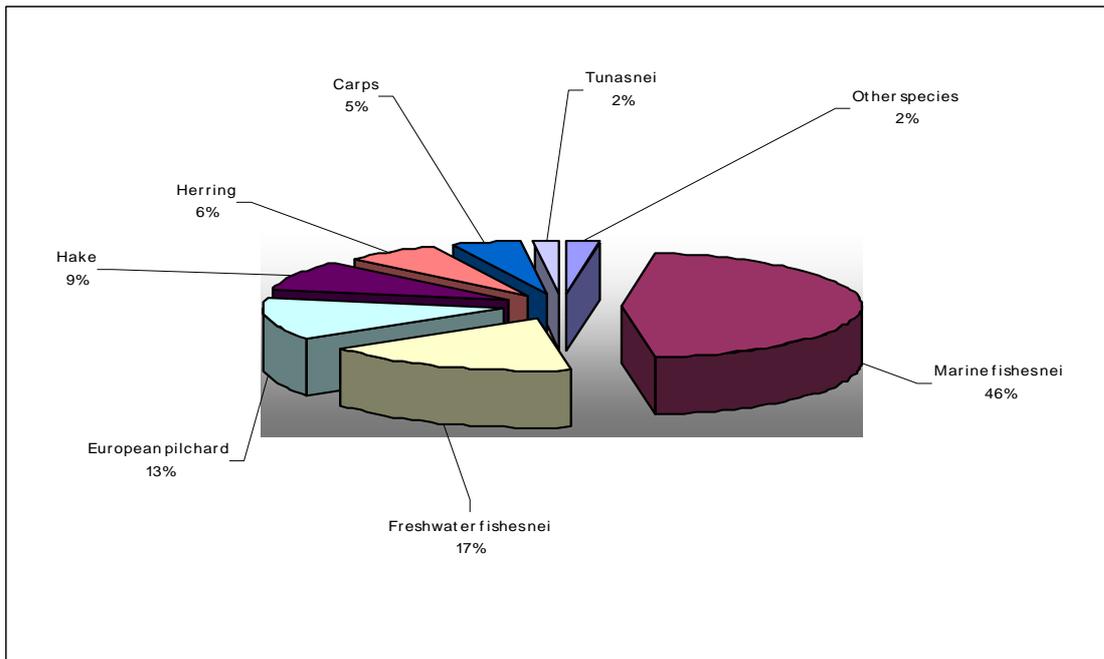


Figure 90: Hungary - Main species consumed in 1998

Assumptions for projection 2005-2030 and main results

Consumption trends for the OECD group of products form the basis of the model's assumptions (see methodology in Part 1 of the study). Further assumptions regarding production, imports and exports and the need for fish in Hungary between 2005 and 2030 take into account and extrapolate previous trends.

Hungary's main consumption trends for the period 2005-2030 assume:

- An increase in demand for cephalopods and prepared/preserved products (100 percent) and to a lesser extent, for cured fish (50 percent), crustaceans (40 percent) and molluscs prepared (20 percent). Frozen fish consumption only increases by 5 percent on the whole period.
- A decrease in demand for raw molluscs (30 percent).
- A stagnation of the demand for all other commodities groups.

The economic development of the country will increase overall Hungarian fish consumption, as seafood consumption has previously been limited to the more economically developed regions (Szucs, 2000).

Still, the gap between the rich and poor in Hungary is widening and the less fortunate tend not to shop at large commercial retailers. At the same time, disposable income for the top strata of society has expanded rapidly and these consumers are adopting consumption patterns similar those found in wealthy western European countries. Demand is on the rise for frozen fish, particularly breaded products (found under the prepared group of products), and the more expensive restaurant cuts, (Nemes, 2002).

Another trend will direct consumers away from their traditional pattern of consumption (freshwater products are expected to stagnate) towards more convenient fish preparations, reflected here by the increase in prepared/preserved products.

Table 480: Hungary - Assumptions for projection

OECD group	94-98% annual %	Prod % 99-30	T Imp % 99-30	T Exp % 99-30	T Cons 99-30	T Prod Annual	% Imp Annual	% Exp Annual	Cons % Annual
Cephalopods	309%	62%	0%	100%	0%	100%		2.2%	2.2%
Crus., mol. & other aquatic inv., prepared	15%	3%	0%	20%	0%	20%		0.6%	0.6%
Crustaceans	113%	23%	0%	40%	0%	40%		1.1%	1.1%
Fish, cured	106%	21%	0%	50%	0%	50%		1.3%	1.3%
Fish, fillets	1%	0%	0%	0%	0%	0%		0.0%	0.0%
Fish, fresh/chilled	-63%	-13%	0%	0%	0%	0%	0.0%	0.0%	0.0%
Fish, frozen	3%	1%	0%	12%	0%	5%	0.0%	0.4%	0.1%
Molluscs	-142%	-28%	0%	-10%	0%	-30%		-0.3%	-0.8%
Prepared/preserved fish	27%	5%	0%	162%	0%	100%	0.0%	3.1%	2.2%
Fish/marine mammal, fat, oil	-79%	-16%	0%	0%	0%			0.0%	0.0%
Flour, meal unfit for hum. Cons.	-17%	-3%	0%	0%	0%			0.0%	0.0%

Source: database

Hungarian fish production will decline due to decreasing outputs in the aquaculture sector. Imports of fish products, especially marine species, will rise to compensate for the increased demand and low domestic supply, while exports will remain stable as no production surplus will be available.

Table 481: Hungary - Main results for projection

Nature	Average 94-98	2005	2010	2015	2020	2025	2030
Exports FU (t live wt)	3388	4501	4501	4501	4501	4501	4501
Imports FU (t live wt)	22654	29374	31909	34837	38221	42136	46667
Production FU (t live wt)	19760	20844	20844	20844	20844	20844	20844
Fish supply FU (t live wt)	39026	45717	48251	51179	54564	58478	63009
Population (X1000)	10186	10149	10184	10219	10254	10289	10325
Per caput supply (kg/h)	4	5	5	5	5	6	6
Production NFU (t live wt)							
Imports NFU (t live wt)	49112	45506	45506	45506	45506	45506	45506
Exports NFU (t live wt)	1363	3204	3204	3204	3204	3204	3204
Net supply NFU (t live wt)	47749	42302	42302	42302	42302	42302	42302
Aquaculture (t live wt)	9376	7300	6049	5245	4750	4470	4341
Capture (t live wt)	7561	7561	7561	7561	7561	7561	7561
Production total (t live wt)	16937	14861	13610	12806	12311	12031	11902

Source: database

Food use net supply and human consumption 2005-2030

As neither production nor exports of food use commodities are expected to vary, the Hungarian food use net supply pattern will reflect the pattern of the imports. Consumption of prepared/preserved commodities and frozen fish increase, while fresh fillet net supply remains constant. Cephalopods and crustaceans are also on the increase.

Table 482: Hungary - FU net supply by OECD group of commodities 2005-2030 (t live weight)

Gp of commodities	Ave. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	28	45	51	56	63	70	78
Crus., mol. & other aquatic inv., prepared	90	144	148	152	157	161	166
Crustaceans	102	206	217	229	241	254	268
Fish, cured	26	56	60	64	68	72	77
Fish, fillets	6450	6608	6608	6608	6608	6608	6608
Fish, fresh/chilled	827	231	231	231	231	231	231
Fish, frozen	15537	16227	16340	16456	16574	16694	16816
Molluscs	87	42	40	38	36	34	31
Prepared/preserved fish	15880	22158	24557	27346	30587	34355	38735
Total FU net supply	39026	45717	48251	51179	54564	58478	63009

Source: database

Net supply increases, especially for marine species, more specifically herring, pilchard and mackerel for small pelagic species; hake for demersal species; shrimp for crustaceans and rainbow trout for diadromous fish. Freshwater species consumption will stagnate as consumer tastes are redirected towards marine species and especially the more convenient seafood preparations.

Table 483: Hungary - FU net supply by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	10645	9464	9464	9464	9464	9464	9464
Diadromous fish	499	306	328	354	383	416	453
Marine fish, pelagic, tunas	397	903	1050	1220	1419	1649	1917
Marine fish, pelagic, small	6355	10245	11798	13602	15696	18129	20955
Marine fish, demersal	1874	4050	4122	4195	4270	4347	4424
Marine fish, others	18949	20312	21034	21868	22835	23955	25253
Crustaceans	102	206	217	229	241	254	268
Molluscs	134	186	188	190	192	195	197
Cephalopods	28	45	51	56	63	70	78
Aquatic animals	43	0	0	0	0	0	0
FU net supply	39026	45717	48251	51179	54564	58478	63009

Source: database

As the Hungarian net supply will grow by 47 percent until 2030, while its population will only increase by 2%, consumption per capita will increase from 4 kg per capita per year in 1998 to 6 kg per capita per year in 2030. In 2000, about 70 percent of the fish was sold and consumed in the more economically developed regions of the country, i.e. Budapest and Trans-Danubia (Szucs, 2000). It is therefore expected that the overall economic development of the country will broaden the geographic fish consumption as well as increase fish consumption in the regions that already consume fish. This trend will also direct consumers away from their traditional pattern of consumption (carp products) towards more convenient fish preparations.

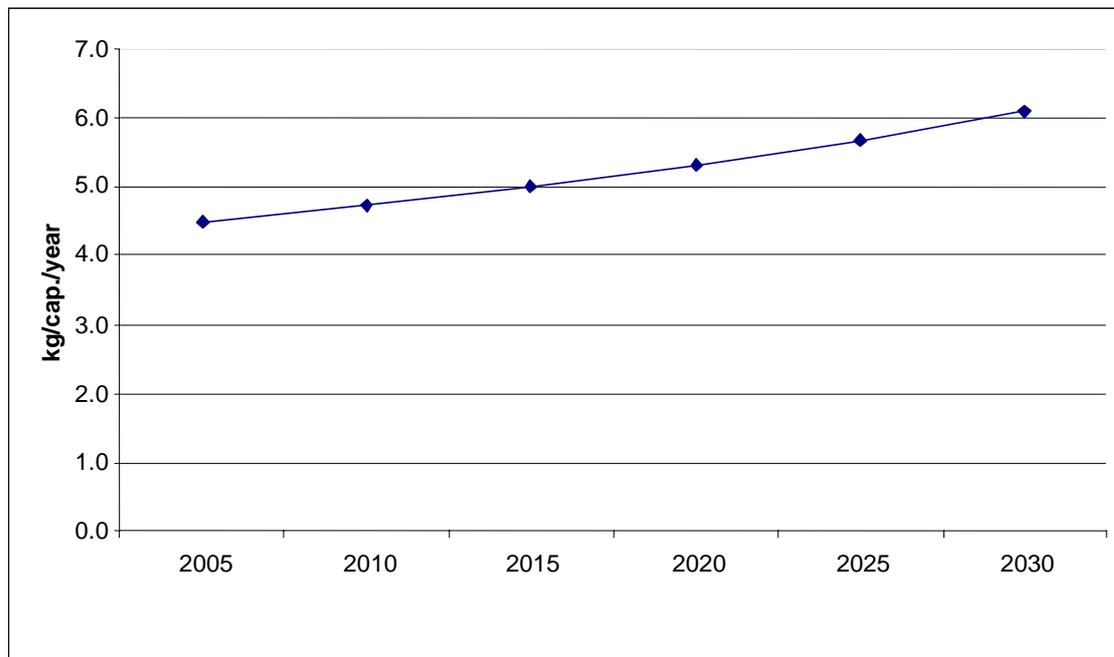


Figure 91: Fish consumption per capita per year in Hungary 2005-2030

The share of fresh water fish diminishes from 22% in 1998 to 15% in 2030. Pilchards increase drastically from 13% to 23%, while herring and hake increase more slowly.

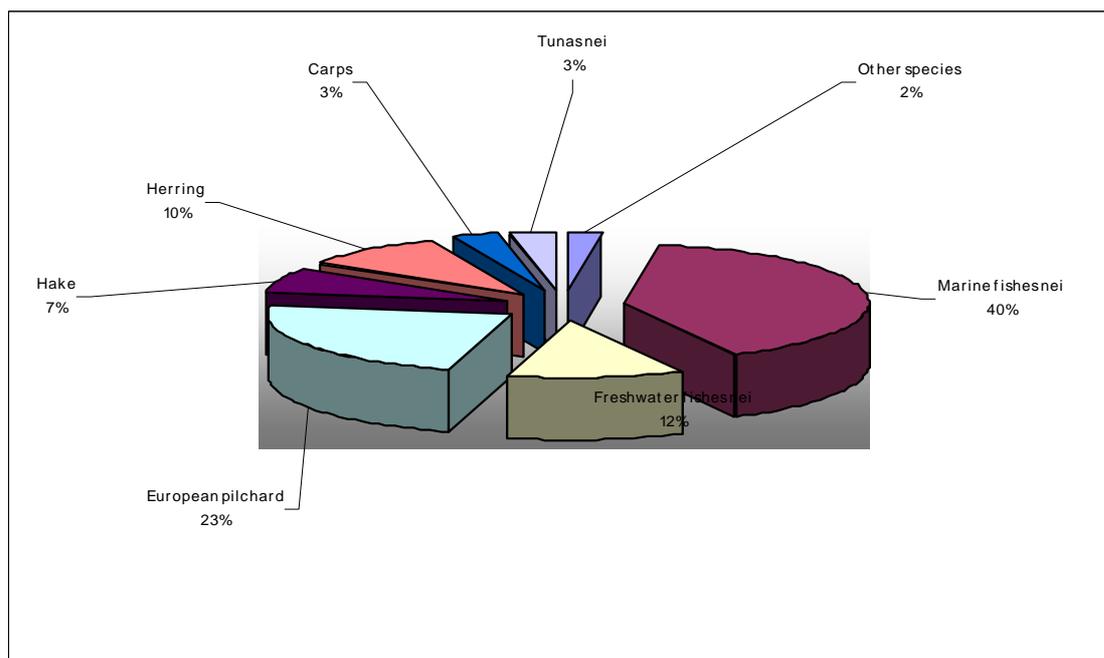


Figure 92: Hungary - Main species consumed in 2030

Non-Food use net supply 2005-2030

There will be no significant change in the Hungarian non-food use net supply, as production, imports and exports of non-food use commodities will not vary.

Production 2005-2030

Capture and aquaculture

Total Hungarian production will decline to reach 12 000 tonnes by 2030 as, aquaculture production will decline by 40 percent during the period, while capture fisheries will remain stable around 8 000 tonnes. As most of the aquaculture sector is turned toward freshwater species production (mostly carp), Hungarian production is expected to decrease along with the decreasing domestic demand for these products (see below). Furthermore, this market problem combined with the increasing competition for natural resources (of which water is one of the most critical) and the increasingly stringent environmental standards create a very difficult situation for the pond fish production sector in Hungary (Varadi, 2000).

Table 484: Hungary - Aquaculture by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	9370	7291	6040	5236	4741	4461	4332
Diadromous fish	7	9	9	9	9	9	9
Total	9376	7300	6049	5245	4750	4470	4341

Source: database

Table 485: Hungary - Total production by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	16571	14493	13241	12438	11943	11662	11534
Diadromous fish	366	368	368	368	368	368	368
Total	16937	14861	13610	12806	12311	12031	11902

Source: database

Commodities

Commodities production will not undergo major changes over the period considered with Hungarian plants still producing 21 000 tonnes by 2030, as Hungarian processing plants are dated as regards their

production range as well as their technical and technological level. They are mostly focussed on the domestic market, where they only partly meet customers' requirements and are heavily influenced by the seasonality of Hungarian fish consumption (peak in carp consumption around the Christmas period) (Szucs, 2000). So, along with the stagnating demand for these traditional products, scope for development of Hungarian production is very limited. In addition, the majority of the plants do not meet the EU food hygienic standards, which limits exports possibilities.

Trade 2005-2030

Imports

Imports of food use commodities will increase as domestic production will decrease and is anyway too low to supply the domestic market. Prepared/preserved products imports increase to represent 66 percent of all Hungarian imports by 2030. They mostly consist of canned products, fish meat and other fish preparations. Frozen fish imports also increase but much more slowly, while fillets imports remain stable. Crustaceans and cephalopods especially will experience some bigger increases but volumes remain quite low.

Table 486: Hungary - FU Commodities Imports by OECD group of products 2005-2030 (t live weight)

Gp of commodities	Av. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	28	45	51	56	63	70	78
Crus., mol. & other aquatic inv., prepared	90	144	148	152	157	161	166
Crustaceans	106	206	217	229	241	254	268
Fish, cured	26	56	60	64	68	72	77
Fish, fillets	6459	6652	6652	6652	6652	6652	6652
Fish, fresh/chilled	1196	987	987	987	987	987	987
Fish, frozen	5337	6367	6480	6596	6714	6834	6956
Molluscs	136	147	145	143	141	139	137
Prepared/preserved fish	9276	14770	17169	19958	23199	26967	31347
Total FU Imports	22654	29374	31909	34837	38221	42136	46667

Source: database

The main species imported will consist mostly of marine fish, more specifically herring, pilchard and mackerel for small pelagic species; hake for demersal species; shrimp for crustaceans and rainbow trout for diadromous fish.

Table 487: Hungary - FU Commodities Imports by FAO group of species 2005-2030 (t live weight)

Gp Species	Av. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	477	51	51	51	51	51	51
Diadromous fish	722	470	493	519	547	580	617
Marine fish, pelagic, tunas	397	903	1050	1220	1419	1649	1917
Marine fish, pelagic, small	6361	10245	11798	13602	15696	18129	20955
Marine fish, demersal	1874	4050	4122	4195	4270	4347	4424
Marine fish, others	12463	13112	13834	14669	15635	16755	18054
Crustaceans	106	206	217	229	241	254	268
Molluscs	182	291	293	295	298	300	303
Cephalopods	28	45	51	56	63	70	78
Aquatic animals	44	0	0	0	0	0	0
Total FU Imports	22654	29374	31909	34837	38221	42136	46667

Source: database

Exports

Exports will remain constant at their 1998 level of 4 500 tonnes.

POLAND

Poland underwent an extended period of economic transition in the 1990's and the fisheries sector is still adapting to new patterns of production, distribution and trade (Anthonisen, 2001). Since the disintegration of the centrally planned system of fisheries management and administration (the "Union of Fishery Economy"), activity within the fishery sector has been decentralised and a process of privatisation has taken place. The transition to a modern and privatised industry has been rapid and largely successful. Long-term planning has been secured by the extension of contract agreements between the new Polish firms and other countries. Both sea and inland fisheries and their associated industries remain very important sectors within the national economy, providing considerable national revenue through exports and a crucial source of employment for tens of thousands.

However, despite Poland's marine and inland production, fish consumption appears low in relation to demand. Fresh marine products are rarely available to consumers inland, for instance, and it is hoped that consumption will continue to grow in the future as distribution and marketing channels are further developed and modernised. The population of Poland is approximately 39 millions inhabitants.

Production: captures, aquaculture and commodities 1989-1998

The total volume of fisheries production decreased from 540 000 tonnes in 1989 to 250 000 tonnes in 1998, mainly due to a fall in catches. The production derived from aquaculture remained quite stable during the 1990s and accounted for approximately 10 percent of the total in 1998.

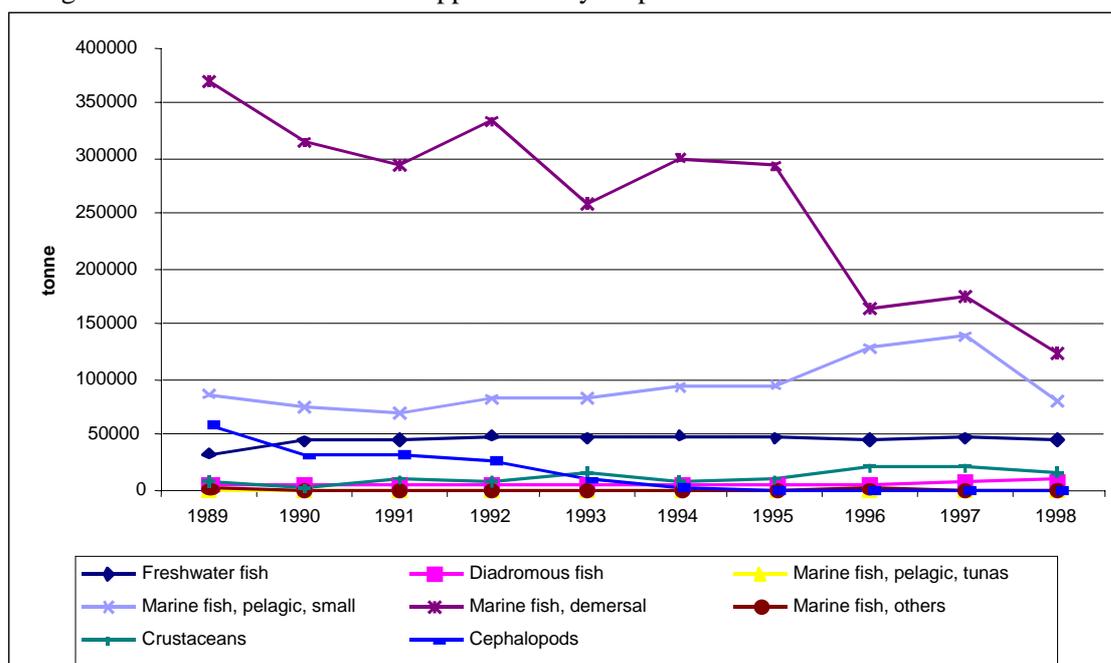


Figure 93: Poland - Capture and aquaculture production 1989-1998

Captures

The Polish marine fishery can be divided into three main sectors: the boat or coastal fishery in the EEZ, the cutter fishery in the Baltic Sea and to a lesser extent in the Northeast Atlantic, and the high-seas fishery beyond the EEZ. The combined catch of the fleets was around 250 000 tonnes in 1998.

Table 488: Poland - Captures by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	11170	21387	20504	22720	33236	29430	27214	24361	25812	25293	24113
Diadromous fish	1326	1539	1495	1605	1587	1498	975	987	1026	1149	1319
Marine fish, pelagic, tunas	0	0	0	0	0	0	0	225	39	0	26
Marine fish, pelagic, small	86866	75727	69191	82991	84533	93667	94916	127692	138842	80963	93539
Marine fish, demersal	369887	314899	293826	333307	258796	300042	292737	164992	175372	123121	262698
Marine fish, others	830	140	59	109	104	194	727	2303	781	125	537
Crustaceans	7798	1275	9571	8607	15912	7915	9384	20610	19980	16296	11735
Cephalopods	60655	31568	33230	26232	10232	2983	282	1	0	19	16520
Total gp of species	538532	446535	427876	475571	404400	435729	426235	341171	361852	246966	410487

Source: database

Despite its ageing vessels and slight declines in landings in recent years, the high-seas fleet still provides the majority of Polish catches. However, this fleet has been declining since 1990 and its contribution to national landings has decreased from 320 000 tonnes in 1990 to 94 000 tonnes in 1999 (FAO, 2001a). Since the end of the 1980s, the Polish high-seas fishery has been very reliant on catches of Alaska pollock caught in the waters of the Bering and Okhotsk Seas. In 1998, this species constituted more than 70 percent of total high-seas fishery catches.

Still, the number of trawlers decreased by two thirds between 1990 and 1998 due to both the limited access of Polish high seas vessels to fishing grounds and the process of adaptation and privatisation since 1989. In addition, during the 1990s catches from high-seas fishery decreased by two thirds to 100 000 tonnes. Despite this decline, the share of this sector in domestic market supplies remains considerable at about 40-50 percent (1997-1998).

During this period, the cutter fishery in the Baltic Sea targeted mainly herring and cod with the later representing in excess of 70 percent of landed value. Sprat, herring, salmon and trout are other commercial species also landed by the cutter fleet. Catches from the coastal fishery (defined as an artisanal fishery) include cod, herring and flatfish, and the remaining species were freshwater and diadromous species (FAO, 2001a).

Poland is one of Europe's main producers of freshwater fish and commercial inland fishing accounted for 51 000 tonnes of landed fish in 1995. The predominant inland species are carp and trout and, to a lesser extent, freshwater bream, perch and pike (Rudiger, 1998).

Aquaculture

Poland possesses about 60 000 hectares of lakes and ponds that are under fish cultivation. In 1998, the volume of aquaculture production was 30 000 tonnes. The principal cultivated species is carp but trout comprises about a third of production. This share is expected to rise in coming years as demand increases (Gorbaczow, 2000). Freshwater fish landings by anglers from lakes, reservoirs and rivers may be as high as 45 000 tonnes (FAO, 2001a).

Table 489: Poland - Aquaculture by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	22224	22400	25500	26050	14300	20300	20120	21900	21200	20677	21467
Diadromous fish	3727	4000	4000	4150	4309	4200	4991	5800	7480	9114	5177
Total gp of species	25951	26400	29500	30200	18609	24500	25111	27700	28680	29791	26644

Source: database

Commodities production

Food use commodities production

The main Polish food use commodities are fish fillets and prepared/preserved fish (canned pelagic). These two products represent on average 50 percent of total Polish food use commodities production.

Production of cephalopods, important at the beginning of the decade, has nearly disappeared in 1998 due to the reorganisation of the Polish distant water fishing fleet.

Polish production has experienced a sharp drop in 1998, with a decrease of around 130 000 tonnes in a year. This was due to a decrease in production of cured fish by 50%, fish fillets by 40%, fresh/chilled fish by more than 50 percent and prepared/preserved fish by 25 percent of. These declines were triggered by the collapse of the traditional eastern markets in the aftermath of the Russian crisis of 1998-1999 (Eurofish, 2003).

Table 490: Poland - FU Commodities Production by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	61353	35118	35325	39876	16543	4543	261	2	0	14	19304
Crustaceans	4822	1991	6540	12010	2676	5253	8025	12322	16489	16406	8653
Fish, cured	77270	53774	54940	69710	59133	65269	87522	55783	67746	37315	62846
Fish, fillets	105290	121657	117889	134556	107564	131850	123878	97531	80743	51535	107249
Fish, fresh/chilled	2212	2352	2344	28645	22113	47200	38360	47613	66390	25670	28290
Fish, frozen	132716	112094	89054	88572	80271	78795	56014	41058	45003	44263	76784
Molluscs	0	0	0	456	453	654	765	654	456	654	409
Prepared/preserved fish	88756	64121	71490	96114	93650	97181	109605	114815	121319	93350	95040
Total FU Production	472419	391106	377583	469939	382403	430745	424431	369780	398146	269207	398576

Source: database

The main species involved in the production of food use commodities are herring, sprats and mackerels for the small pelagic species, cod and pollock for the demersal species and krill for the crustaceans.

Table 491: Poland - FU Commodities Production by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	0	0	0	0	0	0	0	0	6441	5914	1236
Marine fish, pelagic, small	91407	65218	55875	78341	75188	77744	139766	83779	132741	93202	89326
Marine fish, demersal	664	314	312	300	535	525	3366	924	0	0	694
Marine fish, others	314173	288466	279531	338956	287008	342025	272247	272098	242019	153017	278954
Crustaceans	4822	1991	6540	12010	2676	5253	8025	12322	16489	16406	8653
Molluscs	0	0	0	456	453	654	765	654	456	654	409
Cephalopods	61353	35118	35325	39876	16543	4543	261	2	0	14	19304
Total FU Production	472419	391106	377583	469939	382403	430745	424431	369780	398146	269207	398576

Source: database

Non-food use commodities production

The overall trend in Polish production of NFU commodities is decreasing, in line with the declining market worldwide. Average production was around 70 000 tonnes per year for the period 1989-1998.

Table 492: Poland - NFU Commodities Production by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish/marine mammal, fat, oil	829	580	603	0	0	0	0	0	7	50	207
Flour, meal unfit for human cons.	91235	81249	79190	86285	66284	75219	62001	43555	64869	51955	70184
Total NFU Production	92064	81829	79793	86285	66284	75219	62001	43555	64876	52005	70391

Source: database

Table 493: Poland - NFU Commodities Production by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	0	0	0	0	0	0	0	0	24133	14870	3900
Marine fish, demersal	71485	63582	62060	69915	56190	61479	49293	33735	33425	32456	53362
Marine fish, others	20578	18247	17733	16371	10094	13741	12708	9820	7318	4679	13129
Total NFU Production	92064	81829	79793	86285	66284	75219	62001	43555	64876	52005	70391

Source: database

Non-food use: trade and net supply 1989-1998

Non-food use imports

Non-food use imports have been decreasing steadily for the past decade from 15 000 tonnes in 1990 to 2 800 tonnes in 1998. The sharp drop experienced between 1989 and 1990 (a decrease of around 90 000 tonnes) was linked with the breakdown of the economy in the former USSR and the following disappearance of traditional commercial partners.

Table 494: Poland - NFU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish/marine mammal, fat, oil	24291	7614	13800	3255	567	855	1647	2149	1799	368	5635
Flour, meal unfit for human cons.	77880	7200	3600	4891	8038	5259	2902	2027	3185	2408	11739
Total NFU Imports	102171	14814	17400	8146	8604	6114	4549	4176	4984	2776	17374

Source: database

Table 495: Poland - NFU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	77880	7200	3600	4891	8038	4552	2150	1865	3185	2408	11577
Marine fish, others	24291	7614	13800	3255	567	855	1647	2149	1799	368	5635
Aquatic animals	0	0	0	0	0	707	751	163	0	0	162
Total NFU Imports	102171	14814	17400	8146	8604	6114	4549	4176	4984	2776	17374

Source: database

Non-food use exports

Non-food use exports from Poland have followed quite an erratic pattern during the last decade. They start at 7 000 tonnes in 1989, drop to 3 000 tonnes two years later, recover to 6 500 tonnes in 1993, drop again in 1995 to 2 000 tonnes and rise dramatically in 1997 to 20 000 tonnes.

Table 496: Poland - NFU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Flour, meal unfit for human cons.	6793	6000	3000	3977	6535	4416	2940	1845	20345	12421	6827
Total NFU Exports	6793	6000	3000	3977	6535	4416	2940	1845	20345	12421	6827

Source: database

Table 497: Poland - NFU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	6793	6000	3000	3977	6535	3700	1748	1516	20345	12323	6594
Marine fish, others	0	0	0	0	0	441	924	309	0	98	177
Aquatic animals	0	0	0	0	0	274	268	20	0	0	56
Total NFU Export	6793	6000	3000	3977	6535	4416	2940	1845	20345	12421	6827

Source: database

Non-food use net supply

The non-food use net supply reflects the fact that most of Poland's production is consumed locally, with only a small share going for the export markets (7 000 tonnes on average).

Net supply has been decreasing steadily over the period covered, which reflects both a fall in production and imports.

Table 498: Poland - NFU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Fish/marine mammal, fat, oil	25120	8194	14403	3255	567	855	1647	2149	1806	418	5841
Flour, meal unfit for human consumption	162322	82449	79790	87200	67787	76062	61963	43737	47709	41942	75096
Total NFU net supply	187442	90643	94193	90455	68354	76917	63610	45886	49515	42360	80937

Source: database

Table 499: Poland - NFU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, pelagic, small	71087	1200	600	915	1503	851	402	349	6973	4956	8883
Marine fish, demersal	71485	63582	62060	69915	56190	61479	49293	33735	33425	32456	53362
Marine fish, others	44869	25861	31533	19626	10661	14155	13431	11660	9118	4949	18586
Aquatic animals	0	0	0	0	0	433	484	143	0	0	106
NFU net supply	187442	90643	94193	90455	68354	76917	63610	45886	49515	42360	80937

Source: database

Market for human consumption

Trade

Food use imports

Polish imports have been increasing in the past few years after having experienced a decline in the early 1990s. Between 1989 and 1998, Poland imported around 230 000 tonnes annually, mostly from Norway (50 percent of all fish imports in 1996 (Aquirre and Russek, 1999)) and to a lesser degree from Russia. In terms of value, Polish imports amounted to PLN 846 million in 1997 (OECD, 2000). Frozen fish (125 000 tonnes) and fish fillets (48 000 tonnes) are usually the leading Polish imports during the period considered. Imports of frozen fish are mostly made of pelagic species such as mackerels and herrings, while Alaska pollock and hake form the bulk of fish fillets imports. Prepared/preserved also form a significant share of the imports and are mostly made up of herring.

Poland is one of the principal importers of herring in Central and Eastern Europe where this fish has maintained its popularity and represents in excess of 50 percent of imports by volume (Aquirre and Russek, 1999). The majority of imports consist of raw and semi-processed material intended for further processing in Poland (Anon., 1999e). Around two-thirds of the raw material processed by Polish enterprises comes from overseas (FAO, 2001a), mostly from Norway, Russia, Argentina and Canada (Aquirre and Russek, 1999).

Table 500: Poland - FU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	0	0	0	0	0	0	98	82	207	301	69
Crus., mol. & other aquatic inv., prepared	0	0	0	675	345	411	601	879	368	698	398
Crustaceans	0	0	0	250	9896	10238	10803	7711	6315	6005	5122
Fish, cured	13471	8841	8210	8068	4992	5411	6304	5491	3870	1626	6628
Fish, fillets	0	0	0	11634	22253	154215	129209	41523	34801	84344	47798
Fish, fresh/chilled	0	0	0	4713	9039	9426	9688	25303	26721	12775	9766
Fish, frozen	170202	132458	87193	96673	80100	125514	122339	120812	149531	165085	124991
Molluscs	0	0	0	0	0	154	193	33	102	156	64
Prepared/preserved fish	30447	25738	2996	8132	4304	18785	19124	96031	97993	85746	38930
Total FU Imports	214120	167037	98399	130145	130929	324154	298359	297866	319908	356736	233765

Source: database

Table 501: Poland - FU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	0	0	0	2519	3495	2866	3736	2209	1861	8460	2515
Diadromous fish	0	0	0	2553	1421	2681	2893	2050	4269	8740	2461
Marine fish, pelagic, tunas	0	0	0	1056	1979	1642	2341	2925	3670	2044	1566
Marine fish, pelagic, small	0	0	0	77305	59367	225556	225244	117502	129376	155177	98953
Marine fish, demersal	0	0	0	6802	7015	67951	43244	15967	15387	86696	24306
Marine fish, others	214120	167037	98399	38986	47410	12655	9207	148508	158352	88459	98313
Crustaceans	0	0	0	250	9896	10450	11083	7711	6315	6319	5203
Molluscs	0	0	0	675	345	352	486	912	470	482	372
Cephalopods	0	0	0	0	0	0	98	82	207	301	69
Aquatic animals	0	0	0	0	0	0	28	0	0	59	9

Total FU Imports	214120	167037	98399	130145	130929	324154	298359	297866	319908	356736	233765
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Source: database

Food use exports

Total Polish exports were approximately 190 000 tonnes during the period 1989 to 1998. Most of this volume was destined for European, Japanese and American markets. In terms of value, Polish exports represented PLN 670 million in 1997 (OECD, 2000).

The main exported products were fish fillets and frozen fish, but fresh and prepared/preserved fish exports were also significant. In 1996, the principal customer for Polish fisheries products was Germany, followed by Denmark, Canada and Great Britain. During this year, the main fish species exported from Poland were sprat and herring, followed by cod (Anon., 1999e).

Table 502: Poland - FU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	18912	17064	15153	35770	14613	3880	2	4	34	0	10543
Crus., mol. & other aquatic inv., prepared	0	0	0	543	266	255	124	685	317	106	229
Crustaceans	0	0	0	11702	11729	8700	17228	19598	14093	19581	10263
Fish, cured	193	246	1126	1356	3532	10850	15810	8127	4978	4606	5082
Fish, fillets	0	0	0	142002	105452	106986	75717	58181	40887	46726	57595
Fish, fresh/chilled	0	0	0	9543	7757	52667	43718	54440	92634	29603	29036
Fish, frozen	113451	107070	105460	12293	4238	21041	32218	44174	29310	27357	49661
Molluscs	0	0	0	220	188	668	746	273	397	68	256
Prepared/preserved fish	1183	495	125	7501	6318	49813	52227	55949	57157	59257	29002
Total FU Exports	133738	124875	121864	220928	154092	254860	237791	241430	239808	187303	191669

Source: database

Table 503: Poland - FU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	0	0	0	1819	2089	2357	1118	658	1349	4059	1345
Diadromous fish	0	0	0	1154	984	2560	2645	2007	1111	3970	1443
Marine fish, pelagic, tunas	0	0	0	0	0	90	23	63	158	332	67
Marine fish, pelagic, small	0	0	0	213	0	64964	69025	113972	149672	88446	48629
Marine fish, demersal	0	0	0	5331	3519	55367	41074	14245	9609	57631	18677
Marine fish, others	114826	107811	106711	164177	120704	116020	105806	89926	63068	13111	100216
Crustaceans	0	0	0	11702	11729	8700	17228	19598	14093	19581	10263
Molluscs	0	0	0	763	453	923	871	957	714	174	485
Cephalopods	18912	17064	15153	35770	14613	3880	2	4	34	0	10543
Total FU Export	133738	124875	121864	220928	154092	254860	237791	241430	239808	187303	191669

Source: database

Distribution

Distribution in Poland has been rather poorly organised since the collapse of the state-owned enterprise "Centrala Rybna" that once monopolised the retail chain throughout the country. Since the dissolution of this state-run system of distribution, there has been a void in the sector and private companies have yet to perform a similar function. Transactions between the fishermen and buyers are also poorly co-ordinated so that product supply to markets and processors fluctuates and prices become unpredictable. As with many other goods, there is no wholesale centre or central distributor for fisheries products (Polanski, 1997). With respect to the aquaculture industry, for instance, fish tend to be supplied to local markets rather than as value-added products to a wider, national market and this may reflect the absence of a suitable network for handling, storage and transportation.

The lack of a distribution infrastructure and co-ordinated management is one of the most significant factors affecting the availability of fish and fish products to the Polish consumer. However, it is

thought that there is still room for improvements in the distribution, processing and marketing activities within the sector, which would increase the availability of fisheries products to meet existing and increasing public demand (Rudiger, 1998).

Food use net supply and consumption

Between 1989 and 1998 the net supply of fisheries products was 440 000 tonnes. This represents an annual consumption rate of about 12 kg per capita and is equivalent to approximately 11 percent of the total animal protein consumed each day (FAO, 1999b). The consumption of fish and fish products is not uniform throughout Poland though. Consumption is higher in coastal regions than in the South-Eastern provinces. Cities with a population of over 200 000 inhabitants represent the largest markets and consumer groups, while villages of less than 100 000 provide the smallest markets (Acuirre and Russek, 1999). Most fresh fish sales inland are made up of freshwater species such as carp and trout because availability of chilling facilities is still limited within the distribution network (Polanski, 1993).

Table 504: Poland - FU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Cephalopods	42442	18054	20172	4106	1930	663	358	80	173	314	8829
Crus., mol. & other aquatic inv., prepared	0	0	0	132	79	156	477	194	51	592	168
Crustaceans	4822	1991	6540	558	843	6791	1600	434	8711	2830	3512
Fish, cured	90548	62369	62024	76423	60593	59829	78016	53148	66638	34336	64392
Fish, fillets	105290	121657	117889	4188	24364	179080	177370	80873	74657	89153	97452
Fish, fresh/chilled	2212	2352	2344	23815	23395	3959	4330	18476	476	8842	9020
Fish, frozen	189467	137483	70788	172951	156134	183268	146135	117697	165223	181991	152114
Molluscs	0	0	0	236	265	140	212	415	161	742	217
Prepared/preserved fish	118021	89364	74362	96746	91636	66152	76503	154898	162155	119839	104968
Total FU net supply	552801	433269	354118	379156	359240	500038	485000	426216	478246	438640	440672

Source: database

Table 505: Poland - FU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	na	na	0	699	1406	509	2619	1551	6954	10316	3007
Diadromous fish	na	na	0	1399	437	122	248	43	3158	4770	1272
Marine fish, pelagic, tunas	na	na	0	1056	1979	1552	2318	2862	3512	1712	1874
Marine fish, pelagic, small	91407	65218	55875	155433	134555	238337	295985	87309	112446	159933	139650
Marine fish, demersal	664	314	312	1771	4031	13109	5537	2646	5778	29065	6323
Marine fish, others	413467	347692	271219	213765	213714	238660	175647	330681	337303	228366	277051
Crustaceans	4822	1991	6540	558	843	7003	1881	434	8711	3144	3593
Molluscs	0	0	0	368	345	83	380	609	212	962	296
Cephalopods	42442	18054	20172	4106	1930	663	358	80	173	314	8829
Aquatic animals	0	0	0	0	0	0	28	0	0	59	9
FU net supply	552801	433269	354118	379156	359240	500038	485000	426216	478246	438640	440672

Source: database

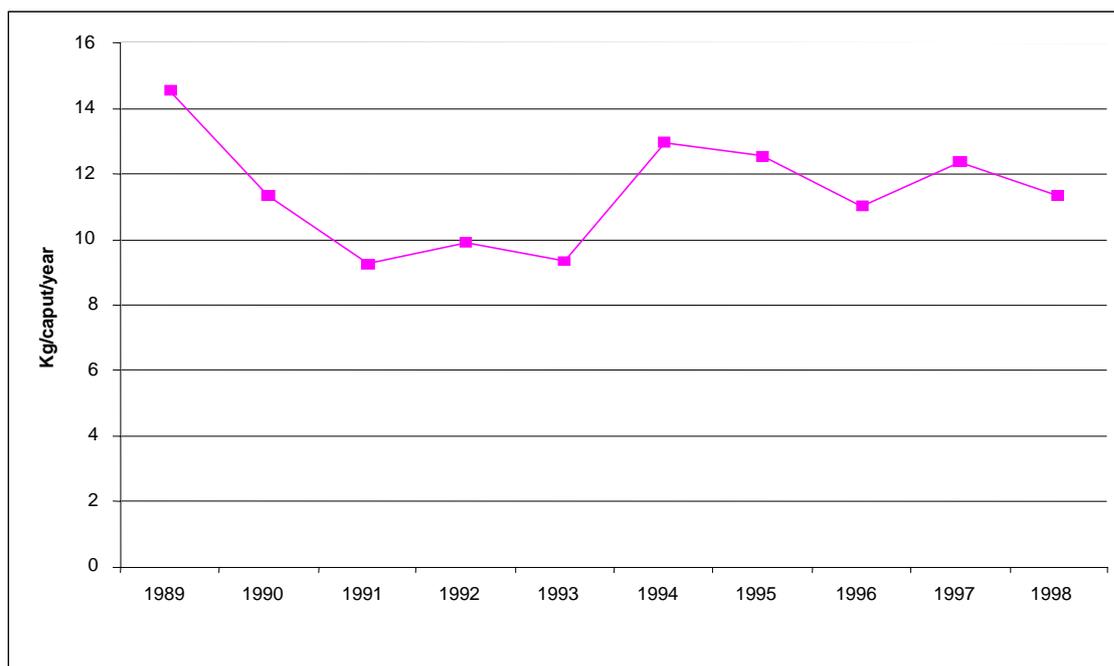


Figure 94: Fish consumption per capita per year in Poland 1989-1998

Although the most frequently consumed fresh fish in Poland is herring (followed by cod and mackerel), the consumer's preference would be for cod over herring. The fact that cod is not easily available in inland regions reflects the poor distribution network within the country (Anon., 1999e) and small pelagic species continue to dominate and provide a very important part of the Polish diet (Anon., 1998e). The most frequently consumed processed fish products are smoked mackerel, canned fish and frozen fillets. There are indications that sales of semi-processed fish products are increasing. Finally, although increasing public interest in maintaining a healthy and varied diet has increased the popularity of fish, high prices, limited choice of products and unattractive marketing are hindering expansion in consumption (Aquirre and Russek, 1999).

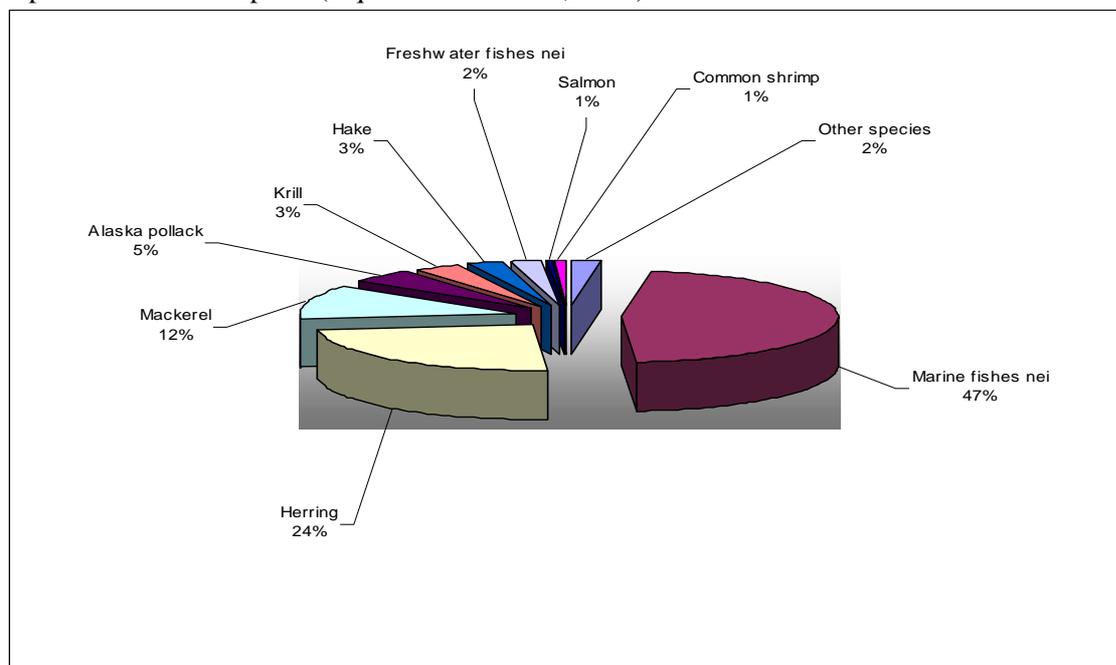


Figure 95: Poland - Main species consumed in 1998

Assumptions for projection 2005-2030

Consumption trends for the OECD group of products form the basis of the model's assumptions (see methodology in Part 1 of the study). Further assumptions regarding production, imports and exports and the need for fish in Poland between 2005 and 2030 take into account and extrapolate previous trends (Anon., 2000k).

Main consumption trends for the period 2005-2030 for Poland assume:

- A large increase (100 percent) in demand for prepared crustaceans (shrimps) and molluscs (mussels), raw crustaceans, fresh and prepared/preserved fish. A lesser increase for frozen fish and molluscs, 40 percent and 20 percent respectively.
- A decrease in demand for fish fillets (-10 percent).
- A stagnation of the demand for all other commodities groups.

Consumption of fish products in Poland will continue to rise with the increasing wealth of the population (Anon., 2001i) and will more and more target high value products. Indeed, the value of sold production in the fish-processing sector has quadrupled in the last decade and sales have increased at an average 14 percent annual rate (Eurofish, 2003). Accordingly, prepared and preserved products, as well as crustaceans, will increase substantially. Frozen fish also increase, but mostly to fuel the processing industry.

Another feature of the Polish market is the growth of the supermarket retailers. This trend has been particularly marked in the past few years and has been accompanied by a fall in fish sales in the more traditional open-air markets. Consequently, one of the limiting factors in the expansion of the Polish seafood consumption, namely lack of efficient distribution channels, is gradually being removed (Anon., 1999e). Demand for freshwater aquaculture products, especially trout, is also steadily increasing (Gorbaczow, 2000).

Table 506: Poland - Assumptions for projection

OECD group	94-98% %	Annual %	Prod % 99-30	T Imp % 99-30	T % %	Exp % 99-30	T Cons % 99-30	T Prod %	% Imp Annual	% Exp Annual	Cons % Annual
Cephalopods	-17%	-3%	0%	0%	0%	0%	0%	0.0%	0.0%	0.0%	0.0%
Crus., mol. & other aquatic inv., prepared	143%	29%	0%	85%	0%	100%		1.9%	0.0%	2.2%	
Crustaceans	59%	12%	0%	47%	0%	100%	0.0%	1.2%	0.0%	2.2%	
Fish, cured	-11%	-2%	5%	0%	40%	0%	0.2%	0.0%	1.1%	0.0%	
Fish, fillets	-40%	-8%	0%	-12%	0%	-10%	0.0%	-0.4%	0.0%	-0.3%	
Fish, fresh/chilled	23%	5%	5%	59%	0%	100%	0.2%	1.5%	0.0%	2.2%	
Fish, frozen	22%	4%	0%	44%	0%	40%	0.0%	1.1%	0.0%	1.1%	
Molluscs	41%	8%	0%	95%	0%	20%	0.0%	2.1%	0.0%	0.6%	
Prepared/preserved fish	84%	17%	0%	140%	0%	100%	0.0%	2.8%	0.0%	2.2%	
Fish/marine mammal, fat, oil	-43%	-9%	0%	0%	0%		0.0%	0.0%		0.0%	
Flour, meal unfit for hum. Cons.	67%	13%	0%	0%	0%		0.0%	0.0%	0.0%	0.0%	

Source: database

Aquaculture production in Poland has been fairly low and stable over the last decade and there is no expected growth in the sector, except in diadromous production. Imports of crustaceans, both prepared and whole, will continue to increase, reflecting growing national consumption triggered by a rise in purchasing power, with Polish consumers turning towards higher value products. This will also reflect itself in the higher demand for fresh (especially diadromous) and prepared fish (herring and tuna). Exports will remain stable as capture production is assumed to remain constant and as the scope for increase in aquaculture production is limited. There will consequently be no surplus available for exports. As for non-food use products, imports and exports will remain at their level of 1998, as consumption is not likely to increase.

Estimations for 2015 and 2030

Table 507: Poland - Main results for projection

Nature	Average 94-98	2000	2005	2010	2015	2020	2030
Exports FU (t live wt)	232238	187655	187922	188205	188502	188815	189145
Imports FU (t live wt)	319405	388487	414312	443123	475293	511242	551452
Production FU (t live wt)	378462	269883	270370	270861	271356	271854	272356
Fish supply FU (t live wt)	465628	470716	496759	525780	558147	594281	634663
Population (X1000)	38641	39500	39521	39606	39069	39153	39238
Per caput supply (kg/h)	12	12	13	13	14	15	16
Production NFU (t live wt)	59531	52005	52005	52005	52005	52005	52005
Imports NFU (t live wt)	4520	2776	2776	2776	2776	2776	2776
Exports NFU (t live wt)	8393	2056	2056	2056	2056	2056	2056
Net supply NFU (t live wt)	55658	52725	52725	52725	52725	52725	52725
Aquaculture (t live wt)	27156	29118	28756	28493	28328	28263	28296
Capture (t live wt)	362391	362391	362391	362391	362391	362391	362391
Production total (t live wt)	389547	391508	391147	390884	390719	390653	390686

Source: database

Food use net supply and human consumption 2005-2030

Polish net supply increases over the period considered to reach 635 000 tonnes by 2030, as seafood consumption rises due to higher standard of living and increased product availability. As Polish aquaculture production is limited and capture production is assumed to remain stable, increase in consumption will be met by imports. Therefore pattern of the net supply will reflect the pattern of imports. Frozen products remain the leading commodities of the net supply with 255 000 tonnes annually followed by prepared/preserved products (240 000 tonnes) and fish fillets (80 000 tonnes).

Table 508: Poland - FU net supply by OECD group of commodities 2005-2030 (t live weight)

Gp of commodities	Ave. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	318	314	314	314	314	314	314
Crus., mol. & other aquatic inv., prepared	294	693	774	862	960	1067	1186
Crustaceans	4073	3358	3763	4194	4651	5137	5653
Fish, cured	58393	34384	34405	34414	34410	34392	34359
Fish, fillets	120227	87081	85632	84208	82810	81436	80086
Fish, fresh/chilled	7217	10481	11742	13085	14515	16038	17663
Fish, frozen	158863	195698	206181	217278	2 29026	241462	254628
Molluscs	334	767	787	809	833	861	891
Prepared/preserved fish	115909	137938	153161	170615	190627	213574	239884
Total FU net supply	465628	470716	496759	525780	558147	594281	634663

Source: database

The most important species in the net supply correspond to the pattern of imports and reflect an overall increase of consumption. Traditionally consumed species such as small pelagic species (herring) continue to grow while interest for higher value species, such as crustaceans (shrimp), diadromous fish (salmon and trout), large pelagic species (tuna) and demersal species (cod, hake, pollock) is increasing.

Table 509: Poland - FU net supply by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	4390	11064	11640	12253	12905	13599	14337
Diadromous fish	1668	5217	5570	5955	6374	6830	7327
Marine fish, pelagic, tunas	2391	2109	2442	2822	3256	3752	4320
Marine fish, pelagic, small	178802	172099	181659	192023	203271	215489	228776
Marine fish, demersal	11227	31220	32954	34859	36945	39224	41706
Marine fish, others	262131	243874	256857	271688	288636	308008	330154
Crustaceans	4234	3717	4159	4629	5130	5664	6233
Molluscs	449	1033	1091	1154	1224	1302	1387

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	318	314	314	314	314	314	314
Aquatic animals	17	68	74	82	90	99	109
FU net supply	465628	470716	496759	525780	558147	594281	634663

Source: database

The growth rate of the population over the period 2005/2030 (1 percent) is lower than the growth rate of the net supply (45 percent), so the apparent consumption per capita will be increasing regularly during the next 30 years. It will rise from 12 to 16 kg per capita per year. Seafood consumption will benefit from higher Polish standards of living and increased availability of seafood products from the expansion of supermarkets throughout the country.

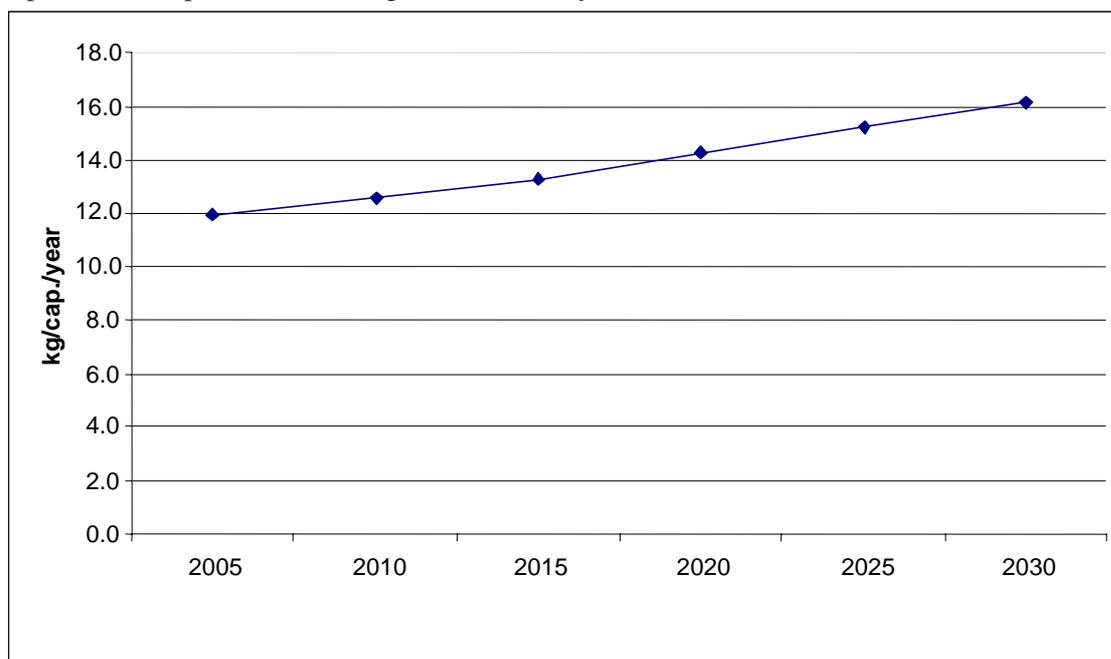


Figure 96: Fish consumption per capita per year in Poland 2005-2030

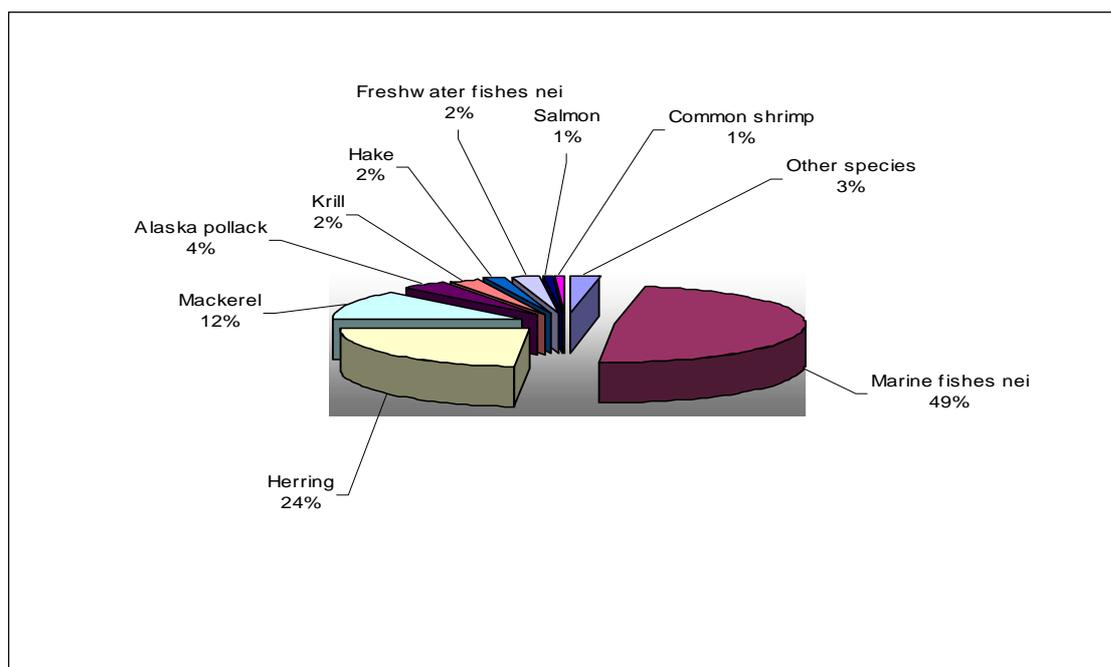


Figure 97: Poland - Main species consumed in 2003

Non-food use net supply 2005-2030

The non-food use net supply will stay at its 1998 level of around 42 000 tonnes, as demand coming from a stable aquaculture production will not rise.

Production 2005-2030

Capture and aquaculture

Aquaculture production in Poland will experience a slight decrease over the period 1998-2030. This will mainly be due to a decrease in freshwater fish production (mainly carp), as demand for these species diminishes. The projected increase in diadromous fish production (trout) will not be large enough to offset the downward trend except at the very end of the period considered.

Table 510: Poland - Aquaculture by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	20839	19341	18476	17684	16963	16312	15729
Diadromous fish	6317	9777	10280	10809	11365	11951	12567
Total	27156	29118	28756	28493	28328	28263	28296

Source: database

Reorganisation of production in the aquaculture sector will not affect total production significantly and its level will remain around 390 000 tonnes annually.

Table 511: Poland - Total production by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	47261	45763	44898	44106	43385	42734	42151
Diadromous fish	7444	10904	11407	11936	12492	13078	13694
Marine fish, pelagic, tunas	53	53	53	53	53	53	53
Marine fish, pelagic, small	107216	107216	107216	107216	107216	107216	107216
Marine fish, demersal	211253	211253	211253	211253	211253	211253	211253
Marine fish, others	826	826	826	826	826	826	826
Crustaceans	14837	14837	14837	14837	14837	14837	14837
Cephalopods	657	657	657	657	657	657	657
Total	389547	391508	391147	390884	390719	390653	390686

Source: database

Commodities

According to the model, Poland's commodities production will not experience important changes and will stay around their 1998 level (270 000 tonnes). The small increase will be triggered by the slight increase in production of cured fish (salted herring and various smoked fish) and fresh fish, both marine and diadromous.

Table 512: Poland - FU Commodities Production by OECD group of products 2005-2030 (t live weight)

Gp of commodities	Av. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	964	14	14	14	14	14	14
Crustaceans	11699	16406	16406	16406	16406	16406	16406
Fish, cured	62727	37716	38004	38295	38588	38883	39181
Fish, fillets	97108	51535	51535	51535	51535	51535	51535
Fish, fresh/chilled	45047	25946	26144	26344	26546	26749	26954
Fish, frozen	53027	44263	44263	44263	44263	44263	44263
Molluscs	637	654	654	654	654	654	654
Prepared/preserved fish	107254	93350	93350	93350	93350	93350	93350
Total FU Production	378463	269884	270370	270861	271356	271854	272357

Source: database

Table 513: Poland - FU Commodities Production by FAO group of species 2005-2030 (t live weight)

Gp Species	Av. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	2471	5958	5989	6021	6053	6085	6118
Marine fish, pelagic, small	105447	93387	93520	93654	93789	93925	94063
Marine fish, demersal	963	0	0	0	0	0	0
Marine fish, others	256281	153465	153787	154112	154440	154770	155102
Crustaceans	11699	16406	16406	16406	16406	16406	16406
Molluscs	637	654	654	654	654	654	654
Cephalopods	964	14	14	14	14	14	14
Total FU Production	378462	269883	270370	270861	271356	271854	272356

Source: database

Trade 2005-2030**Imports**

Polish imports will experience a strong rise during the period 1998-2030, as domestic production is unable to cope with the increasing national demand. Also Poland has increasingly been obtaining its fish from EU countries at the expense of its former main supplier, Norway, as customs duties on imports have progressively been phased out in view of Poland's accession (Anon., 2001i). This trend is likely to deepen, as long as Norway is not part of the EU.

Imports of crustaceans, prepared and whole, will increase, as will frozen fish and prepared and preserved fish products. Frozen fish will mostly be directed to further processing, as is currently the case (Eurofish, 2003). Fish fillets will decline slightly and cured fish imports will remain constant.

Table 514: Poland - FU Commodities Imports by OECD group of products 2005-2030 (t live weight)

Gp of commodities	Av. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	138	301	301	301	301	301	301
Crus., mol. & other aquatic inv., prepared	591	799	880	968	1066	1174	1292
Crustaceans	8214	6533	6939	7369	7827	8312	8828
Fish, cured	4540	1626	1626	1626	1626	1626	1626
Fish, fillets	88819	82271	80822	79399	78000	76626	75277
Fish, fresh/chilled	16783	14139	15201	16344	17572	18892	20312
Fish, frozen	136656	178792	189275	200372	212120	224556	237722
Molluscs	128	181	201	223	247	274	305
Prepared/preserved fish	63536	103845	119067	136521	156534	179480	205790
Total FU Imports	319405	388487	414312	443123	475293	511242	551452

Source: database

Concerning the species, imports of diadromous fish (salmon) and large pelagic species, such as tuna, will increase, mostly under the form of prepared/preserved commodities. Increase in imports of crustaceans will consist of shrimp and prawns. The most important species for demersal imports will be pollock, cod and hake, while for small pelagic species, herring and mackerel will come first.

Table 515: Poland - FU Commodities Imports by FAO group of species 2005-2030 (t live weight)

Gp Species	Av. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	3827	9165	9710	10291	10911	11572	12278
Diadromous fish	4127	9334	9799	10302	10845	11432	12067
Marine fish, pelagic, tunas	2525	2441	2774	3154	3588	4085	4652
Marine fish, pelagic, small	170571	167209	176675	186947	198103	210231	223429
Marine fish, demersal	45849	88851	90585	92490	94576	96855	99337
Marine fish, others	83436	103673	116450	131079	147829	167007	188964
Crustaceans	8376	6892	7334	7804	8306	8839	9408
Molluscs	540	553	611	674	744	821	907
Cephalopods	138	301	301	301	301	301	301
Aquatic animals	17	68	74	82	90	99	109

Gp Species	Av. 94-98	2005	2010	2015	2020	2025	2030
Total FU Imports	319405	388487	414312	443123	475293	511242	551452

Source: database

Exports

As mentioned above, exports will not vary much from their 1998 level of 187 000 tonnes, as no production surplus will be available. The only commodities that will experience some increase are cured fish (mostly smoked salmon), but not by a significant amount.

Table 516: Poland - FU Commodities Exports by OECD group of products 2005-2030 (t live weight)

Gp of commodities	Av. 94-98	2005	2010	2015	2020	2025	2030
Crus., mol. & other aquatic inv., prepared	297	106	106	106	106	106	106
Crustaceans	15840	19581	19581	19581	19581	19581	19581
Fish, cured	8874	4958	5225	5507	5805	6118	6448
Fish, fillets	65700	46726	46726	46726	46726	46726	46726
Fish, fresh/chilled	54613	29603	29603	29603	29603	29603	29603
Fish, frozen	30820	27357	27357	27357	27357	27357	27357
Molluscs	430	68	68	68	68	68	68
Prepared/preserved fish	54881	59257	59257	59257	59257	59257	59257
Total FU Exports	232238	187655	187922	188205	188502	188815	189145

Source: database

Table 517: Poland - FU Commodities Exports by FAO group of species 2005-2030 (t live weight)

Gp Species	Av. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	1908	4059	4059	4059	4059	4059	4059
Diadromous fish	2458	4117	4229	4347	4471	4602	4740
Marine fish, pelagic, tunas	133	332	332	332	332	332	332
Marine fish, pelagic, small	97216	88497	88536	88578	88621	88667	88716
Marine fish, demersal	35585	57631	57631	57631	57631	57631	57631
Marine fish, others	77586	13264	13380	13503	13632	13769	13913
Crustaceans	15840	19581	19581	19581	19581	19581	19581
Molluscs	728	174	174	174	174	174	174
Cephalopods	784	0	0	0	0	0	0
Total FU Export	232238	187655	187922	188205	188502	188815	189145

Source: database

SLOVENIA

Slovenia has a population of approximately 2 million. With a coastline of only 46 km in length, Slovenia has a small fishing industry. Changing patterns of trade and reduced access to fishing grounds since independence in 1991 have hampered the development of the sector over the last decade and there has been minimal investment in the industry. Despite this, the national fisheries sector has an important traditional and economic role by maintaining a liberal importing policy to make new products available to the Slovene public. In future years, it is hoped that processing and aquaculture industries will be consolidated and that the artisanal fleet will be supported and have an opportunity to develop.

Production: captures, aquaculture and commodities 1989-1998

In 1998, total production from the fisheries sector was 3 000 tonnes with aquaculture representing approximately 30 percent of this volume.

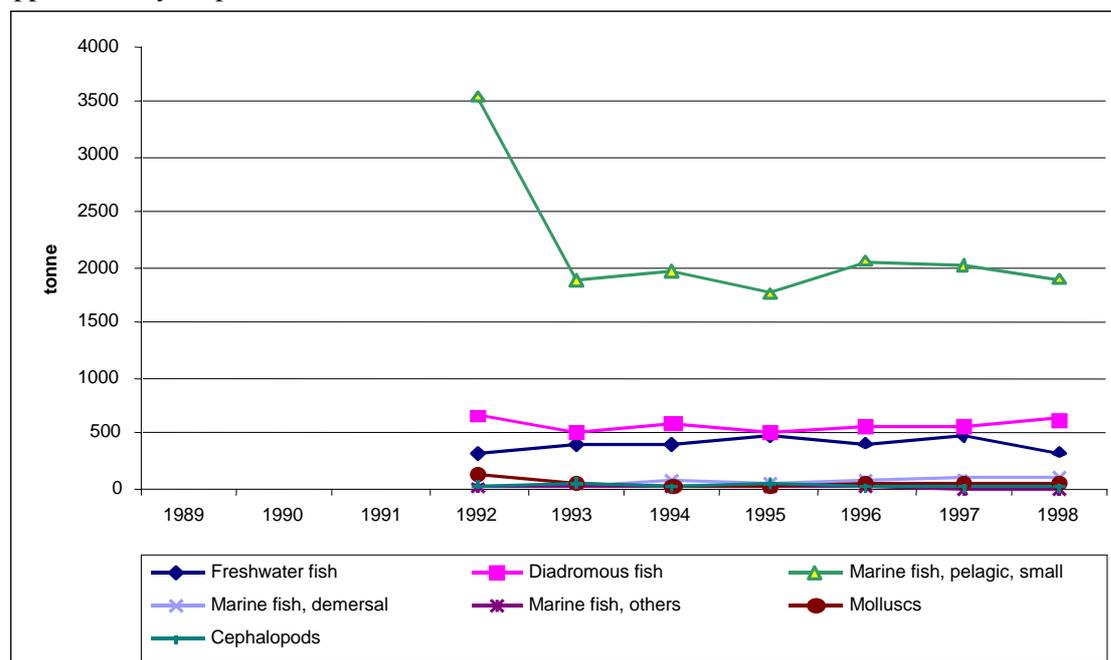


Figure 98: Slovenia - Capture and aquaculture production 1989-1998

Captures

The volume of catches was 2 200 tonnes in 1998 with small pelagic species accounting for more than 90 percent of total landings. Marine fishing conducted by Slovenian vessels takes place in the national EEZ, the North Adriatic Sea and in the adjacent deep sea international waters. The reduction of captures by 50 percent between 1992 and 1995 is due to the loss to Croatia of the traditional fishing ground of the Istria Peninsula (FAO, 1997c).

Table 518: Slovenia - Captures by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	na	na	na	215	233	259	226	203	219	203	156
Diadromous fish	na	na	na	65	55	48	57	53	52	38	37
Marine fish, pelagic, small	na	na	na	3549	1882	1966	1772	2049	2026	1897	1514
Marine fish, demersal	na	na	na	2	9	7	2	1	1	1	2
Marine fish, others	na	na	na	23	35	15	12	8	7	5	11
Molluscs	na	na	na	1	0	1	6	5	10	12	4
Cephalopods	na	na	na	27	50	14	46	10	16	21	18
Total gp of species	na	na	na	3882	2264	2310	2121	2329	2331	2177	1741

Source: database

The total inland water production averaged some 1 000 tonnes of commercial fish in 1996 (European Parliament, 1998). The majority of inland production is comprised of trout and, to a lesser degree, carp (Rudiger, 1998).

Aquaculture

The pre-Alpine and Alpine geographical position of Slovenia provide it with a large source of waterways ideal for the breeding of salmonids. Still, development of the Slovenian salmonid industry has been affected by a spread of viral diseases such as VHS (Viral haemorrhagic septicaemia) or IHN (Infectious haematopoietic necrosis) since 1993 (Jencic *et al.*, 2002).

An estimated 100 fish farms breed trout for human consumption (Jencic *et al.*, 2002), rainbow trout being the principal species. Regarding other freshwater species, common carp and grass carp are also reared in small ponds (FAO, 1997c). In 1996, mariculture production accounted for only 70 tonnes of fish and 50 tonnes of Mediterranean mussel but, in recent years, the cultivation of sea bass and gilt-head seabream has intensified (Rudiger, 1998).

Table 519: Slovenia - Aquaculture by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	na	na	na	103	164	130	247	206	250	129	176
Diadromous fish	na	na	na	592	469	541	446	513	520	601	526
Marine fish, demersal	na	na	na	10	19	75	49	74	90	110	61
Molluscs	na	na	na	146	46	28	13	50	37	44	52
Total gp of species	na	na	na	851	698	774	755	843	897	884	815

Source: database

Commodities production

Food use commodities production

Slovenian production of food use commodities has been stable between 1989 -1998 at a level of 3 000 tonnes. The bulk of the production is made of preserved fish (canned pelagic species) with some frozen products available.

Table 520: Slovenia - FU Commodities Production by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Fish, fillets	na	na	na	32	7	18	77	57	61	80	47
Fish, frozen	na	na	na	513	476	613	580	764	484	442	553
Prepared/preserved fish	na	na	na	2376	2301	2452	2219	2275	2683	2539	2407
Total FU Production	na	na	na	2921	2784	3084	2876	3096	3228	3061	3007

Source: database

The main species used in production of food use commodities in Slovenia are mostly small pelagic species like mackerels and pilchards.

Table 521: Slovenia - FU Commodities Production by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Marine fish, pelagic, small	na	na	na	2761	1944	1104	1059	1358	2038	2287	1793
Marine fish, others	na	na	na	160	840	1980	1817	1737	1190	774	1214
Total FU Production	na	na	na	2921	2784	3084	2876	3096	3228	3061	3007

Source: database

Non-food use commodities production

Non-food use commodities production has never been very high in Slovenia as the majority of domestic fish production is used for human consumption. Non-food use commodities production has even disappeared in the past few years.

Table 522: Slovenia - NFU Commodities Production by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Flour, meal unfit for human cons.	na	na	na	834	178	0	0	76	0	0	156
Total NFU Production	na	na	na	834	178	0	0	76	0	0	156

Source: database

Table 523: Slovenia - NFU Commodities Production by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	na	na	na	834	178	0	0	76	0	0	156
Total NFU Production	na	na	na	834	178	0	0	76	0	0	156

Source: database

Non-food use: trade and net supply 1989-1998

Non-food use production being almost nonexistent, the industry relies upon imports for its supply. From 1989 to 1998, volume of imports decreased and the yearly average was around 5 500 tonnes. The volume of exports was negligible at around 100 tonnes.

*Non-food use imports***Table 524: Slovenia - NFU Commodities Imports by OECD group of products 1989-1998 (t live weight)**

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Fish/marine mammal, fat, oil	na	na	na	18	42	204	333	87	21	30	105
Flour, meal unfit for human cons.	na	na	na	6967	5592	6913	6142	4314	4564	3384	5411
Total NFU Imports	na	na	na	6985	5634	7117	6475	4401	4585	3414	5516

Source: database

Table 525: Slovenia - NFU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	na	na	na	6967	5592	6853	6134	4312	4529	3384	5396
Marine fish, others	na	na	na	18	42	204	333	87	21	30	105
Aquatic animals	na	na	na	0	0	60	8	3	35	0	15
Total NFU Imports	na	na	na	6985	5634	7117	6475	4401	4585	3414	5516

Source: database

*Non-food use exports***Table 526: Slovenia - NFU Commodities Exports by OECD group of products 1989-1998 (t live weight)**

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Flour, meal unfit for human cons.	na	na	na	738	136	0	0	6	0	0	126
Total NFU Exports	na	na	na	738	136	0	0	6	0	0	126

Source: database

Table 527: Slovenia - NFU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Marine fish, pelagic, small	na	na	na	738	136	0	0	6	0	0	126
Total NFU Export	na	na	na	738	136	0	0	6	0	0	126

Source: database

Non-food use net supply

Net supply has been declining because of a steady fall in imports of non food use commodities. National production and exports being essentially nonexistent, net supply of non food use commodities corresponds to the level of Slovenian imports.

Table 528: Slovenia - NFU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Fish/marine mammal, fat, oil	na	na	na	18	42	204	333	87	21	30	105
Flour, meal unfit for human consumption	na	na	na	7063	5635	6913	6142	4385	4564	3384	5441
Total NFU net supply	na	na	na	7081	5677	7117	6475	4472	4585	3414	5546

Source: database

Table 529: Slovenia - NFU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
FU net supply	na	na	na	7066	11025	11811	14192	13892	12991	13402	12054
Marine fish, pelagic, small	na	na	na	7063	5635	6853	6134	4382	4529	3384	5426
Marine fish, others	na	na	na	18	42	204	333	87	21	30	105
Aquatic animals	na	na	na	0	0	60	8	3	35	0	15
NFU net supply	na	na	na	7081	5677	7117	6475	4472	4585	3414	5546

Source: database

Market for human consumption

Trade

Slovenia's trade in fisheries products has been substantially altered since independence in 1991. The Balkan war negatively affected commercial exchanges with Slovenia's principal trading partners, the republics of the former Yugoslavia.

As domestic catch represents only 20 percent to 25 percent of the total national fish supply, imports are very significant to the national industry and markets. Between 1989 and 1998 the volume of imported products was 12 500 tonnes, while exports just reached 3 500 tonnes.

Food use imports

The major food use imports were frozen fish, prepared/preserved fish (large and small canned pelagic species), fish fillets, and cephalopods. Crustaceans (shrimps) are clearly on the increase with a rise of 100 percent in 7 years.

Table 530: Slovenia - FU Commodities Imports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	na	na	na	1612	2030	2164	2685	3035	2589	2341	2351
Crus., mol. & other aquatic inv., prepared	na	na	na	30	50	59	60	41	29	75	49
Crustaceans	na	na	na	232	429	515	492	541	528	552	470
Fish, cured	na	na	na	10	18	36	43	39	42	45	33
Fish, fillets	na	na	na	1118	1674	2309	3023	3264	2785	2770	2420
Fish, fresh/chilled	na	na	na	1674	1178	825	910	855	838	870	1021
Fish, frozen	na	na	na	2222	3464	3916	3294	3237	2917	2940	3142
Molluscs	na	na	na	360	248	359	204	217	283	296	281
Prepared/preserved fish	na	na	na	1794	2824	2570	3143	3211	2940	3462	2849
Total FU Imports	na	na	na	9050	11916	12753	13855	14440	12951	13351	12617

Source: database

Concerning species, pelagic fish include tuna and some clupeoids (pilchards), while cephalopods are made of cuttlefish and octopus.

Table 531: Slovenia - FU Commodities Imports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	na	29	89	77	140	55	66	138	85
Diadromous fish	na	na	na	35	62	84	89	55	87	43	65
Marine fish, pelagic, tunas	na	na	na	439	1017	943	1325	1310	1255	1556	1121
Marine fish, pelagic, small	na	na	na	3496	4100	3961	3518	3436	2868	3136	3502
Marine fish, demersal	na	na	na	630	813	903	791	674	651	481	706
Marine fish, others	na	na	na	2188	3078	3689	4550	5077	4595	4733	3987
Crustaceans	na	na	na	232	429	515	492	541	528	552	470
Molluscs	na	na	na	390	297	418	264	258	311	372	330
Cephalopods	na	na	na	1612	2030	2164	2685	3035	2589	2341	2351
Total FU Imports	na	na	na	9050	11916	12753	13855	14440	12951	13351	12617

Source: database

Food use exports

The loss of some traditional fishing grounds to Croatia in 1991 resulted in an almost 50 percent decline in exports between 1992 and 1995 (FAO, 1997c), as the previous production surplus in small pelagic species vanished. Exports consist mostly of prepared/preserved fish, namely canned mackerels or pilchards.

Table 532: Slovenia - FU Commodities Exports by OECD group of products 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Cephalopods	na	na	na	49	52	151	133	132	129	96	106
Fish, fillets	na	na	na	40	9	24	64	54	59	98	50
Fish, fresh/chilled	na	na	na	135	128	150	263	723	712	254	338
Fish, frozen	na	na	na	492	406	645	268	597	70	81	365
Molluscs	na	na	na	36	3	17	6	1	2	15	12
Prepared/preserved fish	na	na	na	4153	3075	3039	1805	2135	2217	2467	2699
Total FU Exports	na	na	na	4905	3674	4026	2539	3643	3188	3010	3569

Source: database

Table 533: Slovenia - FU Commodities Exports by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Av. 89-98
Freshwater fish	na	na	na	12	10	5	5	3	3	31	10
Diadromous fish	na	na	na	0	0	11	0	0	9	0	3
Marine fish, pelagic, small	na	na	na	4599	2527	1501	939	1910	2313	2563	2336
Marine fish, demersal	na	na	na	19	11	13	99	41	43	53	40
Marine fish, others	na	na	na	190	1071	2328	1357	1556	689	252	1063
Molluscs	na	na	na	36	3	17	6	1	2	15	12
Cephalopods	na	na	na	49	52	151	133	132	129	96	106
Total FU Export	na	na	na	4905	3674	4026	2539	3643	3188	3010	3569

Source: database

Food use net supply and consumption

Between 1989 and 1998 the net supply of fish products was around 12 000 tonnes. As national production was limited at about 2 500 tonnes during the period, a large share of Slovenian fish consumption was supported by imports. Hence the consumption pattern follows the imports pattern regarding products and species.

Frozen fish and prepared/preserved fish (canned large and small pelagic species) are the main commodities consumed in Slovenia, followed by fish fillets and cephalopods.

Table 534: Slovenia - FU net supply by OECD group of commodities 1989-1998 (t live weight)

Gp of commodities	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Cephalopods	na	na	na	1563	1978	2013	2552	2903	2461	2245	2245
Crus., mol. & other aquatic inv., prepared	na	na	na	30	50	59	60	41	29	75	49
Crustaceans	na	na	na	232	429	515	492	541	528	552	470
Fish, cured	na	na	na	10	18	36	43	39	42	45	33
Fish, fillets	na	na	na	1110	1672	2303	3036	3266	2787	2752	2418
Fish, fresh/chilled	na	na	na	1538	1050	676	647	131	126	616	683
Fish, frozen	na	na	na	2243	3534	3884	3607	3404	3331	3302	3329
Molluscs	na	na	na	323	244	341	197	216	281	281	269
Prepared/preserved fish	na	na	na	17	2050	1984	3557	3351	3406	3535	2557
Total FU net supply	na	na	na	7066	11025	11811	14192	13892	12991	13402	12054

Source: database

Regarding species, mackerel represents the bulk of the frozen net supply. Tuna and clupeoids (such as pilchard) are the two main species in canned preserved products.

Table 535: Slovenia - FU net supply by FAO group of species 1989-1998 (t live weight)

Gp Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Ave. 89-98
Freshwater fish	na	na	na	17	79	72	136	52	63	107	75
Diadromous fish	na	na	na	35	62	73	89	55	78	43	62
Marine fish, pelagic, tunas	na	na	na	439	1017	943	1325	1310	1255	1556	1121
Marine fish, pelagic, small	na	na	na	1658	3517	3564	3639	2884	2592	2860	2959
Marine fish, demersal	na	na	na	611	802	891	692	633	608	428	666
Marine fish, others	na	na	na	2158	2847	3341	5010	5259	5096	5255	4138
Crustaceans	na	na	na	232	429	515	492	541	528	552	470
Molluscs	na	na	na	353	294	400	257	257	310	356	318
Cephalopods	na	na	na	1563	1978	2013	2552	2903	2461	2245	2245
FU net supply	na	na	na	7066	11025	11811	14192	13892	12991	13402	12054

Source: database

Annual consumption per capita was approximately 7 kg in 1997 with fish representing 3 percent of the total animal protein consumed (FAO, 1999b).

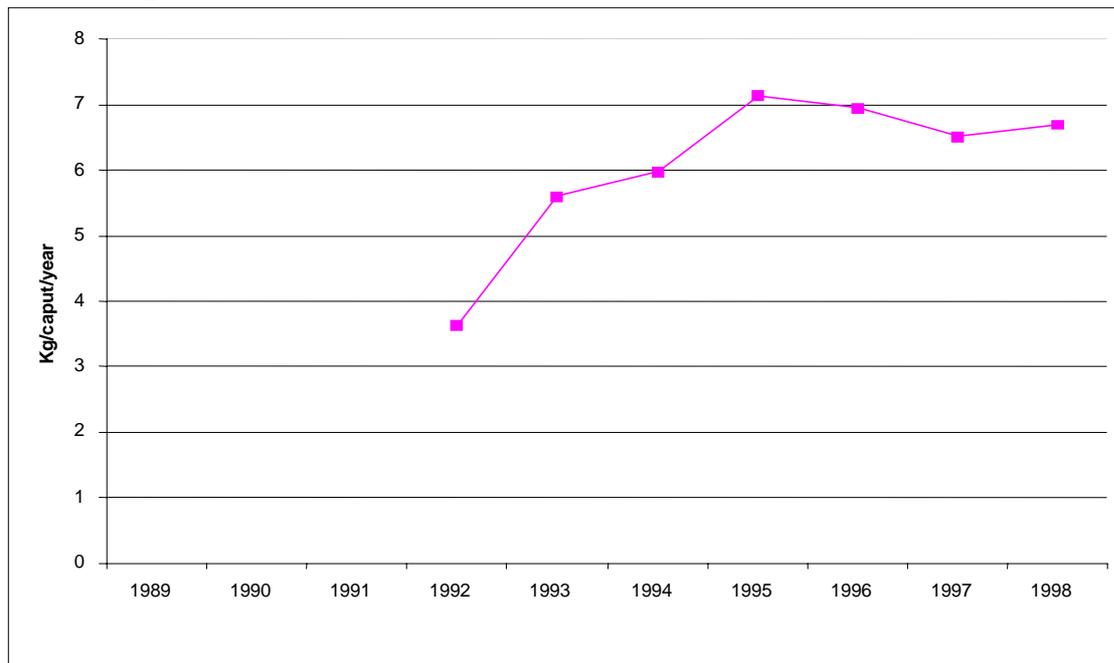


Figure 99: Fish consumption per capita per year in Slovenia 1989-1998

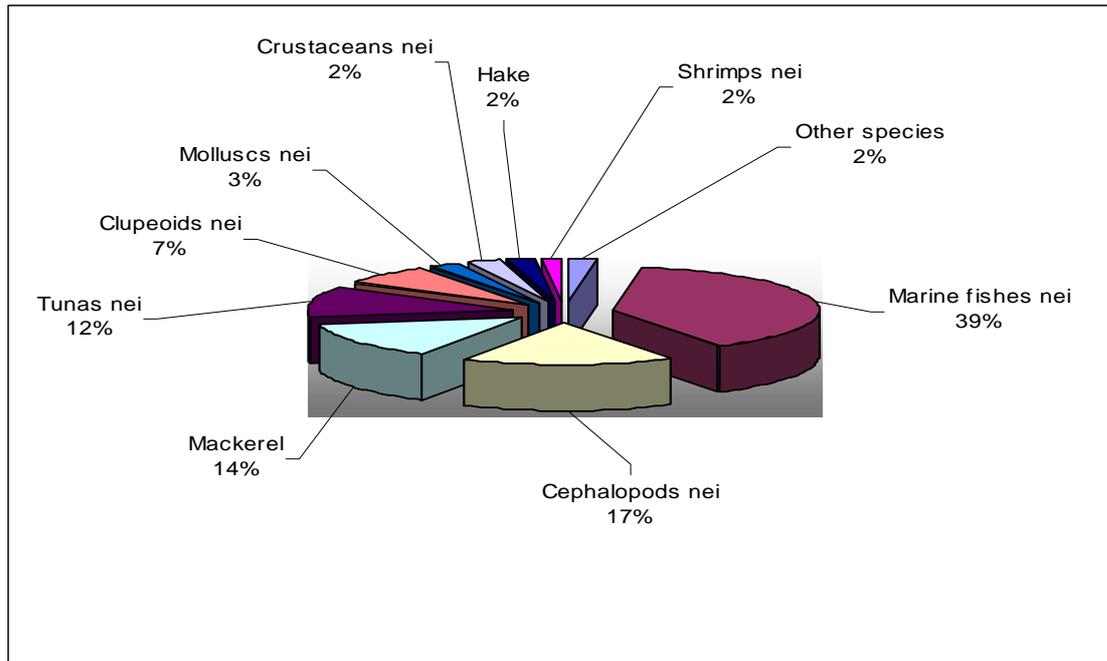


Figure 100: Slovenia - Main species consumed in 1998

Assumptions for projection 2005-2030 and main results

Consumption trends for the OECD group of products form the basis of the model's assumptions (see methodology in Part 1 of the study). Further assumptions regarding production, imports and exports and the need for fish in Slovenia between 2005 and 2030 take into account and extrapolate previous trends.

Slovenia's main consumption trends for the period 2005-2030 assume:

- An increase in demand for prepared/preserved products (100 percent) and to a lesser extent, for fish fillets (20 percent), crustaceans and molluscs prepared (10 percent) and fresh fish (10 percent).
- A decrease in demand for cured fish (-10 percent).
- A stagnation in the demand for all other commodities groups.

Seafood consumption in Slovenia will be boosted by the fact that this country possesses a relatively fast-growing economy, and that the purchasing power of its population is quickly improving (Spencer and Shull, 2002).

The growing number of single and childless households is another feature of the Slovenian market. This is primarily due to young people waiting longer to have a family, and more women are entering the professional job market. The result is a higher demand for convenience products (Spencer and Shull, 2002), reflected here in the growing demand for prepared preserved products.

Another aspect of the Slovene market is a trend toward healthier eating, which includes lighter meals and international cuisines, and a drop in red meat consumption due to the various food scares. This is accompanied by an increase in the consumption of fish, among others (Udovic, 2002).

Table 536: Slovenia - Assumptions for projection

OECD group	94-98% annual %	Prod % 99-30	T Imp % 99-30	T % Exp 99-30	Cons % 99-30	T Prod % Annual	Imp % Annual	Exp % Annual	Cons % Annual
Cephalopods	5%	1%	0%	0%	0%		0.0%	0.0%	0.0%
Crus., mol. & other aquatic inv., prepared	20%	4%	0%	10%	0%	10%	0.3%		0.3%
Crustaceans	-6%	-1%	0%	0%	0%	0%	0.0%		0.0%

OECD group	94-98% annual %	Prod % 99-30	T Imp % 99-30	T % 99-30	Exp T % 99-30	Cons T % 99-30	Prod % Annual	Imp % Annual	Exp% Annual	Cons % Annual
Fish, cured	-33%	-7%	0%	-11%	0%	-10%		-0.3%	0.0%	-0.3%
Fish, fillets	14%	3%	0%	20%	0%	20%	0.0%	0.6%	0.0%	0.6%
Fish, fresh/chilled	7%	1%	0%	7%	0%	10%		0.2%	0.0%	0.3%
Fish, frozen	-22%	-4%	0%	0%	0%	0%	0.0%	0.0%	0.0%	0.0%
Molluscs	-13%	-3%	0%	0%	0%	0%		0.0%	0.0%	0.0%
Prepared/preserved fish	39%	8%	0%	102%	0%	100%	0.0%	2.2%	0.0%	2.2%
Fish/marine mammal, fat, oil	-192%	-38%	0%	0%	0%			0.0%		0.0%
Flour, meal unfit for hum. Cons.	-71%	-14%	0%	0%	0%		0.0%	0.0%	0.0%	0.0%

Source: database

Capture production remaining stable, the slight increase in the overall Slovenian fish production will be due to some expansion in the aquaculture sector. Food use fish imports increase, especially due to a rise in consumption of prepared/preserved fish, fish fillets and fresh fish. Exports will remain stable, as national production will be too low to provide any surplus.

Table 537: Slovenia: Main results for projection

Nature	Average 94-98	2005	2010	2015	2020	2025	2030
Exports FU (t live wt)	3281	3010	3010	3010	3010	3010	3010
Imports FU (t live wt)	13470	14053	14615	15234	15917	16669	17501
Production FU (t live wt)	3069	3061	3061	3061	3061	3061	3061
Fish supply FU (t live wt)	13258	14104	14666	15285	15967	16720	17552
Population (X1000)	1992	2011	2018	2026	2034	2042	2050
Per caput supply (kg/h)	7	7	7	8	8	8	9
Production NFU (t live wt)	15	0	0	0	0	0	0
Imports NFU (t live wt)	5198	3414	3414	3414	3414	3414	3414
Exports NFU (t live wt)	1	0	0	0	0	0	0
Net supply NFU (t live wt)	5213	3414	3414	3414	3414	3414	3414
Aquaculture (t live wt)	831	1015	1121	1238	1367	1509	1666
Capture (t live wt)	2254	2254	2254	2254	2254	2254	2254
Production total (t live wt)	3084	3269	3375	3491	3620	3762	3920

Source: database

Food use net supply and human consumption 2005-2030

Slovenia has a relatively fast-growing economy, and the purchasing power of its population is quickly improving (Spencer and Shull, 2002). Consequently, net supply will increase from 13 000 tonnes in 1998 to 17 500 tonnes in 2030. The major part of this increase will be fuelled by imports, as national production will only increase slightly thanks to the aquaculture sector.

Also, the number of single and childless households in Slovenia is on the rise, which results in a higher demand for convenience products (Spencer and Shull, 2002), reflected here in the rise in demand for prepared/preserved products. Net supply of fish fillets, fresh fish and crustaceans and molluscs prepared will also increase.

Table 538: Slovenia - FU net supply by OECD group of commodities 2005-2030 (t live weight)

Gp of commodities	Ave. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	2435	2245	2245	2245	2245	2245	2245
Crus., mol. & other aquatic inv., prepared	53	77	78	79	80	82	83
Crustaceans	525	552	552	552	552	552	552
Fish, cured	41	44	43	43	42	41	41
Fish, fillets	2829	2865	2948	3034	3122	3213	3306
Fish, fresh/chilled	439	629	638	648	657	667	677
Fish, frozen	3506	3302	3302	3302	3302	3302	3302
Molluscs	263	281	281	281	281	281	281
Prepared/preserved fish	3166	4110	4579	5102	5686	6338	7066

Gp of commodities	Ave. 94-98	2005	2010	2015	2020	2025	2030
Total FU net supply	13257	14105	14666	15286	15967	16721	17553

Source: database

Net supply among the group of species will mostly follow the same pattern as imports with tuna and clupeoids on the increase. The increase in diadromous (rainbow trout), freshwater fish (common carp) and molluscs (mussels) is due to the increase in production of the aquaculture sector.

Table 539: Slovenia - FU net supply by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	86	110	111	113	114	116	117
Diadromous fish	68	45	47	50	52	55	59
Marine fish, pelagic, tunas	1278	1814	2025	2260	2523	2816	3143
Marine fish, pelagic, small	3108	3010	3132	3269	3421	3591	3780
Marine fish, demersal	650	428	428	428	428	427	427
Marine fish, others	4792	5542	5767	6009	6271	6556	6864
Crustaceans	525	552	552	552	552	552	552
Molluscs	316	358	359	360	361	362	364
Cephalopods	2435	2245	2245	2245	2245	2245	2245
Total FU net supply	13257	14105	14666	15286	15967	16721	17553

Source: database

As the population growth rate over the period 1998-2030 (3 percent) is lower than the net supply growth rate (31 percent), annual fish consumption per capita will be increasing steadily over the next 30 years from 7 kg to 9 kg per capita per year.

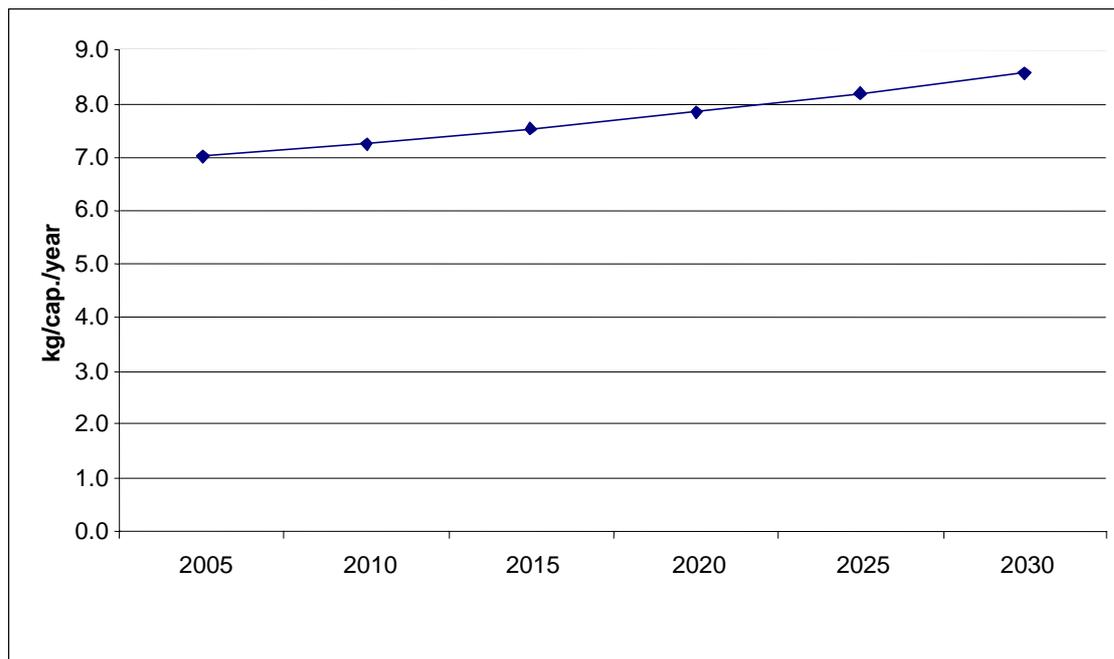


Figure 101: Fish consumption per capita per year in Slovenia 2005-2030

The species consumed in Slovenia in 2030 will be the same as they were in 1998. Only their respective shares vary, with tuna and clupeoids increasing and cephalopods and mackerels decreasing.

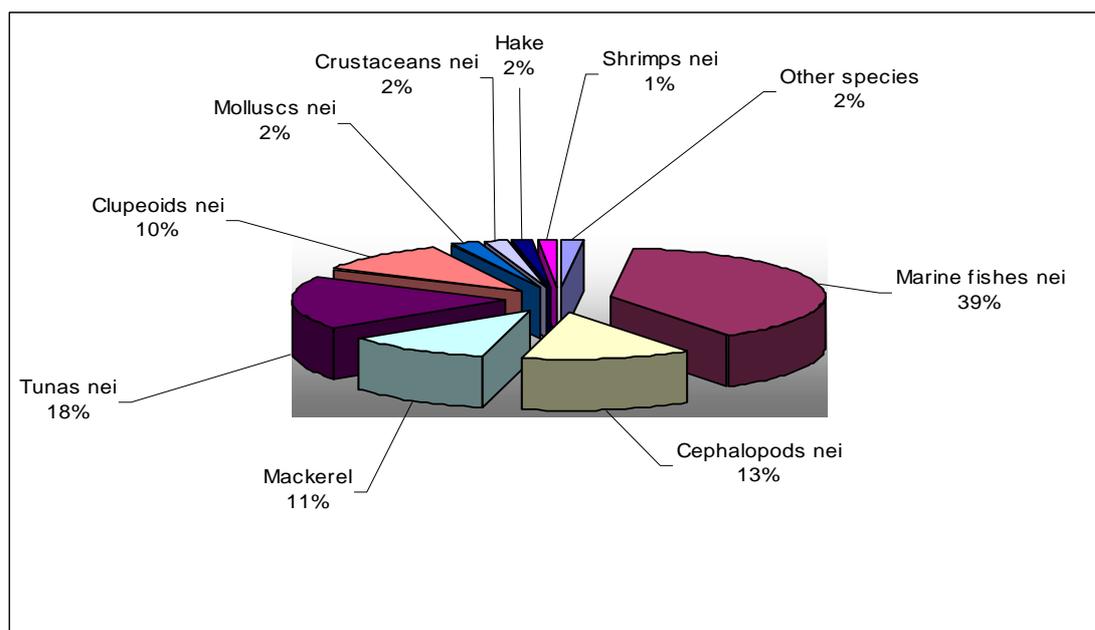


Figure 102: Slovenia - Main species consumed in 2030

Non-Food use net supply 2005-2030

Non-food use net supply will remain constant at its 1998 level of 3 500 tonnes. The possible increase in consumption of non-food commodities due to the increase in aquaculture production will be covered by non-fish based diets.

Production 2005-2030

Capture and aquaculture

Aquaculture production increases to around 1 600 tonnes. All types of production are going to increase, with diadromous fish production remaining the most important sector. The main species include rainbow trout for diadromous fish, mussels for molluscs, sea bass and sea bream for marine fish.

Table 540: Slovenia - Aquaculture by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	192	148	164	181	199	220	243
Diadromous fish	524	690	762	842	929	1026	1133
Marine fish, demersal	80	126	140	154	170	188	207
Molluscs	34	51	56	62	68	75	83
Total	831	1015	1121	1238	1367	1509	1666

Source: database

Table 541: Slovenia - Total production by FAO group of species 2005-2030 (t live weight)

Gp Species	Ave. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	414	370	386	403	421	442	465
Diadromous fish	574	740	812	891	979	1075	1182
Marine fish, pelagic, small	1942	1942	1942	1942	1942	1942	1942
Marine fish, demersal	82	129	142	156	172	190	210
Marine fish, others	9	9	9	9	9	9	9
Molluscs	41	57	63	68	75	82	90
Cephalopods	21	21	21	21	21	21	21
Total	3084	3269	3375	3491	3620	3762	3920

Source: database

Commodities

The slight increase in the diadromous species production will affect positively the production of commodities. The additional production will not be processed but put on the market as fresh products.

Trade 2005-2030

Imports

Food use commodities imports increase to 17 500 tonnes. The major rise will be experienced in prepared/preserved fish, namely canned large and small pelagic species. Other commodities will remain stable (cephalopods, molluscs, crustaceans whole) or increase slightly (crustaceans prepared, fresh fish, fish fillets). Cured fish is the only product to decline.

Table 542: Slovenia - FU Commodities Imports by OECD group of products 2005-2030 (t live weight)

Gp of commodities	Av. 94-98	2005	2010	2015	2020	2025	2030
Cephalopods	2563	2341	2341	2341	2341	2341	2341
Crus., mol. & other aquatic inv., prepared	53	77	78	79	80	82	83
Crustaceans	525	552	552	552	552	552	552
Fish, cured	41	44	43	43	42	41	41
Fish, fillets	2830	2883	2966	3052	3140	3231	3324
Fish, fresh/chilled	860	883	892	901	911	921	931
Fish, frozen	3261	2940	2940	2940	2940	2940	2940
Molluscs	272	296	296	296	296	296	296
Prepared/preserved fish	3065	4038	4506	5030	5614	6266	6993
Total FU Imports	13470	14053	14615	15234	15917	16669	17501

Source: database

Regarding species, imports will have a positive impact mainly on tuna and small pelagic species like clupeoids.

Table 543: Slovenia - FU Commodities Imports by FAO group of species 2005-2030 (t live weight)

Gp Species	Av. 94-98	2005	2010	2015	2020	2025	2030
Freshwater fish	95	140	142	143	145	147	148
Diadromous fish	72	45	47	50	52	55	59
Marine fish, pelagic, tunas	1278	1814	2025	2260	2523	2816	3143
Marine fish, pelagic, small	3384	3286	3408	3545	3697	3867	4056
Marine fish, demersal	700	481	481	480	480	480	480
Marine fish, others	4529	5020	5244	5487	5749	6033	6342
Crustaceans	525	552	552	552	552	552	552
Molluscs	325	373	374	376	377	378	379
Cephalopods	2563	2341	2341	2341	2341	2341	2341
Total FU Imports	13470	14053	14615	15234	15917	16669	17501

Source: database

Exports

Food use commodities exports will remain stable around their 1998 level of 3 000 tonnes.