



General View to Turkish Carp (*C. carpio*) Production

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Abstract

Aquaculture is a basic industry that meets a great part of the world's food necessity. Cultural fish breeding is increasing in Turkey and other part of the world. The production of aquaculture, that is provided by cultivation in the world, has reached to 55 million tons. This proportion meets nearly 37 % of the world aquaculture production. The aquaculture, that is provided by cultivation in Turkey, has been determined to be 233 thousand tons. The species that are commonly cultivated in Turkey, primarily from sea fish are; Gilthead seabream, European seabass, and from freshwater fish; Rainbow trout and Common carp. The production amount of Gilthead Seabream from 1986, in which aquaculture cultivation in Turkey was statistically recorded, to 2013 respectively increased from 86 tons to 35 701 tons; and the production amount of Rainbow Trout, on the other hand, increased from 990 tons to 122 873 tons. However, the production amount of Common Carp decreased from 2050 tons to 146 tons. For Seabass, on the other hand, the first statistical data belongs to 1987 and it is 25 tons; the production amount of the same species reached to 67 913 tons in 2013. In the prudential study, as long as the available conditions continue in Turkey in 2030, it is expected that total aquaculture production of Turkey will be 400 000 tons. Through the end of the 2016s, it is estimated that the production of Common Carp (*C. carpio*) shall come to an end, or in other words, the production of Common Carp is in danger of extinction.

In this study, the potential of Turkey's carp breeding were evaluated and the causes of the reduction in carp farming were focused.

Key Words: Common Carp (*C. carpio*), Aquaculture, Turkey

Türkiye Sazan Balığı (*C. Carpio*) Üretimine Genel Bir Bakış

Özet

Su ürünleri dünyanın gıda ihtiyacının büyük bir bölümünü karşılayan temel bir endüstridir. Kültür balığı yetiştiriciliği Türkiye ve dünyanın bir çok yerinde artmaktadır. Dünya'da su ürünleri yetiştiriciliği (akuakültür) ile sağlanan üretim miktarı 55 milyon tona ulaşmıştır. Bu oran, dünya su ürünleri üretiminin yaklaşık % 37 sine karşılık gelmektedir. Türkiye'de yetiştiricilik yoluyla üretilen balık miktarı 233 bin ton olarak belirlenmiştir. Ülkemizde yaygın olarak yetiştiriciliği yapılan türler deniz balıklarında Çipura, Levrek; içsu balıklarında ise Gökkuşluğu alabalığı ve Sazandır. Su ürünleri yetiştiriciliği istatistiklerine göre, Çipura yetiştiriciliği 1986 - 2013 yılları arasında 86 tondan 35 701 tona çıkarken, aynı dönemde Gökkuşluğu Alabalığı yetiştiriciliği ise 990 tondan 122 873 tona ulaşmıştır. Ancak, sazan üretimine bakıldığında ise, 2050 tondan 146 tona doğru bir azalma görülmektedir. Diğer yandan Levrek balığında ise, 1987 - 2013 yıllarına ait istatistiklerde 25 tondan 67 913 tona olan artış bulunmaktadır. Yapılan çalışmalarda, Türkiye'de mevcut imkanlar ve koşullar olumlu devam ettiğinde 2030 yılında toplam su ürünleri yetiştiriciliği miktarı 400 000 tona ulaşması beklenmektedir. Fakat, 2016 yılının sonuna doğru, sazan (*C. carpio*) üretiminin sona ereceği diğer bir değişle sazan yetiştiriciliğinin yok olma tehlikesi ile karşı karşıya kalacağı tahmin edilmektedir.

Bu çalışmada Türkiye'nin sazan balığı yetiştirme potansiyeli ve yetiştiriciliğinin azalma nedenleri üzerinde durulmuştur.

Anahtar Kelimeler: Sazan (*C. carpio*), akuakültür, Türkiye

INTRODUCTION

The mostly cultured species in Turkey are trout, sea bream and sea bass. According to FAO data, Turkey is the fastest growing third countries in the world aquaculture. Trout is the mostly cultured species between the cultured fish species and trout farming constitutes 54 % of the total aquaculture production. It is followed by sea bass with 31 % and sea bream with 14% in marine aquaculture (Table 1).

In the world, the common carp (*C. carpio*) production is around 4 million tons (Table 2). *Cyprinus carpio* has a significant place in Turkey's in fishing activities and it has widespread distribution in our freshwater ecosystems such as lake, pond and dam lake. Although there is suitable water conditions and it is captured abundantly from inland waters, carp farming is rapidly declining in Turkey. There is only 146 tons carp cultured in 2013 [14].

Table 1. Turkey's aquaculture production between years of 2004-2013(tons) [15].

Species	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Trout	43.432	48.033	56.026	58.433	65.928	75.657	78.165	100.239	111.335	122.873
Carp	683	571	668	600	629	591	403	207	222	146
Total (inland)	44.115	48.604	56.694	59.033	66.557	76.248	78.568	100.446	111.557	123.019
Trout (marine)	1.650	1.249	1.633	2.740	2.721	5.229	7.079	7.697	3.234	5.186
Sea Bream	20.435	27.634	28.463	33.500	31.670	28.362	28.157	32.187	30.743	35.701
Sea Bass	26.297	37.290	38.408	41.900	49.270	46.554	50.796	47.013	65.512	67.913
Mussels	1.513	1.500	1.545	1.100	196	89	340	5	-	-
Others	-	2.000	2.200	1.600	1.772	2.247	2.201	1.442	1.364	1.575
Total (marine)	49.895	69.673	72.249	80.840	85.629	82.481	88.573	88.344	100.853	110.375
Total Aquaculture	94.010	118.277	128.943	139.873	152.186	158.729	167.141	188.790	212.410	233.394

Table 2. Common carp production (capture and aquaculture) in the world between years of 2003-2012(tons) [10].

Species	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Countries										
Bangladesh	14594	19522	16598	18568	33564	36662	40262	46313	61637	64769
China	1958663	2043358	2135832	2234949	2228585	2350691	2462346	2538453	2718228	2896957
Egypt	17006	0	0	0	0	11400	11688	91721	103662	33500
Indonesia	229247	202412	225932	256646	273445	250505	255640	291636	344166	387351
Iran	20441	21950	24559	25658	34085	30011	32808	39177	43709	58232
Myanmar	7000	11100	13100	15800	16700	18563	20916	23413	22747	24727
Russian Federation	48301	49417	56157	46708	47842	51580	54017	60229	58563	64168
Turkey	14363	14134	14289	12784	12886	12254	11555	12461	10205	10195
Viet Nam	0	0	0	0	0	75000	109800	110000	150000	100000
World total	3023675	2629701	2735360	2860255	2887591	3126626	3304606	3715091	3746930	3877118

Current Potential Of Inland Waters

In Turkey, there are nearly 1.5 million hectares of inland water production areas. With the construction of new water reservoirs, it is estimated that Turkey's inland aquaculture will increase in favor of trout farming. However, since Turkey is located in a temperate climate zone, many of inland water resources are more convenient for warm water fish species rather than cold water fish. Because of the high levels in water temperature in the spring and summer seasons, trout farming can be done in autumn and winter season. This brings the production and marketing problems. However, warm water fish farming is possible to find suitable water features for all year around. Despite this potential, warm water fish production has not been developed.

Produced Fish Species In Inland Waters Of Turkey

Aquaculture activities in Turkey has begun with carp and trout farming in 1970s [3,4]. While the rainbow trout farming has been exceeded 120 thousand tons, carp farming has decreased. However, Turkey has an important place in the world with carp fishing.

Table 3. Global common carp (*C. carpio*) capture production (tons) [9].

	Countries	2012
1	Mexico	22186
2	Indonesia	12985
3	Iran	11862
4	Turkey	9973
5	Thailand	7000
6	Hungary	3688
7	Russian Federation	3288
8	Czech Republic	3207
9	Korea	1897
10	Slovakia	1419
Global Capture	Total	85205

Table 4. Inland capture productions of Turkey (tons) [14].

Species	2013
Pearl Mullet (<i>A. tarichi</i>)	8600
Common Carp (<i>C. Caprio</i>)	8277
Silver Crucian Carp (<i>Carassius auratus gibelio</i>)	5090
Sand smelt (<i>Atherina sp.</i>)	5012
European chub (<i>Squalius cephalus</i>)	1094
Siraz (<i>Capoeta pestai</i>)	736
Wels (<i>Silurus glanis</i>)	618
Zander (<i>Sander lucioperca</i>)	491
Trout	438
Total Inland Fisheries	35074

Carp Producing Organizations

General Directorate of State Hydraulic Works (DSI) is one of the carp producing organizations in Turkey. There are 7 hatcheries and carp production units in different regions of Turkey. The main aims of these units is fish population enrichment of dam lakes. In these units in additions to the common carp, grass carp, catfish, rainbow trout and European perch are also produced. DSI units are responsible for stock enrichment of water reservoirs and thus these units produce massive amounts of carp fries. For the production of eggs and juvenile fish carp, Hungarian methods are used. Amount of produced carp fry has exceeded 200 million since 1994. 10-20 cm in length produced carp fry are released into natural reservoirs.

Other organization engaged in production of carp fry is Mediterranean Fisheries Research Production and Training institute. It is an organization affiliated to the Republic of Turkey Ministry of Food, Agriculture and Livestock. Some of the produced carp fries are used for fish population enrichment and the others are sold to the carp farms. Then, these fish are taken to the net cages or earthen ponds in the farms. At the end of the 2 years, when the fish are approximately 1,5 kg, they are consumed by domestic markets. There are 21 fisheries faculties in Turkey and scientific people of those faculties, has projects and studies with the government agencies and the private organizations on the carp production.

Why Is The Carp Breeding Declining?

Low Fish Consumption And Lack Of Recognition Of Carp

In Turkey, the average annual fish consumption per capita is 8 kg, and the habits to the fish consumption is less important. This is the major problem. Generally, fish consumption reaches 24 kg per capita in coastal parts of Turkey but in some interior areas, it remains only 1 kg. But the people who lives in the coastal areas, prefer marine fish consumption mostly. there is also prejudice against to the carp because of the mud smell. These problems negatively affect carp production in Turkey.

Internal Market Demand and Carp Fisheries

About 8,2 thousand tons of common carp were captured in Turkey, and this amount meets the domestic market demands[15]. Most of the captured carp are consumed by Middle Anatolian people. The carp meat should be present to the other people in Turkey.

Long Production Period of Carp

In Turkey waters, trout can reach market size (250-330g.) in 8-9 months normally, if there is good production performance, this period can be shorten. However, carp production period is longer than the trout. It takes average 2 years (1,5 kg weight) for the market size. Entrepreneurs and fish farmers want to convert production to the money in short time. But, with the last scientific projects, scientists showed that it is possible to produce carp in shorter period. In the result of the projects, it is observed that juvenil fish can reach from 20 gr to the 1750 gr in 195 days with the feeding regime adjustment.

Difficulties In Obtaining Sufficient Quantities Of Carp Fry To The Fish Farmers

In the Mediterranean Fisheries Research Production and Training Institute, juvenile fish are sold to the manufacturers at the end of the summer in the size of 3 cm. And this is the problem for production period. So, production planning

should be revisited and carp fry must be at least 20 gr at the end of the summer. This can be observed with the starting production one month before. On the other hand, the establishment of private carp hatcheries and support by the government can solve the carp fry demand problems.

Problems In Obtaining Efficient And Appropriate Feed For Carp

In Turkish aquaculture industry, feed costs has reached nearly 70 % of total production costs. All of the cultured fish in Turkey, are carnivorous fish. So, in this feed, there should be at least 45 % crude protein and at least 30 % of CP has to come from animal sources. This raises the feed costs. Since the carp is omnivorous, the carp feed costs can be reduced. But, there is no special feed for carp. And the fish farmers use trout fish.

RESULTS AND CONCLUSION

Although, Carp farming is old for the Turkish aquaculture history, acceleration of production is decreasing every year. Rather, capture-based production is available for the carp. But, seasonal production is obtained with the capture-based production method. Thus, a suitable production model for export cannot be created. From time to time, demand from abroad for the carp can't be met, due to the lack of sufficient and sustainable production. Whereas, Turkey has very appropriate conditions for the rapid growth of the carp. If this good water conditions are combined with appropriate production methods, it is estimated that carp production will become more profitable. Because carp consumption is mostly based on the capture production and sometimes these fish's meat contains sludge smell due to the capture area, demand for the carp decreases. However, it is thought that production in the net cages would eliminate such a problem. In this way, it is expected to increase the demand to the carp consumption. In Turkey, there are few carp farms and these farms supply their products to the markets in a similar time frame. This situation negatively affects the competitiveness and profitability of enterprises. Rearing period of the carp takes 2 - 3 years, and this increases operating costs for the enterprises. While reducing production period of the fish, to be produced according to market demand, profitability will increase and this will also stimulate the manufacturers to produce carp. By reducing the rearing period with the appropriate conditions, it is estimated that this will increase both domestic and foreign sales.

As a result, for the development of carp production in Turkey has suitable water conditions and knowledge. However, a good planning is required from production till marketing for sustainable carp farming.

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