

## Aquaculture of Russia: status and potential for business

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Now fish consumption per capita in Russia is much lower than it should be according to health norms, and deficiency of fish products in the country is more than 1 mln. tonnes. Aquaculture production plays very important role in food improvement of population of the country, and aquaculture part in the world fish industry is more than 50%. While fishery is mainly depends on external factors (source of raw materials, composition of species), aquaculture enterprises are working in clear dependence on market conditions and management level of enterprise/farm.

Specific diversity of species cultivated in waters with different temperatures gives an opportunity for aquaculture development in many directions and various types of farms, taking into account natural-climatic conditions and satisfaction of requirements of people with different income levels. Present production volumes of commercial fish-breeding (115–120 thousand tonnes) are not more than 15% from potential aquaculture ability in the Russian Federation. During last years national experience of some leading fish farms shows the cost efficiency of rearing rainbow trout in cage farms, sturgeon fishes – in tank and cage farms with thermally enriched water, carp fishes – in ponds of south regions. In Russian there are undoubted perspectives for industrial fish-breeding in the conditions of fish-breeding plants with recirculating systems, especially combining with cage and pond farms, which are traditional for Russia. All this is confirmed by the fact, that now in the country more than 10 large sturgeon and trout fish farms are in developmental stage or under construction.

## Динамика развития аквакультуры

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Аквакультура – не только самая быстрорастущая по производству продуктов питания животного происхождения, но и опережающая рост населения отрасль. На этапе ее становления, в конце 1960-х гг., объем производства составлял около 3 млн. т, хотя потенциал только пресноводной аквакультуры оценивали в 20 млн. т. В 1985 г. общий мировой объем продукции аквакультуры (включая водоросли) составил 12,1 млн. т, однако к концу XX века, в 2000 г., он достиг 41,7 млн. т, а к середине первого десятилетия XXI в., в 2006 г., – 66,8 млн. т. Таким образом, по сравнению с начальным периодом развития, этот показатель увеличился в 22 раза, в результате чего аквакультура обеспечила почти половину (47%) среднего мирового объема поставки рыбы на душу населения – 16,7 кг в 2006 г.

Анализ состояния мировой аквакультуры, проводившийся неоднократно, в том числе и нами (Kotenev et al., 2006a, 2006b), показывает, что темп ее развития опережает самые смелые прогнозы. Удвоение годовой продукции аквакультуры относительно уровня 1985 г. заняло вместо 15 лет, по прогнозу ФАО, всего 9, а к 2000 г. ее общий объем вырос почти в 5,5 раз. Предполагавшееся ФАО удвоение производства гидробионтов (без водорослей) к 2010 г. относительно уровня 1993 г., также было достигнуто раньше – к 2002 г. (соответственно 17,8 и 36,8 млн. т). Начиная с 1953 г., ежегодный прирост продукции аквакультуры составляет около 7%. В 1950-е гг. мировая аквакультура давала примерно 4% от общего объема добычи рыб, беспозвоночных и водных растений, в 1980 г. – 11%, а в 2007 г. достигла 42%. По прогнозам к 2050 г. глобальная продукция аквакультуры может достигнуть 80 млн. т с преобладанием марикультуры.

## **The dynamics of aquaculture development**

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Aquaculture is not only the fastest growing domain of animal food production but also a population growing anticipating branch. At its initial stage, in the late 1960s, the yield of its production comprised about 3 mln tons, though the potential of only freshwater aquaculture was estimated at 20 mln tons. In 1985, the total world volume of aquaculture production (including seaweeds) made up 12.1 mln tons, however by the end of the XXth century, in the year 2000, it reached 41.7 mln tons and by the middle of the first decade of the XXIst century, in 2006, it peaked at 66.8 mln tons. Thus, compared with the initial development period this index increased 22 times with the result that in 2006 aquaculture provided almost half (47%) the world average volume of fishery production of 16.7 kg per capita.

The analysis of world aquaculture state which has been repeatedly performed, including us (Kotenev et al., 2006a, 2006b), shows that its development rates are ahead of the most audacious predictions. A twofold increase in the aquaculture production as related to the 1985 level took only 9 years instead of 15 predicted by the FAO, and by the year 2000 its total volume increased almost 5.5 times. A twofold increase in production of hydrobionts (without seaweeds) assumed by FAO by 2010 as related to the 1993 level was also achieved earlier, by 2002 (17.8 and 36.8 mln tons, respectively). Beginning with 1953 the annual aquaculture production increment made up about 7%. In the 1950s, the world aquaculture provided approximately 4% of the total catch of fish, invertebrates and seaweeds, while in 1980 and 2007 it amounted to 11 and 42%, respectively. According to forecasts by 2050, the global aquaculture production may reach 80 mln tons with mariculture predominant.