RUDN Journal of Economics
Вестник Российского университета дружбы народов.
Серия: Экономика

ISSN 2313-2329 (Print); ISSN 2408-8986 (Online)
2024 Vol. 32 No. 3 436–446
http://journals.rudn.ru/economics

ЭКОНОМИКА ОТРАСЛЕВЫХ РЫНКОВ

ECONOMY OF INDUSTRY MARKET

DOI: 10.22363/2313-2329-2024-32-3-436-446
EDN: MMBDZW
UDC 339

Research article / Научная статья

The EAEU Aquaculture Market: The State, Problems and Prospects of Development

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Abstract. Currently, fish and fish products occupy an important place in the global food market. Recently, the global volumes of caught fish and artificially grown fish have almost equaled, and the latter is showing steady growth. This trend, in the context of the catch restriction policy pursued by environmental organizations, on the one hand, and population growth, on the other, is likely to continue for the long term. For many countries, fish plays an important role in solving the food problem. The demand for fish and fish products is growing in the member States of the Eurasian Economic Union (EAEU), which have sufficient potential for the development of fisheries based on the available resource potential and deepening interstate cooperation. One of the promising areas of integration cooperation within the framework of a coordinated agro-industrial policy is cooperation in the field of aquaculture. In the EAEU member states, the development of aquaculture is becoming one of the priority state tasks in the field of agro–industrial complex. At the same time, in order to increase such production, it is necessary to create appropriate conditions, form measures and mechanisms of state support, taking into account the projected results of its implementation. The article provides a general description of the production potential of aquaculture cultivation in the EAEU. The paper presents the activities of the Eurasian Aquaculture Alliance, an association aimed at supporting the development of aquaculture production; its cooperation with the Eurasian Economic Commission is considered. The most acute problems and promising areas of fish farming development in the Eurasian space are highlighted.

Keywords: Aquaculture, fish, EAEU, fish farming, fish products

Conflicts of interest. The author declares that there is no conflict of interest.

Article history: received on April 3, 2024; verified on May 14, 2024; accepted on June 1, 2024.

For citation: Yakimovich, A.O. (2024). The EAEU Aquaculture Market: State, problems and development prospects. *RUDN Journal of Economics, 32*(3), 436–446. https://doi.org/10.22363/2313-2329-2024-32-3-436-446

Рынок аквакультуры ЕАЭС: состояние, проблемы и перспективы развития

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Аннотация. В настоящее время рыба и рыбная продукция занимают важное место на мировом рынке продовольствия. В последнее время мировые объемы выловленной рыбы и искусственно выращенной рыбы практически сравнялись, причем последняя демонстрирует устойчивый рост. Эта тенденция, в условиях проводимой природоохранными организациями политики ограничения вылова, с одной стороны, и роста населения — с другой, по всей видимости, сохранится на долгую перспективу. Для многих государств рыба играет важную роль в решении продовольственной проблемы. Растет спрос на рыбу и рыбные продукты в государствах — членах Евразийского экономического союза (ЕАЭС), которые обладают достаточным потенциалом для развития рыбного хозяйства на основе имеющегося ресурсного потенциала и углубления межгосударственного сотрудничества. Одним из перспективных направлений интеграционного взаимодействия в рамках согласованной агропромышленной политики является сотрудничество в сфере аквакультуры. В странах — членах ЕАЭС развитие аквакультуры становится одной из приоритетных государственных задач в сфере агропромышленного комплекса. В то же время для наращивания такого производства необходимо создание соответствующих условий, формирование мер и механизмов государственной поддержки с учетом прогнозируемых результатов ее реализации. В исследовании дается общая характеристика производственного потенциала выращивания аквакультуры в ЕАЭС. Представлена деятельность Евразийского аквакультурного альянса — объединения, целью которого является поддержка развития аквакультурного производства; рассматривается его сотрудничество с Евразийской экономической комиссией. Выделяются наиболее острые проблемы и перспективные направления развития рыбоводства на евразийском пространстве.

Ключевые слова: аквакультура, рыба, ЕАЭС, рыбоводство, рыбные продукты

Заявление о конфликте интересов. Автор заявляет об отсутствии конфликта интересов.

История статьи: поступила в редакцию 3 апреля 2024 г.; проверена 14 мая 2024 г.; принята к публикации 1 июня 2024 г.

Для цитирования: *Yakimovich A.O.* The EAEU Aquaculture Market: State, problems and development prospects // Вестник Российского университета дружбы народов. Серия: Экономика. 2024. Т. 32. № 3. С. 436–446. https://doi.org/10.22363/2313-2329-2024-32-3-436-446

Introduction

The average world consumption per capita of fish in the world, according to FAO data, has increased from 9.0 kg in 1961 to 20.5 kg in 2021. In low-income countries, this figure is 5.4 kg. In countries with lower middle income — 15.2 kg; in upper-middle-income countries, 28.1 kg. In high-income countries, 26.5 kg. However, excluding China, the average per capita consumption in upper-middle-income countries is only 13.0 kg.[1] The main factors were: population growth, the growth of high-tech production and the reduction of waste, qualitative improvement and increase in distribution channels, public awareness of the beneficial properties of fish, etc. Due to the fact that one of the main factors influencing the prospects of the global fish market is the policy of limiting catches pursued by environmental organizations in order to restore aquatic biological resources, there will be no significant increase in catches in the foreseeable future. Under these conditions, there is an increase in cases of artificial fish rearing (aquaculture). According to the FAO, aquaculture currently accounts for 49% of all fish and seafood caught worldwide. Average annual growth in world aquaculture production for the period 1990–2020. It is important to note that in the last three observations, there was a stable increase in this indicator in absolute terms (Table 1).

Table 1

Dynamics of aquaculture production in the world (million tons)

Years	Aquaculture, total	Aquatic animals	Seaweed
1990	17	13	4
2000	43	32	11
2010	80	58	22
2020	123	88	35

Source: compiled according to The state of world fisheries and aquaculture — 2022, FAO. Retrieved April 2, 2024, from https://www.fao.org/3/cc0461ru/online/sofia/2022/aquaculture-production.html

It should be noted that the bulk of the world's aquaculture production and industrial catch falls on China (Table 2).

The advantage of aquaculture is a stable supply of fish intended for human consumption, both for domestic and foreign markets. Thus, at present, a trend towards a reduction in the rate of catching commercial fish and, at the same time, a trend toward an increase in the importance of aquaculture as the most dynamically developing and globalized segment of the market for the production and consumption of food products, is being formed in the world fish market.

[1] The State of World Fisheries and Aquaculture — 2022, FAO. Retrieved April 2, 2024, from https://www.fao.org/3/cc0461ru/online/sofia/2022/aquaculture-production.html

Table 2

The largest producers of aquaculture fish in the world, 2020

	Country	Million tons	Share, %
1	China	49.6	57
2	India	8.6	10
3	Indonesia	5.2	5
4	Vietnam	4.6	5
5	Bangladesh	2.6	3
6	Norway	1.5	2
7	Egypt	1.6	2
8	Chile	1.5	2
9	EU	1.0	1
10	Nigeria	0.3	0.3
11	Others	23.5	22.7

Source: compiled according to: The State of World Fisheries and Aquaculture — 2022, FAO. Retrieved April 2, 2024, from https://www.fao.org/3/cc0461ru/online/sofia/2022/aquaculture-production.html

Literature review

To achieve this goal, the authors relied on the works of economists and experts in the field of fish market research. Scientific works of different directions reveal certain aspects on this issue. For example, work related to food security. This topic is given attention in the articles by O.B. Digilina, I.B. Teslenko, I.I. Savelyev (Digilina et al., 2019), as well as V.A. Tikhomirova (Tikhomirova, 2016). Institutional aspects of the development of the fishing industry are presented in the work of L.V. Volkov[2]. An important role in the approaches to the analysis of the world fish market was played by works devoted to the world fish market, current trends, the state and prospects of its development (Andronova, Yakimovich, 2019). The article Digital technology in the fishing sector: international and Russian experience (Andronova, Belova, Yakimovich, 2019) contains important information. In the work of D.S. Neuimin (Neuimin, 2018), studies of the current state and features of the development of the fish and fish products market are conducted. Research by M.V. Sytova (Sytova, 2017) analyzes the safety and information support of traceability of aquaculture products. The works of O.B. Digilina, T.H. Raskaliev (Digilina, Ryskaliev, 2018), A.B. Melnikov, P.V. Mikhailushkin,

[2] Volkov, L.V. (2016) Institutional aspects of the development of the fishing industry in the Far East. *Regionalism*, (6). Retrieved April 2, 2024, from https://cyberleninka.ru/article/n/institutsionalnye-aspekty-razvitiya-rybnoy-promyshlennosti-dalnego-vostoka).

D.M. Presnyakov (Melnikov et al., 2017) are of great importance for the analysis of the development of Eurasian integration in the agricultural sector. Among the works devoted to the development of aquaculture in the EAEU member states, there are articles on fish farming in Russia, devoted to the prospects for the development of Russian aquaculture[3], as well as the production of aquaculture in Russia (Levkin, 2023). E.A. Yakimovich in his work explores the problems and prospects for the development of aquaculture fish production in Russia (Yakimovich, 2018). Important information is contained in the works on the development of aquaculture in Kazakhstan (Nurgaliev, 2021), on the introduction of digital technologies in agriculture in Kazakhstan (Digilina, Ryskaliev, 2018). The works on the development of fish farming in Belarus analyze the state of the Belarusian fishing industry in 2018 and the prospects for its development (Ageets, Kostousov, 2019), the main results of scientific research in the field of fish farming and tasks for the near future (Ageets et al., 2019), trends in fish consumption in Belarus (Korneeva et al. 2019). The authors used information from the websites of specialized organizations of the EAEU, the Russian Federation, Belarus, Kazakhstan, and Armenia. To conduct the study, the authors used statistical data from the official websites of: FAO; the Eurasian Economic Commission; the Eurasian Aquaculture Alliance, etc.

Research methods

The work used a combination of various widely used methods. Among them are the search, systematization, evaluation and structural and dynamic analysis of indicators characterizing the current state of the fish farming (aquaculture) potential in the EAEU member countries. When identifying factors and trends in the development of the aquaculture market, the method of statistical observation was used.

Results and discussion

As global trends show, the demand for aquaculture products is growing. The importance of aquaculture in the Eurasian Economic Union (EAEU) is also growing. This is connected not only with ensuring food security but also with the problem of providing employment, developing and supporting small and medium-sized businesses. Director of the Department of Agro-Industrial Policy of the Eurasian Economic Commission Armen Harutyunyan at the V International Fishery Forum (2020) noted that the volume of aquaculture production in the Eurasian Economic Union has steadily grown over the past five years.

As the data (Figure 1) shows, from 2015, the year of the formation of the EAEU, to the present, aquaculture production volumes have more than doubled.

[3] Lukin, A.A., Bogdanova, V.A., Kostyanichev, V.V., & Korolev A.E. (2016). Prospects for the development of aquaculture in the western part of the Arctic zone of the Russian Federation. *Arctic: Ecology and Economics*, (4), 100–108.

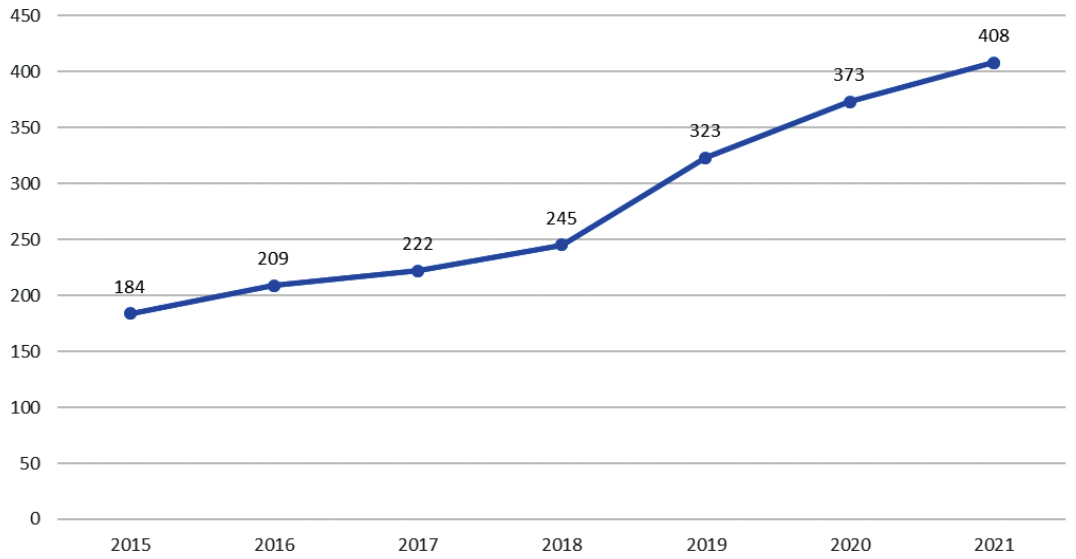

Figure 1. Dynamics of growth in aquaculture production in the EAEU (thousand tons)

Source: The production of aquaculture products in the EAEU has increased 1.7 times in five years. Financial One. Retrieved April 2, 2024, from https://fomag.ru/news-streem/proizvodstvo-produktsii-akvakultury-v-eaes-vyroslo-v-1-7-raza-za-pyat-let/?ysclid=limuz15tpg157148937

Fish farming is becoming an important component of the agro-industrial complex of the EAEU states. According to the Eurasian Economic Commission, fish production in Kyrgyzstan increased by 1.5 times over three years, in Kazakhstan by 3.6 times, and in Russia by 1.4 times. Over three years, aquaculture production in Armenia increased by 1.5 times, Belarus — by 15%, Kazakhstan — by 5.4 times, Kyrgyzstan — by 2.3 times, and Russia — by 1.3 times. Thus, within the framework of the common Eurasian space, an understanding is being formed that, in current conditions, an increase in the production of water resources is possible only through aquaculture development.

In Kyrgyzstan, there are quite good conditions for growing fish: clean mountain rivers, cold water, and many lakes and reservoirs. Trout farming is concentrated in Lake Issyk Kul and the reservoirs of the Naryn River.

In Belarus, 86% of the total fisheries production comes from aquaculture. Basically, pond fish farming is developed, in which about 20 varieties of fish are grown. Up to 11 thousand tons of fish are produced in artificial reservoirs (94% of the total commercial catch)[4].

Kazakhstan also has excellent potential for the development of fish farming. Over the past seven years, the volume of fish production has increased nine times — from

[4] Fish world / Scientific sphere. *Journal "Economics of Belarus".* Retrieved April 2, 2024, from https://belarus-economy.by/ru/science-ru/view/rybnyj-mir-977/

800 tons to 7.4 thousand tons. One hundred eighty fish farms are growing fish in the country, employing more than 1,000 people[5].

In Armenia, aquaculture production provides about 86% of the demand for fish products. The production base of aquaculture in the country is made up of freshwater reservoirs of complex purposes with an area of more than 3 thousand hectares. Aquaculture production has shown steady growth and has increased by 31% over the past two years to over 15,000 tons.

The share of Russia is 87% of the total aquaculture production in the EAEU, and also shows a positive growth trend (Figure 2).

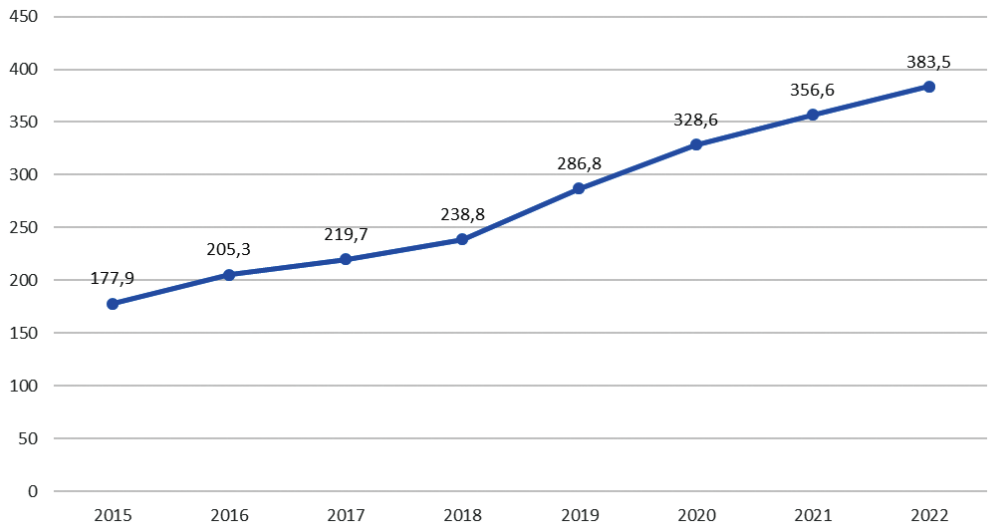

Figure 2. Growth dynamics of aquaculture production in Russia (thousand tons)

Source: compiled according to the presentation PowerPoint. Retrieved April 2, 2024, from https://seafoodexporussia.ru/files/presentations_reports/2022/businessprogram-materials/H4/EEU/Sokolov.pdf?ysclid=lims5bwxdb922052731

In 2015, almost immediately after the formation of the EAEU, the Eurasian Aquaculture Alliance was created to develop and manage the fishery complex on the territory of the EAEU. Now the alliance unites most of the enterprises of the countries of the Eurasian Economic Union in the field of fish farming, which accounts for up to 70% of farmed fish.

This organization develops national technical guidelines for aquaculture, including certification, standardization of products and technologies, certification of production facilities adapted to FAO requirements; provides consulting, legal, scientific and methodological support to fish farmers; provides financial support in the promotion of innovative projects in the field of fish farming; plans and coordinates the production and marketing of aquaculture products; takes part in the development of recommendations for the provision of state support; prepares the system of direct

[5] How the fishing industry is being developed in Kazakhstan. *NJSC "National Agrarian Scientific and Educational Center".* Retrieved April 2, 2024, from http://nasec.kz/ru/news/kak-v-kazakhstane-razvivayut-rybnuyu-otrasl

deliveries with the help of IT-technologies; takes part in the preparation of programs for the development of the fishery complex of the EAEU.

This association maintains close cooperation with the Eurasian Economic Commission (EEC). The EEC supported the first proposed integration project, "Organization of production for the cultivation and processing of salmon and sturgeon fish species to meet the needs of the EAEU market and develop export potential (Eurasiafish Eurasiafish Aquaculture Development Cluster)". Its implementation is designed for the period from 2018 to 2030. It is included in many program documents of state bodies and EEC bodies as the primary integration project in aquaculture development. The capacity of the project should be more than 1200 thousand tons per year. The volume of investments — 600 million dollars. Sources of financing — private investors, investment funds; supply of planting material is provided by Russia, Kyrgyzstan; scientific support — Russia, Belarus (including recreational fish farming); feed supply — Belarus, Russia, Kazakhstan; supply of solar batteries — Kyrgyzstan.

Other projects are also proposed for investment cooperation. The largest of them:

- the project in Kyrgyzstan involves the modernization and expansion of the existing trout fish farm in the Toktogul and Tash-Kumyr reservoirs. Project implementation 2021–2025 The volume of investments is 3.0 million dollars. It is planned to build a workshop for processing products. Payback period — 4 years;
- the project to create a fish cluster in Kazakhstan involves expanding the capacity of the existing shrimp farm from 45 to 135 tons per year. The annual design capacity from 2025 is 90 thousand kg of king prawns. Sales — 72 thousand kg in the domestic market and about 18 thousand kilograms — in the Russian Federation, Uzbekistan, Kyrgyzstan and Azerbaijan Payback period — 5.5 years. The volume of investments — 2.6 million dollars: 70% — debt financing; the participation of the investor National Company KAZAKH INVEST JSC provides 30%;
- it is planned to build a trout farm in the Almaty region in the pools along the channel of the Chilik River, as well as in cages on the Bartogai reservoir. The initiator is the largest producer of rainbow trout in the Republic of Kyrgyzstan. The amount of financing is 16.0 million dollars.

The total production will be 7,200 tons of trout per year. Payback period — 5 years. Participation of the investor National Company "Kazakh Invest" JSC. Despite the positive steps in the development of aquaculture production, representatives of this field of activity in all Union republics have common problems, the most significant of which are: high import dependence on feed, insufficient use of breeding achievements and shortage of high-quality domestic fish stock; low level of disease control in aquaculture facilities; obsolete production capacities and material and technical base of fish-breeding enterprises; non-compliance with technological regulations, lack of control over the quality of the environment; lack of insurance in aquaculture; insufficient funding. As the Minister for Industry and Agro-Industrial Complex of the EEC, Artak Kamalyan emphasized: "The relevance of the development of interstate cooperation

in the EAEU in the field of aquaculture is due not only to the situation in the internal market of the Union but also to the general issues of the development of fish farming in the Union States, which should be addressed jointly"[6].

In this context, the Board of the Eurasian Economic Commission has developed a document containing a list of measures for the development of aquaculture in the Member States of the Eurasian Economic Union in the field of aquaculture dated May 23, 2022 N 21 "Recommendation on General Principles and Approaches to Ensuring the Sustainable Development of Aquaculture and Fisheries in the States — members of the Eurasian Economic Union". All recommended measures are divided into 5 blocks: measures in the field of resource provision; measures in the field of aquaculture production; measures to develop the aquaculture market; measures in the area of scientific and innovative cooperation; measures in the field of improving the legal and methodological base, information support[7].

Implementing the proposed measures will create conditions for closer interaction and cooperation between fish farmers in the Eurasian space. There is already positive experience in certain areas in this area, which will be helpful for enterprises. For example, in Armenia, fish feed is successfully harvested. All components of the granules are natural: fishmeal, wheat and vegetable oil. In addition, vitamins are added there. At each stage, the product is tested. More than three thousand tons of fish food is produced per month at one enterprise[8].

In Kazakhstan, research aimed at developing a technology for the artificial reproduction of rare and endangered fish species and biotechnology for the commercial cultivation of valuable fish species is becoming increasingly important[9].

In the Vologda region of the Russian Federation, the first stage of a plant for growing salmon in recirculating water supply installations was launched. This is the first industrial-type fish-breeding complex in Russia and the Eurasian Economic Union for farming Atlantic salmon using the latest recirculating water supply systems (RAS) technology. Currently, similar enterprises are successfully operating in Canada, Japan and Poland. The development of salmon production at enterprises with RAS will significantly increase the supply of this type of salmon, which is in demand among domestic consumers[10].

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[6] The countries of the Eurasian Economic Union were recommended to develop aquaculture jointly. Retrieved April 2, 2024, from https://www.magazine.fish/news/akvakultura/stranam_evraziyskogo_ekonomicheskogo_soyuza_porekomendovali_sovmestno_razvivat_akvakulturu/?ysclid=liya2zo1cg971338860

[7] Recommendation of the Board of the Eurasian Economic Commission dated May 23, 2022 N 21. Retrieved April 2, 2024, from https://rulaws.ru/acts/Rekomendatsiya-Kollegii-Evraziyskoy-ekonomicheskoy-komissii-ot-23.05.2022-N-21/?ysclid=limtr2kwm8412009614

[8] Dinner for trout: fish feed production launched in Armenia. Retrieved April 2, 2024, from https://mir24.tv/news/16496420/uzhin-dlya-foreli-v-armenii-naladili-proizvodstvo-korma-dlya-ryby

[9] Program — 2030. Retrieved April 2, 2024, from https://rybhoz.kz/files/programma2030.pdf

[10] New prospects for growing salmon: the first in Russia innovative complex for its production in UZV was launched. Federal Agency for Fisheries. Retrieved April 2, 2024, from https://fish.gov.ru/news/2023/03/24/novye-perspektivy-vyrashhivaniya-semgi-dan-start-pervomu-v-rossii-innovaczionnomu-kompleksu-po-ee-proizvodstvu-v-uzv/

Conclusion

Interstate cooperation will allow EAEU enterprises to stimulate the expansion of trade and economic relations, increase the effectiveness of national plans for the development of fisheries, and share best practices. On the part of the EAEU member states, an important factor stimulating the development of aquaculture production should be: comprehensive, long-term, thoughtful support for fry producers, fish hatcheries in the form of subsidies, grants, concessional lending; subsidizing part of the capital costs for the creation of fish-breeding infrastructure; full insurance of aquaculture crops; financial support for personnel training and specialized educational institutions; as well as the adoption of laws harmonizing legislation for entering the common market of the European Union under international standards recommended by the UN FAO and Best Aquaculture Practices.

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Bio note / Сведения об авторе

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