НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ

«Key Areas of Agricultural Innovations in the World and Russia»

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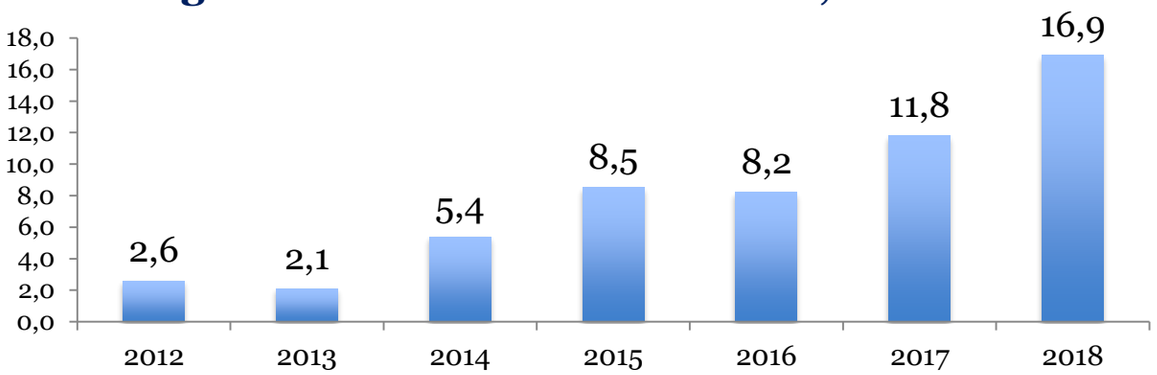
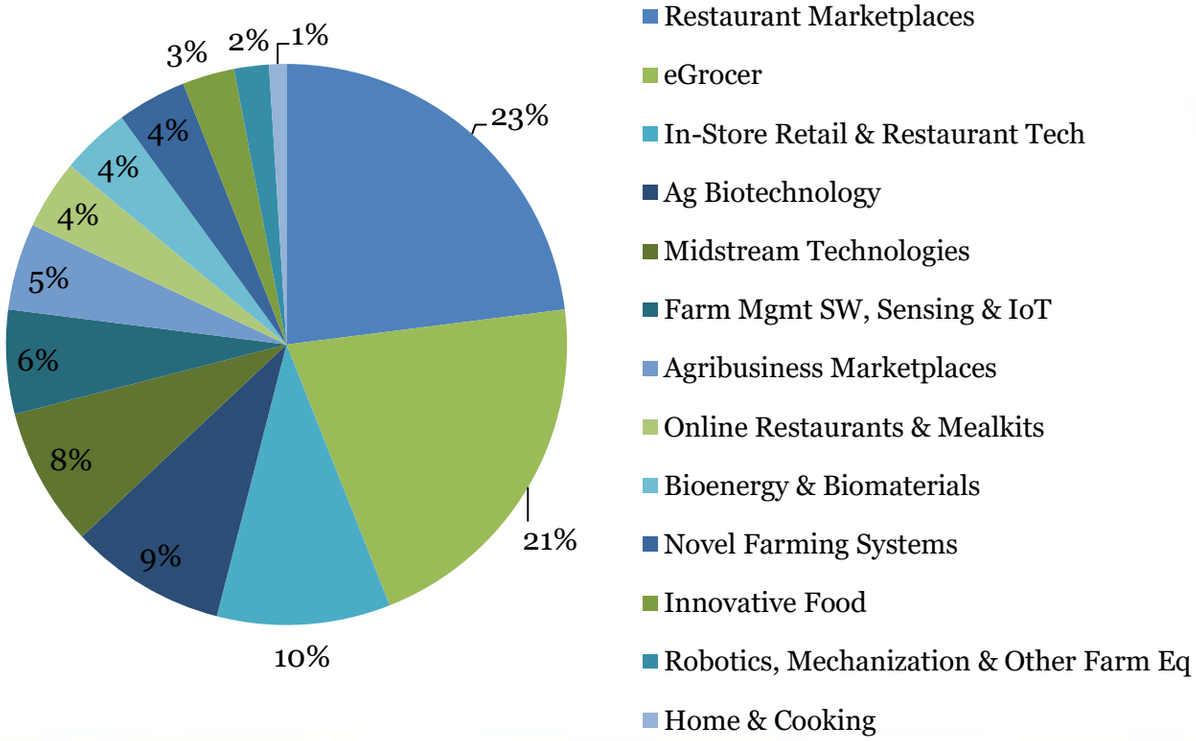
Key Areas of Investments in the World Agrotech

$16.9 bln	1450	+43%	10,5%	1 776	$1 bln
Investments	Deals	Investment Growth	Deal Growth	Unique Investors	Largest Deal

Agrotech Investment 2012-2018, bln USD





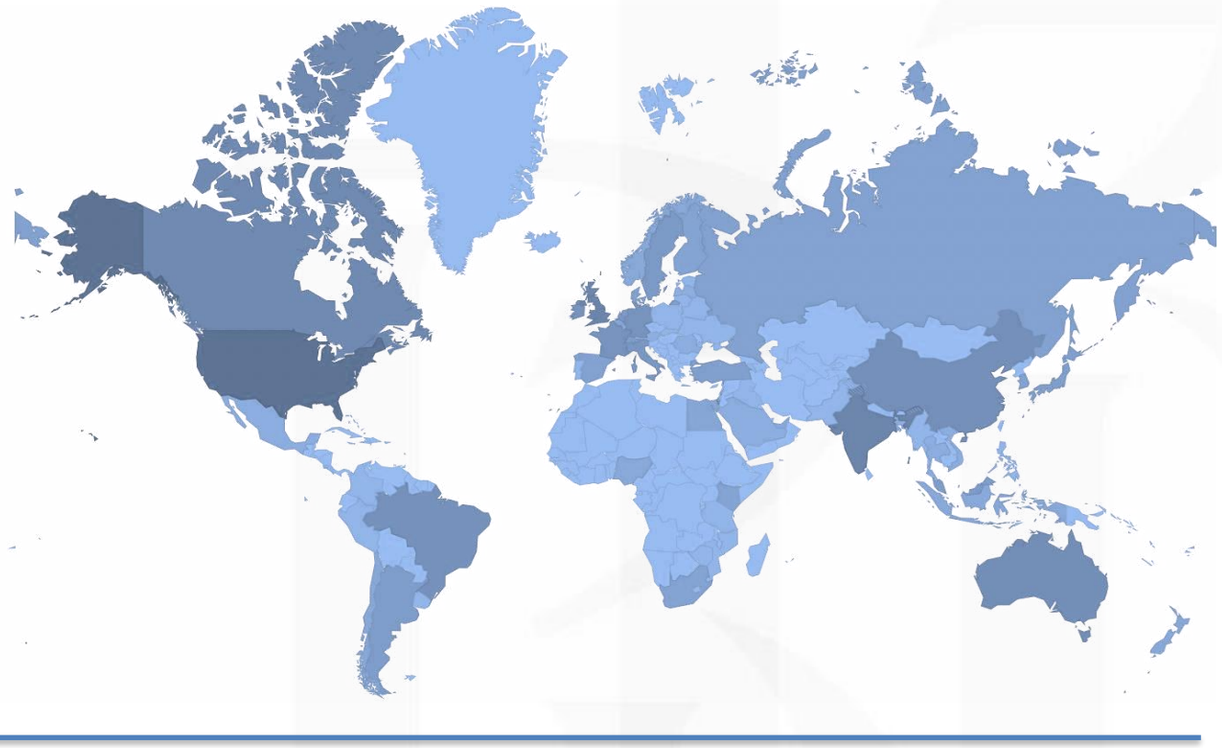
- The volume of investments in AgTech in 2018 is 16.9 billion USD (1,450 transactions).
- The largest investment in the United States (California), but investment in India increased by a record 280%, thanks to the largest transaction of the year - $ 1 billion (Swiggy is an online restaurant site)
- The AgTech industry is becoming mature for venture capitalists, the growth of investments in the later stages in such companies as Instacart and Swiggy, an increase in the average transaction.
- For more than 60% of transactions, investors received an “exit” through mergers and acquisitions. Corporations that made major deals last year - Syngenta, Bayer, DuPont, Land O’Lakes and Merck.
- In the early stages of the industry’s development, there was a significant increase in investment in start-ups focused on technology development from farm to retailer, including robotic and biotech companies..

Source: AgFunder, HSE Institute of Agrarian Studies

Deals by Geography and Trends

AgTech is a global industry

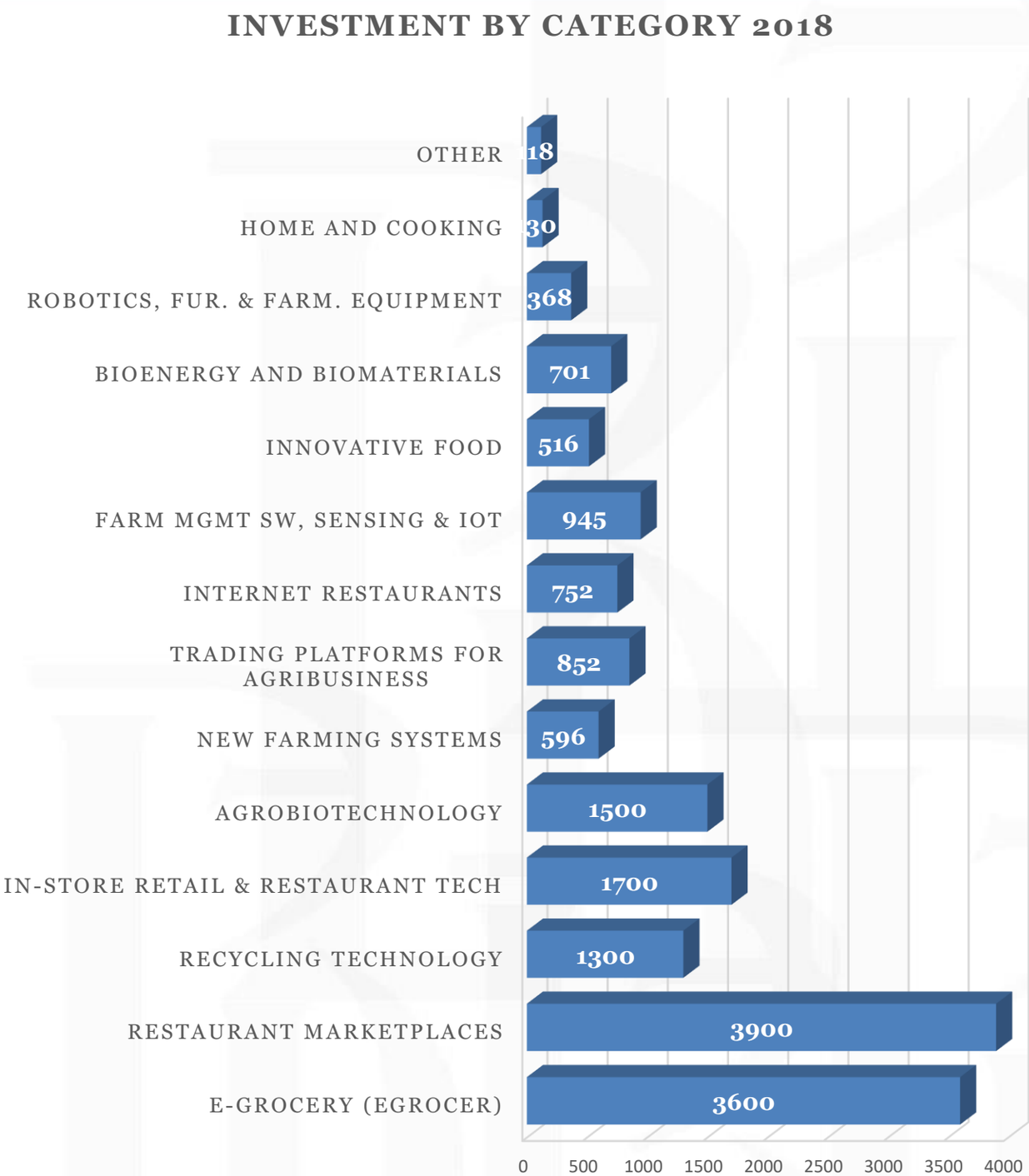
- ✓ Geographically, the majority of transactions were concluded in the US - 567 transactions totaling $ 7.9 billion, followed by China with 184 transactions - $ 3.5 billion, India at 2.4 billion, and Brazil at $ 700 million.
- ✓ In the United States, most of the deals were in California for 5 billion USD, in Massachusetts for 799 million USD and in New York for 539 million USD.
- ✓ The largest deals in the US were made with Instacart, DoorDash, the developers of Zymergen and ZUME strains - a robotic pizzeria.
- ✓ This year, AgTech's investment sector includes new countries, as AgFunder first quotes investments in Albania, Romania, Serbia and Zambia.



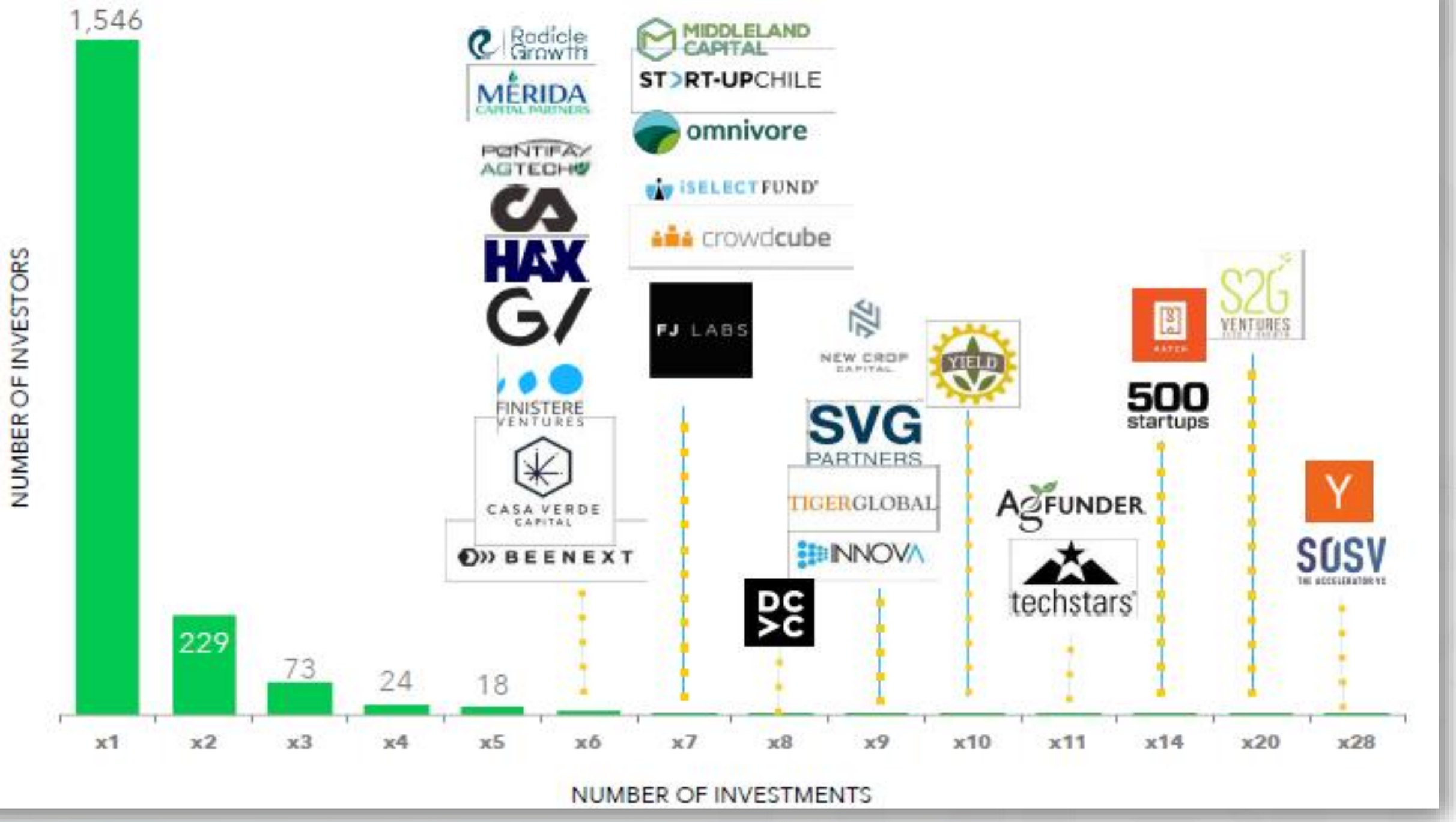
Overall Deal Volume and Activity by Stage

Growing Innovative Markets in AgTech in 2018

- ✓ In a number of areas AgTech growth is observed:
- ✓ Online restaurant markets have invested the largest number of transactions: 91 deals - $ 3.9 billion. USA, primarily due to active investments in Siggy, Brazilian iFood and American DoorDash.
- ✓ They were followed by online stores: 153 transactions - 3.6 billion dollars. Restaurant and retail technologies ($ 1.7 billion), agricultural biotechnology companies ($ 1.5 billion) and medium-sized businesses, which include technologies for ensuring safety and food tracking ($ 1.3 billion), have grown United States).
- ✓ The average transaction size was the largest in the areas of agricultural biotechnology and innovative food companies, reflecting the high cost of agricultural research and development, as well as serious technological challenges that need to be solved in order to get something like “cultivated” meat closer to the market.
- ✓ Some of the most profitable investors include Zymergen - a company that develops microbial strains, Indigo Ag - biotechnological plant protection products, and Impossible Foods. Other significant investments were made in the cannabis manufacturer, the French manufacturer of meal worms (squirrels) and a robotic pizzeria.



Key Investors in Agrotech Innovations in the World in 2018



Key Investors in Agrotech Innovations in The World in 2018

1. By their nature, accelerators are often the most active investors, as they invest little and often, many invest in several tranches every year.

2. SOSV - which has 3 acceleration programs - is the leader in 2018, although it invested 13 projects less than in 2017. Y Combinatory caught up with SOSV - 28 rounds of investment.

3. There were some similarities in the types of startups they invested: biotechnology, robotics, new farming systems, and software.

4. The Chicago Venture Fund of Agricultural and Food Technologies S2GU Ventures chose an investment policy, almost like an accelerator, making 20 investments in 19 startups. VC invests in farm robots, agrobiotech, processing and safety technologies, innovative food products, software.

5. AgFunder - the first year invested in the market (11 start-up projects), ranging from innovative food and ingredients, processing technologies, software and farm management to agrobiotech.

6. The most active venture capital funds are still in the United States. Omnivore exception, India's leading venture capitalist. Leading accelerators in the industry are actively working on all continents of the globe.

7. The number of investors has been steadily growing every year since the beginning of AgFunder analytics (2014) - this year 1,776. The group is diversifying and looks more and more in line with more traditional technological investments.

8. General venture capitalists appreciated the potential of the agri-food industry. The billionaire syndicate, including Jeff Bezos, Bill Gates and Richard Branson, are investing in the agro-tech innovation industry through the Breathrough Ventures foundation.

Russia's chances

In Russia, the agro technology sector is only beginning to develop: in 2016–2017, venture deals of only 750 million rubles were closed. In addition, the Skolkovo Foundation gave start-ups grants for 125 million rubles.

Despite the modest performance so far, this time Russia has a real chance to take the lead.

What is the basis of our confidence?

1. The history of the venture agrotech began only 5 years ago when Monsanto bought the startup Climate Corporation in 2013 (this is a crop forecasting system for insurance companies, which then became the pioneer of the software market for farmers) for $ 1 billion. We have a chance to take part in verticals in the global venture capital market.

2. We have a good starting position. Our agricultural sector is one of the leading industries (4.5% of GDP) with strong positions in export markets (Russia is a major exporter of grain). Russia possesses 10% of the global arable land fund. It is also important that our industry is strongly consolidated: the top 50 agricultural holdings control 13 million hectares in total (i.e., about 20%) of agricultural land and a significantly larger share in processing, which means they accumulate resources and demand for technology.

3. Our grain yield is 2 times lower than in Canada, and 3 times lower than in France, Germany, and the USA. Similar statistics and livestock. Agricultural holdings are aware that there is a great potential for growth in increasing business efficiency. Industry leaders are already customers of innovations that will allow them to reach the performance of leading countries.

4. Over the past 10-15 years, Russia has become one of the leading exporters of agricultural products on the world market. At the same time, it is planned to increase exports to 45 billion rubles until 2025, which is impossible without intensifying existing agriculture, tight control over costs and economic profitability, and using the most advanced technologies in genetics, feed, plant protection and seed production.

Russia's chances

1. There are more than 200 startups working in different segments of agricultural technologies, “from field to plate” in Russia now.

2. First of all, this is the Internet of Things: as a rule, these are technologies that allow using sensors to monitor in real-time the operation of equipment and various equipment, increasing its productivity.

3. The next step is the introduction of artificial intelligence to automate business solutions.

4. Then you can select projects in microbiology for replacing pesticides and increasing the efficiency of fertilizers, which is combined with the global trend for agricultural biologization.

5. And the direction that is very relevant for our country is the technology of precision farming, which allows you to accurately calculate in which part of the field how much fertilizer should be applied and what crop is better to sow, and improve the quality of agronomic solutions.

6. We believe that investors of the best Russian start-ups in agrotech in 5-6 years can increase investments by 5 times or more.

1. A limited circle of strategic investors in Russia, which increases interest in Russian startups that create a product for the global market.

2. Global companies consider the Russian market only to market the solutions they have created, and not to create such solutions.

3. The practice of working with start-ups in the agricultural sector has not been developed. Competition with grant and state money.

4. The lack of a system of large-scale reliable industrial testing and implementation of developments on the market. Risks in product implementation. The cycle of testing and testing technology in agriculture, unlike IT, takes about 2-3 seasons. After this time, the investor may find that the technology actually does not work well or requires too large changes from other business processes for the client.

5. While agrotech startups are deprived of the attention of traditional venture capital funds in Russia

The economic efficiency of investment in agriculture

Social and environmental implications of innovation

Programs of scientific, technical and innovative development of regions, universities, companies

1. The impact of innovation on the economy of agriculture.

2. Evaluation of direct and indirect economic effects from the localization in Russia of the production of components of animal feed (enzymes, amino acids, probiotics, vitamins, protein of various origin, etc.), plant protection products, breeding animal breeding technologies (clean lines) and seeds of the super-elite class . Opportunities and limitations.

3. Life cycles of creation and implementation of innovative agricultural technologies and products in agriculture. Strategic planning of public and private sector investment programs.

Thank you for your attention

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