

MODERN BUSINESS IDEAS IN AGRICULTURE AND FOOD PRODUCTION

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Abstract. Innovations in modern agriculture, in general, and the food industry, in particular, are more important than ever before. The industry as a whole is facing huge challenges related to rising supply costs, labor shortages and changes in consumer preferences. There is a growing recognition in agricultural corporations that new approaches are needed to solve these problems. The article describes innovative business ideas that contribute to the development of the food and processing industry.

Key words: agriculture, startup, food and processing industry, innovation, development.

СОВРЕМЕННЫЕ БИЗНЕС-ИДЕИ В СЕЛЬСКОМ ХОЗЯЙСТВЕ И ПРОИЗВОДСТВЕ ПРОДУКТОВ ПИТАНИЯ

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Аннотация. Инновации в современном сельском хозяйстве, в общем, и пищевой промышленности, в частности, важнее, чем когда-либо прежде. Промышленность в целом сталкивается с огромными проблемами, связанными с растущими расходами на поставки, нехваткой рабочей силы и изменениями в предпочтениях потребителей. В сельскохозяйственных корпорациях растет признание того, что для решения этих проблем необходимы новые подходы. В статье описываются инновационные бизнес идеи, способствующие развитию пищевой и перерабатывающей промышленности.

Ключевые слова: сельское хозяйство, стартап, пищевая и перерабатывающая промышленность, инновации, развитие.

The purpose of the article is to analyze non-traditional start-ups that can be applied in modern agriculture and food processing industry. The development of these sectors definitely promotes economic sustainability [1-6] and population's well-being [7-11].

One of the prospective ideas is the production of vegetable meat. People are already used to vegetable milk in Russia, then the alternative to traditional meat is

just beginning to gain momentum. According to NielsenIQ, the share of meat based on vegetable proteins in the country in 2021 accounted for less than 0.5% of trade turnover. However, this direction has great potential. While over the past 12 months, sales of traditional meat in the largest retail chains have decreased by 3%, sales of vegetable meat have increased by 4%. Moreover, in convenience stores and online stores, sales growth amounted to 323% and 83%, respectively, and positive dynamics is observed in almost all regions of the country. It is worth noting that Russian manufacturers and retailers have an additional advantage - the opportunity to interest the audience with their products during Lent. For example, sales of vegetable meat in March 2021 increased by 53% in physical terms compared to February, which is 10 times more than the average annual dynamics.

The trend for healthy lifestyle and healthy food facilitate the production of vegetable cheeses. The popularity of vegetable cheeses is growing rapidly abroad. In appearance and taste, vegetable cheeses are similar to dairy cheeses, but do not contain milk protein, fat and animal ingredients.

For example, the Swedish startup Stockeld Dreamery is engaged in the production of vegetable cheese from peas and beans. And recently, Daiya has stirred up the dairy-free cheese market with its novelty, releasing a mixture of Italian 4 Cheese Style vegetable cheeses from chickpeas. It tastes like parmesan, mozzarella, provolone. Earlier, in 2021, the brand presented a similar mixture, but with Mexican flavors. Such mixtures do not contain milk, soy, gluten, but are able to transform a large number of snacks and main dishes. Since vegetable products are now in fashion and are not going to leave it, the production of vegetable cheeses has serious prospects. Such a product will be in demand not only by vegans, but also by people who would like to take care of the environment through the use of more environmentally friendly products.

Interestingly, vegetable cheeses are gradually penetrating into those areas where they were not expected, for example, in fast food. Recently, for example, the American burger chain Fuddruckers has acquired three variants of dairy-free cheese. Cheeses "American", "Smoked provolone" and "Pepper Jack" can now optionally be added to any menu item that supports the addition of cheese, including burgers, salads and sandwiches.

A very unusual startup is presented by the idea of making black garlic. Ancient recipes of Asian cuisine are conquering the markets of Europe. Black garlic is not the "sort of that" as you might think. Black garlic is ordinary garlic, which is cooked in a special way. Spices are very popular in the national Asian cuisine. They have long used a phenomenon that chemists and food technologists later called the Maillard reaction. The Maillard reaction is what happens to the original food product, the raw material when it is heated. In the process of uniform, slow and long heating, any food raw materials begin to emit a pleasant – appetizing – smell of cooking food! This happens with bread that is baked and browned in the oven, with meat whose crust smells nice during cooking and with vegetable dishes – such as stews or grilled vegetables.

From the chemist's point of view, at this moment there is a chemical reaction between amino acids and sugars, which are contained in any initial food product –

even in meat, even in dough, even in vegetables. But thermal fermentation takes place not only in the oven at a temperature of 200 degrees Celsius! Take, for example, "dried" fruits that have not been removed from the tree for too long. They like to do this, for example, with cherries. If the cherries are not removed from the tree, they will become "black" and very tasty. Winegrowers do the same with grapes. They do not remove the grapes from the vine, and as a result, it also "drips". Wine from such grapes becomes "sweet" without adding sugar at all.

And what about garlic? In the case of garlic, thermal fermentation does not take place on the native tree, but in a special heat-resistant dish - such as a saucepan or foil. A whole head of garlic, unpeeled, is put there and heated over low heat in the oven – literally languishing, like melted milk. That's just the process of "languishing" is not a couple of hours, but ... a couple of months! Garlic is seriously "evaporated", everything superfluous comes out of it, and everything useful is not only preserved, but also chemically changes for the better.

Black garlic is much more useful than ordinary, unprepared. It tastes like sweet caramel (there is a natural caramelization), although there is no sugar and sweeteners in sight. All its beneficial antioxidants enhance their effect. Black garlic gives even more antimicrobial and antifungal effect. But it ceases to be "too sharp" for the stomach at the same time. And besides, black garlic loses its characteristic "garlic fume", because of which many "people working with people" deny themselves this natural medicine all their lives.

Where and who sells black garlic? Ecomarkets, organic food stores, eco-food fairs, herbal and alternative medicine shops, oriental or Ayurvedic spice shops, vegan outlets. That's how it started. And now the black garlic market is also "haute cuisine" restaurants – finally, it has become fashionable there too! Now everyone eats black garlic, not just some special personalities with strangely arranged brains.

Vertical agriculture/vertical greenhouses gain more and more popularity. While vertical farming is mainly developing in the West, the technology is just beginning to reach Russia. And it is likely that with the growth of the world's population, this type of agriculture will become universally recognized. This direction is especially advantageous where there are no natural conditions for growing vegetables and fruits in the open ground. You can work for a local consumer, and products will no longer have to be imported from distant countries.

Another area of business is the construction of vertical greenhouses. For example, iFarm is already engaged in a similar business, creating automated vertical greenhouses for growing salads, berries and vegetables in urban conditions.

Next idea is agricultural exploration and tree planting by drones. With the help of drones, costs in agriculture are increasingly being optimized. With their help, it is possible to control crops, distribute water, fertilizers and pesticides more efficiently. Agricultural exploration services are developing all over the world - and everywhere drones have their own "untilled field" for work. For example, in Costa Rica, the agricultural intelligence company Indigo Drones helps rice and pineapple producers. With the help of drones, Indigo Drones allows farmers to monitor crops and identify potential problems during the growing season. Farmers can see the condition of the land on a digital landscape map, which allows them to understand where it is

necessary to organize watering and introduce pesticides in the first place. Another work of the system is to make a weather forecast for farms in order to predict harvests and choose exact dates for care procedures.

Also, with the help of drones, one can not only monitor the state of the environment, but also, in fact, create this very environment. In particular, a project called Biocarbon Engineering has developed drones capable of planting forests. They work by scattering special seed bombs - the idea was spied on by birds that promote tree planting by bombarding the ground with droppings. Thus, the Biocarbon Engineering project plants 36 thousand trees a day. It is obvious that the times of “pioneers with shovels on subbotniks” with such methods are unlikely to ever return.

And the last but not the least is the idea of manufacturing edible tableware. Edible containers for serving various dishes can be made from many edible materials. It can be chocolate (coffee shops and tea shops will appreciate it), bran (vegans will appreciate it), and even jelly with different flavors (everyone will appreciate it). Most often, visitors are delighted with this zero waste approach in its purest form. Thanks to this, sales volumes in catering establishments are beginning to increase significantly.

The start-up capital will depend on which business you decide to launch. If you plan to open a workshop, for example, for the production of edible cups, 300 thousand rubles may be enough. If one decides to start production at home, then the investment will be much less. One can start with 30 000 – 40 000 rubles. Edible dishes can also be created manually, without special equipment, working as a self-employed pastry chef at home.

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