

# Production technology of innovative dairy products from camel milk



# Ayan Orazov



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## EXPERIENCE

February 2021 - Current  
**Vice director for scientific work**  
Zhangir Khan University

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## EDUCATION

September 2020 - June 2022  
**Master of Science** | Food Safety  
ITMO University, Saint-Petersburg

September 2019 - June 2021  
**Bachelor of Linguistics** | Translation  
Kazakh-Russian International University, Aktobe

September 2016 - December 2020|  
**Doctor of Philosophy** | Biotechnology of food and biologically active substances  
ITMO University, Saint-Petersburg

September 2014 - July 2016  
**Master of Technical Sciences** | Technology of processing industry (by industry)  
West Kazakhstan Agrarian and Technical University, Uralsk

September 2010 - June 2014  
**Bachelor of Engineering and Technology** | Technology of processing industry (by industry)  
West Kazakhstan Agrarian and Technical University, Uralsk



### Carotenoids: Therapeutic Strategy in the Battle against Viral Emerging Diseases, COVID-19: An Overview

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**ABSTRACT:** Carotenoids, a group of phytochemicals, are naturally found in the Plant kingdom, particularly in fruits, vegetables, and algae. There are more than 600 types of carotenoids, some of which are thought to prevent disease, mainly through their antioxidant properties. Carotenoids exhibit several biological and pharmaceutical benefits, such as anti-inflammatory, anti-cancer, and immunity booster properties, particularly as some carotenoids can be converted into vitamin A in the body. However, humans cannot synthesize carotenoids and need to obtain them from their diets or via supplement. The emerging zoonotic virus severe acute respiratory syndrome coronavirus 2, which causes coronavirus disease 2019 (COVID-19), originated in bats, and was transmitted to humans. COVID-19 continues to cause devastating in



### Role of Camel Husbandry in Food Security of the Republic of Kazakhstan

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**Abstract:** The past 10 years among the y

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Agriculture 2023, 11, 604. https://doi.org/10.3390/ag11050604



### A review of polyphenol and whey protein-based conjugates

Stefanos D. Sotiris, A. D. Pitsigkou, S. Behar, M. Vito, M. Di Bari, M. A., and Ayan O. 2023  
A review of polyphenol and whey protein-based conjugates // BioResources 2023, 17, 4

**Abstract:** Protein and polyphenol conjugates obtained from different food sources, in various conjugation methods and an abundance present in plants, so their combination plays a vital role in affecting the functional properties of food products in the current times, the entire polyphenol conjugates have been.



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Energy Procedia 147 (2018) 510–517  
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### Comparison of the energy efficiency of production of camel's and cow's milk resources

Liudmila Nadochii<sup>1,4,6\*</sup>, Ayan Orazov<sup>4,6</sup>, Mariam Muradova<sup>3</sup>, Kazhybay Bozymov<sup>5</sup>, Assel Japarova<sup>4</sup>, Denis Baranenko<sup>4</sup>

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**d breeding:** Camel breeding in the Republic of Kazakhstan has ample pp of food both inside the country and outside of it. According to it in Kazakhstan is estimated at about 7 million tons per year, the camel's milk can be evaluated as an alternative source of preventive i of urban and rural population in Kazakhstan for the period 2016–2017 on from 26.8 % to 57.2 % and a decrease in the number of rural population of Kazakhstan and the quality of life in recent years leads to losing the requirements of the livestock sector, it can be stated that it is the cow management, in particular, on energy supply of animal addition, energy consumption can be partially compensated by using s available in Kazakhstan.

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Agronomy Research 16(5), 2117–2129, 2018  
https://doi.org/10.15159/AR.18.210

### Identification of yeast species involved in fermentation of the Kazakh camel dairy product—shubat

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**Abstract:** In certain countries of the world, camel's milk is used for food on a level with cow's milk. Shubat is a traditional food product based on camel milk in Kazakhstan. It is a fermented milk product obtained as a result of spontaneous fermentation of camel's milk under the influence of native microflora. Received dairy product from the southern region of Kazakhstan became the object of the investigation of the microflora of the fermented milk product shubat. The aim of the research was to study the microflora of camel milk, which causes its spontaneous fermentation. During the experiment, the dynamics of acid accumulation by the change in active acidity (pH) and titratable acidity (T) was studied. In addition to lactic fermentation fermented product (shubat), alcoholic fermentation was noted, which has given the finished product an increased acidity and a high degree of gassing. To enumerate and identify microorganisms, shubat was sown to the following nutrient media: MRS, Malt wort-sugar medium at 36 °C and 30 °C respectively both for 3 days. We suppose that the dominant component of the shubat's microflora was yeasts: *Brettanomyces anomalous*, *Naumovozyma castellii*. Pathogenic microorganisms, such as *Salmonella*, *Shigella*, were not detected during the research, considering that the shubat is formed as a result of spontaneous fermentation and has poor hygienic characteristics in comparison with pasteurized milk. Identification of individual strains of bacteria allows us to simulate a starter microflora for the production of a safe fermented product based on camel milk on an industrial scale in Kazakhstan. The identified microflora, which causes spontaneous fermentation of camel milk and isolated strains of lactic acid bacteria, will make a significant contribution to the improvement of food safety in arid regions.

**Key words:** camel milk, shubat, spontaneously fermented dairy products, lactic acid bacteria, yeasts, *Brettanomyces anomalous*, *Naumovozyma castellii*.

## PROFESSIONAL AFFILIATIONS

### Research grants:

- Participant in four research projects worth more than 30 million rubles (R&D of ITMO University, RF, St. Petersburg, 2017-2022).
- 2023 Head of research work on "Development of a line of high-protein ice cream based on camel milk for specialized nutrition" Competition for grant funding of young scientists under the "Zhas Galym" project for 2023-2025

## PUBLICATION

1. Tazeddinova D., Toshev A., Abylgazinova A., Rezarul Rahman Md., Mahbubul Matin Md., Bin Bakir M., Orazov A. A review of polyphenol and whey protein based conjugates // BioResources. 2023. 17.4
2. Orazov A., Nadochii L., Muradova M., Bozymov K., Zhumayeva A. Role of Camel Husbandry in Food Security of the Republic of Kazakhstan // Agriculture – 2021, Vol. 11, No. 7, pp. 1-16
3. Khalil A., Tazeddinova D., Aljoumaa Kh., Zhumayeva A., Toshev A., Orazov A. Carotenoids: Therapeutic strategy in the battle against viral emerging diseases, COVID-19: An overview // Prev. Nutr. Food Sci. 2021;26(3):241-261
4. Nadochii L., Orazov A., Kuznetsova L.I., Pinaev A.G., Weihong L., Garbuz S., Muradova M. Identification of yeast species involved in fermentation of the Kazakh camel dairy product-shubat // Agronomy Research — 2018, Vol. 16, No. 5, pp. 2117-2129
5. Nadochii L., Orazov A., Muradova M., Bozymov K., Japarova A., Baranenko D. Comparison of the energy efficiency of production of camel's and cow's milk resources // Energy Procedia — 2018, Vol. 147, pp. 510-517.

# Project Description



Sustainable Development Goals (SDG 2) of the 2030 Agenda (FAO WHO):

## Objective 2.1.

*Ensuring universal access to safe, nutritious and sufficient food for all*

## Objective 2.2.

*Elimination of all forms of malnutrition*



# Alternative milk

85%



*Cow's milk*

15%



*Goat's milk*



*Mare's milk*



*Camel milk*



*Buffalo milk*



*Sheep's milk*

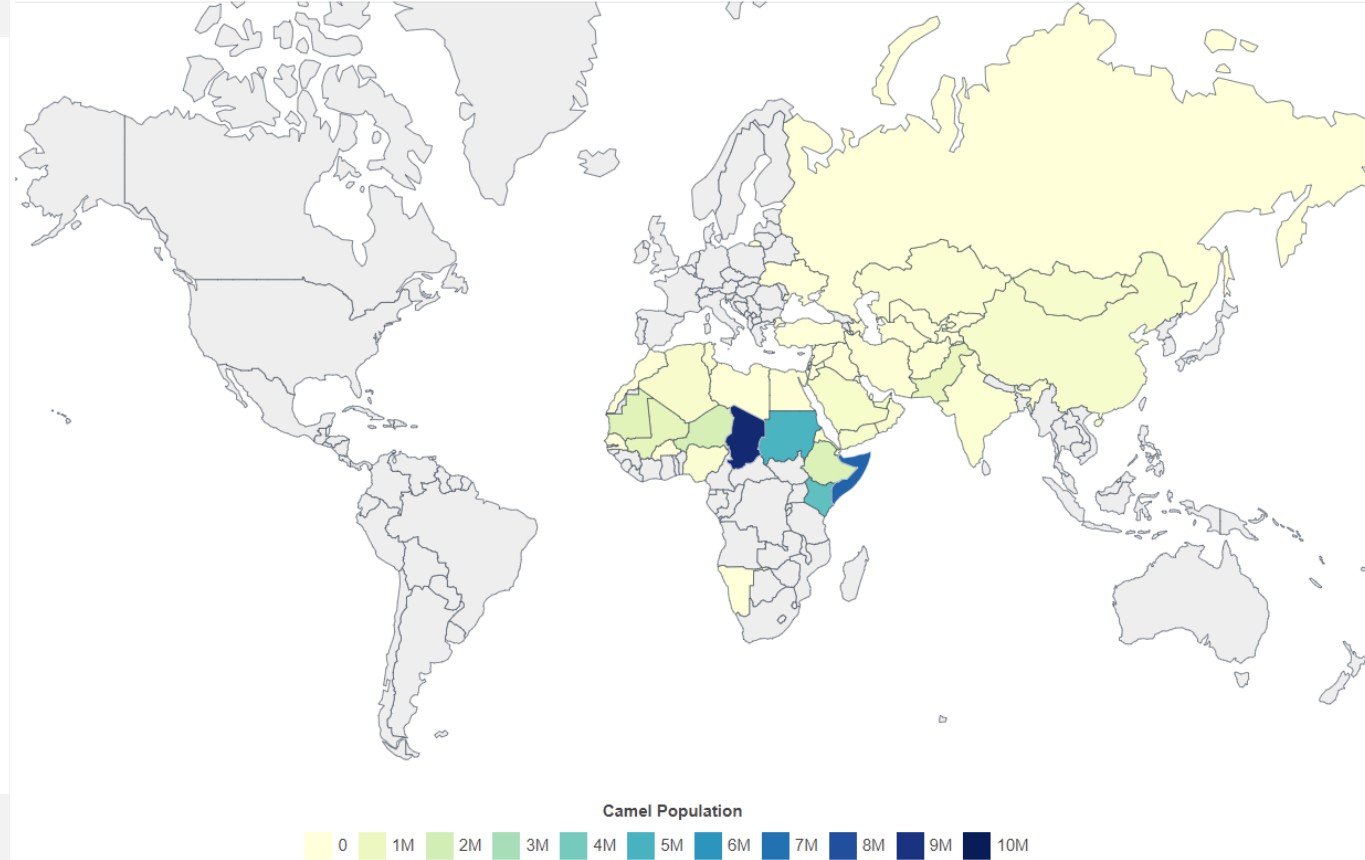
In recent years, much attention has been paid to the consumption of different types of milk as an alternative to cow's milk

# Camel Population by Country 2023



*Where Can Other Camel Populations Be Found?*

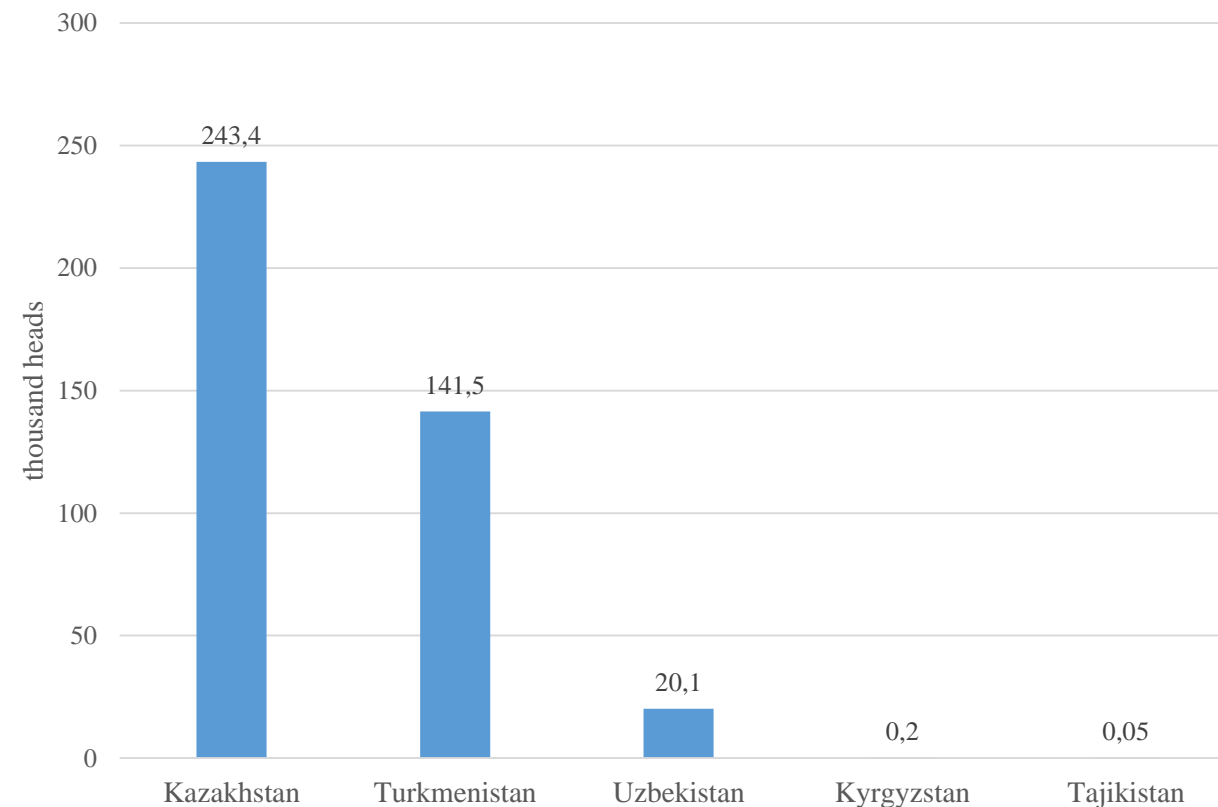
Country	Camel Population
Chad	9.4M
Somalia	7.4M
Sudan	4.9M
Kenya	4.4M
Niger	1.9M
Ethiopia	1.7M
Mauritania	1.5M
Mali	1.3M
Pakistan	1.1M
United Arab Emirates	511.2K



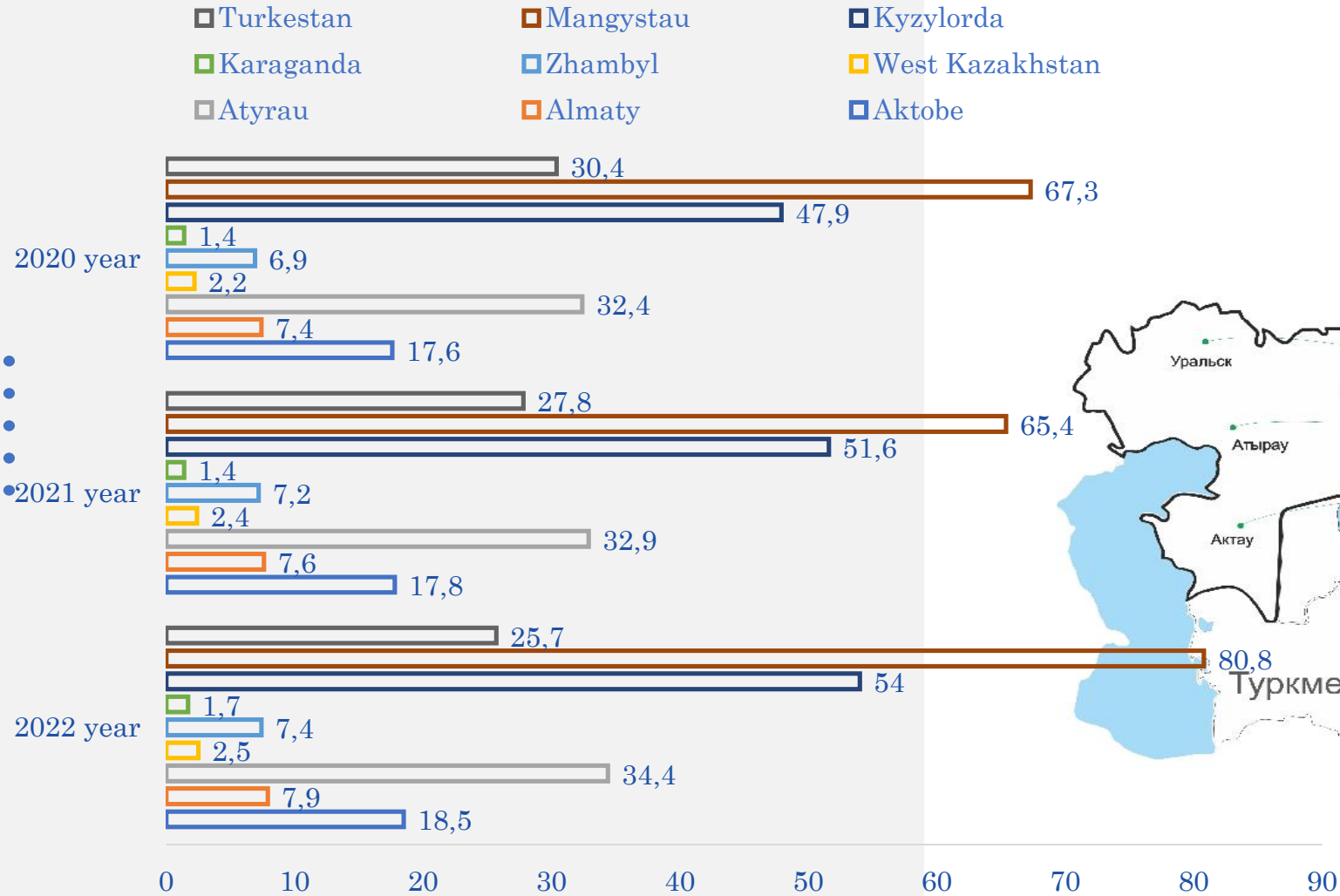
# Relevance of the problem



Kazakhstan - 243.4k  
Turkmenistan - 141.5k  
Uzbekistan - 20.1k  
Kyrgyzstan - 261  
Tajikistan - 51



# Camel population in Kazakhstan





# Camel species in Kazakhstan



*Dromedary (Camel dromedarius)*



*Bactrian (Camel bactrianus)*



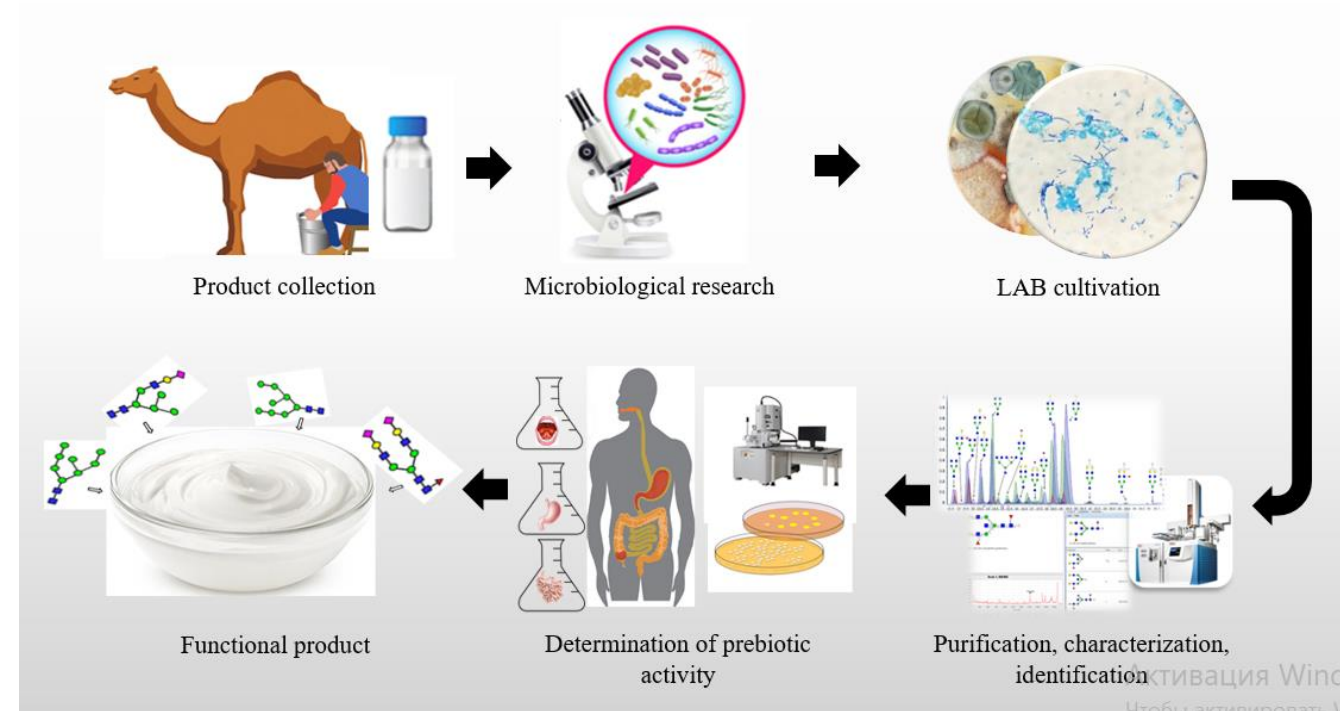
*Hybrids camels*

According to the latest FAO statistics, the global camel population is approximately 35 million, of which about 95% are dromedary camels (*Camelus dromedarius*) (FAO, 2023).

# Scientific significance of the solution



*The idea of the project* is to develop a line of functional food products to meet the needs of the population and prevent diseases. Thus, one of the most important tasks is to create technologies for the production of food products of therapeutic and prophylactic purpose, differentiated for the prevention of various diseases and strengthening the protective functions of the human body.



# Objects of development



Functional food products of a given chemical composition, increased nutritional value and directed efficiency, consisting of a complex of products or represented by their separate types, which has a functional effect on increasing the adaptive capabilities of a person to physical and neuro-emotional stresses:

- Enriched national fermented dairy products;
- Functional yogurt;
- High-protein ice cream;



# Advantages over analogues



✓ *An environmental declaration of the product in accordance with international requirements (ISO 14025-2012) will be developed, which will provide the consumer with information on the environmental impact of the product;*



✓ *A combination of low calorie and high protein content with additional functional ingredients for better absorption of components;*



✓ *Balanced macronutrient composition of the proposed line of nutrition due to the combination of fast and slow digestible additional protein ingredients.*

# Competitors. Analogs



The domestic market is characterized by high competition in selected product categories dominated by large multi-national companies. Moreover, the wide presence of Russian and Western brands has a significant impact.

# Planned outcomes



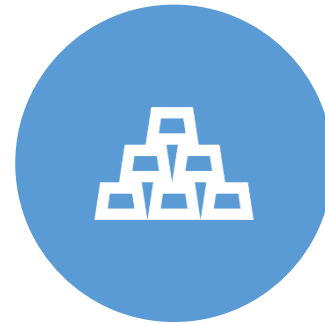
*Developed technical requirements for food packaging and labeling*



*Developed technical requirements and recommendations on food storage and consumption conditions*



*Models of product variants ready for commercial realization*



*Production of batches of developed food products together with partner enterprises under industrial conditions*



## CONTACTS

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**Thank you for  
your attention!**