



РОСБИОТЕХ

РОССИЙСКИЙ
БИОТЕХНОЛОГИЧЕСКИЙ
УНИВЕРСИТЕТ

TRAINING OF SPECIALISTS IN FOOD QUALITY AND SAFETY IS AN ESSENTIAL ELEMENT IN ENSURING RUSSIA'S FOOD SECURITY

BIOTECH'S EXPERIENCE



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TASKS OF FOOD SECURITY OF THE RUSSIAN FEDERATION



- ▶ Ensuring that food is physically accessible to all levels of our population
- ▶ Guaranteeing the safety of the food products

IF THE CONSUMER PROPERTIES OF FOOD PRODUCTS ARE THE CHOICE OF THE CONSUMER, THEN FOOD SAFETY IS THE RESPONSIBILITY OF THE GOVERNMENT

RISKS TO FOOD SECURITY



ECONOMIC

- ▶ The possibility of slower growth in both national and global economies
- ▶ High inflation and possible crisis
- ▶ Reduced attractiveness of domestic industries to investors
- ▶ Reduced competitiveness of domestic products

TECHNOLOGICAL

- ▶ Lack of technological development of the production base
- ▶ Unapproved use of medicines in the agro-industrial sector

CLIMATIC AND AGRO-ECOLOGICAL

- ▶ Adverse climatic changes and abnormal natural phenomena
- ▶ Consequences of natural and man-made disasters
- ▶ Increased area of degraded land

FOREIGN POLICY

- ▶ Fluctuations in the market, due to different measures taken by the government

SOCIAL

- ▶ Risks related to the declining attractiveness of rural lifestyles

SANITARY AND EPIDEMIOLOGICAL

- ▶ The emergence and spread of public illness resulting from violations of product safety and quality requirements at all stages of product circulation on the consumer market

VETERINARY AND PHYTOSANITARY

- ▶ The spread of animal and plant diseases and pests

GOVERNMENTAL MEASURES MUST BE USED TO ADDRESS EMERGING RISKS AND THREATS

ENSURING FOOD SAFETY

>250

FOOD THREATS



DISEASES /DEATHS
WHO data

600 million people

A YEAR (1 IN 10) FALL ILL AFTER INGESTION OF
CONTAMINATED FOOD

MISTAKES MADE BY FOOD
INDUSTRY WORKERS



> 97%

FOOD POISONINGS



DOCUMENTS REGULATING FOOD SAFETY

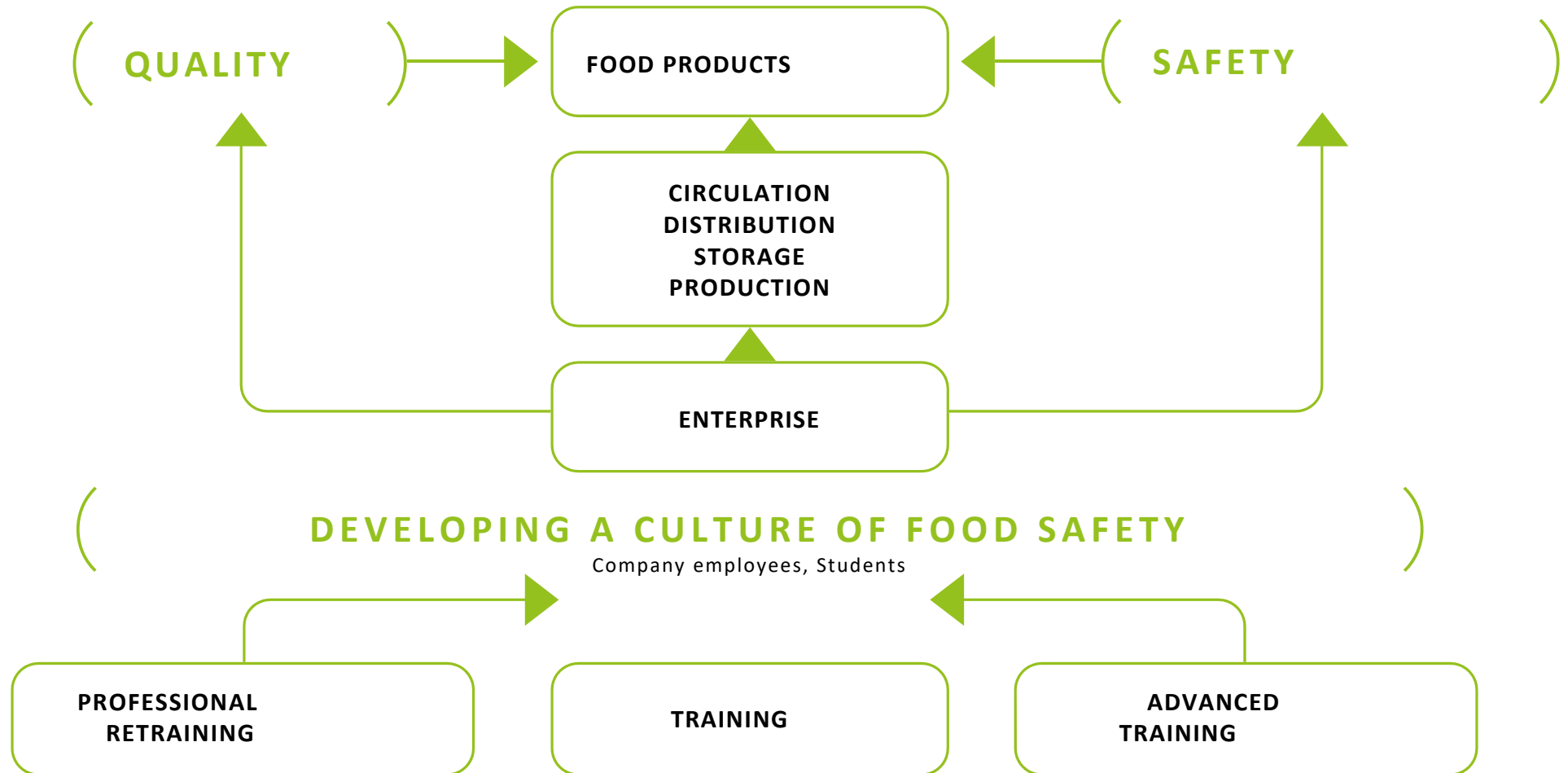
▶ FOOD SECURITY DOCTRINE OF THE RUSSIAN FEDERATION

new edition from 21.01.2020 No. 20

▶ THE CUSTOMS UNION TECHNICAL REGULATION ON FOOD SAFETY AND THE ISO 22000 SERIES OF INTERNATIONAL STANDARDS

The requirements of the technical regulations are mandatory for all food and catering businesses, while compliance with the standards is voluntary

FOOD SAFETY CULTURE





THE UNIVERSITY HAS TRAINED FOR 90 YEARS:

▶ **45000**
TECHNICAL ENGINEERS

▶ **3600**
SPECIALISTS FOR FOREIGN COUNTRIES

▶ **600**
TEXTBOOKS, MONOGRAPHS AND RESEARCH PAPERS

▶ **420**
DOCTORS OF SCIENCE

▶ **3300**
CANDIDATES OF SCIENCES

>8000
STUDENTS

12
INSTITUTES

>1200
GRANTS

400
EDUCATIONAL PROGRAMS

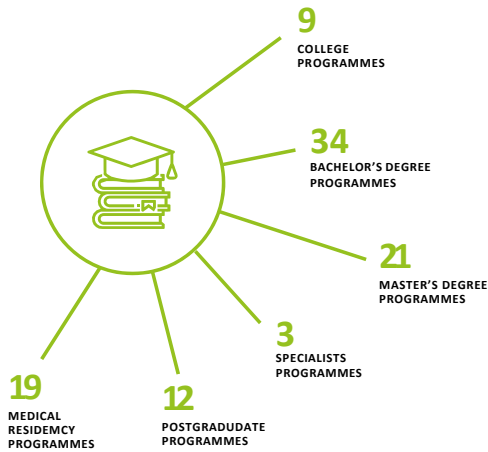
40
NEW TRAINING AND RESEARCH CENTRES

50
TRAINING- PRODUCTION LABORATORIES

2
CAMPUSES IN THE CENTRE OF MOSCOW

5
DORMITORIES

1000
EMPLOYING COMPANIES



PARTICIPANT IN THE BASIC PART OF THE PRIORITY 2030 STRATEGIC LEADERSHIP PROGRAMME

приоритет2030[^]
лидерами становятся

BIOTECH STARTUP STUDIO

ONE OF THE FIRST 20 START-UP STUDIOS IN RUSSIA

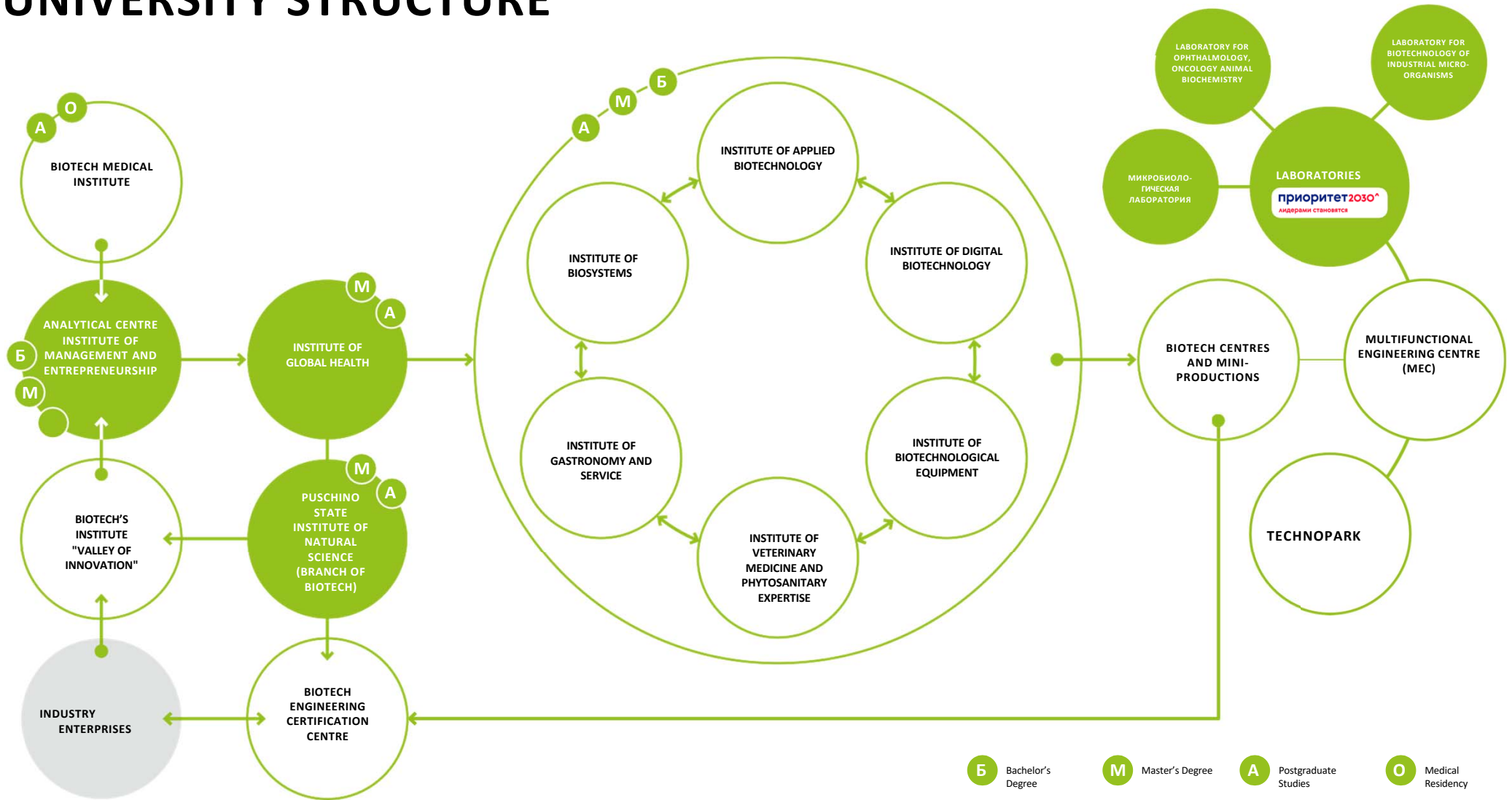
BIOTECH IS INCLUDED IN ALL GLOBAL UNIVERSITY RANKINGS



ЛУЧШИЕ ИНЖЕНЕРНО-ТЕХНИЧЕСКИЕ ВУЗЫ



UNIVERSITY STRUCTURE





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ENSURING FOOD SAFETY

FOOD SAFETY DEPARTMENT

TRAINING

- ▶ Development and implementation of quality management systems according to ISO 9001 series standards
- ▶ Developing and implementing food safety management systems to ISO 22000 standards
- ▶ Environmental management and monitoring systems according to ISO 14000
- ▶ Modern sensory analysis, sensory laboratories, food tester testing and training

PROFESSIONAL RETRAINING

- ▶ Quality Management

ADVANCED TRAINING

- ▶ Development and implementation of quality management systems in accordance with GOST R ISO 9001:2011
- ▶ Modern methods of organoleptic analysis (testing and training of expert tasters)
- ▶ System of food safety during production, storage and transportation on the basis of HACCP principles in accordance with the requirements of TR CU 021/2011
- ▶ Integrated management systems
- ▶ Sensory analysis of food
- ▶ Food safety: the HACCP concept and ISO 22000 standards

22

22 AGREEMENTS OF COOPERATION WITH RUSSIAN REGIONS HAVE BEEN SIGNED BY THE DEPARTMENT

>400

SPECIALISTS

working in the quality, standardisation and certification departments of food industry enterprises, certification bodies, testing centres and laboratories of the system of Rosstandart and Rospotrebnadzor, departments of environmental control and occupational safety departments of enterprises.

FOOD SAFETY DEPARTMENT

FOOD SAFETY TRAINING MODULE



THE MAIN SCIENTIFIC TRENDS

DEVELOPED

7

NATIONAL STANDARDS OF THE RUSSIAN
FEDERATION FOR ORGANOLEPTIC
ANALYSIS

THEORETICAL

- ▶ Scientific approaches to risk theory in relation to food safety and quality
- ▶ Study of functional relationships between food parameters using analytical methods
- ▶ Theoretical basis of sensorimetry
- ▶ Scientific basis for the development of systems of food safety and food quality
- ▶ Creating effectively balanced eco-economic systems

APPLIED RESEARCH

- ▶ Developing safety and quality management systems in the food industry
- ▶ Development of sensorimetric quality control systems
- ▶ Development of regulatory documentation

LABORATORY FACILITY

ADVANCED FOOD TECHNOLOGY AND FOOD SAFETY

45

UNITS OF TOP ANALYTICAL EQUIPMENT,
INCLUDING ISOTOPE MASS SPECTROMETRY
FACILITY

TYPES OF RESEARCH:

- ▶ Organoleptic
- ▶ Toxicological Physico-chemical
- ▶ Microbiological
- ▶ Full cycle biodegradation



INNOVATIVE SENSITOMETRIC LABORATORY FOR FOOD QUALITY AND SAFETY ASSESSMENT

THE MAIN SCIENTIFIC TRENDS:

- ▶ Physiological and psychophysiological studies of the mechanisms of perception of various sensory stimuli by the human senses
- ▶ Researches of formation of qualitative characteristics of food products according to consumer preferences
- ▶ Development of methodology for the consumer evaluation of food products on the basis of multisensory system for testing their taste and aroma, mechanical, visual and acoustic characteristics
- ▶ Development and application of a methodology for modelling and designing new food products and improving the range of existing products on the market, taking into account the sensory preferences of consumers
- ▶ Improving the system of consumer property assessment and food identification based on sensory and analytical methods
- ▶ Research into sensory neuromarketing, sensory metrology
- ▶ Research into the application of neuro-technology and VR-technology in sensory analysis
- ▶ Development of a system for food sensory quality assurance
- ▶ Development of new analytical and consumer methods for sensory analysis
- ▶ Development of adaptive technologies for selection of media and advertising content as well as other ways of sensory influence on consumers



WATER QUALITY ASSESSMENT CENTRE

- ▶ **EQUIPPED WITH HI-TECH FACILITIES FOR COMPREHENSIVE WATER QUALITY ANALYSIS**
- ▶ **ANALYSES ARE CARRIED OUT USING NOT ONLY ANALYTICAL, BUT ALSO MODERN INSTRUMENTAL METHODS OF RESEARCH, EVEN AT THE MOLECULAR LEVEL**





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**ENSURING THE PHYSICAL
ACCESSIBILITY OF FOOD TO ALL
LEVELS OF OUR COUNTRY'S
POPULATION**

General analysis of food industry companies and equipment producers for the food and processing industry:

POTENTIAL

A total of food enterprises are in operation:

240
IN MOSCOW

22000
IN RUSSIA

Population employed in the food industry :

50 thousands
IN MOSCOW

2 million
IN RUSSIA

Moscow's food enterprises supply Moscow:

Sausages	66%
Bread / bakery products	45%
processed meat	23%
pasta products	15%
processed milk	13%
fish products / seafood	6%
dairy butter	6%
ice cream	4%
cheeses	3%

The annual share of taxes paid to the Moscow city budget by the food industry:

6-9 billion rubles

\$80-120 million

CHALLENGES

Degree of depreciation of machinery and equipment in commercial organisations in the Russian Federation

(excluding small businesses):

59%
FOOD PROCESSING

72,6%
DRINKS
PRODUCTION

Total volume of the Russian domestic market for food processing equipment in constant prices by 2030

\$149 MILLION

Of these, the share of imported equipment:

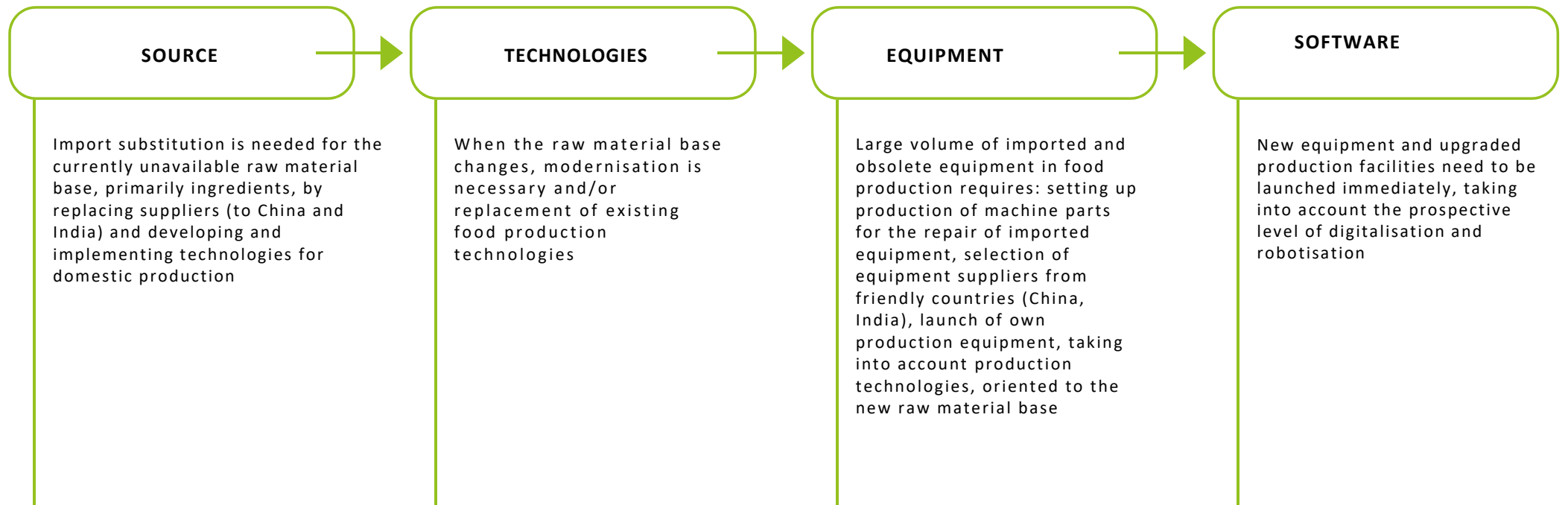
\$120 MILLION

Share of imported software in the food industry:

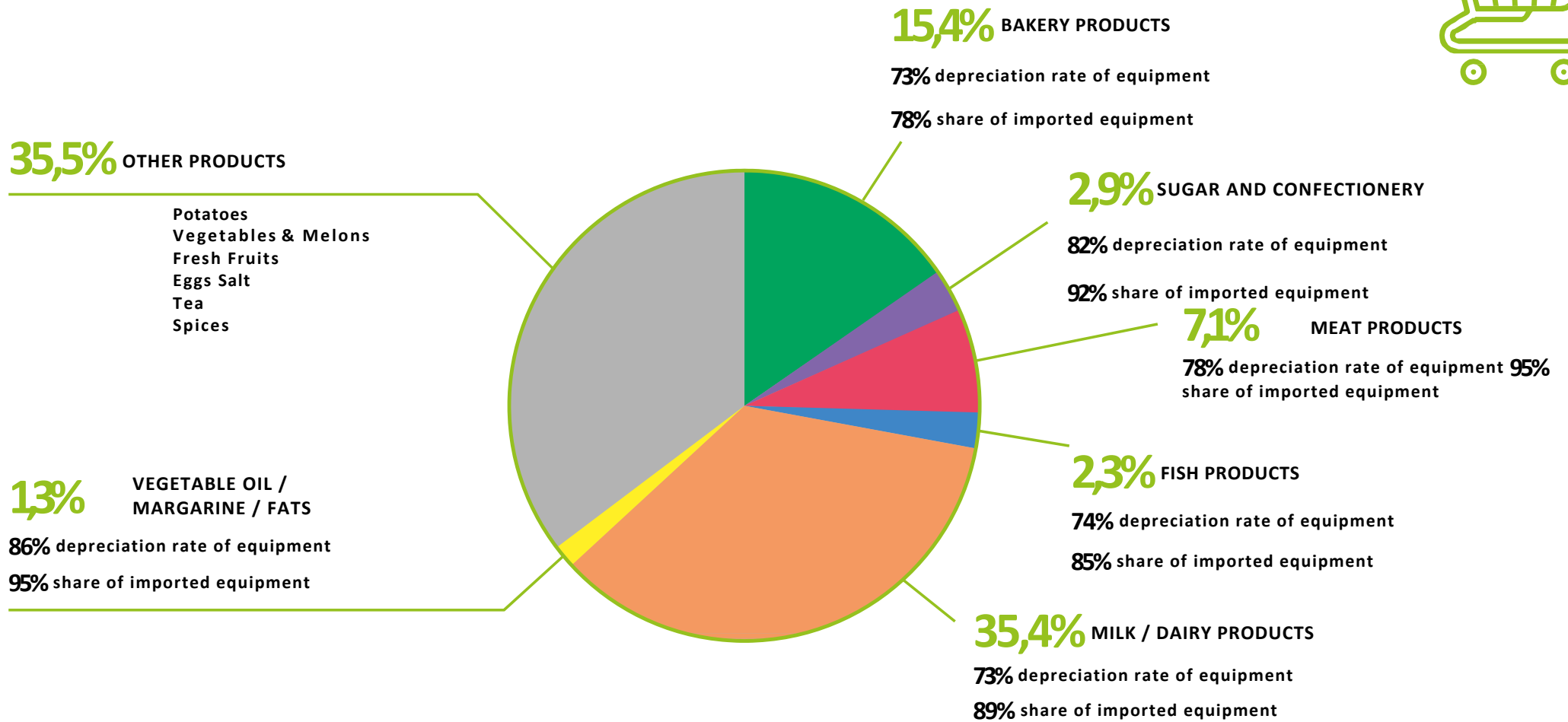
90%

GOAL

Ensure smooth production of essential products with domestic equipment and software, considering advanced technology and prospective growth in consumption



Critical depreciation of equipment with dominant imports may risk reducing the consumer basket (basic necessities)





NATIONAL ENGINEERING CENTRE FOR FOOD SYSTEMS

1

SITUATION CENTRE

- ▶ Monitoring
- ▶ Analysis
- ▶ Systematisation
- ▶ Expertise
- ▶ Consulting
- ▶ Support

2

CENTRE OF REVERSE-ENGINEERING AND R&D

- ▶ Research into ready-made solutions
- ▶ Development / modernisation of process and design documentation
- ▶ Development of innovative box solutions
- ▶ Design, modelling and prototyping
- ▶

3

VERIFICATION, VALIDATION AND CERTIFICATION CENTRE

Поверка новых разработок на предмет соответствия требованиям к оборудованию для пищевой отрасли

SITUATION CENTRE

1



**Situation centre for engineering hardware,
production technology and software**



GOAL

**Establishment of a unified platform of federal
databases of best available technologies to ensure
smooth operation of the food sector**

MONITORING AND ANALYSIS

of the state of the hardware, technology and software in use, with regular audits of the Moscow region's food enterprises

TASKS

EVALUATION

of the state of the hardware and the relevance of the technology and software in use

FORECASTING

needs for the replacement and upgrading of hardware, software and technology in the food sector

MODELLING

Scenario of assessment of the consequences of management decisions using information and analysis systems

ЭКСПЕРТНАЯ ОЦЕНКА

принимаемых решений по всем ключевым вопросам в сфере модернизации аппаратных комплексов, а также программного и технологического обеспечения пищевой отрасли

CENTRE OF REVERSE-ENGINEERING AND R&D

2



Centre of Reverse engineering and R&D



GOAL

Development of advancing engineering and technological solutions based on advanced and scientific research, including the development of subject prototypes

TASKS

DIAGNOSTICS AND MAINTENANCE OF PROCESS EQUIPMENT

Carrying out diagnostic studies of existing and projected equipment to improve operational reliability and repair planning

CRITICAL POINT ANALYSIS OF IMPORTED EQUIPMENT

PROTOTYPING AND 3D-MODELLING OF PARTS AND MACHINERY COMPLEXES

Creation of 3D models of machine parts and components with potential enhancement and their implementation into production

PROTOTYPING PARTS USING 3D-PRINTING

Using 3D printing to test designed parts and assemblies, measuring and analysing them

PROTOTYPE TESTING

DEVELOPMENT OF DIGITAL TWINS AND LINE SIMULATORS FOR PROCESS EQUIPMENT

Create digital replicas of real equipment for deeper analysis and develop virtual laboratory complexes and simulations of both individual lines and entire plants

TRAINING ON UPGRADED EQUIPMENT

Implementation of further vocational education and training programmes

Existing engineering and technological capacity

- ▶ **DIGITAL TWIN AND FOOD PROCESSING ENGINEERING CENTRE**
at BIOTECH



- ▶ **PROTOTYPING AND ADDITIVE TECHNOLOGY CENTRE**
BIOTECH'S TECHNOPARK



- ▶ **FOOD PROCESSING REVERSE-ENGINEERING CENTRE**
A joint venture between BIOTECH and Begarat



- ▶ **DESIGN BUREAU**
BIOTECH'S TECHNOPARK



**VERIFICATION, VALIDATION AND
CERTIFICATION CENTRE**

3



► CONFORMITY CHECK

Technical regulation of the Customs Union
TP TC 021/2011 On food safety as amended on July 14,
2021

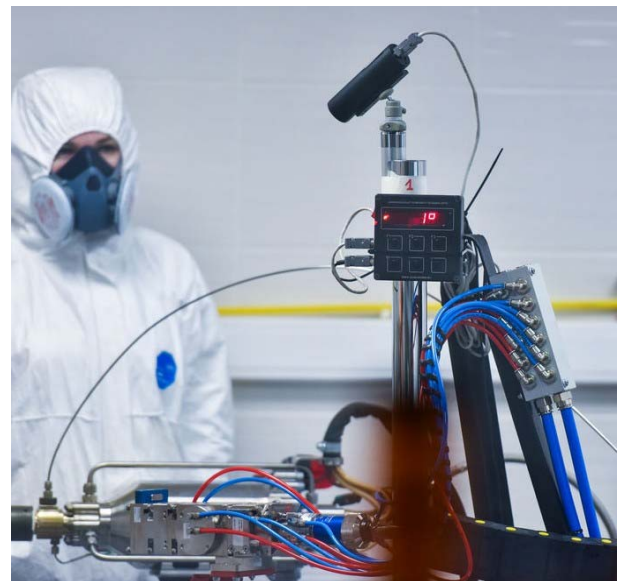
ГОСТ EN 1672-1-2014 Interstate standard Equipment for
food industry. Safety and hygiene requirements

ГОСТ EN 1672-2-2012 Interstate standard Food processing
equipment

► SETTING UP A LABORATORY TO CARRY OUT RESEARCH AND TESTING OF CERTIFIED EQUIPMENT

► CERTIFICATION

Maintenance and repair (service) certification
Quality management system certification
Environmental Certification
Hygiene certification
Design and Construction Compliance Certification
Process Requirement Certification
Material conformity certification





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**THANK YOU
FOR YOUR ATTENTION!**

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