E-learning tools for **Food** technology and development education (**E-Food**) – a new concept in food technology education

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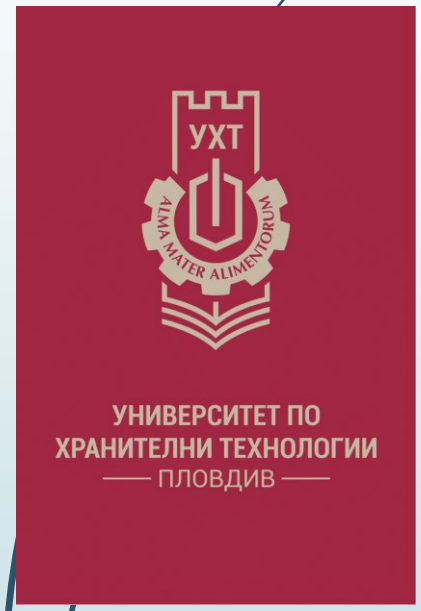
Project consortium



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AIMS and GOALS

In the last years, the education system has been heavily influenced by COVID-19. The imposed restrictions, in combination with the different educational standards, led to a strong reduction of the realized mobilities under the Erasmus+ program. Many universities have been unprepared to offer new types of mobility such as blended or virtual mobility.

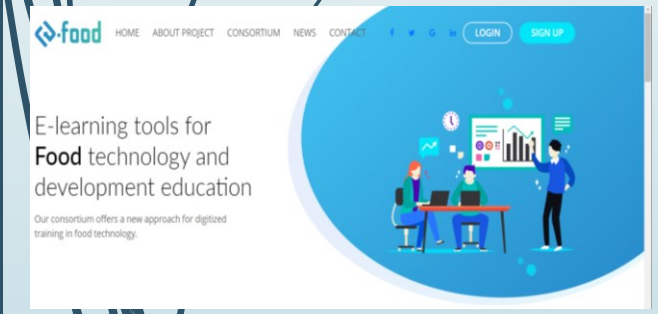
The current project development team is proposing a new concept for the development of e-learning tools for food technology training and the development of new food products. Developing an e-learning system is an ambitious and expensive task, but investing in it is long-term and meets the new challenges facing Europe.

AIMS and GOALS

In this case, we are motivated to develop a new educational product in the field of food and food technology, subject to new standards developed by the team proposing this project:

- ***Opportunities for the realization of blended or virtual mobility between students from the partner universities will be created and inter-institutional cooperation will be encouraged;***
- ***Opportunities for students to receive high quality training from specialists with different profiles, ensuring the rapid involvement of the student in the implementation of physical mobility in partner universities, will be created;***
- ***Digital courses for training and development of the so-called case study will be created;***
- ***Conditions to reduce intercultural differences and real-time communication will be created.***

AIMS and GOALS



The main goal of E-Food is to create an educational platform in the field of food technology, connecting the knowledge triangle and allowing solving problems in the set priority areas. To solve the set goal, the E-Food team sets the following priority goals and directions:

O1. Analysis of existing programs and related digital resources and electronic training systems in the field of food technology at the partner universities;

O2. Analysis of the existing differences in social, economic, cultural and geographical terms in the training in the field of food technologies;

O3. Creation of educational standards (for development, audit and training) for e-learning tools for training in the field of food technology, aimed at reducing differences in training and implementation of inclusive forms of training;

O4. Development of an open access e-learning platform based on cloud technologies with access by students, faculty and industry;

O5. Development of e-learning courses with unified content to be offered to students from partner universities within the project, and at a later stage to students from other universities in order to facilitate mobility, to implement the inclusion policy and to reduce the identified differences in ***O2***;

AIMS and GOALS

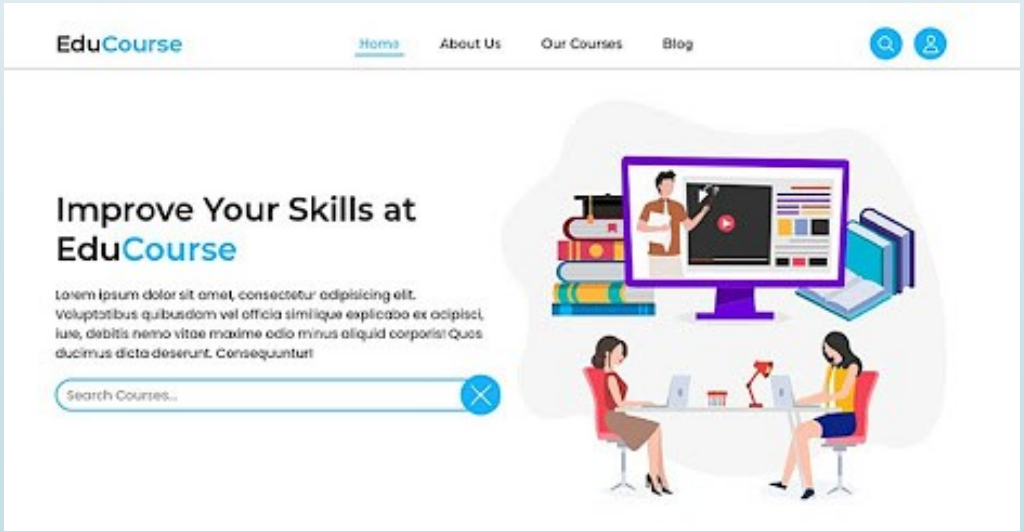
The project will achieve results in the following priority areas of the Erasmus+ program:

R1: Development of digital educational content in the field of food technologies, supporting the digitalization of educational systems;

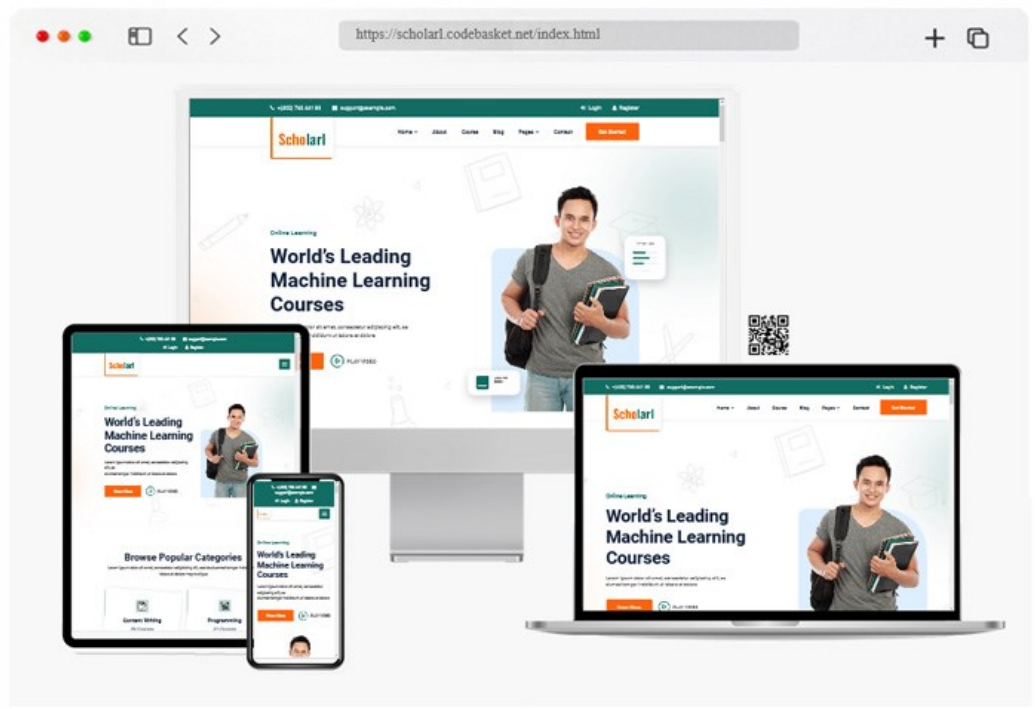
R2: Creation of digitalized educational infrastructure, subjected to specially developed standards to reduce the observed differences, both at the level of teaching/training and in the areas defined in O2;

R3: Establishing a sustainable partnership between universities with a training profile in the field of food and food technology;

R4: Development and approval of a joint program between partner universities for training students in the field of food and food technology, based on the developed digital content and the e-learning learning platform.



AIMS and GOALS



As a result of the project implementation the following global results will be achieved:

CO1: Analysis of the existing training programs and the used e-learning systems in the partner universities;

CO2: Development of educational standards for e-learning training and choosing an open access platform for implementation;

CO3: Development of educational courses in the field: Food biochemistry and microbiology; Food biotechnology; Food processing; Emerging technologies in the food industry; Food technologies (bread; dairy; beverages; fruits and vegetables, sugar; meat, etc.); Nutrition; Management and marketing in food industry, etc).

CO4: Reducing social, economic, geographical and cultural differences and reducing disparities in the food learning principles.

CO5: Development of a joint teaching/training program in the field of food technology (Tailor-made foods) at the end of the project.

TARGET GROUPS OF THE PROJECT

E-Food as an educational project aimed at higher education focuses its attention on the following target groups:

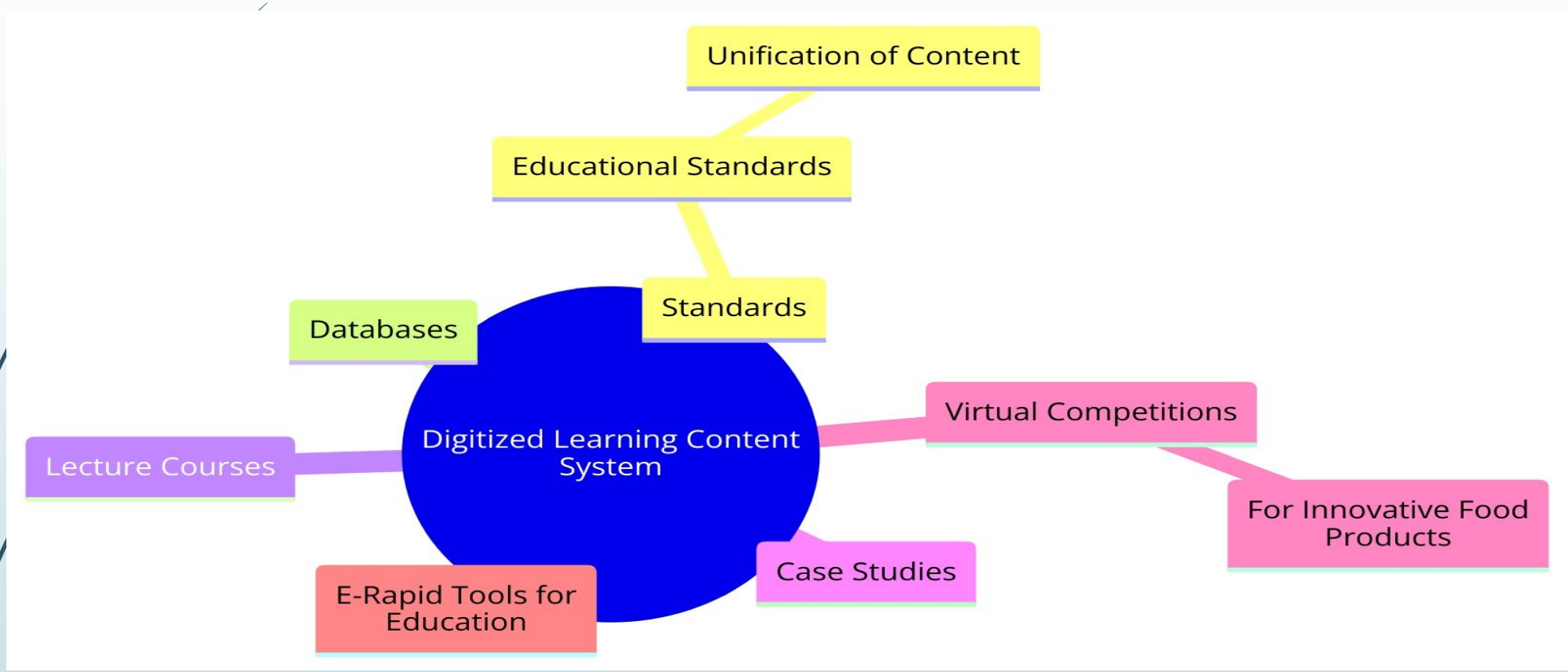
• ***Students and PhD students*** - as users of educational services. The main goal of E-Food is to provide this group with high quality educational information in the form of freely available digital educational content in the field of food technology.

• ***Teachers*** - as the people creating digital learning content that ensures high quality education;

• ***Business institutions working in the field of food technology*** - as users of human resources, which have received high quality training, as well as users of educational resources for the development of new products.

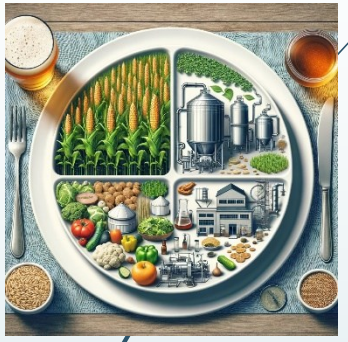
The E-Food team will develop higher education content and in particular B.Sc., M.Sc. and doctoral curricula on the field, and verify it at all 5 participating higher education institutions. The program will be based on an interdisciplinary approach of academic and professional trainers, as well as an intra-educational system.

EDUCATIONAL STANDARDS



In the current project, we propose the development of digitized learning content based on a system of standards. The current educational standards guarantee the unification of educational content in the form of databases, educational courses, case studies, virtual competitions for the development of innovative food products, e-rapid tools for short-term training courses.

EDUCATIONAL STANDARDS



TRADITIONAL, INNOVATIVE AND SUSTAINABLE PRODUCTS

This standard defines the content criteria of the database for traditional, innovative and sustainable products, developed within the E-Food project. The standard aims to develop educational content, guaranteeing an opportunity for its users to familiarize themselves with different types of food products, the technologies for their production and the possibilities for their innovation.

TRADITIONAL, INNOVATIVE, EMERGING, SUSTAINABLE PROCESSES

This standard defines the content criteria of the database for traditional, innovative, emerging and sustainable processes, developed within the E-Food project. The standard aims to develop educational content, guaranteeing an opportunity for its users to familiarize themselves with various processes and their application in food production.

TRADITIONAL, INNOVATIVE AND SUSTAINABLE RAW MATERIALS/RESOURCES

This standard defines the content criteria of the database for traditional, innovative and sustainable raw materials and resources, developed within the framework of the E-Food project. The standard aims to develop educational content, guaranteeing an opportunity for its users to familiarize themselves with various traditional, innovative and sustainable raw materials/resources, their characteristics for their application in the development of innovative food development.

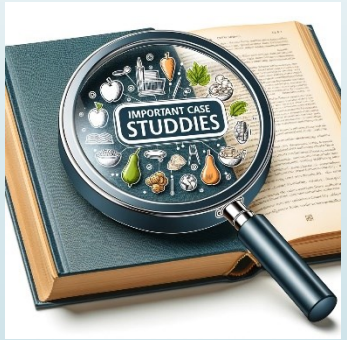
EDUCATIONAL STANDARDS

INNOVATION

This standard defines the content criteria of the database for innovation within the framework of the E-Food project Innovation in food can take many forms, from creating new recipes and flavors to developing sustainable and health-focused products.

CASE STUDY

This standard defines the content criteria for case study development within the framework of the E-Food project A case study is a detailed and in-depth analysis of a specific individual, group, event, or situation. It is a research method that involves an intensive, comprehensive examination of a subject within its real-life context. Case studies are commonly used in various fields such as psychology, business, medicine, education, and social sciences. The case studies within the E-Food project focus on the examination and development of a solution/new food product based on the simultaneous use of knowledge and information obtained from all the databases from the project.



EDUCATIONAL RESOURCES

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TRADITIONAL, INNOVATIVE AND SUSTAINABLE PRODUCTS

NAME	"KAYSEROVAN VRAT TRAKYJA" КАЙЗЕРОВАН ВРАТ „ТРАКИЯ" 
SHORT DESCRIPTION OF THE PRODUCT	Kayserovan vrat Trakiya is a traditional Bulgarian meet product. 'Kayserovan vrat Trakiya' is a raw-cured delicacy of uncut meat. It is prepared from fresh boneless pork collar. It is pressed repeatedly during curing and coated with the Kaiser mixture (kayserova smes) of natural herbs and white wine. It is suitable for direct consumption by all consumer groups
CULTURAL HERITAGE AND HISTORY OF PRODUCTION	The name Kayserovan vrat Trakiya was first introduced in 1980 in a standardisation document for its production — Industry standard 18-71996-80, drawn up by two Bulgarian researchers — Dzhevizov and Kiseva. The product rapidly became popular, and has now been traditionally produced in Bulgaria under the above name for over 30 years. The name is also specific in itself because it includes the main ingredients of the product described under point "Raw m
RAW MATERIALS AND INGREDIENTS	For the production of Kayserovan vrat Trakiya, the follow ✓ meat: pork collar: 100 kg; ✓ salting mixture for 100 kg of pork collar: 3,35 kg potassium nitrate (E252) or 85 g of sodium nitrai ✓ Kaiser mixture for 100 kg of pork collar: — 4 kg of red peppers, — 3 kg of fenugreek, — 2 kg of garlic, — 12 litres of white wine, — twine/hemp yarn.

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TRADITIONAL, INNOVATIVE, EMERGING, SUSTAINABLE PROCESSES

NAME	***LYOPHILIZATION***  LYOPHILIZED PINEAPPLE
SHORT DESCRIPTION OF THE PROCESS	Lyophilization is a process of removing water from products. Water is solidified by freezing and then removed by ice sublimation and desorption. The method is also called freeze drying. This drying method is applied to thermolabile products that degrade in an aqueous environment and are more stable in a dry environment. Lyophilization has multiple applications in biotechnologies, food, pharmaceutical and chemical industries. In food industry, freeze-drying is used to extend the shelf life of easily perishable products, such as fruit, vegetables, meat, pasta, shrimp or fish.
	Freeze drying is a drying method based on the sublimation of ice. At atmospheric pressure, water can appear in three states of aggregation: an 4.579 mm of Hg and a temperature lower than 0.0099 ºC (known as the triple point of water), solid and gaseous. In the sublimation process, the ice turns from solid to vapor, directly, without place below the triple point. phylization allows obtaining higher quality products. The quality of the product is not lost through , smell, nutrient content and biological properties.  The samples are subjected successively to the stages of freezing, sublimation of ice crystals (primary drying) and desorption (secondary drying). Before lyophilization, the sample is subjected to a pretreatment which involves concentration of the sample, revision of the formula, reducing the high vapor pressure of the solvent or increasing the surface area.

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TRADITIONAL, INNOVATIVE AND SUSTAINABLE RAW MATERIALS/RESOURCES

NAME OF THE RAW MATERIAL/RESOURCE	***ASTURIAN BEANS*** ***FABA ASTURIANA*** 
SHORT DESCRIPTION OF THE RAW MATERIAL	Dried beans, separated from the pod, of the species "*Phaseolus vulgaris* L.", of the traditional variety "Granja Asturiana", healthy, whole, clean, intended for human consumption. The production area is in lands located in Asturias, a province in the north Atlantic area of Spain. Faba Asturiana has been a specific denomination since 1990, registered as a Protected Geographical Indication (PGI) since 1996.
PHYSICAL- CHEMICAL CHARACTERISTICS	The morphological characteristics of the variety in terms of colour, shape and grain size are: • Colour: Creamy White. • Shape: Kidney-shaped, long and flattened. • Size: Big size, about 100-110 grains/100 g of seeds.

PARAMETERS EXTRA category	TOLERANCE (% Max. in weight)
Calibre between 70 and 90 grains per 100 g	Less than 120 grains per 100 g
Absence of strange materials	Max. 0.5 % in weight
Absence of: • Altered or parasitized albumen • Mould or rot attacks • Spots on the albumen	Max. 0.5 % in weight
Absence of: • Grains with external appearance not typical of the commercial type • Superficial spots of the integument • Deep wrinkles of the integument • Broken grains	Max. 3 %

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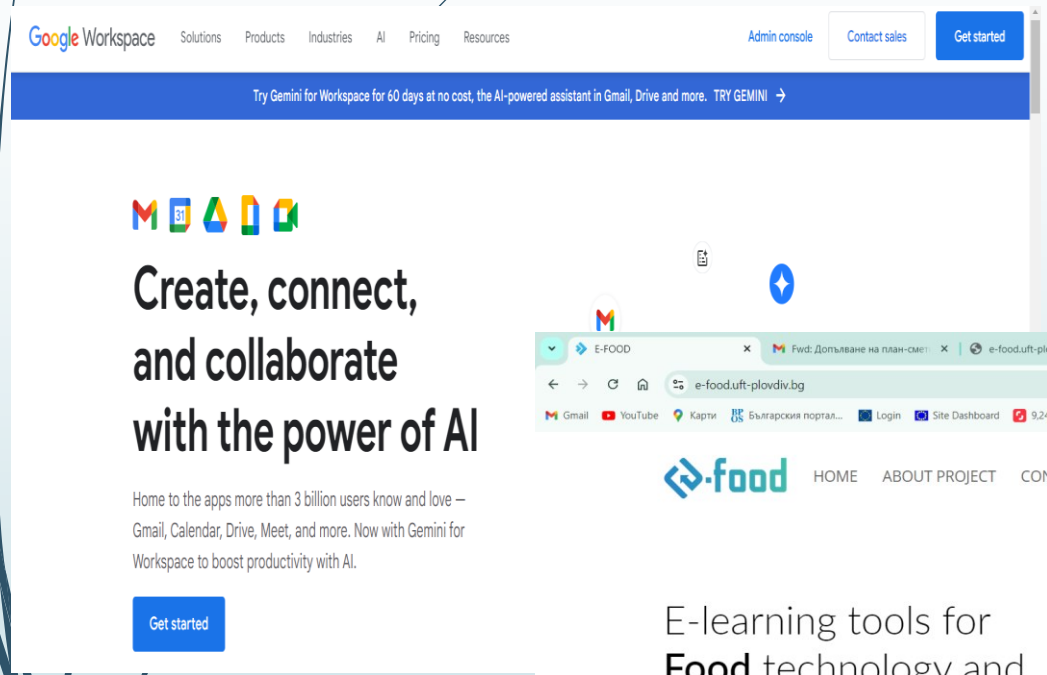
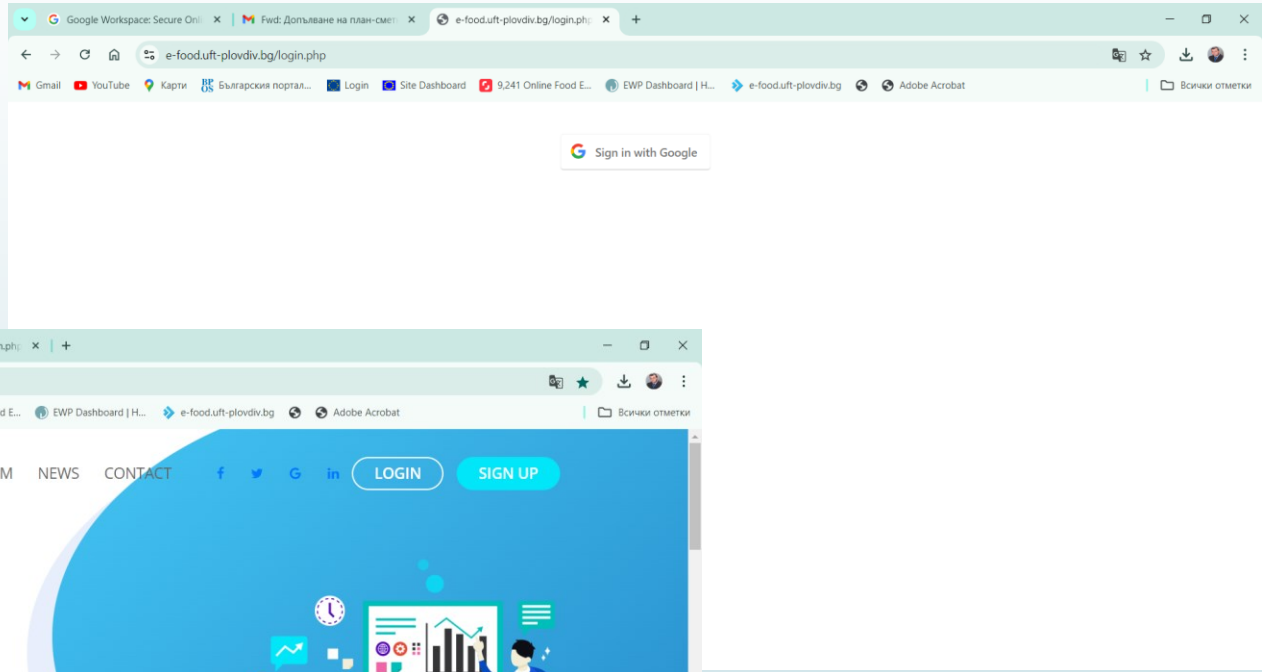
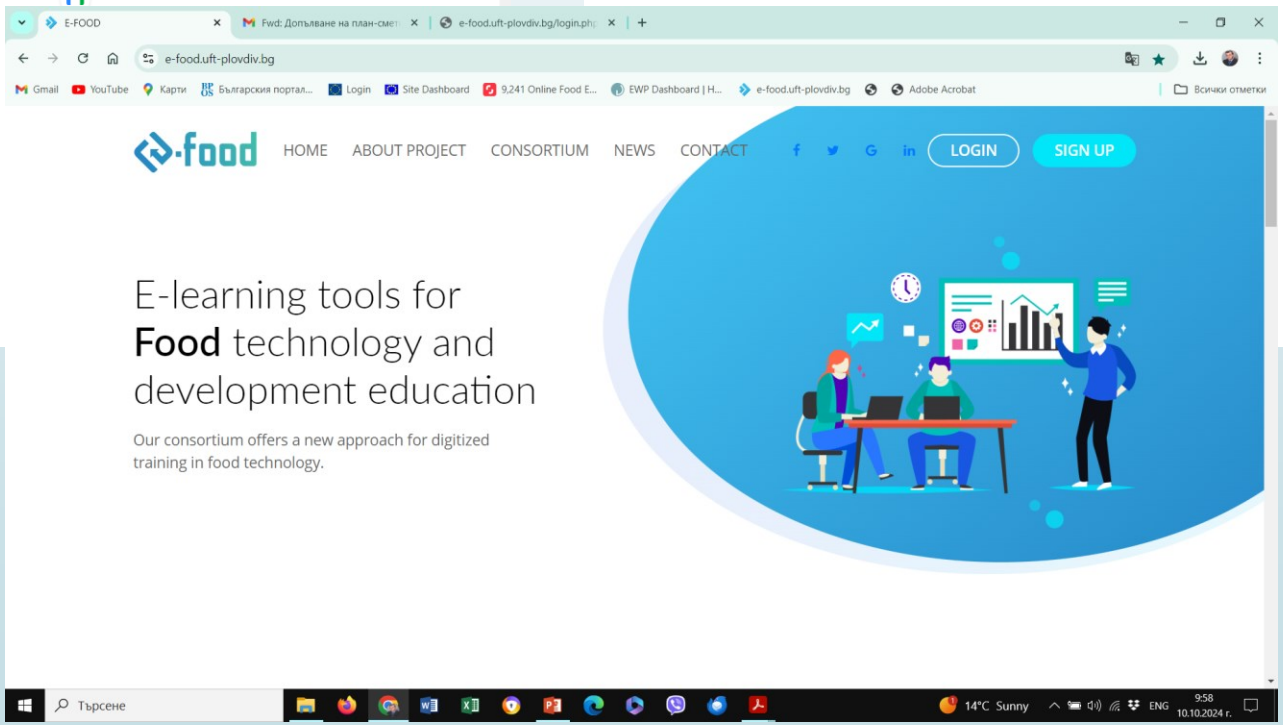
EDUCATIONAL PLATFORM







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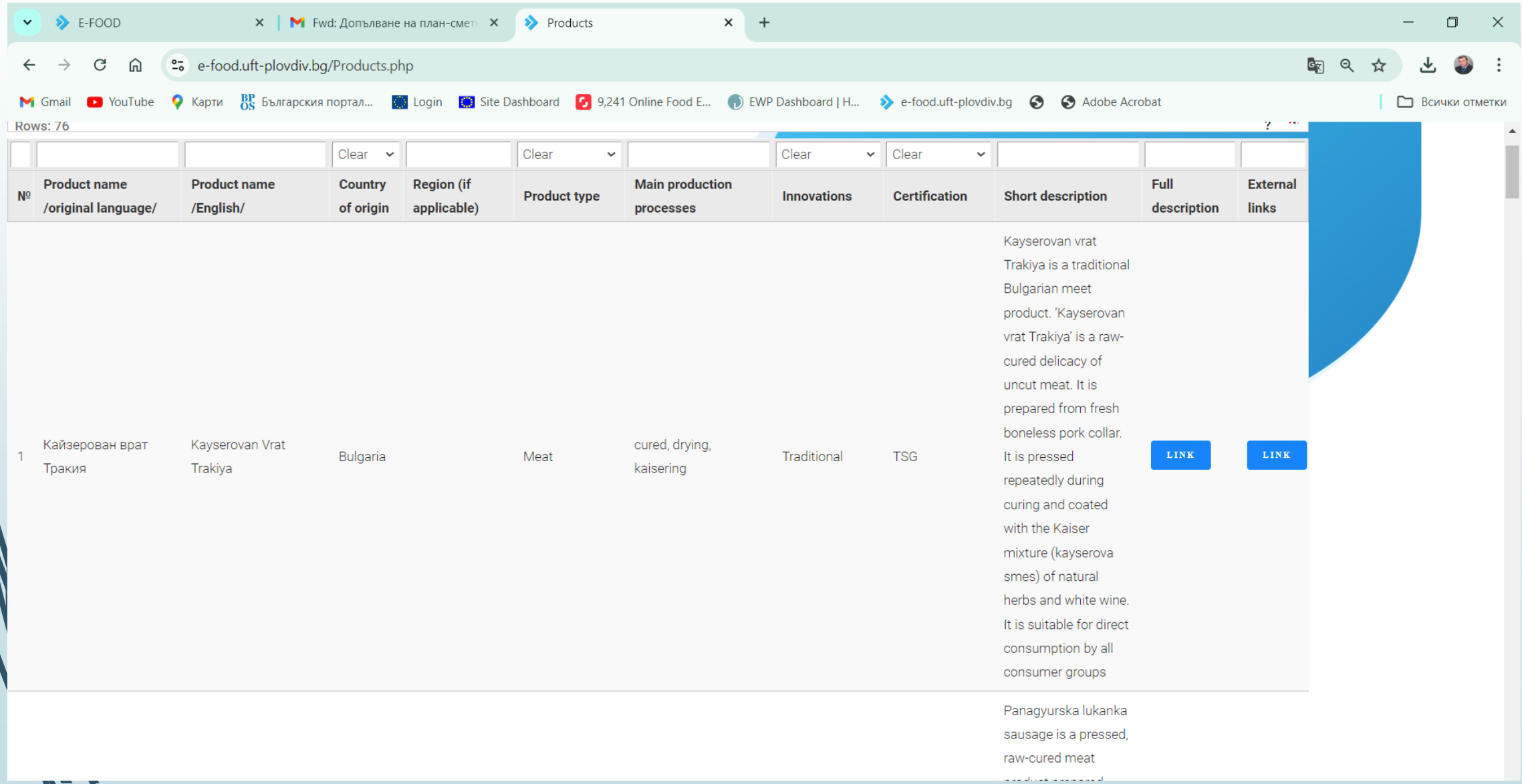
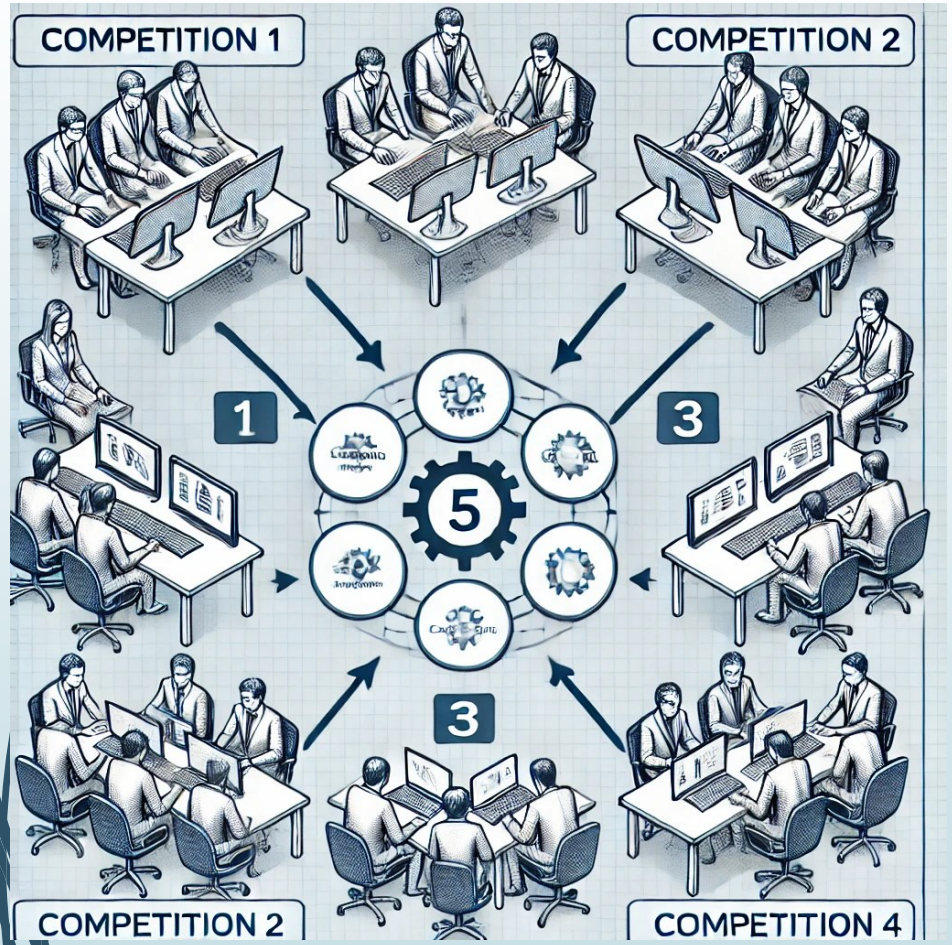


VIRTUAL COMPETITION AND CASE STUDIES



Executive Summary (150 words)	Provide a brief overview of the case study, including the objective and key findings.
Introduction (300 words)	*- Explain the background and context of the project.* *- Identify the problem or opportunity that led to the development of the new food product.* *- Describe the purpose and scope of the case study.*
Market Analysis: (300 words)	*- Conduct a thorough analysis of the target market and its characteristics.* *- Identify the target audience and their preferences, needs, and purchasing behavior.* *- Analyze the competition and market trends related to similar food products.*
Research and Development: (500 words)	*- Explain the research and development process undertaken for the new food product.* *- Describe any consumer surveys, focus groups, or taste tests conducted to gather feedback.* *- Detail the formulation, recipe development, and production processes involved.*
Product Description: (500 words)	*- Provide a detailed description of the new food product, including its key features, ingredients, and nutritional information.* *- Explain the unique selling proposition (USP) and how it differentiates from existing products in the market.*
Marketing and Promotion: (300 words)	*- Outline the marketing strategy for launching the new food product.* *- Describe the branding, packaging, and labeling considerations.* *- Discuss the pricing strategy, distribution channels, and promotional activities planned.*
Financial Analysis: (300 words)	*- Conduct a cost analysis of developing and manufacturing the new food product.* *- Estimate the potential sales and revenue based on market research.* *- Evaluate the profitability and return on investment (ROI) for the project.*
Challenges and Risks: (200 words)	*- Identify potential challenges, risks, and obstacles that could affect the success of the new food product.* *- Propose mitigation strategies or contingency plans for addressing these challenges.*
Conclusion: (150 words)	*- Summarize the key findings and outcomes of the case study.* *- Provide recommendations for the successful launch and growth of the new food product.*
References and Appendices: (up to 20 references)	*- Include a list of references used for the case study.* *- Attach any supporting documents or additional information related to the project.*
The specific content and sections of your case study may vary depending on the nature of the new food product and the scope of your study.	

THE CASE STUDY FOR THE VIRTUAL COMPETITIONS WILL BE ASSIGNED BY FOOD INDUSTRY COMPANIES FROM THE COUNTRY PARTNERS OF THE PROJECT

E-rapid tools

E-RAPID TOOLS

This standard defines the content criteria for e-rapid tools for short term education within the framework of the E-Food project E-rapid tools for short-term training refer to electronic or digital tools and platforms designed to facilitate quick and efficient learning or skill acquisition in a condensed time frame. The E-rapid tools within the E-Food project ensure quality learning in a variety of innovative food development – related courses framed for the format of short term education.

Main goals and indicators

Case study development and e-rapid tools development and education – main indicators;

- Number the Case studies set by business - at least 15 (3 from each project partner country);
- Number of Case study descriptions developed by the team - 8;
- Number of virtual competitions between students - 5 competitions, each competition will lead to the development of one Case study.
- Number of students that have participated in the virtual competitions - 4 competitions * 4 teams * 5 participants – 80 students (16 from each project partner country).
- Number of teachers leading the individual teams - 4 competitions * 4 teams - 16 teachers - (the distribution will be made depending on the type of products to be developed)
- Number of realized virtual mobilities of students under KA1 - if possible to realize such mobilities - at least 40 mobilities, that will be related to the activities for solving the Case Study;
- Conducted final training (workshop) - 1;
- Participants in the final workshop - at least 50, of which 25 from outside the partner organizations.

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Co-funded by
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Thank you for your kind attention!