



# RESEARCH ON COMPARISON OF THE ALL PARTENRS CURRICULA IN BAKERS QUALIFICATION



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## **INTRODUCTION**

This material was created as a result within Erasmus+ Programme – Strategic Partnership project Nr: 2017-1-RO01-KA202-037394 with the title «Better Bakers Ready For An European Market» co-funded by the Erasmus+ Programme of the European Union.

Nowadays technology has changed so much that no matter which bakery you enter, Italian one, Greek or Turkish, it looks absolutely the same. There are several bakery equipment manufacturers in Europe and all the bakeries buy their equipment from them. On the other side the training in the domain of bakery has not changed in all European countries and by training we mean curricula, the programme, the methods, the content of the curricula chapters and the training of the trainers. According to the bakeries and bakery equipment manufacturer, bakers in today's bakeries need more IT skills and competences because the most of the work is done by the machines, which they need to know how to operate. With the same problem confronted our partners from Latvia and Slovenia, while Italian Greek and Turkish partner consider they can use improvements to make their curricula more interactive and attractive to the trainees and to increase the numbers of employment in their area.

In this project we want to improve the existing curriculum for the bakers qualification and especially the part which refers to the equipment used in the domain of bakery.

The research is addressed to the trainers who teach vocational course for qualification of bakers. All partners National Curricula were studied and discussed in order to be compared.

This work contains the main ideas about each country National Curriculum on Bakers qualification and in conclusion we made a table comparing all curricula and took out the similarities and differences.

At this work participated all the partner organisations of our project:

- Asociatia Socio-Culturala "Sfantul Ioan Botezatorul", Berbesti Romania;
- Akhisar Halk Egitim Merkezi ve Aksam Sanat Okulu, Turkey;
- SIA "Manteifels projekti", Latvia;
- EURELATIONS GEIE, Italy;
- Ariadne, Greece ;
- Ljudska univerza Zavod za izobrazevanje odraslih in mladine Lendava, Slovenia;
- SC TECHNOG SRL, Sibiu, Romania.

# PRESENTATIONS OF ALL PARTNERS NATIONAL CURRICULA

## 1. ROMANIAN CURRICULUM FOR BAKERS QUALIFICATION

This curriculum is based on the standard of vocational training for the qualification of Bakers and Pastry makers.

The curriculum has the following structure:

Module 1 – Health and safety at work and environmental protection in the food industry

Module 2 – Microbiology and hygiene in the food industry

Module 3 – Operations and equipment in food industry

Module 4 – Manufacture of bakery products

Module 5 – Pastry products manufacture

Module 6 – Manufacture of other flour products

### **Module 1 – Health and safety at work and environmental protection in the food industry**

The module "Safety and health at work and environmental protection in the food industry" is part of the specialized culture related to the general training field Food Industry.

The module goes in parallel with the other modules in the curriculum.

The module "Health and Safety at Work and Environmental Protection in the Food Industry" focuses on learning outcomes and aims at acquiring skills specific to the general food industry, with a view to using all procurement (knowledge, abilities, attitudes) in practicing level qualifications 2 in the field.

This module contains the following learning contents:

1. Legislation and rules on safety and health at work, Prevention and firefighting and environmental protection in the food industry
2. Training of staff in the food industry. Types of training
3. Personal protective equipment and fire extinguishing equipment
4. Risk Factors in the Food Industry. Classification of risk factors. Effects of risk factors. Measures to prevent risk factors
5. Occupational accidents and occupational diseases – definitions – classification - preventive measures
6. First aid measures in case of accident
7. Emergency and evacuation measures specific to the workplace in case of: fire, flood, earthquake
8. Waste and waste circuit of the food industry
9. Collection, storage and disposal of waste and residues
10. Sources of pollution in the food industry. Classification of sources of pollution. Measures to prevent and combat pollution

## **Module 2 – Microbiology and hygiene in the food industry**

1. Characterization of microorganisms
  - Microorganisms: Bacteria, yeasts, molds
  - Morphology of microorganisms: shape, dimensions,
  - Physiology of microorganisms: nutrition, multiplication
2. Techniques for making wet and dry preparations. Microscope: component parts, use. Wet and dry microscopic preparations: utensils, preparation, simple and double coloring
3. The action of external factors on microorganisms. Influence of physical factors (temperature, humidity, osmotic pressure, external pressure). Influence of mechanical factors (agitation). The influence of chemical factors (pH, chemicals)
4. Ways of spreading microorganisms in nature. Soil microflora: bacteria, actinomycetes, fungi, pathogenic microorganisms. Water microflora: sulphurous,

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ferruginous, rotting, butyric bacteria, cellulose-fermenting bacteria. Air microflora: bacteria, molds (sporulated forms).

5. Useful and harmful microorganisms in the food industry. Useful microorganisms: bacteria (lactic, acetic), yeast (beer), mold ("noble") used in the food industry. Harmful microorganisms: pathogenic (viruses, bacteria) and alteration (viruses, bacteria, yeasts, molds).

6. Individual hygiene rules in the food industry. Individual hygiene rules: according to the rules and procedures in law. Consequences of non-compliance with hygiene rules.

7. Methods of hygiene of food industry premises and equipment. Hygiene rules: of premises and equipment. Cleaning and sanitation materials.

8. Diseases due to the consumption of contaminated food. Characterization of pathogens. Classification of diseases due to contaminated food consumption.

9. Factors that lead to food contamination. Contamination at manufacturing. Contamination during transportation. Contaminated storage. Measures to prevent food contamination.

### **Module 3 – Operations and equipment in food industry**

1. Specific terms of a technological process:

- unit operations,
- raw materials,
- by-products,
- finished product,
- waste,
- technological process,
- manufacturing scheme.

2. Material balance:

- total,
- partial.

3. Transport of materials: classification of means of transport.

- Transport of liquid and gaseous materials:
  - ✓ characterization of the fluid state,
  - ✓ Physical properties of fluids.
- Types of pumps for fluid transport (construction, operation):
  - ✓ centrifugal pump,
  - ✓ gear pump,

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- ✓ pump rotary piston pump,
- ✓ the injector.
- Transport of solid materials:
  - ✓ characterization of conveyors for solid materials,
  - ✓ Classification of conveyors for solid materials.
- Conveyor types for solid materials (construction, operation):
  - ✓ gravitational transporters (slide, gutter, inclined plane),
  - ✓ conveyor belt,
  - ✓ elevatorul,
  - ✓ Helical conveyor.
- 4. Pneumatic transport:
  - ✓ the principle of achieving pneumatic transport.
  - ✓ Pneumatic transport installations (construction, operation): by aspiration, from discharge.
- 5. Grinding of the materials:
  - ✓ principles underlying the operation (definition, purpose, factors of influence),
  - ✓ methods and shredding processes
  - ✓ classification of grinding machines.
  - ✓ Shredders (construction, operation):
    - o Machines for grinding high-hard materials: crusher, cylindrical, hammer mill;
    - o machines for grinding of medium hardness materials: automatic roller;
    - o Machines for grinding high consistency materials: vegetable cutting machine, volf, cutter.
- 6. Separating solid materials by sorting:
  - ✓ principles underlying the operation (definition, generalities, factors of influence).
  - ✓ Equipment used for sorting solid materials (construction, operation):
    - o plane plane;
    - o alveolar tricuspid;
    - o tararul.
- 7. Separation of heterogeneous mixtures:
  - ✓ principles underlying the operation (definition, purpose, factors of influence).
  - ✓ Equipment used for the separation of heterogeneous mixtures (construction, operation):
    - o dehumidifying chamber with baffles,
    - o the horizontal decoder,
    - o plain Florentine waist,

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- the bag filter,
  - open filter with agitator,
  - filter with frames and plates,
  - Vertical decanter centrifuge with tray,
  - Horizontal filter centrifuge.
8. Mixing of solid, pasty and liquid materials:
- ✓ principles underlying the operation (definition, purpose, factors of influence).
  - ✓ Mixing equipment (construction, operation):
    - agitator,
    - double drum mixer,
    - branch and propeller mixers;
    - pneumatic spraying mixer.
9. Heat Transfer Operations:
- ✓ Heat Transfer Modes: Conduction, Convection, Radiation, Mixed;
  - ✓ thermal heaters: heating, cooling;
10. Heating and cooling:
- ✓ principles underlying the operation (definition, generalities, factors of influence).
  - ✓ Heating and cooling equipment (construction, operation):
    - the jacket heat exchanger,
    - the coil heat exchanger,
    - Multi-tubular heat exchanger.
11. Pasteurization:
- ✓ the underlying principles of carrying out the operation (definition, purpose, factors of influence).
  - ✓ devices used for pasteurization (construction, operation):
    - heat exchanger with plates.
12. Sterilization:
- ✓ the underlying principles of carrying out the operation (definition, purpose, factors of influence).
  - ✓ devices used for sterilization (construction, operation):
    - autoclave.
13. Refrigeration:
- ✓ principles underlying the conduct of operation (definition, purpose, factors of influence),
  - ✓ refrigeration methods



14. Freezing:
  - ✓ principles underlying the conduct of operation (definition, purpose, factors of influence),
  - ✓ freezing methods
15. Operations that ensure conservation by reducing humidity:
  - ✓ The classification of the purposes of the operation of conservation by reducing moisture
  - ✓ Concentration through vaporization: principles underlying the conduct of operation (definition, purpose, factors of influence).
  - ✓ Machines used for concentration (construction, operation): concentration plant with simple installation, concentration-effect with multiple.
16. Drying:
  - ✓ principles underlying the conduct of operation (definition, purpose, factors of influence).
  - ✓ Drying equipment (construction, operation):
    - Tower drier.
17. Condensation:
  - ✓ principles underlying the conduct of operation (definition, purpose, factors of influence).
  - ✓ devices used for condensation (construction, operation):
    - capacitor altimeter with trays
18. Distillation:
  - ✓ principles underlying the conduct of operation (definition, purpose, factors of influence).
  - ✓ Installations used for distillation (construction, operation):
    - distillation plant with discontinuous operation,
    - the continuous distillation.

### **Module 3 – Operations and equipment in food industry**

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  - ✓ raw materials,
  - ✓ by-products,
  - ✓ finished product,
  - ✓ waste,
  - ✓ technological process,
  - ✓ manufacturing scheme.



2. Material balance:
  - ✓ total,
  - ✓ partial.
3. Transport of materials: classification of means of transport.
  - ✓ Transport of liquid and gaseous materials:
    - characterization of the fluid state,
    - Physical properties of fluids.
  - ✓ Types of pumps for fluid transport (construction, operation):
    - centrifugal pump,
    - gear pump,
    - pump rotary piston pump,
    - the injector.
  - ✓ Transport of solid materials:
    - Characterization of conveyors for solid materials,
    - Classification of conveyors for solid materials.
  - ✓ Conveyor types for solid materials (construction, operation):
    - gravitational transporters (slide, gutter, inclined plane),
    - conveyor belt,
    - elevatorul,
    - Helical conveyor.
4. Pneumatic transport:
  - ✓ the principle of achieving pneumatic transport.
  - ✓ Pneumatic transport installations (construction, operation): by aspiration, from discharge.
5. Grinding of the materials:
  - ✓ principles underlying the operation (definition, purpose, factors of influence),
  - ✓ methods and shredding processes
  - ✓ classification of grinding machines.
  - ✓ Shredders (construction, operation):
    - Machines for grinding high-hard materials: crusher, cylindrical, hammer mill;
    - machines for grinding of medium hardness materials: automatic roller;
    - Machines for grinding high consistency materials: vegetable cutting machine, volf, cutter.
6. Separating solid materials by sorting:
  - ✓ principles underlying the operation (definition, generalities, factors of influence).

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- ✓ Equipment used for sorting solid materials (construction, operation):
  - plane plane;
  - alveolar tricuspid;
  - tararul.
- 7. Separation of heterogeneous mixtures:
  - ✓ principles underlying the operation (definition, purpose, factors of influence).
  - ✓ Equipment used for the separation of heterogeneous mixtures (construction, operation):
    - dehumidifying chamber with baffles,
    - the horizontal decoder,
    - plain Florentine waist,
    - the bag filter,
    - open filter with agitator,
    - filter with frames and plates,
    - Vertical decanter centrifuge with tray,
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- 8. Mixing of solid, pasty and liquid materials:
  - ✓ principles underlying the operation (definition, purpose, factors of influence).
  - ✓ Mixing equipment (construction, operation):
    - agitator,
    - double drum mixer,
    - branch and propeller mixers;
    - pneumatic spraying mixer.
- 9. Heat Transfer Operations:
  - ✓ Heat Transfer Modes: Conduction, Convection, Radiation, Mixed;
  - ✓ thermal heaters: heating, cooling;
- 10. Heating and cooling:
  - ✓ principles underlying the operation (definition, generalities, factors of influence).
  - ✓ Heating and cooling equipment (construction, operation):
    - the jacket heat exchanger,
    - the coil heat exchanger,
    - Multi-tubular heat exchanger.
- 11. Pasteurization:
  - ✓ the underlying principles of carrying out the operation (definition, purpose, factors of influence).
  - ✓ devices used for pasteurization (construction, operation):

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- o heat exchanger with plates.

12. Sterilization:

- ✓ the underlying principles of carrying out the operation (definition, purpose, factors of influence).
- ✓ devices used for sterilization (construction, operation):
  - o autoclave.

13. Refrigeration:

- ✓ principles underlying the conduct of operation (definition, purpose, factors of influence),
- ✓ refrigeration methods

14. Freezing:

- ✓ principles underlying the conduct of operation (definition, purpose, factors of influence),
- ✓ freezing methods

15. Operations that ensure conservation by reducing humidity:

- ✓ The classification of the purposes of the operation of conservation by reducing moisture
- ✓ Concentration through vaporization: principles underlying the conduct of operation (definition, purpose, factors of influence).
- ✓ Machines used for concentration (construction, operation): concentration plant with simple installation, concentration-effect with multiple.

16. Drying:

- ✓ Principles underlying the conduct of operation (definition, purpose, factors of influence).
- ✓ Drying equipment (construction, operation):
  - o Tower drier.

17. Condensation:

- ✓ principles underlying the conduct of operation (definition, purpose, factors of influence).
- ✓ devices used for condensation (construction, operation):
  - o capacitor altimeter with trays

18. Distillation:

- ✓ principles underlying the conduct of operation (definition, purpose, factors of influence).
- ✓ Installations used for distillation (construction, operation):
  - o distillation plant with discontinuous operation,
  - o the continuous distillation.

#### **Module 4 – Manufacture of bakery products**

1. Raw materials and auxiliaries used in physical and technological. Features of flour
2. Technological process of manufacture of bakery products.
  - a. Machinery and equipment used in the manufacture of bakery products
  - b. Sanitizing utensils, vessels, machinery and installations used in the manufacture of bakery products
  - c. methods of preparation of the dough
3. Classification of ovens (by mode of operation, after the fuel used, by number of winds) of bakery
4. Preparing finished products for packaging. Ways of packaging and labeling finished products.
5. Hygiene and OSH standards specific to bakery products
6. Traditional bread products specific to different geographical areas

#### **Module 5 – Pastry products manufacture**

1. Raw and auxiliary materials used in pastry
2. Calculation of the recipe for the pastry
3. Technological schemes for obtaining pastry products from different types of dough
4. Classification of semipreparations used in pastry
5. Preparation of semipreparations used in pastry
6. Quality indices of pastries used in pastry
7. The technological process of obtaining pastry products from leavened dough dough
8. Quality indices of pastry dough products
9. The technological process of obtaining dough pastry products
10. Quality indices of dough pastry products
11. Preparation of different types of pie
12. Production defects of the pie
13. Measures of remedy the defects of the pie
14. Preparation of pie pastry products
15. Preparation of pie dough
16. Preparation of dough pastry products
17. Preparation of sheet dough pastry products
18. Means of presentation of pastries

19. Equipment and specific equipment used in pastry
20. Hygiene, SSH and environmental protection standards for pastry products

### **Module 6 – Manufacture of other flour products**

1. Raw and auxiliary materials used in the manufacture of nuts
2. Classification of pasta products
3. Technological schemes to obtain:
  - a. biscuits,
  - b. sticks
  - c. sweet cake
4. The manufacturing process of:
  - a. biscuits,
  - b. sticks
  - c. wafers
  - d. pasta
5. Packaging of pasta products
6. Machinery, aggregates and installations specific to the manufacture of pasta
7. Hygiene and SSM standards specific to the production of the products

## **2. SLOVENIAN CURRICULUM FOR BAKERS QUALIFICATION**

Required professional knowledge and skills:

- ✓ completed elementary education and
- ✓ vocational training (theoretical and practical).

The candidate prepares a personal portfolio, which is assessed by national commission and have practical verification with oral presentation.

- MATERIAL AND PERSONNEL REQUIREMENTS THAT MUST BE MET BY INSTITUTIONS CONDUCTING PROCEDURES FOR THE DETERMINATION AND VALIDATION OF OCCUPATIONAL QUALIFICATIONS:

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- Material requirement space with appropriate room temperature, warehouse for raw materials and product, working counter, scale, dispenser, sifter, kneating machine, machine for separating and rounding pieces of dough and pastries, dough proofer, convection and multi-deck oven, utensils and tools for the technological procedures of product making, cleaning and desinfection preparations, personal protective equipment

□ MEMBERS OF COMMISSION FOR THE VERIFICATION AND VALIDATION ON NATIONAL LEVEL:

- one member has at least university education in food technology

and 5 years of work experience in food technology;

- the second member has at least higher professional education in food technology and five years of work experience in food technology;

- the third member must meet one of the criteria referred in the first or second indent or is a bakery chef

**STANDARD OF PROFESSIONAL KNOWLEDGE AND SKILLS:**

- ✓ Kneading various types of bread and pastry dough, preparing raw materials, sifting flour or supervising the automatic transport and sifting of flour.
- ✓ Manually or mechanically weighing raw materials.
- ✓ Additionally preparing raw materials: combining certain types of flour, soaking seeds and cereal.
- ✓ Preparing leaven and sourdough with cultures in indirect methods.
- ✓ Adding water and other liquids.
- ✓ Adjusting water quantity according to flour quality and other conditions that affect product.
- ✓ Regulating water temperature according to the desired dough temperature by considering the temperature of raw materials and the surrounding environment.
- ✓ Adding yeasts (adjusting yeasts quantity according to the temperature of raw materials and the surrounding environment).
- ✓ Controlling and adding other raw materials (salt, sugar, fats, eggs, milk, spices).
- ✓ Mixing and kneading dough.
- ✓ Regulating kneading processes according to flour quality –quality of gluten.
- ✓ Operating kneading machines.
- ✓ Gradually adding raw materials and leading the process of dough preparation in indirect methods.
- ✓ Supervising dough maturation and re-kneading dough.
- ✓ Having knowledge of ingredients of various types of bread and pastry dough.

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- ✓ Knowing how to select a recipe according to the desired product.
- ✓ Having knowledge of sifting, whipping, griding, melting...
- ✓ Having knowledge of different kneading methods according to the type of product.
- ✓ Having knowledge of the fermentation process.
- ✓ Having knowledge of mechanical kneading and operating kneading machines and dumpers.
- ✓ Having knowledge of kneading duration according to the final product.
- ✓ Having knowledge of how to prepare raw materials for kneading.
- ✓ Having knowledge of the kneading procedure (adding raw materials) and kneading duration.
- ✓ Having knowledge of appropriate temperature of dough and the surrounding environment in which the dough rises.
- ✓ Having knowledge of the characteristics dough obtains while resting in a boiler and having knowledge of adjusting the resting time.
- ✓ Kneading bread and pastry dough as requested by the commission.
- ✓ Selecting the recipe according to the final product.
- ✓ Having knowledge how to select a recipe according to the desired product.
- ✓ Having knowledge of ingredients for various types of bread and pastry dough.
- ✓ Preparing leaven and sourdough with cultures in indirect methods.
- ✓ Appropriate handling of allergenic ingredients.
- ✓ Supervising dough maturation and re-kneading dough.
- ✓ Complying with work safety and health regulations.
- ✓ Complying with the principles of good hygiene.
- ✓ Baking bread and pastries determining the leavening of dough and suitability for baking.
- ✓ Cutting and coating over shaped pieces of risen dough.
- ✓ Preparing and operating a baking oven (setting the temperature and other baking conditions).
- ✓ Manually and automatically inserting products into an oven and supervising the insertion.
- ✓ Regulating the baking of products (supervising the baking process, altering the baking conditions).
- ✓ Manually or mechanically removing products from the oven.
- ✓ Transporting baked products (manually with a trolley or automatically on a cooling belt).
- ✓ Having knowledge of different baking oven types.
- ✓ Having knowledge of processes occurring in dough during baking.
- ✓ Having knowledge of how temperature and moisture affect baking.



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- ✓ Having knowledge of how determine baking duration.
- ✓ Having knowledge of defects occurring during baking.
- ✓ Having knowledge of how to calculate the baking loss of products.
- ✓ Selecting and preparing baking trays and mould.
- ✓ Properly sorting products onto and inserting into baking trays or moulds.
- ✓ Determining the leavening level of products.
- ✓ Preparing products for baking: piercing, cutting, coating, sprinkling of dough pieces.
- ✓ Participating in baking, selecting the appropriate temperature and baking duration according to dough type and weight.
- ✓ Inserting products into an oven.
- ✓ Baking products in different ovens.
- ✓ Emptying the oven, placing products onto cooling trolleys.
- ✓ Ensuring the quality performance of work.
- ✓ Complying with work safety and health regulations.
- ✓ Prudent use of energy, materials and time.
- ✓ Cooling, refrigerating and freezing products supervising the cooling of baked products.
- ✓ Supervising the freezing or pasteurization of special products.
- ✓ Ensuring the quality and appropriate preparation of products for storage.
- ✓ Having knowledge of different methods for making pastries through slow or interrupted fermentation.
- ✓ Having knowledge of how to make pastries through controlled fermentation and half-baked pastries.
- ✓ Having knowledge of cooling, freezing and defrosting pastries.
- ✓ Emptying the oven and cooling products (placing products onto cooling trolleys).
- ✓ Sorting through products, eliminating them, placing them into caskets and preparing them for sale.
- ✓ Ensuring the quality of products and services.
- ✓ Cutting, packing and sorting products; cutting or supervising the automatic cutting of products.
- ✓ Manually or mechanically weighting and packing products.
- ✓ Fitting the products with the corresponding declaration.
- ✓ Checking the mass of packed products.
- ✓ Selecting the appropriate storage method according to time of storage and type of product.
- ✓ Controlling and regulating conditions in warehouses.
- ✓ Having knowledge of bread's aging process, spoiling and bread defects.

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- ✓ Having knowledge of storage conditions.
- ✓ Having knowledge of product packaging.
- ✓ Having knowledge of how to cut and package products.
- ✓ Having knowledge of product packaging, declaring and storing regulations.
- ✓ Packaging and storing products.
- ✓ Manually or automatically packing bread and pastries.
- ✓ Selecting the corresponding declaration and labelling bread and packaged pastries.
- ✓ Presenting storage methods according to the estimated time of storage and type of product.
- ✓ Delivering, sorting and loading confectionery products for the shop.
- ✓ Being in charge of the shop's aesthetic appearance.
- ✓ Selling products to costumers.
- ✓ Ensuring hygiene, safety and quality of products.
- ✓ Maintaining personal hygiene before, during and after work processes, especially when handling products.

### **3. TURKISH CURRICULUM FOR BAKERS QUALIFICATION**

The Bakery Curriculum of Turkey contains 7 main titles – 7 different modules. These are :

the Food Technology (I),

the Bread Dough Preparation (II),

the Bread Fermentation (III),

the Baking Bread (IV),

The Production of Different Bread Types (V),

the Preparing Additive Bread (VI) and,

the Preparing Products with Fermented Dough (VII).

In the first module, the Food Technology, it includes some subtitles. The first subtitle is about staff hygiene. In this part there are explanations about hygiene and sanitation, personnel cabinets (dressing rooms for the staff) and their features, the tools required in staff cabinets, working clothes and protective materials, the matters to be

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considered when wearing working clothes, cleaning and maintenance of working clothes. The second subtitle of the module is on personal cleaning rules. In this part, it talks about the body cleaning of the workers in point of many aspects of view in detail. The third part of the module is about toilets, bathrooms and hand washing areas in enterprises.

In the second module, there is mention about the Bread Dough Preparation. And this module also contains three articles and their subtitles. The first article is about basic components in bread production like flour, salt, water and yeast and the preparation of basic components according to formulation and production quality. The second one is about auxiliary components in bread production like antimicrobial substances, sweeteners, oxidants, enzymes, oils, stabilizers, gels and thickeners and so on, and the calculation and preparation of the components according to formulation. The last article is about different kinds of dough making methods and kneading dough processing.

The third module is about the Bread Fermentation. It has two subtitles. The first one mentions about mass fermentation on dough processing detail such as its purpose and function and, machinery and equipments used in the process. The second subtitle is about final fermentation and its purpose, functions, features and types.

The fourth module of the Curriculum tells about the Baking Bread. When mentioning about this subject, this module also refers to some other matters concerning baking bread. For instance, considering making bread dough, it explains about commonly used oven types and their properties and, all stages of baking bread dough. In addition to this, there is an article on cooling and packaging the bread. The last article of this module tells the bread defects and diseases.

The fifth part of the Curriculum is about the Production of Bread Types such as francala bread, whole wheat bread, rye bread, corn bread and, their definitions, properties, formulation, and how to bake all these kinds of breads and their sales methods.

The sixth module of the Curriculum is about the Preparing Additive Bread. When it mentions about this subject, it describes the tools and materials used in preparation, the properties and quantities of sample additives included to breads such as bird grapes, cinnamon, anise, sesame, walnut, sunflower seed and other mostly known and used additives like milk, yoghurt, cheese, potato, olive, parsley etc. It also explains about the preparation process, forming the dough and baking stages.

The seventh and the last part of the Curriculum tells about the Preparing Products with Fermented Dough. This module focuses firstly on preparation of fermented dough, the effect of yeast on dough, the methods of fermentation with different types of yeasts. Then it tells about preparing regional products from fermented dough like pies, biscuits, cookies, buns, muffins, cakes, and international products like bagels, donuts, berliners, pancakes, croissants and pizzas.

#### **4. ITALIAN CURRICULUM FOR BAKERS QUALIFICATION**

The Italian educational and training system is structured on the principles of subsidiarity and autonomy of educational institutions. The State has exclusive legislative jurisdiction on the “general laws of education” and for establishing the basic level of performances that have to be ensured in all the national territory.

The State, moreover, set the fundamental principles that regions have to respect, while managing their specific powers. The regions have concurrent legislative competences in educational sector while they have exclusive competences on vocational and educational training. The national educational institutions have autonomy in education, organisation and research, experimentation and development.

##### Mandatory education and vocational training

Mandatory education lasts for 10 years, from 6 to 16 years old, and entails eight years of the first cycle and the first two years of the second cycle (law 296 of 2006) that can be attended either in the secondary state school or in the regional vocational and educational training courses.

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At the end of the mandatory educational cycle, it is possible to go ahead with the studies or to apply for training courses that provide qualification and certificates suitable for an dependent or independent job. The baker qualification is included in the vocational training.

To get qualified as baker it is needed:

To attend a vocational training course organised by a trade association or a private body:

- ✓ a course of professional baker, to whom wants to get sectoral competences and practical and operational skills about the preparation of baked goods, allows to learn the job and to work as a baker in the sector of commercial food service, both as entrepreneur or employee.

Normally the participation to the courses entail to get a certification:

- ✓ HACCP certification – mandatory to undertake any job in the food sector
- ✓ Certification about the “safety in the work places”
- ✓ Certification of professional qualification “qualified baker” valid at national and EU level.

To complete an apprenticeship program:

- First level apprenticeship for qualification or diploma.
- In some regions it is foreseen a three or four years apprenticeship, according to education cycles.
- The participation to the program results in a certification or a diploma to enter the job market.
- Apprenticeship for youth between 18 and 29 years with professional qualification.
- The apprenticeship contract lasts at the most, 60 months.

Professional profile description

The baker makes baked good and fresh pastry goods. He/She carries out both manual activities and through machines and equipment. Most of the working activities are the same for baker and the pastry maker. Some activities are carried out more specifically by the baker (automatic moulding) or pastry maker (filling and adornment). The baker elaborates recipes and modify the ingredients

according to the needs, he/she takes care of the appearance and the exhibition of the products.

The baker can work as employee within a bakery or pastry-making and he/she can, after getting the qualification, open his/her own business as artisanal entrepreneur.

In the last years, the baker profession undertook a major change due to technological innovation. Nowadays, basic IT skills are required for the use of equipment software and for the management of companies' processes.

Moreover the work is done standing and in a hot and humid environment. The availability to the night work and a good health state, without respiratory diseases or allergies, are essential.

Many skills are required in this field, such as: precision, responsibility at work, power of observation, manual skills, finger dexterity, technical understanding.

It is required good taste and smell and aesthetic sense. Moreover, it is required mathematical ability and a good oral communication. Finally, it is essential to have the ability to handle heavy workloads and operate effectively under stressful conditions.

## **5. GREEK CURRICULUM FOR BAKERS QUALIFICATION**

### **Professional Profile of Specialty**

The branch of bakery-pastry making is one of the most dynamic pillars of the food service industry. Bread is a basic accompaniment to every meal, while the dessert completes our daily menu deliciously. The fundamental role of baking-pastry products in our daily dietary habits has imposed the need for specialised professionals, significantly increasing both the demand and the economic benefits of the industry.

The IEK Graduates of the Specialty "**Bakery – Pastry Technician**" with the specialised knowledge and skills acquired during their education, deal with the preparation of bread, pastries, sweets and dishes of all kinds and forms, organize their production into the necessary quantities, in accordance with market and health rules.

Besides classical bakery, which offers plenty of jobs in bakeries, patisseries, catering companies, etc., a specialised Bakery – Pastry Technician has the ability to work in the Tourism Industry both in Greece and abroad.

### **Areas of Employment**

The IEK graduate of the Specialty "**Bakery – Pastry Technician**" with the specialised knowledge and skills acquired during his/her education can work in Hotel and Catering Enterprises of any form and structure, both in the Private and the Public sector, in the jobs related to his/her subject matter.

Bakers – Pastry Chefs work as freelancers in their own businesses, whether they are employed as employees in other small or Large Enterprises in the Food Service Industry or Hotel – Tourism sector, or in particular in recent years in the growing Bread Industry, as well as in large Confectionery chains in Retail Trade. Concerning Small businesses which are mostly family-run, there are no significant restrictions to access the profession. The Bakery – Pastry Industry offers employment to a large number of employees as well as in related professions (such as producers and suppliers of raw materials, machinery, flour industries, etc.) that give the Greek economy in proportion to its share, a strong dynamic of independence and self-sufficiency.

### **Professional Qualifications**

The professional qualifications obtained by the graduate of this Specialty according to the relevant profile of E.O.P.P.E.P. (the National Organisation for the Certification of Qualifications and Vocational Guidance) to which the Specialty corresponds consist of the following:

#### **1. Bread making, bakery products and pastries.**

- Preparation of yeast.
- Shaping of dough.
- Baking.

#### **2. Production of types of pastry making based on flour.**

- Preparation of dough.
- Shaping of pastry - Rolling out of pastry.
- Baking.

#### **3. Production of types of pastry making based on Sugar, Chocolate, Dairy products, etc.**

- Creation of mixtures of any kind based on the above raw materials and auxiliaries.



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- Shaping them into different sizes and shapes.
- Decoration of each preparation.

**4. Organisation and management of the Bakery – Patisserie.**

- Financial Management.
- Warehouse Organisation and Stock Management.
- Capital Management (physical and intangible)

**Professional Tasks**

**The tasks that will be assigned to the Graduates of the Specialty are as follow:**

- Baker – Pastry Chef.
- Entrepreneur.
- Executive of an existing craft unit.
- Executive in the food service industry.
- Production Team Manager.
- Supervisor of a Laboratory for Production of testing samples.
- Executive of a Chain of Stores.
- Production Manager in an Industry of raw materials.
- Supervisor of a Laboratory for raw materials testing.
- Executive Promoter of raw and auxiliary materials.
- Department store Chain Manager.
- Supervisor of a Production Laboratory.
- Production Planning Manager.
- Supply Manager.
- Selection and practical Quality control of raw and auxiliary materials and their supply.
- Production and Quality control of products.
- Products display and distribution.
- Furthermore, these Executives should be able to be in a position to proceed in:
  - Improvement of the existing Products.
  - Development and production of new Products.
  - Financial evaluation of Products, analysis of cost elements and determination of the sale price.
  - Production planning and utilization of economies of scale.

The Specialty "**Bakery – Pastry Technician**" of IEK is equivalent to the following Specialties of the Professional Education and Training Schools below:

<b>EPA.S.</b> <b>Professional Training Schools</b>
Organisation of Employment of Workforce (O.A.E.D.) <b>BAKERY – PASTRY MAKING</b>
Organisation of Tourism Education and Training (O.T.E.K.) <b>THE ART OF PASTRY MAKING</b>
<b>I.E.K.</b> <b>Institutes of Professional Training</b>
<b>BAKERY – PASTRY TECHNICIAN</b> (according to the Law N.2009/92)

## 6. LATVIAN CURRICULUM FOR BAKERS QUALIFICATION

### Description of Employment

- Vocational qualification level – the second vocational qualification level
- Summary of the basic tasks of professional activities:

Baker is an employee in the sector of food production who works for the bread production merchant where he or she cooks bread from wheat or rye in large quantities. He or she has the following duties: to manage the technological process of bread production and to perform a skilled job to obtain a quality final product, as well as to participate in introduction of new products.

### Professional Competences Necessary for Performing Professional Activities (1)

1. Ability to understand hygiene requirements in food production.
2. Ability to perform work accordingly to the given task.
3. Ability to determine the quality of raw materials and their organoleptic indicators.
4. Ability to perform preparation of raw materials for the production.
5. Ability to understand the technological process of product preparation and comply with it, and to make the necessary calculations.
6. Ability to understand the exploitation and maintenance of the equipment.

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7. Ability to understand the technical documentation.
8. Ability to work with technical equipment in accordance with the exploitation rules.
9. Ability to understand work safety and fire safety rules and to comply with them.
10. Ability to comply with work ethics principles.
11. Ability to comply with basic principles of good production and hygiene practice.
12. Ability to follow and learn the latest information in the sector.
13. Ability to protect environment.
14. Ability to communicate in the official language and in one foreign language.
15. Ability to use professional terms in a foreign language.
16. Ability to work independently and cooperate in a team.
17. Ability to follow the latest news in the sector by using all accessible information sources.
18. Ability to use information technologies.

**Skills Necessary for Performing Basic Tasks of a Professional Activity (1)**

1. Prepare the work place according to the instructions.
2. Comply with the labour protection, fire and electrical safety rules.
3. Be able to provide the first aid.
4. Use technological documentation.
5. Fulfil the requirements of the food production technological cycles prescribed by the laws and regulations.
6. Comply with the sequence of the technological process.
7. Prepare the raw materials for processing according to the recipe requirements.
8. Perform the necessary actions to ensure the technological process at any time.
9. Count the ready production.
10. Analyse the results of his or her own work.
11. Be able to use the latest information and production technologies.

12. Improve his or her knowledge about the innovations in the sector.
13. Perform basic principles of good hygiene and production practice.
14. Master the laws and regulations regarding the food products circulation and self-control.
15. Comply with the basic principles of work ethics.
16. Communicate in the official language and one foreign language.
17. Be able to work independently and in a team.
18. Protect the environment.

### **Knowledge Necessary for Performing Basic Tasks of a Professional Activity (1)**

1. Knowledge necessary for performing basic tasks of a professional activity at the level of notion:
  - o employment legal relationships;
  - o labour protection requirements;
  - o environment protection requirements;
  - o basics of business;
  - o basics of communication.
2. Knowledge necessary for performing basic tasks of a professional activity at the level of understanding:
  - o basic principles of risk analysis critical points;
  - o general hygiene requirements;
  - o basics of chemistry;
  - o the basic principles of cleaning, washing and disinfection;
  - o basic knowledge of the technical drawing;
  - o technical designations;
  - o regulated parameters;
  - o electrical safety requirements for the equipment;
  - o fire safety rules;
  - o importance of records in a quality management system;
  - o basics of business;
  - o loss of raw materials and the reasons for it;
  - o professional development opportunities.

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3. Knowledge necessary for performing the basic tasks of the professional activity at the level of use:
- o bread production technology;
  - o personal hygiene;
  - o basic operation principles and exploitation of the technological equipment;
  - o knowledge about certain raw material requirements;
  - o basics of microbiology;
  - o official language;
  - o professional terminology in the official language and one foreign language;
  - o information technologies;
  - o first aid.

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**COMPARISON OF THE ALL PARTENRS CURRICULA**

	ITALY	TURKEY	LATVIA	SLOVENIA	GREECE	ROMANIA
LEVEL	Level 3	Level 2	Level 2	Level 3	Level 5	Level 2
NUMBER OF HOURS - THEORETICAL - PRACTICAL	As private VET course: 600 h. - theory 900 h. - practice	640 total -360 theory - 280 practice (adjustable - depends on needs of trainees)	240  240	Appoint by themselves the number of hours Office of Unemployment says how many hours you can provide  300 hours -60 theory -240 practice	- 625 theory - 675 laboratory - 960 practical	240 theory 480 practice
MODULES (nr. and types)	List of activity areas: 1. Supply definition 2. Provision, delivery, storage and preservation of foods 3. Dough preparation 4. Dough moulding (manual or automatic) 5. Leavening 6. Cooking	7 modules Mostly about manufacturing the bread and bakery products Hygiene	7 modules -technology -material training -basics of chemistry - sanitary and hygiene -labor and fire safety -business -communication (official language)	8 modules 5 Theoretical 3 practical  Basics of biotechnology Food technology Management Types of bread and pastry – 3 modules	13 modules - Language skills - Food industry knowledge - Hygiene And safity - Economics	9modules Communication IT skills Teamwork Bakery Pastry

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	<p>7. Filling and decoration</p> <p>8. Packaging and distribution</p> <p>9. Environmental and personal hygiene</p> <p>10. Lab arrangement</p>					
INITIAL REQUIREMENTS FOR TRAINEES	<p>First cycle of secondary school (4/5)</p> <p>Medical exam</p> <p>BEFORE:</p> <p>Mandatory education lasts for 10 years, from 6 to 16 years old, and entails eight years of the first cycle and the first two years of the second cycle (law 296 of 2006) that can be attended either in the secondary state school or in the regional vocational and educational training courses</p> <p>LATER:</p>	Age limitation ( to be over 18)	<p>Primary school</p> <p>Medical examine</p>	<p>Primary education</p> <p>Over 18 years old</p> <p>Medical exam</p> <p>HACCP exam</p> <p>Exam of work safety</p>	<p>Secondary school education (12years)</p> <p>Medical certificate</p>	<p>10years mandatory school education</p> <p>Medical certificate</p>



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	At the end of the mandatory educational cycle, it is possible to go ahead with the studies or to apply for training courses that provide qualification and certificates suitable for an dependent or independent job. The baker qualification is included in the vocational training.					
SPECIAL REQUIREMENTS FOR TRAINERS	<ol style="list-style-type: none"> <li>1) Secondary school addressed to technical studies</li> <li>2) 3 years of experience as teacher</li> </ol>	University degree in domain of food Technology and catering services (the name of the faculty- 2 or 4 years). Work experience is preferable.	At least University degree in pedagogy;  Qualification of baker.	For practical stage: 8 years work experience, Bologna degree (3 years of university) For theoretical – University degree of food technology and pedagogical exam.	5 years experience in domain For theory – University degree For practical – min 5 years experience in domain of food	Depends on organization the number of years of experience Theory – University degree in domain, trainer certificate Practice – trainers certificate studies and experience in food industry
SPECIAL REQUIREMENTS FOR THE COURSE	Authorization from regional training authority for the classrooms Practical stages in enterprises	To have classrooms To have laboratories Practice is in the enterprises	Licence and accreditation of the programme from State Education	Classrooms for theoretical stage – authorized. Practice is in the enterprises	To have classrooms To have laboratories Practice is in the enterprises	Agreements for practice stages Authorized classrooms Practice is in the enterprises.

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	The annual catalogue of regional training courses (you have to have this course in this catalogue).		Quality Service.  Material-technical base according to qualification. Authorized classrooms.  Practice is in the enterprises and in school laboratories.			Accreditation of the course from Regional Authority.
EVALUATION (for certification)	The final exam with examiners from Regional Educational System to obtain the professional Certificate.	At the end of each module By the institute's teachers	By the company's evaluators - at the end of the course 1 theoretical exam 1 practical exam	National Commission	Every 3 months After each half semester and at the end of semester By the company's evaluator	National commission at the end of the course 1 theoretical exam 1 practical exam
CERTIFICATION (value of certificates)	HACCP certification – mandatory to undertake any job in the food sector  - Certification about the “safety in the work places”  - Certification of	National certificates for the level 2 (beginners)	National professional certificates for the occupation of Baker	National Certificate for the vocation not for the level of education	National Certificate for the level 5 (last level)	National professional certificates for the occupation of Baker and Pastry maker

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	professional qualification “qualified baker” valid at National and EU level.					
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**SIMILARITIES:**

- All the countries have theoretical and practical stages
- All of us have more than seven modules
- All include hygiene, safety of the workplace and technology of preparation of the bread from the beginning to the end (the use of ingredients, raw materials and equipments)
- The requirements for the trainees in almost all the countries are approximately the same : the required age and education
- Most of the countries require medical exam for trainees
- Most of the countries require University degree for trainers of theoretical part of the course and some experience in the domain
- All the countries need a kind of official authorization to start the course.
- In all countries the classrooms are authorized in a way or another to hold the course
- All countries have their practical stages in enterprises
- All countries have Evaluation to get certification
- All countries are being controlled by the national Authorities in their process of Evaluation.
- All countries have National Certificates for their gradulators which they can use to be employed

**DIFFERENCES:**

- The number of hours differ in all countries
- Some theoretical modules are different. Some countries have included communication, foreign languages, teamwork, economics, management modules.
- Some countries have special requirements for trainees (HACCP exam, Exam of work safety – because of the National Educational System)
- Number of years of experience for trainer is different in each country
- Some countries depend on their Regional Authorities, other countries depend on State Authorities to hold the course.
- Some of the countries organize their evaluation on the internal level, others by the external evaluators

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- Some countries have only final evaluation, others have also intermediate evaluation.
- Italy offers other certificates (not only for the qualification of baker) and after graduating the gradulators are obliged to get a job (mandatory to undertake any job in the food sector)

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